M. PLAN/ M. TECH. (PLANNING)

(1) SPECIALIZATION IN URBAN PLANNING

First Year: Integrated First Semester
Core Subjects
In. C.1.1 : Planning History and Theory
In. C.1.2 : Socio-economic basis for Planning
In. C.1.3 : Planning Techniques
In. C.1.4 : Infrastructure and Transport Planning
In. C.1.5 : Housing and Environmental Planning
In. C.1.6 : Studio course

First Year: Second Semester
Core Subjects
UP. C.2.1 : City and Metropolitan Planning
UP. C.2.2 : Infrastructure Planning
UP. C.2.3 : Urban Heritage Conservation
UP. C.2.4 : Advanced Planning Techniques
UP. C.2.5 : Studio Course
Elective Subjects (Select any one)
UP. E.2.1 : Inclusive Urban Planning
UP. E.2.2 : Planning for Tourism

Second Year: Third Semester
Core Subjects
UP. C.3.1 : Urban Development Management
UP. C.3.2 : Project Planning and Management
UP. C.3.3 : Urban Governance UP. C.3.4 : Politics and Planning
UP. C.3.5 : Studio
Elective Subjects (Select any one)
UP. E.3.1 : Environment, Development and Disaster Management
UP. E.3.2 : Energy, Climate change and Urban Development

Second Year: Fourth Semester
Core Subjects
UP. C.4.1 : Development Finance
UP. C.4.2 : Legal Issues and Professional Practice
UP. C.4.3 : Thesis

Note:
In. stands for Integrated First Semester.
UP. Stands for Urban Planning. RP.
Stands for Regional Planning.
EP. Stands for Environmental Planning.
H. stands for Housing

TP. Stands for Transportation Planning
IPM. Stands for Infrastructure Planning and Management.
C. stands for Core Subjects and E. stands for Elective Subjects.

SWARNIM INSTITUTE OF DESIGN

M. PLAN / M. TECH. (PLANNING) – INTEGRATED FIRST SEMESTER

Scheme of Examinations

Name of the Subject		Hours Per Week* L + T	Credits	Marks		
				Internal Assessment	End Semester Examination	Total
Core Subjects						
In. C.1.1 :	Planning History and Theory	2 + 1	2	50	50	100
In. C.1.2 :	Socio-economic basis for Planning	2 + 1	2	50	50	100
In. C.1.3 :	Planning Techniques	2 + 1	2	50	50	100
In. C.1.4 :	Infrastructure and Transport Planning	2 + 1	2	50	50	100
In. C.1.5 :	Housing and Environmental Planning	2 + 1	2	50	50	100
Sub-Total		**10 + 5**	**10**	**250**	**250**	**500**
Studio						
In. C.1.6 :	Studio course	3 + 0	2	100	-	100
Sub-Total		**3+0**	**2**	**100**	**-**	**100**
	Studio Assignments	0 + 12	8			
	Film Appreciation			50	-	50
	Literature Review			50	-	50
	Area Appreciation			50	50	100
	Site Planning			50	50	100
	City Development Plan			50	50	100
Sub-Total		**0 + 12**	**8**	**250**	**150**	**400**
Total		**13 + 17**	**20**	**600**	**400**	**1,000**

In. stands for Integrated First Semester.
C. stands for Core Subjects and E stands for Elective Subjects.
* L stands for Lectures and T stands for Tutorials or Studio.

M. Plan / M. Tech. (Planning) - Integrated First Semester

In. C.1.1 : PLANNING HISTORY AND THEORY

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Evolution of City Building

Relevance of the study of evolution of settlements; Hunter, gatherer, farmer and formation of organized society; Cosmological and other influences, origins and growth of cities, effects of cultural influence on physical form; Human settlements as an expression of civilizations; Basic elements of the city; Concepts of space, time, scale of cities.

Module 2: Planning History

Town planning in ancient India; Medieval, renaissance, industrial and post industrial cities; City as a living spatial entity; Concepts of landmark, axis, orientation; City form as a living space; City as a political statement: New Delhi, Chandigarh, Washington D.C. Brasilia etc; Contribution of individuals to city planning: Lewis Mumford, Patrick Geddes, Peter Hall, etc; Dynamics of the growing city, impact of industrialization and urbanization, metropolis and megalopolis.

Module 3: Definitions and Objectives of Planning

Definitions of town and country planning; Orthodoxies of planning; Goal formulation, objective, scope, limitations; Sustainability and rationality in planning; Components of sustainable urban and regional development.

Module 4: Theories of City Development and Planning Theories

Theories of city development including Concentric Zone Theory, Sector Theory, Multiple Nuclei Theory and other latest theories; Land use and land value theory of William Alonso; Ebenezer Howard's Garden City Concept; and Green Belt Concept; City as an organism: a physical, social, economic and political entity; Emerging Concepts: global city, inclusive city, safe city, etc.; City of the future and future of the city; Shadow cities, divided cities; Models of planning: Advocacy and Pluralism in Planning; Systems approach to planning: rationalistic and incremental approaches, mixed scanning and middle range planning; Equity planning; Political Economy Model; Types of development plans, plan making process.

SWARNIM INSTITUTE OF DESIGN

*** L stands for Lectures and T stands for Tutorials or Studio.**

In. C.1.2 : SOCIO - ECONOMIC BASIS FOR PLANNING

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Nature and Scope of Sociology

Sociological concepts and methods, man and environment relationships; Socio-cultural profile of Indian society and urban transformation; Tradition and modernity in the context of urban and rural settlements; Issues related to caste, age, sex, gender, health safety, and marginalized groups; Displacement, resettlement and rehabilitation due to compulsory land acquisition.

Module 2: Community and Settlements

Social problems of slums and squatters communities, urban and rural social transformation and their impact on social life, safety, security; Crimes in urban areas and their spatial planning implications, social structure and spatial planning; Role of socio-cultural aspects on growth patterns of city and neighbourhood communities; Social planning and policy, and community participation; Marginalization and concepts of inclusive planning, and gender concerns in planning. Settlement Policy: National Commission on Urbanization, Rural Habitat Policy and experiences from developing countries regarding settlement structure, growth and spatial distribution.

Module 3: Elements of Micro and Macro Economics

Concepts of demand, supply, elasticity and consumer markets; concept of revenue costs; Economies of scale, economic and social costs, production and factor market; Different market structures and price determination; market failures, cost-benefit analysis, public sector pricing; Determinants of national income, consumption, investment, inflation, unemployment, capital budgeting, risk and uncertainty, and long-term investment planning.

Module 4: Development Economics and Lessons from Indian Experiences

Economic growth and development, quality of life; Human development index, poverty and income distribution, employment and livelihood; Economic principles in land use planning; Policies and strategies in economic planning, balanced versus unbalanced growth, public sector dominance; changing economic policies, implications on land.

*** L stands for Lectures and T stands for Tutorials or Studio.**

SWARNIM INSTITUTE OF DESIGN

In.C.1.3 : PLANNING TECHNIQUES

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Survey Techniques and Mapping

Data base for physical surveys including land use, building use, density, building age, etc., and socio-economic surveys; Survey techniques; Land use classification or coding and expected outputs; Techniques of preparing base maps including understanding the concepts of scales, components and detailing for various levels of plans like regional plan, city plan, zoning plan, and local area plan.

Module 2: Analytical Methods

Classification of regions, delineation techniques of various types of regions, analysis of structure of nodes, hierarchy, nesting and rank size; Scalogram, sociogram, etc.; Planning balance sheet; Threshold analysis; Input output analysis, SWOT analysis;

Module 3: Demographic Methods

Methods of population forecasts and projections; Lorenz Curve, Ginni Ratio, Theil's index, rations: urban – rural, urban concentration, metropolitan concentration; Location dimensions of population groups – social area and strategic choice approach – inter connected decision area analysis.

Module 4: Planning Standards

Spatial standards, performance standards and benchmarks, and variable standards; UDPFI guidelines, zoning regulations and development control rules and regulations.

*** L stands for Lectures and T stands for Tutorials or Studio.**

SWARNIM INSTITUTE OF DESIGN

In.C.1.4 : INFRASTRUCTURE AND TRANSPORT PLANNING

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Role of Infrastructure in Development

Elements of Infrastructure (physical, social, utilities and services); Basic definitions, concepts, significance and importance; Data required for provision and planning of urban networks and services; Resource analysis, provision of infrastructure, and land requirements; Principles of resource distribution in space; Types, hierarchical distribution of facilities, Access to facilities, provision and location criteria, Norms and standards, etc.

Module 2: Planning and Management of Water, Sanitation and Storm Water

Water – sources of water, treatment and storage, transportation and distribution, quality, networks, distribution losses, water harvesting, recycling and reuse, norms and standards of provision, institutional arrangements, planning provisions and management issues; Sanitation – points of generation, collection, treatment, disposal, norms and standards, grey water disposal, DEWATS, institutional arrangements, planning provisions and management issues.

Storm water – rainfall data interpretation, points of water stagnation, system of natural drains, surface topography and soil characteristics, ground water replenishment, storm water collection and disposal, norms and standards, institutional arrangements, planning provisions and management issues;

Module 3: Planning and Management of Municipal Wastes, Power and Fire

Municipal and other wastes – generation, typology, quantity, collection, storage, transportation, treatment, disposal, recycling and reuse, wealth from waste, norms and standards, institutional arrangements, planning provisions and management issues.

Power – Sources of power procurement, distribution networks, demand assessment, norms and standards, planning provisions and management issues. Fire – History of fire hazards, vulnerable locations, methods of fire fighting, norms and standards, planning provisions and management issues.

Module 4: City Development and Transport Infrastructure Planning, Management and Design

Role of transport, types of transport systems, evolution of transport modes, transport problems and mobility issues**;** Urban form and Transport patterns, land use – transport cycle, concept of accessibility; Hierarchy, capacity and geometric design elements of roads and intersections**;** Basic principles of Transport infrastructure design; Traffic and transportation surveys and studies, traffic and travel characteristics; Urban transport planning process – stages, study area, zoning, data base, concept of trip generation Transport, environment and safety issues; principles and approaches of traffic management, transport system management.

*** L stands for Lectures and T stands for Tutorials or Studio.**

SWARNIM INSTITUTE OF DESIGN

In.C.1.5 : HOUSING AND ENVIRONMENTAL PLANNING

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Concepts and Definitions

Shelter as a basic requirement, determinants of housing form, Census of India definitions, Introduction to policies, housing need, demand and supply, dilapidation, structural conditions, materials of constructions, housing age, occupancy rate, crowding, housing shortage, income and affordability, poverty and slums, houseless population

Various housing typologies viz. traditional houses, plotted development, group housing, multi-storied housing, villas, chawls, etc., slums and squatters, night shelters, public health issues related to housing, various theories of housing, concept of green housing, green rating of housing projects.

Module 2: Social and Economic Dimensions

Housing as social security, role of housing in development of family and community well being, status and prestige related to housing, safety, crime and insecurity, deprivation and social vulnerability, ghettoism, gender issues, housing for the elderly.

Contribution of housing to micro and macro economy, contribution to national wealth and GDP, housing taxation, national budgets, fiscal concessions, forward and backward linkages.

Module 3: Housing and the City

Understanding housing as an important land use component of city plan / master plan, considerations for carrying out city level housing studies, projections, land use provisions; Suitability of land for housing, housing stress identification, projecting housing requirements, calculating housing shortages, housing allocation.

Module 4: Planning for Neighbourhoods

Approaches to neighbourhood living in traditional and contemporary societies, elements of neighbourhood structure, Planning and design criteria for modern neighbourhoods, norms and criteria for area distribution, housing and area planning standards, net residential density and gross residential density, development controls and building byelaws, UDPFI guidelines, NBC 2005 provisions and Case studies of neighbourhood planning.

*** L stands for Lectures and T stands for Tutorials or Studio.**

SWARNIM INSTITUTE OF DESIGN

In.C.1.6 : STUDIO COURSE

Lecture Hours Per Week	(L) 3+ (T) 0*
Credits	2
End Semester Examination	--
Internal Assessment	100
Total Marks	100

The studio program is divided into two parts. The first part involves learning of basic techniques such as GIS applications, remote sensing and statistical applications. The second part contains a number of plan preparation assignments.

Module 1: GIS Applications

Coordinate system and geo-coding, vector data structure and algorithms, raster data structure and algorithms, data bases for GIS – concepts, error modeling and data uncertainty, decision making through GIS, constructing spatial data infrastructure and spatial information system; National Urban Information system.

Module 2: Remote Sensing

Why remote sensing, aerial and satellite remote sensing, principles of aerial remote sensing, Aerial photo-interpretation, photogrammetry, stereovision, measurement of heights / depths by relief displacement and parallax displacement. Principles of satellite remote sensing, spatial, spectral, temporal resolutions. Applications in planning, population estimation, identification of squatter / unauthorized areas, sources of pollution, etc., spatial resolution related to level of Planning

Module 3: Demography

Sources of demographic data in India, Settlement type, growth pattern and structure: urban settlement analysis, Concentration: spatial, vertical and size, peri-urban sprawl, economic base; Rural Settlements – Size, occurrence and character, transformation, Policies towards various size class settlements.

Population structure and composition – Age, sex, gender, marital status, caste, religion, literacy level, etc.; Age - sex ratio, structure, pyramid; dependency ratio; occupational structure; Fertility; mortality, migration analysis, natural growth of population, migration and its implications in spatial planning;

Module 4: Statistical Applications

General concepts - statistical interference, population and samples variables, Sampling, simple statistical models, Measures of central Tendency, Measures of Dispersion, Measures of shape of distribution, Correlation and regression

*** L stands for Lectures and T stands for Tutorials or Studio.**

SWARNIM INSTITUTE OF DESIGN

STUDIO ASSIGNMENTS

Lecture Hours Per Week	(L) 0+ (T) 12*
Credits	8
End Semester Examination	150
Internal Assessment	250
Total Marks	400

First Assignment

Film Appreciation (individual assignment)

Films related to city development and socio-economic issues will be screened for students. The purpose of these films is to educate the students' understanding of various development issues and to absorb them in the planning practice. At the end of the film, a discourse around the film will also be held.

After viewing the films, each student is expected to write about its main focus, city / region context, its applicability to Indian environment by answering the given questions in not more than half a page.

Second Assignment

Literature Review (individual assignment)

Each student is expected to read the article given from a journal/book and write a summary of not more than a page (250 words only) highlighting the problem, approach, methodology, analysis, how the author arrived at the conclusion and its relevance to Indian context. There will be a negative marking for writing the same text as in the original (that is copying from the original text given to them).

Third Assignment

Area Appreciation (individual assignment)

The aim of the area appreciation exercise is to enable the students to understand and contextualize the location of the area in relation to the city, zone and area in which the particular place is situated. This is done in relation to the socio-economic, spatial and cultural characteristics of that city, zone, location, etc. The main purpose is to make the students appreciate the locational attributes of land parcels for future development in a city.

Due to the size of the area, this exercise is done in groups of students being assigned to a particular area.

The following planning issues at area level should be identified:

Review of the Master Plan / Zonal / Area plan in relation to the selected areas.
Appreciation / Analysis of ward level data.
Perception of areas in terms of legal / illegal / authorized / unauthorized, Slums, Urban Aesthetics.
Social Categorizations of people - Type of population living, people's perception about

SWARNIM INSTITUTE OF DESIGN

area and its planning problems.

Land use including Agriculture land and land use conflicts, extent (%) of broad land use such as commercial, industrial, residential, institutional and recreational.
Extent of formal / informal activities present in the area including their location and conflicts.
General land tenure of the area and land value for different uses.
Major types of transport, type of roads, hierarchy of roads, type of transport modes used.
Amenities: Location of Social and Physical infrastructure and their problems as perceived by local population. Look for specific infrastructure such as Water supply, drainage (water logging areas), waste collection and disposal system, sanitation, etc.
Environmental Issues: Open Spaces – Availability and extent of open space to built-up area, garbage disposal, encroachment (through photographic evidences and sketches).
Locating the study area in the zone, city and regional context with respect to all the above aspects.

Fourth Assignment

Site Planning (individual assignment)

Site planning is a process whereby the optimum utilization of potential of site is considered recognizing the constraints the site has. It uses 3 dimensional space of the site and the associated locational advantages, human activities and the regulations that are assigned to a particular site.

The site is developed using a set of standards / norms in a given context which varies from location to location. A student is expected to understand the intricacies and interface between various variables such as soil conditions, topography, environmental dimensions, location, spatial standards applicable to the site, etc.

Fifth Assignment

City Development Plan (Group assignment)

A City is a multi-dimensional, dynamic and a futuristic space. Understanding city involves appreciating this multi direction, and include them in the city making process. A job of physical planner does not merely understand the current conflict in development but to emerge out of this and to come out with a vision for the city. To arrive at this vision, a planner needs to understand the dynamics of various components of the city and how and what level interventions can be made to achieve that vision.

A group of students are expected to study a city in terms its present problems and issues and project a futuristic vision in terms of scenario building.

*** L stands for Lectures and T stands for Tutorials or Studio.**

SWARNIM INSTITUTE OF DESIGN

M. PLAN / M. TECH. (PLANNING) – SPECIALIZATION IN URBAN PLANNING

Scheme of Examinations

Name of the Subject		Hrs. Per Week* L + T	Credits	Marks		
				Internal Assessment	End Semester Examination	Total
INTEGRATED FIRST SEMESTER						
Core Subjects						
In. C.1.1	Planning History and Theory	2 + 1	2	50	50	100
In. C.1.2	Socio-economic basis for Planning	2 + 1	2	50	50	100
In. C.1.3	Planning Techniques	2 + 1	2	50	50	100
In. C.1.4	Infrastructure and Transport Planning	2 + 1	2	50	50	100
In. C.1.5	Housing and Environmental Planning	2 + 1	2	50	50	100
Sub-Total		**10 + 5**	**10**	**250**	**250**	**500**
Studio						
In. C.1.6	Studio course	3 + 0	2	100	-	100
Sub-Total		**3 + 0**	**2**	**100**	**-**	**100**
	Studio Assignments	0 + 12	8			
	Film Appreciation			50	-	50
	Literature Review			50	-	50
	Area Appreciation			50	50	100
	Site Planning			50	50	100
	City Development Plan			50	50	100
Sub-Total		**0 + 12**	**8**	**250**	**150**	**400**
Total		**13 + 17**	**20**	**600**	**400**	**1,000**
SECOND SEMESTER						
Core Subjects						
UP.C.2.1	City and Metropolitan Planning	2 + 1	2	50	50	100
UP.C.2.2	Infrastructure Planning	2 + 1	2	50	50	100
UP.C.2.3	Urban Heritage Conservation	2 + 1	2	50	50	100
UP.C.2.4	Advanced Planning Techniques	2 + 1	2	50	50	100
Elective Subjects (Select any one)						
UP.E.2.1	Inclusive Urban Planning	2 + 1	2	50	50	100
UP.E.2.2	Planning for Tourism					
Sub-Total		**10 + 5**	**10**	**250**	**250**	**500**
UP.C.2.5	**Studio**					
	Project I: Geo-Informatics Laboratory Training	3 + 0	2	50	50	100
	Project II: Development Plan	0 + 12	8	250	150	400
Sub-Total		**3 + 13**	**10**	**300**	**200**	**500**
Total		**13 + 17**	**20**	**550**	**450**	**1,000**
THIRD SEMESTER Core Subjects						
UP.C.3.1	Urban Development Management	2 + 1	2	50	50	100
UP.C.3.2	Project Planning and Management	2 + 1	2	50	50	100
UP.C.3.3	Urban Governance	2 + 1	2	50	50	100
UP.C.3.4	Politics and Planning	2 + 1	2	50	50	100
Elective Subjects ((Select any one)						
UP.E.3.1	Environment, Development and Disaster Management	2 + 1	2	50	50	100
UP.E.3.2	Energy, Climate Change and Urban Development					
Sub-Total		**10 + 5**	**10**	**250**	**250**	**500**

SWARNIM INSTITUTE OF DESIGN

UP.C.3.5	**Studio**					
	Project I: Geo-Informatics Laboratory Training	3 + 0	2	50	50	100
	Project II: Management and Governance Plan	0 + 12	8	250	150	400
Sub-Total		**3 + 12**	**10**	**300**	**200**	**500**
Total		**13 + 17**	**20**	**550**	**450**	**1,000**
FOURTH SEMESTER						
Core Subjects						
UP.C.4.1	Development Finance	2 + 1	2	50	50	100
UP.C.4.2	Legal Issues and Professional Practice	2 + 1	2	50	50	100
UP.C.4.3	Thesis	0 + 24	16	500	300	800
Total		**4 + 26**	**20**	**600**	**400**	**1,000**
Grand Total		**40 + 80**	**80**	**2,300**	**1,700**	**4,000**

In. stands for Integrated First Semester.

C. stands for Core Subjects and E. stands for Elective Subjects.

* L stands for Lectures and T stands for Tutorials or Studio.

** All students are required to undertake internship after Second Semester at a selected planning organization during the summer vacations for 6 to 8 weeks and obtain a certificate satisfactory performance.

SWARNIM INSTITUTE OF DESIGN

M. Plan / M. Tech. (Planning) - Specialization in Urban Planning

SECOND SEMESTER

UP.C.2.1 : CITY AND METROPOLITAN PLANNING

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Urban Growth and System of Cities

Growth of cities scale, complexity and its impact on national development, cities as engines of growth, cities as ecosystems, resources in cities.

Module 2: City – Region Linkages

City, fringe and the periphery - physical and functional linkages, peri-urban development.

Module 3: Metro and Mega Cities: Problems and Issues

Growth trends and processes, characteristics, problems, concepts and concerns of urban sustainability, issues related to diversity and unintended growth, economic, social and environmental sustainability, quality of life, inclusivity and equity, climate change, transit oriented development, participatory planning. Inner city – issues and problems, approach to development.

Module 4: Human Settlement Planning, Urban Development Policies and Programmes

Concepts, approaches, strategies and tools; Policies and programmes at various levels, impact on metro and mega city development.

*** L stands for Lectures and T stands for Tutorials or Studio.**

SWARNIM INSTITUTE OF DESIGN

UP.C.2.2 : INFRASTRUCTURE PLANNING

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Water Supply and Sanitation

Quantity and quality, source of supply, transmission and distribution, treatment methods, design guidelines.
Sanitation – concepts, disposal systems, low cost sanitation options; engineering aspects of sewage disposal;
Wastewater – generation, disposal system
Storm water drainage – systems

Module 2: Solid Waste Disposal and Management

Basic principles, generation, characteristics, collection, disposal, management.

Module 3: **Fire and Electrification, and Social Infrastructure**

Planning for fire protection, services and space standards, location criteria; Planning for Education, health, civic, cultural infrastructure

Module 4: Traffic and Transportation

Planning for infrastructure and facilities for transport

*** L stands for Lectures and T stands for Tutorials or Studio.**

SWARNIM INSTITUTE OF DESIGN

UP.C.2.3 : URBAN HERITAGE CONSERVATION

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Introduction to Urban Heritage

Typology / classification, inventories, mapping; Human habitation in historical context; Heritage as a motivating force in sustainable urban conservation and development,

Module 2: Heritage Conservation

Natural heritage conservation - typologies, policies for conservation, regulatory measures, community participation; Concept of Historic Urban Landscapes; Built heritage conservation - determinants of built form on heritage; Historic urban infrastructure and traditional water harvesting systems. Integration of historic monuments / areas / cores / urban systems in the developmental process and land use, regulatory measures and community involvement; Intangible cultural heritage and development: issues, conservation strategies. Preparation of conservation and heritage management plans.

Module 3: Heritage and Tourism, Policies and Programmes, Legislation

Cultural and heritage based tourism - nature, potential and prospects, marketing aspects; Acts and laws recognizing conservation / regeneration; Heritage toolkit; Implications of 74th Constitution Amendment Act.

Module 4: Design in Human Habitation

Social / cultural / ecological / energy determinants of design; Imagibility of the city; Structure of urban spaces – location criteria of activities and urban uses; Urban Regeneration, renewal, rehabilitation, revitalization, reconstruction and redevelopment - concepts, interventions, processes, approaches and methods, tools.

*** L stands for Lectures and T stands for Tutorials or Studio.**

SWARNIM INSTITUTE OF DESIGN

UP.C.2.4 : ADVANCED PLANNING TECHNIQUES

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Survey Techniques

Data Base for Physical surveys (including land use / building use / density / building age, etc.) and Socio-economic surveys; Questionnaire formulation, Sampling and survey techniques, etc. Land use classification / coding.

Module 2: GIS Mapping

Coordinate system, Georeferencing and geo-coding; GIS data processing (Digitization, topology building and metadata creation), Data structures and modeling, GIS analysis (Buffer, proximity and overlay), Decision making through GIS, Information systems (Land Information system, Urban Information system for various activity sectors).

Module 3: Research Design and implementation

Approaches in research, developing a method for research; Questionnaire Design, Types of data, sampling methods; developing aims, objectives, scope, limitations; and literature research – using library, accessing the Internet

Module 4: Analytical Techniques, Presentation and Report Writing

Data tabulation; Interpretation of information; Graphical presentation of data; Spatial representation of data; Types of reports with specific focus on technical report writing; Organizing the report, structure chapter organization, Writing the report (analytical findings); Referencing in text, use of software in referencing

*** L stands for Lectures and T stands for Tutorials or Studio.**

SWARNIM INSTITUTE OF DESIGN

UP.E.2.1 : ELECTIVES (SELECT ANY ONE)

INCLUSIVE URBAN PLANNING

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Understanding Inclusive Planning

Definitions and components

Module 2: Stakeholders Profile and Needs, Access to Shelter, Services and Livelihoods

Urban Poor, Informal Sector, Gender, Children, Elderly, Disabled, Displaced people, etc.; Slums - dimensions, causative factors, determinants, location characteristics of settlements; Informal sector - growth, characteristics, functions, economic contributions, linkages with formal sector, impact on Urban Development

Module 3: Participatory Planning Process and Policies, Programmes and Legislation

Methods, role of stakeholders (including civil society organizations), etc.; Related Acts, Five year plans, policies and programmes at various levels.

Module 4: Planning interventions

Inclusive zoning, development and building regulations, Slum Improvement.

SWARNIM INSTITUTE OF DESIGN

*** L stands for Lectures and T stands for Tutorials or Studio.**

UP.E.2.2 : PLANNING FOR TOURISM

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Introduction to Tourism

Definitions, scope, nature, classification and dimension, tourism as an industry, tourism in developed and developing world.

Module 2: Tourism Sector – impacts

Relationship between Tourism and Urban Development, Tourism multiplier and forecasting methods: capacity building and carrying capacity planning for tourism projects, tourism and cultural and social change: Socio-cultural problems, environmental degradation.

Module 3: Planning for Tourism

Nature and scope of a tourism plan- key issues and stages, data requirements, surveys, role of key players / stake holders in tourism policy and planning, sustainable tourism development planning; community planning and tourism; implementation and management, role of travel and tourism promoting agencies, monitoring the tourism development; Tourism marketing - concept, techniques and strategies.

Module 4: Policies and Programmes

Tourism policies at various levels.

*** L stands for Lectures and T stands for Tutorials or Studio.**

SWARNIM INSTITUTE OF DESIGN

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM
INSTITUTE OF
DESIGN

UP.C.2.5 : STUDIO

Studio Hours Per Week	(L) 3+ (T) 12*
Credits	10
End Semester Examination	200
Internal Assessment	300
Total Marks	500

(a)Project I: Geo-Informatics Laboratory Training

Studio Hours Per Week	(L) 3+ (T) 0*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

The laboratory training will be conducted in accordance with the studio exercise. Introduction to Geo-informatics, introduction to Remote Sensing – Aerial and Satellite; introduction to GIS, Spatial data and Attribute data; Satellite images as input to GIS; Collection and presentation of baseline information.

(b)Project II: Development Plan

Studio Hours Per Week	(L) 0+ (T) 12*
Credits	8
End Semester Examination	150
Internal Assessment	250
Total Marks	400

The first studio exercise focuses on the planning, development and design aspect (in line with the other core and elective courses offered in the semester). The exercise pertains to large cities and emerging metropolitan cities and ranges from preparation of sustainable development plans to sector specific themes pertaining to tourism, SEZs, etc. The studio exercise enables them to develop an approach/ framework for the task; it is field based as a database is generated that is analyzed and the plan and strategies are formulated.

Initial study involves understanding of the exercise through theories, study of similar case studies, awareness of relevant norms and standards through extensive literature search. Students are required to prepare a comprehensive list of required data and identify probable sources before making a field visit to the case study town/city. Students are encouraged to translate learning from the core and elective subjects to the studio exercise. The introduction of GIS in the studio enables them to apply it in the studio exercise. Students are expected to analyze the data collected and come out with proposals and recommendations for planned development of the city. The entire exercise is also documented in the form of a technical report.

The second exercise is a short and intensive exercise of one-month duration. It pertains to topical issues i.e. property tax reforms, informal sector, development of railway land, etc. The study is based on primary surveys and students are expected to analyze the information and arrive at recommendations.

*** L stands for Lectures and T stands for Tutorials or Studio.**

SWARNIM INSTITUTE OF DESIGN

THIRD SEMESTER

UP.C.3.1 : URBAN DEVELOPMENT MANAGEMENT

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Introduction to Development Management

Concept, approaches, components, interface with national goals and political economic system.

Module 2: Urban Development Management

Strategies, Tools and Techniques; organizations involved

Module 3: Land and Real Estate Development

Economic concepts of land, Land Pricing / valuation; Economic principles of land use; demand forecasting for land use: factors affecting land supply and demand; Land development methods, Supply Management, Demand side Management; Real estate markets, type of property development and its impact on supply and demand, method of development, environmental considerations.

Module 4: Information System and Urban Reforms

Spatial and Non - spatial information systems; Urban reforms and acts and policies.

*** L stands for Lectures and T stands for Tutorials or Studio.**

SWARNIM INSTITUTE OF DESIGN

UP.C.3.2 : PROJECT PLANNING AND MANAGEMENT

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Project planning

Introduction to Projects; Nature of planning projects; Project Life Cycle; Identification of projects

Module 2: Project Formulation and Appraisal

Relationship between projects and planning issues including sectoral policy at: Local, State and National levels Project appraisal: Market analysis – Macro environment survey, survey methods, market characterization, demand forecasting; Technical Analysis – Magnitude, processes, materials, equipment, factors of production availability, implementation schedule; suitability of the plans, layout and design, location of the project; location analysis; supporting infrastructure requirements- Capital Budgeting – Estimation of costing of components; developing over project cost; Social cost benefit analysis – UNIDO, Merles, ZOPP/GOPP, etc

Module 3: Project Management and Implementation, and Project Evaluation and Monitoring

Project characteristics - pitfalls in management of a project; Techniques of management; Planning milestones - responsibility charts and principle responsibility, principles of activity planning; Project Implementation – methods, hurdles, facilitative factors; Project culture: line management, steering committee, role of project manager; Project Control: cost and time, quality - ISI standards and its application to Indian context; Introduction to Project Management Software (Ms Projects) and its usage. Types of evaluation - concurrent, ex-ante and ex-post. Methods of evaluation, techniques of evaluation, end results, Presentation of evaluation findings, Techniques of Monitoring of Development Works.

Module 4: Regulatory Frameworks Governing Projects

National Rehabilitation and Resettlement Policy (2007) - Social Impact mitigation; National Environmental Policy (2006) – Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP)

SWARNIM INSTITUTE OF DESIGN

*** L stands for Lectures and T stands for Tutorials or Studio.**

UP.C.3.3 : URBAN GOVERNANCE

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Overview of Urban Governance

Definition, concepts, components, government and governance, hierarchy and structure, forms of governance, process of inclusion and exclusion,

Module 2: Legislations pertaining to Urban Governance

Institutional frame and mechanism for urban governance as envisaged in the 73rd and 74th Constitution Amendment Acts.

Module 3: Institutions and Organizations

Differences between institutions and organizations; approaches to understanding organizations; types, structure and functions, their interface and conflicts, reach, and their effectiveness; Methods, process and evaluation; Present organizations and involved in urban governance.

Module 4: Urban Local Governance and Participatory Processes

System, structure, functions, powers, process and resource, performance, interface with NGO's, other agencies. Stakeholders' participation, roles and responsibilities, access to government by various stakeholders.

*** L stands for Lectures and T stands for Tutorials or Studio.**

SWARNIM INSTITUTE OF DESIGN

UP.C.3.4 : POLITICS AND PLANNING

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Interface between Politics and Planning

Social and economic context; State in India – political culture of the Indian State – Centre – State – Local political economy: 74th Constitution Amendment Act, State Finance Commissions; Emergence of the State in the federal set up.

Module 2: City and the State

State as a manager of resources – property rights, norms and standards – Government market and market by Government – Regulatory State, Reforming State, and Rent Seeking State – their spatial implications; Development planning and the Indian state – Centralization, powerlessness and decentralization; spatial politics and competition; Politics of the State and bureaucracy; New State spaces, invited and contested spaces – changing role of the state

Module 3: Politics related to Planning and Development

Politics related to land, shelter, urban infrastructure, resources; Regeneration and redevelopment politics; politics of provision, financing and pricing; decision-making and decision taking

Module 4: Politics and Civil Society

Politics and emergence of civil society – NGO, CBO and their role in planning, development and management, collective bargaining and collective action

*** L stands for Lectures and T stands for Tutorials or Studio.**

SWARNIM INSTITUTE OF DESIGN

ELECTIVES (SELECT ANY ONE)

UP.E.3.1 : ENVIRONMENT, DEVELOPMENT AND DISASTER MANAGEMENT

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Environment, Development and Disaster Management – Interface

Resource use, exploitation and conservation; Impact of human activities on environment; Environment and economy interaction, introduction to environmental accounting.

Module 2: Environmental Management

Environmental Impact Assessment, thresholds, indicators, audits, environmental certification, lifecycle analysis, environment and poverty links, environmental policy, Acts and regulations; Environmental education, participatory approaches, emerging concepts. Disaster classification, concepts, hazards, vulnerability, risks, human response to disaster, impacts

Module 3: Disaster Mitigation and Management

Relevance of disaster management in development and environment, disaster preparedness, prevention, displacement and development, Role and responsibilities of government and non–government organizations, Disaster Education – awareness of individuals, communities and participation at various levels; Integrating disaster mitigation in the spatial planning process, provision of infrastructure for disaster mitigation.

Module 4: Policies and Legislation Pertaining to Environment and Disaster Management

Policies and Legislation at various levels.

*** L stands for Lectures and T stands for Tutorials or Studio.**

SWARNIM INSTITUTE OF DESIGN

UP.E.3.2 : ENERGY, CLIMATE CHANGE AND URBAN DEVELOPMENT

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Introduction

Energy, Climate change and Urban Development – Interface.

Module 2: Energy Generation and Consumption.

Energy Supply and Demand, Energy Consumption in cities, determinants of energy demand, phenomenon of climate change, factors influencing climate change, impacts of climate change

Module 3: Energy Planning and Management, and Mitigation and Adaptation to Climate Change.

Energy efficient development, Compact city form, Transit oriented development. Mechanisms and measures for mitigating and adapting to climate change at various levels

Module 4: Plans, Policies and Strategies.

Related to energy planning, conservation, climate change mitigation and adaptation.

*** L stands for Lectures and T stands for Tutorials or Studio.**

SWARNIM INSTITUTE OF DESIGN

UP.C.3.5 : STUDIO

Studio Hours Per Week	(L) 0+ (T) 15*
Credits	10
End Semester Examination	200
Internal Assessment	300
Total Marks	500

(a)Project I: Geo-Informatics Laboratory Training

Studio Hours Per Week	(L) 3+ (T) 0*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

The laboratory training will be conducted in accordance with the studio exercise. Introduction to Geo-informatics, introduction to Remote Sensing – Aerial and Satellite; introduction to GIS, Spatial data and Attribute data; Satellite images as input to GIS; Collection and presentation of baseline information.

(b)Management and Governance Plans

Studio Hours Per Week	(L) 0+ (T) 12*
Credits	10
End Semester Examination	150
Internal Assessment	250
Total Marks	400

The focus of the studio is on management and governance aspects (in line with the other core and elective courses offered in the semester). The exercise pertains to metropolitan cities and mega cities and ranges from preparing management plans and projects related to various sectors pertaining to infrastructure, disaster risk, riverfront development etc. Students are also required to identify and formulate projects, work out the appraisals and do the feasibility, viability and implementation mechanisms of the projects. Students work on a case study town/city and have to visit the field for collection of data and interaction with city officials and stakeholders. Although planning continues to be an important aspect of the exercise, students are also exposed to project identification, formulation, and appraisal, financing mechanisms and institutional framework. Students draw from the theoretical knowledge provided in the core and elective subjects related to management, finance and governance offered in the semester and translate them in their studio exercise. The culmination of the exercise is in the form of group presentations and studio report.

SWARNIM INSTITUTE OF DESIGN

*** L stands for Lectures and T stands for Tutorials or Studio.**

FOURTH SEMESTER

UP.C.4.1 : DEVELOPMENT FINANCE

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Overview of Development Finance

Approaches, concepts, components, process, credit rating.

Module 2: State Finance

Finance Commissions, functions, relationship between Central, State and Urban Local Government.

Module 3: Municipal Finance

Urban reform incentive fund, Sources of revenues; Equities; Loans; Debt financing; City challenge fund, Pooled finance development fund, National urban infrastructure fund, Municipal Bonds, Miscellaneous sources; Structure of finances, fiscal problems and issues of financial management, implications of 74th Constitution Amendment Act for municipal finance, expenditure pattern, Bilateral and multi lateral lending intuitions mobilizing resources for a project - financial resources, land resources, project resources, and other resources.

Module 4: Investment Planning and Financing Mechanism

Link with spatial plans, process, components, investment needs, budgeting, financial investments in infrastructure and services. Financing of urban development, infrastructure and services – mechanisms and instruments, subsidy reduction, cost recovery, public private partnerships; Financial appraisal, investment appraisal; Financial Risk – Sources, Measures and perspectives on risk, Sensitivity analysis.

*** L stands for Lectures and T stands for Tutorials or Studio.**

SWARNIM INSTITUTE OF DESIGN

UP.C.4.2 : LEGAL ISSUES AND PROFESSIONAL PRACTICE

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Introduction

Interface between policy and legislation pertaining to urban development.

Module 2: Understanding of Law

Concepts, sources, terminologies, significance of law and its relationship to Urban Planning benefits of statutory backing for schemes - eminent domain and police powers; Indian Constitution: concept and contents; 73rd and 74th Constitution Amendment Act, provision regarding property rights.

Module 3: Planning Legislation and Policy Formulation and Appraisal

Evolution; An over view of legal tools connected with Urban Planning and Development, Town and Country Planning Act, Improvement Trust Act, Urban Planning and Development Authorities Act – objectives, contents, procedures for preparation and implementation of Regional Plans, Master Plans and Town Planning Schemes. Various Acts related to urban governance, planning and development organizations, land resources, environment protection, and public participation in statutory planning process; Approaches of formulation of policies, appraisal of policies.

Module 4: Professional Practice

Aims and objectives of professional Institutes, sister bodies, professional role and responsibility of planning consultants, professional ethics, code of conduct and scale of professional charges; Formulation of project proposal and outlines, consultancy agreements and contracts, managerial aspects; Role in inter disciplinary groups: Appreciation of the decision-making processes and the process in relation to varied consultancy assignments of planning.

*** L stands for Lectures and T stands for Tutorials or Studio.**

SWARNIM INSTITUTE OF DESIGN

UP.C.4.3 : THESIS

Lecture Hours Per Week	(L) 0+ (T) 24*
Credits	16
End Semester Examination	300
Internal Assessment	500
Total Marks	800

The students are required to carry out independent research and prepare a thesis on a topic on urban planning selected by them and approved the faculty under the supervision of a research guide allocated by the department.

*** L stands for Lectures and T stands for Tutorials or Studio.**

SWARNIM INSTITUTE OF DESIGN

M. PLAN / M. TECH. (PLANNING) - CONSOLIDATED SCHEME OF EXAMINATIONS

Name of the Specialization	Theory Subjects		Lect Hrs Per Week for Theory Subjects*	Total Marks for Theory Subjects			Credits	Studio and Theory Hours for Studios Per Week		Total Marks for Studio/Thesis			Credits	Grand Total	
	Core	Electives		Internal	External	Total		Theory	Studio/ Thesis	Theory	Practical	Total		Marks	Credits
Integrated First Semester (Common to all)	5	0	10 + 5	**250**	**250**	**500**	**10**	**3**	**12**	**100**	**400**	**500**	**10**	**1,000**	**20**
(UP) Urban Planning															
Second Semester	4	1	10 + 5	**250**	**250**	**500**	**10**	**3**	**12**	**100**	**400**	**500**	**10**	**1,000**	**20**
Third Semester	4	1	10 + 5	**250**	**250**	**500**	**10**	**3**	**12**	**100**	**400**	**500**	**10**	**1,000**	**20**
Fourth Semester	2	0	4 + 2	**100**	**100**	**200**	**10**	**0**	**24**	**-**	**800**	**800**	**10**	**1,000**	**20**
(															

*includes both lectures and tutorials.
**Internship Training to be completed during the summer vacations.

SWARNIM INSTITUTE OF DESIGN

SWARRNIM INSTITUTE OF DESIGNS

BOS

BACHELORS IN FASHION DESIGN

4 Year

2020-21

For Semesters: I, II, III, IV, V, VI, VII & VIII

SWARNIM STARTUP & INNOVATION UNIVERSITY * SWARNIM INSTITUTE OF DESIGN

Course Content for FASHION DESIGN

4 Year Bachelors in Fashion Design

SR NO	CODE	COURSE	CATEGORY	CREDITS	WEEK
SEMESTER1 DESIGN FOUNDATION					
1	33000001	Foundation Studio	SK	16	8
2	33000002	Design Communication	SK	2	1
3	33050101	Appreciation of Art	SK	10	5
4	33020108	IE (Introduction to Entrepreneur Ship)	TH	2.5	NA
			Total	30.5	16
SEMESTER 2 Specialized Subjects (foundation)					
1	33050201	Fashion Drawing and Illustration - I	SD	6	3
2	33050202	Pattern Making - I	SK	6	3
3	33050203	Draping - I	SK	4	2
4	33050204	Garment Construction - I	SK	4	2
5	33050205	Surface Techniques - I	SK	4	2
6	33050206	Fabric Study	SD	2	1
7	33050207	History of Design - I	TH	2	1
8	23000013	Preparing Wider Horizon for Entrepreneurship	TH	2.5	NA
			Total	30.5	16
SR NO	**CODE**	**COURSE**	**CATEGORY**	**CREDITS**	**WEEK**
SEMESTER 3 Specialized Subjects					
1	33050301	Introduction to Design (DCC)	TH	2	1
2	33050302	Fashion Drawing and illustrations - II	SD	4	2
3	33050303	Garment Construction - II	SK	4	2
4	33050304	PatternMaking- II	SK	6	3
5	33050305	Draping - II	SK	2	1
6	33050306	Surface Techniques - II	SK	6	3
7	33050307	Fashion Theory and Overview (looks and styling)	SD	4	2
8	33020308	Entrepreneurship Motivation	TH	2.5	NA
			Total	30.5	16

SEMESTER 4 Specialized Subjects					
1	33050401	Fashion Drawing and Illustration – III	SD	4	2
2	33050402	Pattern Making – III	SK	4	2
3	33050403	Draping – III	SK	4	2
4	33050404	Garment Construction – III	SK	4	2
5	33050405	Surface Techniques – III	SK	4	2
6	33050406	Design Process – I	DP	4	2
7	33050407	History of Design – II	TH	2	1
8	33050408	Digital Design – I	SK	2	1
9	23000017	Product feasibility and marketing skills	TH	2.5	NA
			Total	30.5	16
SR NO	**CODE**	**COURSE**	**CATEGORY**	**CREDITS**	**WEEK**
SEMESTER 5					
1	33050501	Fashion Drawing and Illustration – IV	SD	4	2
2	33050502	Pattern Making – IV	SK	4	2
3	33050503	Draping – IV	SK	4	2
4	33050504	Garment Construction – IV	SK	4	2
5	33050505	Surface Techniques – IV	SK	4	2
6	33050506	Design Process – II	DP	4	2
7	33050507	History of Design – III	TH	2	1
8	33050508	Digital Design – II	SK	2	1
9	23000020	Scaling up the Venture	TH	2.5	NA
			Total	30.5	16
SEMESTER 6					
1	33050601	Fashion Drawing and Illustration – V	SD	4	2
2	33050602	Pattern Making – V	SK	4	2
3	33050603	Draping – V	SK	4	2
4	33050604	Garment Construction – V	SK	4	2
5	33050605	Surface Techniques – V	SK	4	2
6	33050606	Design Process – III	DP	4	2
7	33050607	History of Design – IV	TH	2	1
8	33050608	Digital Design – III	SK	2	1
9	23000021	Idea to Minimize Viable Product	TH	2.5	NA
			Total	30.5	16

SEMESTER 7					
1	33050701	Industry Work Culture	SK	2	1
2	33050702	Jeans Culture	SK	4	2
3	33050703	Denim Wear	SK	8	4
4	33050704	Advance Pattern Making	SK	8	4
5	33050705	New Age Illustration (Digital)	SK	4	2
6	33050706	Fashion Sustainability	TH	2	1
7	23000022	Managing Innovation & IPR for Entrepreneurs	TH	2.5	NA
			Total	30.5	16
SEMESTER 8					
1	33050801	Graduation Project (Internship)	SD	30	16
			Total	30	16

SWARNIM STARTUP & INNOVATION UNIVERSITY * SWARNIM INSTITUTE OF DESIGN

SWARRNIM INSTITUTE OF DESIGNS

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

Board of Studies Meeting for Fashion Design

Detail Information/ Invitation Acceptance Form

Name	: **MR. Paresh Chatterjee**
Designation	: **Director of Textile**
Organizationname	: **United world Institute of Design (UID)**
OrganizationAddress	: **Ganghinagar,Ahmedabad**
Qualification	: **Masters inTextile**
AreaofExpertise	: **Fashion, Textile and Design EducationExpert**
ResidentialAddress	: **Gandhinagar**
Email	: **chatterjeeparesh9@gmail.com**
Contactno	: **9375072700**

Bank Details

AccountNo	:_____
Saving/Current	:_____
NameofBank	:_____
Branch	:_____
IFSCCode	: _____

I herebyaccept theinvitation to join as the Board of Studies member for the SchoolofFashionDesign, A constituent school of Swarrnim startup and Innovation University.

Name : _____

Signature : _____

Date : _____

SWARNIM STARTUP & INNOVATION UNIVERSITY * SWARNIM INSTITUTE OF DESIGN

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM
INSTITUTE OF
DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

School of Fashion Design

Terms of References

Agenda Points for Board of Studies

1) ToconsiderschemesfortheadvancementofthestandardsofteachingandResearch/ORany amendment/ advancementinexistingsyllabus/ NewCurriculumofFashionDesign
2) Procedureto coordinate the teaching and Researchwork in the School.
3) Considerandapprovesubjectsfortheresearchforvariousdegreesandotherrequirements.
4) Toframegeneralrulesandguidelinesfortheevaluationofcontinuousinternassessment.
5) TorecommendtotheAcademicCouncilforthecreationorabolitionofteachingposts.
6) To considerand act on any proposalregardingwelfareof the students.

SWARNIM STARTUP & INNOVATION UNIVERSITY * SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

Fashion Design, I, II, III, IV, V, VI, VII & VIII

Semester, 2020-21 Teaching and Evaluation

Scheme

Module Based: Design Study is entirely practical work where Students have to learn Stitching, Patternmaking,dofieldwork,Documentationandmuchmorethatisthereasonwhythecoursesare runin modularformat.Thisgivesstudentsabenefittogodeeperwiththeirstudies,skillsorresearch andget continuoussupporttoimproveontoeachsubject.Theygetmoretimetofocusoneveryaspect ofthesubject andthecourse.TheygetregularFacultyguidancethroughoutthemoduleandcanplan their activities and assignmentwithout gettingaffectedof any other course.

WeekwiseTimetable:Thesubjectandthetimetablearedividedweekwise.Thesubjectthatbeginson MondaygetsoverbyFriday.ThemajorsubjectslikeDesignProject,Stitching,andPatternMakingare given2to4 weeksoftimeaspertheavailabilityoftheweekduringthesemester.Thisalsohelps studentstoeaseupwith theiractivitiesandcarryingofdaytodaymaterialstotheclassduringpractical lectures.

Course Categories

In Design Education SSIU provides courses in major six categories as below

SK - Skill Based Courses, e.g.Patternmaking, Stitching, Embroidery

SD - StudioCourses,e.g.drawingandillustration,Colorstudy **TH** - Theory,e.g.ApparelManufacturing,BasicsofMarketing **DP** - DesignProject,e.g.GarmentorProductDevelopment

RW - ResearchandFieldWork,e.g.ResearchandDocumentationonIndianCrafts

Examinations

TheExaminationsaretakenintheformofSemesterwisedisplayandpresentationattheendofeach semester. Forexaminationsstudentsarerequiredtopresentanddisplaytheirrealwork,prototypes, documentation, explorationsetc.doneduringthesemester.Studentsareevaluated,Judgedandguided by field experts of 2 to 4 members as Jury panel.

Theyaregiven30to45minutestospeakanddiscussinfrontoftheJurypanelregardingtheirwork, learning and improvements duringattendingthesemester courses. The Students who fail to attend Juries as per their Jury Panel decidedby theexamination committeearesubjectto fail and repeat the entire Semester or a year.

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

Attendance

80%attendancewitheverycourseiscompulsoryforeachstudentforpassing.Studentshavinglessthan 80% withoutanypriornoticeorsupportingdocumentswillbesubjecttosuspend,repeatthecourse that is unattended in the coming next year, Repeat semester or a year repeat, or cancelation of admission for the coming years.

Evaluation Scheme

60% by Course Faculty and 40% by Jury Members,
Firstevaluationoutof60%isdonebythesubjectFacultyastheendofthecoursemodulethatison Friday.Each subjectteacherisresponsible to evaluate students on the last day of their module. They are alsoresponsibleto submittheattendancesheetaswellastheevaluationpaperstotheprincipaloftheir discipline.Theremaining 40%evaluationisdividedamongtheJurymembersandthisevaluation happensimmediatelyafterthe studentsemesterjuryanddisplay.Theevaluationpapersandthe attendancerecordforeachstudentare savedintheseparatefiletocheckthеimprovementyearby yearduringthestudentisenrolledwithSSIU.The Alumnirecordswillbepreservedatlibrarylocker under the admin department to refer to it if needed in Future.
(Please find the format of attendance sheet attached here with)

Credits: 15 Hours = 1 Credit

Example for Evaluation Format

NO	CD	COURSE	CTGY	CR	WK	INT	EXJY	TL
1	**33050302**	**Fashion Drawing & Illustration - II**	**SK**	**2**	**4**	**60%**	**40%**	**100%**

CD : Code
CTGY :Category
CR : CreditPoints
WK : WeekUnit
INT : InternalMarking
EXJY :ExternalJuryMembers
TL : Total

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

In Design Education SSIU provides courses in major five categories as below

SK - Skill Based Courses, e.g.Patternmaking, Stitching, Embroidery

SD - StudioCourses,e.g.drawingandillustration,Colorstudy **TH** - Theory,e.g.ApparelManufacturing,BasicsofMarketing **DP** - DesignProject,e.g.GarmentorProductDevelopment

RW - Research Work,e.g. Research andDocumentationon IndianCrafts

Skill Course Evaluation Criteria:

SR No	Evaluation Criteria	Description	I & II Sem	III & IV Sem	V & VI Sem	VII & VIII Sem
1	Application	Abilitytorelateconceptstopracticethrough demonstration, illustration, interpretation and design solutions.	40	30	20	20
2	Detailing, Sensitivity	Capability ofattendingtodetails andfinishes Responsetodistinctive,subtlefeatureand variation of material, tools and medium.	10	30	40	40
3	Skill Exploration	Abilitytofindvariationsonskillsoftools/material/ media in order to learn or discover with practice.	30	20	20	20
4	Basic of Design Principles	AdherencetotheprincipleofDesignviz.Balance, Rhythm etc.	5	10	10	10
5	Time & Attendance	Regularity, punctuality of attendance and time management.	15	10	10	10
		Total Marks	100	100	100	100

Studio Evaluation Criteria:

SR No	Evaluation Criteria	Description	I & II Sem	III & IV Sem	V & VI Sem	VII & VIII Sem
1	Conceptual Clarity & Comprehension	Levelofunderstandingandcomprehension,linking newlearningtotheexistingknowledgeforbetter organizationofinformation.Abilitytounderstand conceptscomprehensively,rememberand articulate them.	15	20	25	30
2	Exploration & Improvisation	Abilitytoinquireorinvestigatethoroughlyinorder to learnordiscover.Diversityandrangeof explorations. Ability to perform extempore.	40	30	20	20
3	Problem Solving & Lateral Thinking	Ability to adopt a methodological approach to solve design problems. Attitude to think on a broader framework and correlate such thoughts to own work.	20	20	20	20
4	Originality & Visualization	Ability to generate ideas that are not imitations. Abilitytoimagineandarticulateintheformof visuals.	10	20	25	20
5	Time & Attendance	Regularity, punctuality of attendance and time management.	15	10	10	10
		Total Marks	100	100	100	100

SWARNIM INSTITUTE OF DESIGN

Theory Evaluation Criteria:

SR No	Evaluation Criteria	Description	I & II Sem	III & IV Sem	V & VI Sem	VII & VIII Sem
1	Reflective Thinking	Abilitytoreconsiderconcepts,ideas,designissues and evaluatethem.	15	20	25	25
2	Communication	Abilitytotransmitideasthroughdifferentmedias.	15	20	25	25
3	Participation	Qualityofclassparticipationandinteractionwith fellow students and faculty.	40	30	20	20
4	Conceptual Clarity and Comprehension	Levelofunderstandingandcomprehension,linking newlearningtotheexistingknowledgeforbetter organizationofinformation.Abilitytounderstand conceptscomprehensively,rememberand articulate them.	15	20	20	20
5	Time & Attendance	Regularity, punctuality of attendance and time management.	15	10	10	10
		Total Marks	100	100	100	100

Design Project Evaluation Criteria:

SR No	Evaluation Criteria	Description	I & II Sem	III & IV Sem	V & VI Sem	VII & VIII Sem
1	Research and Comprehension	Abilitytoresearchideas,issuesandproblemsin the chosencontext.Levelofunderstandingand comprehension, linking new learning to the existingknowledgeforbetterorganizationof information.Abilitytounderstandconcepts comprehensively,rememberandarticulatethem.	5	10	20	15
2	Design Process	Ability to adopt a methodological approach to solve design problems.	15	20	10	15
3	Exploration & Visualization	Ability to imagine and articulate in the form of visuals. Diversity and range of explorations.	40	25	10	10
4	Originality & Innovations	Ability to generate ideas that are not imitations.	5	10	15	10
5	Professional Values, Ethics & Concern	Ability to adhere to professional behavior in business interactions. Incorporating design issues, social concerns and ecological responsibility. Ability to confirm to professional values.	10	10	15	20
6	Quality of Output & Documentation	Ability of the product creation to fulfill the objective/ purpose within the given constraints and communicative/ experiential or expressive quality/ substance of product/ creation.	10	15	20	20
7	Time & Attendance	Regularity, punctuality of attendance and time management.	15	10	10	10
		Total Marks	100	100	100	100

SWARNIM STARTUP & INNOVATION UNIVERSITY * SWARNIM INSTITUTE OF DESIGN

Research and Field Work Evaluation Criteria:

SR No	Evaluation Criteria	Description	I & II Sem	III & IV Sem	V & VI Sem	VII & VIII Sem
1	Motivation and Self-management	Self-initiative, concern and motivation. Ability to organizeandregulateone'sownactivitiesand time management.	10	15	20	20
2	Research and Comprehension	Abilitytoresearchideas,issuesandproblemsin the chosen context. Linking newlearning to the existingknowledgeforbetterorganizationof information.Abilitytounderstandconcepts comprehensively and to articulate them	10	15	15	15
3	Reflective and Critical Thinking	Ability to judge merits and demerits of concepts, ideas and design issues and reconsider them for specificcontext.Abilitytoanalyze/synthesize problems and concepts and think logically.	10	15	15	15
4	Perception, Observation and Sensitivity	Attention to the details and ability to apprehend them.Keennessofobservationandsensitivityand responsivenesstodistinctive/subtlefeatures.	10	10	15	15
5	Attentiveness, Awareness and Empathy	Curiosity and inquisitiveness. Desire to be well informed and gain knowledge. Ability to identify the self with the context and reality.	35	25	15	15
6	Quality of Output & Documentation	Abilitytocreatetangibleoutcomethatfulfillsthe objective/purposewithinthegivenconstraints. Communicative/experientialorexpressivequality and substance reflected through the outcome.	10	10	15	15
7	Time & Attendance	Regularity, punctuality of attendance and time management.	15	10	5	5
		Total Marks	100	100	100	100

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM
INSTITUTE OF
DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

BOS Papers for

SEMESTER I

Year 2020-21

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Foundation Studio
Course Code 33000001
Semester I **Duration**
: 8 Week **Category** : SK
Credits 16

Relevance: This coursehelps develop aqualityofkeenobservationandexperience space in terms of perspective. Sharpenthe ability to analyze and appreciate the structure that is either visibleor hidden. Helps understandingthebasicsofdrawingintermsofperceptionandrepresentationofdistance, conceptsof3D spacesandformson2Dsurface.Helpsestablishsenseofinter-relatednessofpartsin overall proportion

Objective:

To observe and represent images, ideas,concepts andability.

- To develop an ability to visualize and articulate one'sthinking process.
- To improve coordination of eye and hand.
- To explore pencil as a media.

Content:

1. Basic Exercise
   - Movement of fingers, elbows and arms in drawing.
   - Different grades of pencil, its properties and use.
   - Representation oftextures.
   - Freehand plotting andlayout.
2. Nature Drawing
   - Analysis and appreciation of natural form through visual reference.
   - Capturingof anoverallform-character,overall proportions and fine details.
   - Understanding depth, light and shade.
3. Human FigureStudy
   - Overallhumanformstudywithactualmodel,quicksketchingtoenhanceobservation.
   - Human body details - understandingof form, relative proportions and details by rendering techniques.
4. Dimensional Solids
   - Drawingbasicsolid(cube/cone/ sphere)andunderstandingitshiddendimensionandstructurein perspective.
5. Perspective Study
   - Simpleone point and two point perspectiveof interiorand exteriorspaces.
   - Complex perspective.

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

Methodology: Actualdemonstrationwithlectures, discussionsanddiscourse.Grouppresentations and critiques.

Activities and Assignments:

- Drawing freehand lettersin large size with different grades ofpencil.
- Exploringlines - straight line, curve line, drawing freehand straight lines in different direction and orientation of the paper. Drawing Spirals.
- GreyscaleAssignment-Createdifferentblocksofshadesinhalfimperialpaperusingdifferent grades of pencils ranging from 6H to 6B.
- Leaf,FoliageTreestudy.Observingthepatternsandtextures.Observingandunderstanding different shape,structure and their relation. Zoom in and zoom out.
- Observeanddrawthenaturalandmanmadetextures.Creatingtextureandpattern.
- Combine three natural element in given spaces.
- Observe Silhouette of horizon and draw it.
- Solid Shapestudy.
- Pebble study from different angle and capturing its texture.
- Studyofhumanfigure:observeanddrawposition,volume,proportionoflimbsandbodyparts - ear, eye, nose, lips, head, hand feet and whole human figure.
- Drawing portrait.
- Exploringdifferent mediums of drawing namely dry pastel, charcoal,ball-peninketc when drawing humanfigure.
- Elements of Perspective. Drawing cube in one point andtwopointperspective.
- Drawing nine cubes in one point perspective.
- Drawing different cubes in two point perspective.
- Observeanddrawoneoutdoorscenariokeepinginmindtheknowledgeofperspective.
- Rapid Sketching and morning sketching

LearningOutcome: StudentswilllearntheBasicsofDrawingwithObservationtonatureand Form. At the end of this course they should be able represent their ideas on paper constructively..

Book Recommended:

- The Natural way to Draw – Kimon Nicolaides
- The act of Drawing - Edward Laning Design
- Drawing - Francis D K Ching
- A step by step guide to drawing the Figure - John Raynes
- Perspective Drawing Handbook - Joseph D'Amelio
- The complete Paintings andDrawings - Leonardo da Vinci
- Film: BBCdocumentary-TheSecretofDrawingbyGrahamDixonCaveofforgottenDreamsby Werner Herzog

E-Sources key words: Nature Drawing, Leaves, Flowers, Botanical Drawing, natural textures, Fruits, encyclopedias, step by step drawing guide etc… https://www.amazon.co.uk/Botanical-Drawing-Graphite-Coloured-Pencils/dp/1785001590 https://www.asba-art.org/about-botanical-art/scientific-illustration https://www.123rf.com

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Basic Material &Method
Course Code 33050102
Semester I **Duration** : 2 Week **Category** : SK **Credits** 4

Relevance: Materialsareoneofthemostbasicresourcesofdesignerstogivetangibilitytotheir concepts andideas.Inthiscontextitbecomesimportantforthemtounderstandthevariouskindsof materials that they can use, know their properties, the processes and the tools and their interrelationships requiredto work on them. Newmaterials, processes andtools keep gettingdeveloped anditbecomesrelevantforthe studentstolearnthemethodandpedagogyofunderstandingthe materials, processes and the tools and techniques involvedso that they can getconfidence to workwith anymaterials,processes,toolsandtechniques -knownornew.Itisalsoimportantforthestudentsto developsensitivitytoexperiencethepropertiesof differentmaterialstogetcomfortabletointeract with the world around filled with materials.

Objective: Toenhancetheunderstandingofdifferentmaterialsandtheirproperties-technical, structural, behavioral andvisual. To explore the potential of these material through the use of various hand tools.

Content

- Introductiontobasicforms-solid,sheet,clayandlinearformotherunconventionalmaterial
- Clay– moldingandshaping(Sculpture,achievingdimensions,Modelsetc)
- Linearmaterials (rope,metal wire) -exploringtensionproperties. Techniques that can lead to surface and volumegeneration.
- Introduction to hand toolsacross the workshops
- Wastemateriallike news papers, Cardboard,BuildingupMaterialLibrary.

Methodology

- Demonstrations anddiscussions.
- Hands on experience through assignments.
- Continuous feedback and assistance while the processis on.

Activities and Assignments:

Assignment 1: Basic knots , 2to 4 linear structures with knots
Assignment2: Creatingsurface withknots
Assignment 3: 3 to 8 strands linear flatbraids(3to5assignments), 4 to 8 strands round braids (2or3 assignments), Variations in braids (1 assignment)
Assignment 4: Ply-split braiding, 8 to10 strands linear structure with 2 ply cords,

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

Ply-splitbraiding,8to10strandslinearstructurewith4plycords
Assignment 5:Ply-split braiding, 3D product with 2 ply or 4 ply cords
Assignment 6:Continues

Learning Outcome:

Book Recommended:

- MaterialMatters: Newmaterials in design by Philiip Howes and Zoe Langhlin
- UltraMaterials: HowMaterials Innovation Is Changing the World by GeorgeM.Beylerian, Andrew Dent
- Nature and Art of workmanship by David Pye
- "the book of nature " and "the book of history"

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Analytical Drawing
Course Code 33050103
Semester I **Duration**
: 2 Week **Category** : SK
Credits 4

Relevance: It helps understanding the concepts of coordinates, line, planes and orderly movement of planesin spaces.Italsohelpsinconceptualizing,visualizingandcommunicatingideasthroughthe concepts of isometric representation and orthographic projections.

Objective: To develop an analytical attitude, understand and represent the structure of forms.To develop an ability to deal with complexity ofimagination andvisualization.

Content:

- Basicexercisesexploringconceptsofdot,lineandanglesforhandandeyecoordinationand thereby acquainting with the concepts of figure and configuration.
- Conceptofgridandcoordinatesforgenerating3-dimensionalformsinanisometricspace.
- Constructionofcurvaturestounderstandhowtheyoperateinlines,planesandsolids.
- Conceptsoforthographyandorthographicprojectionsthathelpfacilitateisometricviews.
- Understanding the compoundcurves.
- Drawingobjectsthatcharacterizethehumanenvironment,withsingleandcompoundcurves.

Methodology: Actual demonstration along with lectures, discussion and discourse. Group presentationsandcritiques.Modularmethodsofconductingthecoursenecessitatecontinuous feedback and at least four major submissions of work during the course.

Day Plan, Activities and Assignments:

1. All assignments have to be done on A3 size copier paper.
2. Leave a margin of 1cm on all sides of the paper.
3. Use of drawinginstruments like straight edge and compass are notallowed.
4. Use the provided isometric grid for all isometric drawings.
5. You must mention your name, roll no, assignment no, date, etc on the back of the paper.
6. Assignmentsshallbemarkedforqualityoflines,consistency,neatnessandunderstanding.

Set 1:

- Draw horizontal lines at equal distances
- Draw vertical lines at equal distances
- Draw six horizontal & six vertical lines through points marked on a sheet of paper
- Mark 6 points and Draw horizontal & vertical lines through them

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

- Drawdiagonallinesonyourpaperfromlefttorightatequaldistances
- Drawdiagonallinesonyourpaperfromrighttoleftatequaldistances
- Draw a diagonalgrid
- Use 2 points to draw lines passing through them. Make a number of such lines
- Draw intersecting lines passing through the centre of the paper
- Draw a grid using vertical,horizontal& diagonal lines

Set 2:

- Draw 5 continuous straight lines & transfer them to isometric drawing
- Draw the same line in paper strip form
- Draw the same in one square tube form
- Draw the same tube form on 3 isometric planes of the cube
- Draw one square tube in continuous form
- Draw 6 horizontal & vertical planes
- With vertical& horizontal planes, create architectonic spaces
- Draw the orthographic drawings of the wooden cube provided
- Draw an isometric view of the wooden cube
- Draw a second isometric view of the wooden cube
- Draw an upside-down isometric view of the wooden cube
- Drawanisometricviewofthewoodencube,imaginingaholepassingthroughthecube
- Drawtheorthographic drawings of a paper cube with cut-outs on the surface.
- Draw a transparent isometric view of the paper cube
- Draw an opaque isometric view of the paper cube

Set 3:

- Draw Circles of three different sizesoffsettingeachother by 5mm circles
- Draw circles with different diameters such that each is tangent to thepreviousone.
- Draw an half sectional isometric view of the paper cube
- Draw a three fourth sectional isometric view of the paper cube
- Draw an exploded view of the paper cube
- Use the demonstrated method to draw a circle and anellipse
- Draw isometric views of ellipses
- Draw ellipseson all the six sides of a cube in its isometric view
- Draw isometric views of described simple objects
- Draw the isometricview ofa continuous tube rounded at all corners.
- Use Ellipses and rounded rectangles to create architectonicspaces

Set 4:

- Imagine a circularobject and draw its orthographic and isometricviews
- Draw the sectional view of the above object
- Choose a simple object from around you and draw its orthographic drawings
- Draw an isometric view of the object
- Draw a sectional view of the object
- Draw an isometric view showing the object as distorted

Learning Outcome:

Book Recommended:

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Elements of Colours
Course Code 33050104
Semester I **Duration** : 3 Week **Category** : SK
Credits 6

Relevance: Ithelpsinunderstandingtheperceptualqualitiesofcolourandtheinteractionofcolour and form and application of different media.

Objective: To understand the science of colour and its application. To understand colour perception andits relationshipwithform.Todevelopvisualsensitivitythroughapplicationofcolourandbeableto differentiate the steps in hue, value and chrome.

Content:

- Colourtheoryintermsofscience,terminologyexplanations,harmony,contrastandtexture.
- Light and Pigments - additive and subtractive mixture.
- Colour and formrelationship.
- Develop steps and the range amongchromatic andachromatic colours.
- Laws ofGestalt.
- Colour interaction as a phenomenon.

Methodology:

- Lecturesanddemonstrationwithconstantfeedbackanddiscussionsoftherelationshipof colour to theother.
- Experiment with pigmentpaint.
- Perceive the changes in the process of colour in the modern context.
- Discussions on phenomenon of light, colour, etc.

Day Plan, Activities and Assignments:

- Introduce:Hue,Value andChroma/ Intensity,Shade,Tone,Monochrome
- IntroducetheColourmodels,Colourwheel,SubtractiveandAdditivecolours,PrimarySecondary colours,
- Warm and coolcolours, Complimentary colours, contrast
- Colouris relative-Simultaneouscontrast,Successivecontrast/ afterimage
- IntensityScale-actualmixingofcomplimentarycolours, opticalmixingofcomplimentary colours (could
- speak about pointillism, precursor ofprinting technology etc.)
- Colour constancy,Metamerism
- ColourInteraction (talk on Chevreul,Pointillism, Josef Albers)
- Transparency,Translucency-Understandhowcolourchangeswhenitiswet,transparent,
- translucent and give a similar `impression'

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

Learning Outcome:

Book Recommended:

- TheArtofColour:TheSubjectiveExperienceandObjectiveRationaleofColour,JohannesItten
- Color&humanresponse: aspects of light and color bearing on the reactions of living things and the welfare of human beings /Faber Birren.
- Interaction of color: text of the original edition with revised plate section, Joesf Albers

Video Reference: Evolveseries-Vision,PrintedRainbow-GeetanjaliRao,Paradise,IshuPatel, Gabbeh- MohseenMakmalbaf

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Geometric Construction I (2D)
Course Code 33050105 **Semester**
I **Duration** : 2 Week **Category** :
SK **Credits** 4

Relevance:

Geometry (literally 'earth (geo) measure') is primarily a philosophical pursuit. Along with Arithmetic, Music& Astronomy,Geometrywasoneofthefourobligatoryeducationalstudiesinancienttimes.

- It provides the tools, methods andvocabulary to giving tangible form to abstract ideas, which is the primary concern of Design
- Itenablestheanalysisanddescriptionofshapes,patternsandtheirinterrelationship.
- It sensitizes designers to the hidden geometric order in natural forms, which cancontribute significantly to theirwork.

Objective:

- Usetraditionalmethodsoftwo-dimensionalgeometricconstructionwithprecision&dexterity.
- Seek out,observe andanalyze occurrencesof Geometry in the world
- Articulateanddeveloptheirimagination&intellectthroughdrawings,readinganddiscussions

Content:

- **Introduction to tools**
  Peg & strings (carpenter's method), Compass, Straight Edge, T-Square, Set square
- **Basic Concepts & Terminology**
  Angles, Division of a line, Tangents
- **Shapes**
  Circles, Ellipses, Spirals, Regular Polygons
- **Proportions**
  The root proportions, The Golden proportion
- **Series & Progressions** Fibonacci, Logarithmic
- **Symmetry**
  Two-fold, Three-fold, Four-fold, Five-fold
- **Tiling & surfaces**
  Regular tessellations, Semi regular tessellations

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

Methodology: Shorttalksonselecttopicsanddiscussions(GoldenProportion,Fractals,Sacred Geometry, Symmetry,Origami)

- Lectures & theoreticalinputs
- Demonstrations
- Discussions
- Studio/workshop handson

Activities and Assignments:

- Parallel, Horizontal & Inclined Lines
- Circles with differentcentres
- Concentric circles
- Tangential circles
- Semi Circle and Vertical lines
- Parallel arcs Flower ofLife
- Angles andlines
- Circles
- Ellipses
- Regular polygons
- Multiple polygons on the same base
- Multiple polygons inside a vessica piscis
- Tessellations (3 regular and 8 semi regular)
- Proportion systems (Root rectangles,
- Golden proportion)
- Spirals (Archimedean, root,golden spiral,
- Fibonacci)

Analysis of Islamicpatterns

Learning Outcome:

Book Recommended:

- Andrew Sutton, 'Ruler & Compass',Wooden Books, 2009
- Daud Sutton,'IslamicDesign: A Genius forGeometry'WoodenBooks,2007
- DavidWade,'Symmetry:The OrderingPrinciple',WoodenBooks,2006
- DorisSchattschneider,'M.C.Escher:VisionsofSymmetry',HarryN.Abrams,2004
- Eric Gjerde, 'Origami Tessellations:Awe-InspiringGeometricDesigns', A K Peters/CRC Press, 2008

JonAllen,'DrawingGeometry:APrimerofBasicFormsforArtists,Designers&Architects',Floris Books,

- 2007
- KeithCritchlow,'Orderin Space: A Design SourceBook',Thames&Hudson,1987
- KeithCritchlow,'IslamicPatterns-AnAnalytical&CosmologicalApproach',Thames&Hudson, 1987

KeithCritchlow,'TheHiddenGeometryofFlowers:LivingRhythms,FormandNumber',Floris Books,

- 2011
- Mario Livio, 'The Golden Ratio', Broadway Books, 2002
- RobertLawlor,'SacredGeometry:Philosophy&Practice',Thames&Hudson,1982

ScottOlsen,'TheGoldenSection:Nature'sGreatestSecret',WoodenBooks,2006

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

E-Sources key words:

- http://mathworld.wolfram.com/
- http://www.learner.org/interactives/geometry/platonic.html
- http://demonstrations.wolfram.com/ Cristóbal Vila, 'Nature by Numbers'
- CristóbalVila,'Inspirations:A ShortMovie Inspired OnEscher'sWorks'
- JanBosdriesz,'Metamorphose:M.C.Escher,1898-1972',Cinemedia,1999
- Stephen Cooter,MichaelLachmann, 'The Code',BBC Two, 2011
- Vanessa Gould, 'Betweenthe Folds',GreenFuse Films, 2008

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Elements ofComposition
Course Code 33050106
Semester I **Duration** : 3 Week **Category** : SK **Credits** 6

Relevance: Ithelpsthestudentsunderstandingthebasicelementsandprinciplesofvisual composition. It takes the students through the process of arrangement of elements in proper inter relationwithalogical approachsuchthatitcommunicatestheexpectedorintended.

Objective:

- To develop sensitivity towards visual perception.
- Toacquireconceptualabilityandthenecessaryskillsofcreatingcommunicativecompositions using basic elementsof point, line, plane, volume, etc. in abstractway.
- Todevelopanunderstanding ofvisual dynamics that exists between any two ormoreelements within a givenformat.

Content:

- Basicelementsofcomposition andmanipulatingtheseelementsintwo dimensionstocreate and induce specificemotions.
- Sequentialandcontinuousexperiencestostrengthentheconceptofharmony,rhythm,balance, contrast andmovement.
- Basics of graphic simplification and refinement of a form in a given format.

Methodology:

- Concepts through lectures and demonstrations.
- Practical assignments both at an individual and group level.
- Group presentations, discussions and critiques.
- Continuous feedback andguidance.

Activities and Assignments:

- Compositionsmadewithdots showingabstract representationofmovement
- Compositionsmadewithlinesshowingabstractrepresentationofmovement
- Compositionsmadewithbasicshapesshowingabstractrepresentationofmovement,depth and weight
- Compositionsmadewithtwobasicshapesoverlappingandabstractlyaddingafeatureof interactive expression
- Showinginserialarhythmictransitionandinteractionamongtwobasicshapesin15steps
- Compositionsmadewithletterformsshowingasymmetricalbalanceandvisualhierarchy

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

- Compositingwithabovestriprepeatingandalignedinsuchawaythatproducescompositions showing movements over the surfaces
- Application of knowledge of composition on a product

Learning Outcome:

Book Recommended:

- A primer of visual literacy, Dondis, Donis A.
- Elementsofdesign:RowenaReedKostellowandthestructureofvisualrelationships,GailGreet Hannah
- Basicprinciplesofdesign:thefoundationprogrammeatschoolofdesign,Maier,Manfred
- Title Principles oftwo-Dimensional design, Wong, Wucius
- PRINCIPLESOFCOLORDESIGN:DESIGNINGWITHELECTRONICCOLOR,Wong,Wucius
- Principles of Form and Design, Wong, Wucius
- ThePsychologyofGraphicImages:Seeing,Drawing,Communicating,Massironi,Manfredo
- SHAPE: TALKING ABOUT SEEING AND DOING, Stiny, George
- GEOMETRYOFDESIGN:STUDIESINPROPORTIONANDCOMPOSITION,Elam,Kimberly

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Design Theory (History of Art and Design)
Course Code 33050107 **Semester** I
Duration : 2 Weeks **Category** : TH **Credits** 4

Relevance: Studentsofdesignneedtoengagewithartanddesignhistoryasawayofinforming design practice as well asthinking. This coursewill introduce students to the breadth of art and design history from Indian as well as Western perspectives.

Objective: Theobjectiveofthiscourseistointroducestudentstohistoricaldevelopmentsinartand design againstthebackgroundofmajormovements,stylesandperiodsandwithrelationtosocial, cultural, economic,scientificandphilosophicaldevelopments.Thecoursewillintroducestudentsto Indian as well as Westernperspectivesinhistoryandalso introducestudentstoresources forstudying historythatwillenable themintheirownfutureinvestigations.Itwillcoverhistoricaldevelopments until the Industrial Revolution in the 19th century.

Content:

1) Pre-history and Ancient Civilizations

- Pre-historicsites and cave art in Africa, Europe, India and China
- Indus ValleyCivilization
- China, Persia andBabylon
- Egypt andNubia
- Classical Greece and Roman Civilization
- Incas and AztecCivilization

2) Western Art and Design till Industrial Revolution

- Byzantium and medievalEurope
- Renaissance andHumanism
- Baroque, Mannerism andRococco
- Easterninfluences– Islamic Spain, Chinoiserie, Japonisme
- Neo-classicism, Romanticism and the Age of Enlightenment

3) Indian Art and Design till IndustrialRevolution

- Buddhismandrock-cutArchitecture
- Hindu temple art and architecture
- The sultanateperiod
- The Mughal period: miniature paintings and luxury goods
- Company Style and the Colonial India

4) Industrial Revolution: the first machine age

- Inventions andinnovations
- Mechanization in the textile industry and printing

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

- Rise of socialism and the middle class
- The Great Exhibition of 1851
- The Aesthetic Movement, Arts & Crafts and Art Nouveau

Methodology:

- Introductory lectureson session themes, supported by films/videos.
- Visits to localmuseumstoexploreresources availablefordesign students.
- Visitstositesofhistoricalandculturalsignificance helpexamineIndiandesigninitsoriginal context.
- Group Discussions based on readings and field visits.

Activities and Assignments:

Learning Outcome:

Book Recommended:

- *Mention the list of reference material including Books, Paper, Documents, Websites etc.*
- H.KumarVyas,*Designthe InternationalMovement withIndian Parallel*,SID,Ahmedabad,2010.
- Henri Bergson, *Creative Evolution*, New York, Random House,1944.
- S. Balaram,"ModernIndianDesign:TheRoots"in*Thinking Design*, NID, Ahmedabad, 1998, 15- 25.
- Sparke,Penny.*An Introduction to Design and Culture: 1900 to Present*.NewYork,Routledge.
- Tristan Tzara, "Dada Manifesto" inEugene Weber, ed. *Movements, Currents, Trends*, Lexington, DC Heath,1992.

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : IE, Introduction to Entrepreneurship, Module 1
Course Code 33050108 **Semester** I
Duration : 4 hourweekly
Category : TH **Credits**
3

Relevance: Thiscourseisdesignedtogivethestudentabasicandoverallunderstandingofthe relevance of entrepreneurship and related issues like start-up, innovation etc in the context of a growing economy.

Objective: Oncompletionofthecourse,studentwillbeabletoappreciatethecontextandelements of entrepreneurship,willbeabletodistinguishbetweenstart-upsnormalbusinessprojects,ventures etc.

Content:

- Definitionofbusiness – types ofbusiness – forprofit and not-for-profit. Classificationofbusiness in terms ofmicro,small,mediumandlargeenterprises–conceptofSMEThroughparticipative discussion.
- RoleofSMEinIndianeconomy–contributionofSMEtoGDP–No.ofSMEs–no.ofpersons employed– geographicalspreadandimpact.Presentpast5yearsmacro-economicdataandhelp students make analysis.
- Understanding the SME ecosystem – owners- customers – suppliers –employees – service providers/vendors – input sources– technologyinputs –utilities –bank/finance providers –govt and its agencies – linkagewithsociety,Involvestudentstodevelopa Generic Modeloftheeco-system through discussion.Explainvariousbusinesses with the help of the model. Explain how this model can be used to ascertainthe criticalaspects of any business.
- Entrepreneurship as a key driver to SMEs– modesofentrepreneurship– Traitsofentrepreneurs– Differencebetweenentrepreneur and employee– Entrepreneurshipcultureandcompetencies– Stages ofentrepreneurship.Anexerciseinexploringthevariousstagesandthesalientfeatures inherent in each. Exercise to be carried out by students in smallgroups.
- Interviewing/interactingwithasetofentrepreneurstounderstandthekeyfactorsoftheir success/failure;whatarethekeychallenges facedbythem.Organizetalksofentrepreneurs; students in small groups to interview an entrepreneur prepare a report and make presentation.
- Entrepreneurship in different sectors – industrial/ rural/ social/ healthcare / education/ services / professional services/ IT related/ An exercise in creating an elaborate list of entrepreneurshipin different technical services/ catering/ etc.[sectors.
- Understanding the concepts of invention/innovation/ startup etc and how each differs from each other.Phasesofstartups Exercisethrough large no.ofexamples.
- Idea- generationasthestartingpoint inentrepreneurshipandstartups. Techniques ofidea generation. Initiate theconcepts through alecture. Conduct anidea-generationworkshop.

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

Book Recommended:

- Poornima Charantimath: Entrepreneurship Development for Small Business Entreprises. Pearson India
- 2.DonaldFKuratkoandTVRao:Entrepreneurship–ASouthAsianPerspective.Cengage Learning. 2016.
- 3. Rajeev Roy: Entrepreneurship. Oxford University Press.
- 4.ArunSahay&VSharma:EntrepreneurshipandNewVentureCreation.ExcelBooks.
- 5.MichaelSchafer,ThierryVolery,etal:EntrepreneurshipandSmallBusiness.Wiley India
- 6. Alpana Treehan: Entrepreneurship. Dreamtech Press
- 7.AchyutPPednekar:EntrepreneurshipandNewVentureCreation.HimalayaPublishing *House*.
- 8.RobertJAdamsJr&StephenSpinelliJr:Entrepreneurshipfor21stCentury.Tata McGraw Hill.
- 9.SinerADavid:EntrepreneurialMegabucks.JohnWiley&SonsNewYork.
- 10.SrivastavaSB:APracticalGuidetoIndustrialEntrepreneurs.SultanChand&Sons,Delhi.
- 11.PrasannaChandra:ProjectPlanning,Appraisal&Implementation.TataMcGrawHill, New Delhi.
- 12.Pandey,IM:VentureCapital–TheIndianExperience.PrenticeHallofIndia,NewDelhi.
- 13.Holt:Entrepreneurship-NewVentureCreation.PrenticeHallofIndiaNewDelhi.
- 14. UNIDO Guidelines onPreparing Feasibility Studies
- 15. UNIDO Guidelines on Project Appraisal
- 16.Little IMD & Mirrles: Project Planning & Appraisal

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

BOS Papers for

SEMESTER II

Year 2020-21

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Fashion Drawing and Illustration - I
Course Code 33050201 **Semester** II
Duration : 3 Week **Category** : SK
Credits 6

Relevance: Drawingis considered as an important medium of expression in any designfield. It is also importanttogethandfreewithdrawingbeforeoneapproachfortheconstructiveFashionillustrations and fashiondrawings.DifferentCharacters,Folds,Lightingeffects,reflectionsandelementsinnature have always been the ultimate source ofreference thedesigners.

Objective: To get the students Confident enough with theirdrawing skills. To create a sense of awareness and appreciation with different shapes, proportion, size, structure and form that comes out of the vast nature. Introduce the learner's to Fashion drawing as a tool to showcase design ideas, where emphasis will be to understand and apply the different body parts, movements, fabrics and garments. Develop understanding of the paper rendering and various mediums like- water colors, poster colors, pencil colors etc.

Content: Nature Drawing, Object Drawing, RenderingTechniques, Dry Media, drawing with different Pencils, Staedtler, soft pastels, Charcoal and introduction to wetmedia.

Methodology: Starting with pencil drawing for the subjects that interest them inside the collegecampus,theywillbeslowlyguidedtowardstheappreciationofdifferentelementsof Nature. Here the discussion in group of studentsplays the key role to improve their observation skills. Slowly once the students are confident enough to select their subjects they will be introducedtoother Mediaswherethispracticalactivitycanbeenjoyedsittingatdifferent locations within theCampus.

Learning Outcome: StudentswillllearntheBasicsofDrawingwithObservationtonatureand Form of any shape including human body. At the end of thiscourse they should be ablerepresent their ideas on paper constructively and more efficiently using any of the color media.

Book Recommended:

'On Drawing Trees & Nature' by 'J. D. Harding'
'DrawingandSketchinginPencil' by'ArturL Guptill'
'BotanicalDrawing' by'Penny Brown'
'Leaves,ObservationinWatercolor' by'JuliaTricky'
'Basics Fashion Design 05: Fashion Drawing' by 'John Hopkins'
EncyclopediaofBirds,Flowersandmore…

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

E-Sources key words: Nature Drawing, Leaves,
Flowers, Botanical Drawing, natural textures,
Fruits, encyclopedias, step by step drawing guide etc.… https://www.amazon.co.uk/Botanical-Drawing-Graphite-Coloured-Pencils/dp/1785001590 https://www.asba-art.org/about-botanical-art/scientific-illustration https://www.123rf.com

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Pattern Making - I
Course Code 33050202
Semester II **Duration** : 3 Weeks **Category** : SK
Credits 6

Relevance: It'stheBaseofFashionDesignCourse;thethingsmaynotworkoutasperone's illustrationsand sketching.Therearesometechnical ways of how to take measurements to the constructingthefinalgarment. This courseintroducestailoringas well as standard methods of Patternmakingandalsoenablesthemtovisualize,transfer andconstructsystematicallywhat they have illustrated on paper.

Objective: Theobjectiveofthiscourseistomakestudentsidentifythecrucialpointsonthe bodyfigurethatcan bereferredtotransfermeasurementsandform2Dpatterns,whenfitson the3Dbodycanachieveitsfittingandform. InGarmentconstructiontheyneedtolearnsewing and attachmentoffiveSloppersincluding pocket and zip attachment.

Content: Introduction to Pattern making, basic bodice pattern drafting using pattern making techniques. Muslin trueing techniques, grainlines, how to trace a drafted pattern, basic sleeve pattern drafting methods, basic skirt drafting, dart manipulation, style lines, collar variation, sleeve variation.

Methodology:

- Lectures, demonstration.
- Discussion, Pattern checking.
- Spot assignments.

Learning Outcome: ThisisaSkillorientedtechnicalcourse.Attheendofthiscoursethe students are supposed to learn how to achieve 3d forms from 2d surface that is Fabric identifyingreferencepoints andmeasurements. The module is designed to enable the learner workfromadesignbriefanddevelop ideasfromtheirdrawingandillustrationtofinallyachieve a correct pattern for their garment. The module will develop learners' practical skills, knowledgeofmaterialsandtechniquesandcompetence inPatternDraftingthroughself- directed learning.

Book Recommended:

"Metric Pattern Cutting" –Winfred Aldrich
"PatternMakingforFashionDesign"–HellenJosephArmstrong
"PatternDrafting forFashion"–TeresaGilewska
"Fashion & Styles": Reference Book

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

“AHistoryofPaperPatternIndustry”–JoySpanabelEmery

“PatternDraftingforDressmaking”–PamelaStringer
“AGuidetoFashionSewing”–ConnieAmadenCranford
“FashionPatternMakingTechniques”–Antonio
Donnano

E-Sources key words:

https://issuu.com/sherifabid1/docs/1405175672metric_20patternc
https://www.slideshare.net/franckblau1/metric-pattern-cutting-womenswear-winifred-aldrich
https://www.pinterest.com/pin/402720391649949608/
https://www.wiley.com/en-us/Metric+Pattern+Cutting+for+Women%27s+Wear%2C+5th+Edition-p-9781444309294
https://www.threadsmagazine.com/2008/11/01/quick-reference-for-cut-and-spread-pattern-grading

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Draping - I
Course Code 33050203
Semester II
Duration : 2 Weeks
Category : SK **Credits**
4

Relevance:

Where Pattern Making teaches referring to Body measurements and transferring them to paperandFabric, Drapinghasadifferentapproach.Wecancallitasatechniqueofdrapingdirectlyon thebody,dressformora form.ManydesignerCollectionsarejustinspiredfromdrapesit'samediumof Designersexpressionaswellas drapesbelongtothefarbackhistorytomanykinds.Thismakesitvery much relevant for the FashionDesign Studentsto learnCreativeDraping.

Objective: To make the students confident enough with their draping skills and creativity. To create a sense ofawareness andappreciationwithdifferent fabric,falls,drapes,bodyforms, tradition, culture and so on.

Content:

Basic Sloppers to be draped (Front,back, SkirtFront,SkirtBack) Dart manipulation and style lines for the Final Draped Garment witha properMaterial.
Present the work in form of a mini Fashion Show on walking model.

Methodology:

- Demonstration,
- Discussion,
- Practice,
- Spot.

LearningOutcome: Studentswilllearnpracticallyhowthedrapesareformedtheywillbeableto relate drapes with the evolution of Fashion. It's done and learn course where students are supposed to learn how the 2d surface of the fabric when wrapped differently creates various meanings. The learning about thedrapescanbeasdeepaspossiblerelatedtotheoriginsofclothing.TobecontinuedinDraping-II

Book Recommended:

"IntegratingDraping Drafting andDrawing"by Bina Abling, Kathleen Maggio "Draping" by Annette Duburg

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

“Draping for Fashion Design” by Hilde Jaffel

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Garment Construction - I
Course Code 33050204
Semester II **Duration** : 2 Weeks **Category** : SK **Credits** 4

Relevance

This course provides the knowledge of sewing techniques and its application, which is essential in converting fabrics into products.

Objectives

- To understandthe use of sewing machine asa toolofconstruction
- Todevelopskillsandunderstandingofsewingtechniquesinrelationtoconstructionoftextile products
- To develop aesthetic and construction sensibility to detailing

Course Contents

- Sewing, introduction to sewing machine and its functioning (paper practices).
- Basic seams and hem finishes used in garment construction.
- Finishes, facing, piping, hems, etc.
- Detailing such as: Pleats, tucks, couching etc.
- Application of the above on various types of fabrics.

Methodology

- Lectures
- Demonstration
- Individual assignments
- Presentation andcritiques

Learning Outcome: Students will be able to achieve skills in stitching. They will be able to understand practically the handling of different fabric materials and its adjustments with machine for a proper outcome.

Book Recommended:

'Stitches andSeams'by'Webster/Laing' 'ClotildesSewSmart'byclotildes
'ApparelProductiontermsandprocesses'byJanaceEBubonia 'Sewingfor ApparelIndustry'byShaeffer,Claire

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Surface techniques - I
Course Code 33050205
Semester II **Duration** : 2 Weeks **Category** : SK **Credits** 4

Relevance: Increase the value ofGarmentbothbyappearanceandprice.Attractthecostumertoby a particulargarmentofenhancedlook.This module adds immense beauty and enhances the look of garment.ThemainideaofFabricdecoration is toadd anelementofinterestonthefabric.The most common material used of embellishment is mirrors, beads, sequence, threads, wires and buttons.

Objective: Make student go through the hand techniques of embroidery earning several techniques. Define the term surfaceornamentation; recognize the significance ofsurfaceornamentation on textile asvalue addition.Explainthescopeofsurfaceornamentationandembellishmentonfashionand apparelproducts. Classifythetechniquesofsurfaceornamentationandembellishmentbydifferent types of embroideries, appliqué work and more.

Content: IntroductionofBasicstitchestheory,BasicStitches,transferringandtracingdesign,appliqué work, stencil, smocking, metal and bead work.

Methodology:

Lectures,
Demonstration,
Individual assignments,
Presentation and critiques

LearningOutcome: Thestudentswillbeabletorecognizeandexecuteworkingpracticewithhand embroidery techniques.

Book Recommended:

'Simple Embroidery' By Elsie Mochrie
'Basic Embroidery Designs' by Nirmala C Mistry
'Embroidery skills and Techniques' by Dorothi wood
'A step by step Guide to more than 200 stitch' by Lucinda Gandertone

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : FabricStudy
Course Code : 33050206
Semester : II **Duration** : 1 Week
Category : RW
Credits : 2

Relevance: This module aims to introduce participation to students' basic approaches in identifying fiber andfabricsbythecompletionofthemodulestudentsshouldbeabletodistinguishcommonfiber types. Understand processused in simple yarns and fabricsfrom fiber.

Objective: analyses andidentification of different fabrics used for Fashion, Furnishing andother usage.

Content: IntroductionofBasicFabric, Fibers inPublic, Lookingatfibersnaturalandmanmade fiber, introduction to Fabric structure, collectionof cottons,wool, Silks and blends.

Methodology: Lectures, Demonstration, Individual assignments, Presentation and critiques

Learning Outcome: This module aims to introduce participation to students' basic approaches in identifying fiberandfabricsbythecompletionofthemodulestudentsshouldbeabletodistinguish commonfibertypes. Understandprocessusedinsimpleyarnsandfabricsfromfiber.

Book Recommended:

'Textiles in Fashion' by Rose Sin Claire
'Fabric Science Swatches' by Allen C. Cohen

E-Sources key words: Company Catalogs, Fabric catalogs

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : History of Design - I
Course Code 33050207
Semester II **Duration**
: 2 Week **Category** : TH **Credits**
2

Relevance: Studentsofdesignneedtoengagewithartanddesignhistoryasawayofinforming design practice as well asthinking. This coursewill introduce students to the breadth of art and design history from Indian as well as Western perspectives.

Objective: Theobjectiveofthiscourseistointroducestudentstohistoricaldevelopmentsinartand design againstthebackgroundofmajormovements,stylesandperiodsandwithrelationtosocial, cultural, economic,scientificandphilosophicaldevelopments.Thecoursewillintroducestudentsto Indian as well as Westernperspectivesinhistoryandalso introducestudentstoresources forstudying historythatwillenable themintheirownfutureinvestigations.Itwillcoverhistoricaldevelopments until the Industrial Revolution in the 19th century.

Content:

- Ancient civilization, Mesopotamian, Ancient Egypt, Indus Valley, Vedic age, Ancient Greece, Ancient Greek, Sat vahana, Kushan, Ancient Roman, Gupta.

Methodology:

- Introductory lectureson session themes, supported by films/videos.
- Visits to localmuseumstoexploreresources availablefordesign students.
- Visitstositesofhistoricalandculturalsignificance helpexamineIndiandesigninitsoriginal context.
- Group Discussions based on readings and field visits.

Book Recommended:

- *Mention the list of reference material including Books, Paper, Documents, Websites etc.*
- H.KumarVyas,*Designthe InternationalMovement withIndian Parallel*,SID,Ahmedabad,2010.
- Henri Bergson, *Creative Evolution*, New York, Random House,1944.
- S. Balaram,"ModernIndianDesign:TheRoots"in*Thinking Design*, NID, Ahmedabad, 1998, 15- 25.
- Sparke,Penny.*An Introduction to Design and Culture: 1900 to Present*.NewYork,Routledge.
- Tristan Tzara, "Dada Manifesto" inEugene Weber, ed. *Movements, Currents, Trends*, Lexington, DC Heath,1992.

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : IE (preparing a wider horizon for Entrepreneurship)
Course Code 23000013 **Semester** II
Duration : weekly 3Hours
Category : TH **Credits**
2.5

Objective: Thiscourseisdesignedtowidenthethinkinghorizonofthestudentandgive him/her an overall andmulti-dimensional perspective of anyreal-life situation and thus leading to a fuller and in-depth problem-solvingability.

Content & Methodology:

SR.NO	Description	Pedagogy	No. of sessions
1.	Set Theory and its practical applications	Explorethroughasetof illustrations.	2
2.	Introduction to Logic	Explore through large number of illustrations	4
3.	ConceptofGestalt/holisticThinking–basicsof Systems thinking and analysis.	Case-lets and illustrations; discussions	6
4.	Mind mapping workshop [Expert Workshop]	Expert workshop	8
5.	Design thinking workshop [Expert Workshop]	Expert workshop	8
6.	Business Modeling Concepts – conceptual models–mathematicalmodels–business models	Lecture, case-lets, illustrations	4

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

BOS Papers for

SEMESTERIII

Year 2020-21

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Design Concepts and Concerns, DCC
Course Code 33050301 **Semester** III
Duration : 1 Week **Category** : TH (theory)
Credits 2

Relevance:

Thiscourseequipsthestudentswiththenecessarymethodologiesandprocessesfortheidentificationand analysis of different issues and concerns related to design and to the initiation, expression and communicationof concepts.Thecoursefocusesonthebroaderissuesthatpointondesignactionand learning.

Objective:

Tointroducethestagesofinformationresearchthroughbroadbasedinvestigation,analysis,synthesis and communicationbyuseofdifferentmethodologies.Tounderstandandappreciate'Content– Structure– Form'relationshipandtheinteractionandinter-relationamongitsdifferentelements.

Content:

- Information Strategies and User Research
- Complexity, Structure &Constituents
- Structure, function & opportunity maps/ models; Metaphor development

Methodology:

- Lectures
- Group Project
- Presentations and Groupdiscussions

Day Plan, Activities and Assignments:

Learning Outcome: Studentswilllearn,ObserveandrelatetheDesigninMacroterms.Theywill start understandingDesignSyntropyasawhole.TheyaresupposedtounderstandtheDesigns interventions, implementationandimpactsonthesociety.Attheendofthiscoursetheyshouldbeable represent their ideas on paper constructively and more efficiently.

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

Book Recommended:

- DesignfortheRealWorld, HumanEcologyandSocialChange,byVictorPapanek
- In the Bubble: Designing in a Complex World, by JohnThackara
- TheDesignWay:FoundationsandFundamentalsofDesignCompetence,byHaroldG.Nelson&Erik Stolterman
- Designing Designing, by John Chris Jones
- The Design of Everyday Things, by Donald A. Norman
- ToothpicksandLogos: Design in Everyday Life, by John. Heskett
- Design for Society. by Nigel Whiteley
- What is aDesigner: things, places,messages, by Norman Potter

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Fashion Drawing and Illustration - II
Course Code 33050302 **Semester** III
Duration : 2 Week **Category** : SK
Credits 4

Relevance: Illustrationhelpsthedesignertovisualizethebodyform,proportion,garmentpattern, drape,silhouette,colorandmanysuchthings.Stylizedillustrationsarethequickwayofexpressing designer's ideas.

Objective: To learn the standard proportion ofhuman figure for Fashion illustration. Different possess,heights,bodyshapes,expressions,scaling,andproportions in human croquis.

Content: Various fashion figures (male, female, kids), Different poses, fabric drawing - prints, textures, patterns; Fashion library - neckline, sleeve, collar, tops, shirts, blouses, pants, skirts, dresses; Design details - pleats, gathers, trims, piping, buttons etc.

Methodology: Demonstrations,Presentationanddiscussioninclass,Reviewandfeedbackon assignments.

Learning Outcome: Students will learn the Basics of Drawing with Observation to nature and Form. At the end of thiscourse, they shouldbe ablerepresent theirideas on paper constructively and more efficiently using any of the color media.

Book Recommended:

Basic Fashion Design 04: Developing a Collection by Elinor Renfrew.
Fashion Illustration & Design: Methods & Techniques for achieving professional results by Manuela Brambatti, 2017.
Fashion Illustration by Anna Kiper, 1979.
Big Book of Fashion Illustration by Martin Dawber, 2007.
Fashion Illustration for Designers by Kathryn Hagen, 2010.
Fashion Illustration Techniques : A super refernce book for begineers by Zeshu Takamura, 2012.

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Garment Construction - II
Course Code 33050303
Semester III **Duration** : 2 Weeks **Category** : SK **Credits** 4

Relevance

This course provides the knowledge of sewing techniques and its application, which is essential in converting fabrics intoproducts.

Objectives

- To understandthe use of sewing machine asa toolofconstruction
- Todevelopskillsandunderstandingofsewingtechniquesinrelationtoconstructionoftextile products
- To develop aesthetic and construction sensibility to detailing

Course Contents

- Handling different materials,
- Concealed zipper,
- Collar attachment,
- Lining attachment,
- Pocket attachment,
- Press stitch.

Methodology

- Lectures
- Demonstration
- Individual assignments
- Presentation andcritiques

Learning Outcome: Students will be able to achieve skills in stitching. They will be able to understand practically the handling of different fabric materials and its adjustments with machine for a proper outcome.

Book Recommended:

'StitchesandSeams'by'Webster/Laing'
'Clotilde'sSewSmart'byClotilde's
'ApparelProductiontermsandprocesses'byJanaceEBubonia
'SewingforApparelIndustry'byShaeffer,Claire

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Pattern Making - II
Course Code 33050304
Semester III **Duration** : 3 Weeks **Category** : SK
Credits 6

Relevance: It's the BaseofFashion Design Course;thethings may not workout as per one's illustrations andsketching.Therearesometechnical ways of how to take measurements to the constructingthefinalgarment. This courseintroducestailoringas well as standard methods of Patternmakingandalsoenablesthemtovisualize,transfer andconstructsystematicallywhat they have illustrated on paper.

Objective:

- Tointroducethefundamentalsofflatpatternmakingandtheabilitytouseitforfurther explorations.
- Equipthestudenttoanalyzeandtakethebasicskillsofpatternmakingfurtherinordertomeet challenges of garmentmaking.
- Tounderstandthevariations withcombinations–Sleeve+bodice,bodice+skirt,bi-furcated bottom etc.
- Tounderstandforminrelationtothehumanbodyproportionsandsilhouettes&itsinteraction with theenvironment.

Content:

- Sleeve variations(bodice sleeve Combination)
- Drafting of BasicSkirt
- Skirtvariationssuchas:pleated,A-line,flared,umbrella,paneled,pegskirt,cowlskirt,andskirt with yoke
- Button/buttonhole,yoke, facings, placket and pockets
- Basic shirtblock
- Constructingbasictrouserblockandvariationssuchasculottes,trousers,slack,jean

Methodology:

- Lectures, demonstration.
- Discussion, Pattern checking.
- Spot assignments.

Learning Outcome: ThisisaSkillorientedtechnicalcourse.Attheendofthiscoursethe students are supposed to learn how to achieve 3d forms from 2d surface that is Fabric identifyingreferencepoints andmeasurements. The module is designed to enable the learner workfromadesignbriefanddevelop

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

ideasfromtheirdrawingandillustrationtofinallyachieve a correct pattern for their garment. The module will develop learners' practical skills, knowledgeofmaterialsandtechniquesandcompetence

inPatternDraftingthroughself- directed learning.

Book Recommended:

"Metric Pattern Cutting" –Winfred Aldrich
"PatternMakingforFashionDesign"–HellenJosephArmstrong
"PatternDrafting forFashion"–TeresaGilewska
"Fashion & Styles": Reference Book
"AHistoryofPaperPatternIndustry"–JoySpanabelEmery
"PatternDraftingforDressmaking"–PamelaStringer
"AGuidetoFashionSewing"–ConnieAmadenCranford
"FashionPatternMakingTechniques"–Antonio
Donnano

E-Sources key words:

https://issuu.com/sherifabid1/docs/1405175672metric_20patternc
https://www.slideshare.net/franckblau1/metric-pattern-cutting-womenswear-winifred-aldrich
https://www.pinterest.com/pin/402720391649949608/
https://www.wiley.com/en-us/Metric+Pattern+Cutting+for+Women%27s+Wear%2C+5th+Edition-p-9781444309294
https://www.threadsmagazine.com/2008/11/01/quick-reference-for-cut-and-spread-pattern-grading.

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Draping - II
Course Code 33050305
Semester III **Duration** : 2 Weeks **Category** : SK **Credits** 2

Relevance:

Where Pattern Making teaches referring to Body measurements and transferring them to paperandFabric, Drapinghasadifferentapproach.Wecancallitasatechniqueofdrapingdirectlyon thebody,dressformora form.ManydesignerCollectionsarejustinspiredfromdrapesit'samediumof Designersexpressionaswellas drapesbelongtothefarbackhistorytomanykinds.Thismakesitvery much relevant for the FashionDesign Studentsto learnCreativeDraping.

Objective: To make the students confident enough with their draping skills and creativity. To create a sense ofawareness andappreciationwithdifferent fabric,falls,drapes,bodyforms, tradition, culture and so on.

Content:

- Cowl (neckline, armhole, front and back),
- Skirt cowl,
- Draping techniques (knotting, twisting and pleating)

Methodology:

- Demonstration,
- Discussion,
- Practice,
- Spot.

LearningOutcome: Studentswilllearnpracticallyhowthecowls areformedtheywillbeableto relate drapes with the evolutionof Fashion. It's done andlearn coursewhere students are supposed to learn how the 2d surface of the fabric whenwrapped differently creates various cowls. The learningabout thedrapescanbeasdeepaspossible relatedtotheoriginsofclothing.TobecontinuedinDraping-III.

Book Recommended:

"IntegratingDrapingDraftingandDrawing"byBinaAbling,KathleenMaggio "Draping" by AnnetteDuburg.
"Draping for Fashion Design" by Hilde Jaffel.

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Surface techniques - II
Course Code 33050306
Semester III **Duration** :
2 Weeks **Category** : SK **Credits**
6

Relevance: Increase the value of Garment both by appearance and price. Attract the costumer to by aparticulargarmentofenhancedlook.Thismoduleaddsimmensebeautyandenhancesthelook ofgarment.The mainideaofFabricdecoration is toadd anelementofinterestonthefabric.The mostcommonmaterialusedof embellishmentismirrors,beads,sequence,threads,wiresand buttons.

Objective: Make student go through the hand techniques of embroidery earning several techniques. Define the term surfaceornamentation; recognize the significance ofsurfaceornamentation on textile asvalue addition.Explainthescopeofsurfaceornamentationandembellishmentonfashionand apparelproducts. Classifythetechniquesofsurfaceornamentationandembellishmentbydifferent types of embroideries, appliqué work and more.

Content: Patch work, mirror work, Stencil, Smocking, White and lace work; State wise embroidery - Kasuti, kashida.

Methodology:

Lectures,

Demonstration,

Individual assignments,

Presentation and critiques

LearningOutcome: Thestudentswillbeabletorecognizeandexecuteworkingpracticewithhand embroidery techniques.

Book Recommended:

'Simple Embroidery' By Elsie Mochrie
'Basic Embroidery Designs' by Nirmala C Mistry
'Embroidery skills and Techniques' by Dorothi wood
'A step by step Guide to more than 200 stitch' by Lucinda Gandertone

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Fashion Theory and overview (looks and styling)
Course Code 33050307 **Semester** III **Duration** : 2 Weeks **Category** : SD **Credits** 4

Relevance:

To be able to understand trends and quick fashion tips.
To have a portfolio of theirown showcasing theirpersonal and client style.
Fashion original andevolution.
Fashion cycle and differentiationson the basis of length of fashion cycle.

- Fashion Terminology: Fashion, Style, Fad, Classic, Boutique, Trends, Designer, Silhouette, Hi- fashion.
- Fashion theories: Trickle down, Trickle across and trickle up.

Objective:

- Tocreateawarenessonfashionstylingandimpactknowledgeonapparelcommunicationand fashion expression.

To be able to understand the basic and general idea of fashion styling.
To have a strong sense of their own personal style.

- To nurture graduate to be creative, innovate.

Content:

Introduction to Fashion and fashion styling.
Type of fashion and fashion styling.
Fashion theory Looks andStyling
Indian TraditionalLooks.

- Basic of fashionTerminology.
- Fashion Cycle.
- Styling as per body shape.
- Fashion forecasting.

Methodology:

- Discussion andlecture
- Presentation Groupactivity.
- Individual assignment.

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : IE, Entrepreneurship Motivation
Course Code 33050308 **Semester**
III
Duration : 2.5 hourweekly
Category : TH **Credit**
2.5

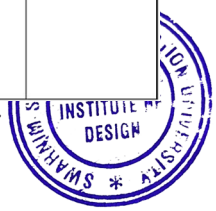
Relevance:

Objective:

Thiscourseisdesignedtofamiliarizethestudentswiththeprocessesinvolvedinunderstanding marketing aspects,technicalaspects,financialaspectsandstrategicaspects.

Content:

SR No	Description	Pedagogy	No. of Sessions
1.	Understanding market prospects – Elements of Marketing aspects – planning for effectivemarketingof the product/service–assessingmarketing prospects– elementsofmarketresearch–identifyingthecritical factors – sensitivity analysis	Initiatewithasituation. Uselecturemethodto covertheconcepts.Use extensive no. of cases/situations. Make students [in small groups] to work on a project	6
2.	Understanding technical aspects – relevance of technology- elements of technology- methods of acquiring technology – comparative analysis of technology,sources, inputs, compatibility etc– location aspects–scalingoftechnologyandtherelatedrisks- technical feasibility	Lectures, cases, illustrations, Exercises and projects.	6
3.	RegulatoryFramework:Constitution–criteriaforthe choiceofconstitution–TypeofActivity,Size,Control, Transparency, No. of Owners, Risk & Liability; FormalitiesofIncorporation; Licenses&Permits: a. for startingaBusiness–b.forimportingcapitalgoods. ClearancesfortechnologyandCollaboration– Environmentalclearance- Locationclearance– clearance from SEBI for IPO etc.	Lectures, cases, illustrations, Exercises and projects.	6
4.	Understandingfinancialaspects–Estimatingthecapital costsandOperatingCostsinaccordancewithwidely	Lectures, cases, illustrations, Exercises	6



acceptednorms.Understandingthefundingpatterns and projects.
andnorms–Workingoutprofitabilityprojectionsasper

	widelyacceptedPerforma–estimatingtheparameters offinancialfeasibility–Sensitivityanalysis–Assessing the Riskfactorsandbuildinginremedialmeasures.		
5.	Strategic analysis of overall feasibility of the project – SWOT Analysis-Enhancingoverallfeasibilityand strategic strength of the project	Lectures, cases, illustrations, Exercises and projects.	6

Learning Outcome:

Oncompletionofthiscourseastudentwillbeabletoindependentlygathertheinformation,analyze them andassessthefeasibilityoftheprojectwithrespecttomarketprospects,technicalaspects, financial parameters and strategic aspects.

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

BOS Papers for

SEMESTERIV

Year 2020-21

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Fashion Drawing and Illustration - III
Course Code 33050401 **Semester** IV
Duration : 2 Week **Category** : SD
Credits 4

Relevance: Illustration helps the designer to visualize thebody form,proportion, garment pattern, drape,silhouette,colorandmanysuchthings.Stylizedillustrationsarethequickwayofexpressing designer's ideas.

Objective: To learn the standard proportion ofhuman figure for Fashion illustration. Different possess,heights,bodyshapes,expressions,scaling,andproportions in human croquis.

Content: Stylized illustration; male, female and kids (create own ideal style)
Flat drawing
Fashion accessories (M/F) (shoe, Bag, etc.)
Combine Figure & Flats.

Methodology: Demonstrations,Presentationanddiscussioninclass,Reviewandfeedbackon assignments.

Learning Outcome: Students will learn how to develop own croque for fashion Drawing.At the end of this course, they shouldbe ablerepresent theirideas on paper constructively and more efficiently using any media. Able to draw flat drawings of their collection including fashion accessories.

Book Recommended:

Basic Fashion Design 04: Developing a Collection by Elinor Renfrew.
Fashion Illustration & Design: Methods & Techniques for achieving professional results by Manuela Brambatti, 2017.
Fashion Illustration by Anna Kiper, 1979.
Big Book of Fashion Illustration by Martin Dawber, 2007.
Fashion Illustration for Designers by Kathryn Hagen, 2010.
Fashion Illustration Techniques : A super refernce book for begineers by Zeshu Takamura, 2012.

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Pattern Making - III
Course Code 33050402
Semester IV **Duration** : 2 Week **Category** : SK **Credits** 4

Relevance: The2dimensional(2D)fabricdesignedisultimatelyusedformakinggarmentsfor3 dimensional (3D)figures – the human body. The diversification of the industrial need makes it important for an appareldesignertobeabletovisualize,designandconstructgarmentsataquickpace.Advanced intervention into the techniques of pattern making helps them achieve these abilities methodically with the help of measurement specifications.

Objective:

- Tointroducethefundamentalsofflatpatternmakingandtheabilitytouseitforfurther explorations.
- Equipthestudenttoanalyzeandtakethebasicskillsofpatternmakingfurtherinordertomeet challenges of garmentmaking.
- Tounderstandthevariations withcombinations– Sleeve+bodice,bodice+skirt,bi-furcated bottom etc.
- Tounderstandforminrelationtothehumanbodyproportionsandsilhouettes&itsinteraction with theenvironment.

Content:

- Skirt variation (Aline, circular, Gore skirt, godet, tiered, layered, tulip, pegged),
- Pants (Culottes, pant, shorts)

Methodology:

- Lectures & theoreticalinputs
- Demonstrations
- Discussions
- Studio/workshop handson

Learning Outcome: ThisisaSkillorientedtechnicalcourse.Attheendofthiscoursethe students are supposed to learn how to achieve 3d forms from 2d surface that is Fabric identifyingreferencepointsand measurements.Themoduleisdesignedtoenablethelearner workfromadesignbriefanddevelopideasfromtheir drawingandillustrationtofinallyachieve a correct pattern for their garment. The module will develop learners' practical skills, knowledgeofmaterialsandtechniquesandcompetenceinPatternDraftingthroughself- directed learning.

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

Book Recommended:

"Metric Pattern Cutting" –Winfred Aldrich
"PatternMakingforFashionDesign"–HellenJosephArmstrong
"PatternDrafting forFashion"–TeresaGilewska
"Fashion & Styles": Reference Book
"AHistoryofPaperPatternIndustry"–JoySpanabelEmery
"PatternDraftingforDressmaking"–PamelaStringer
"AGuidetoFashionSewing"–ConnieAmadenCranford
"FashionPatternMakingTechniques"–Antonio
Donnano

E-Sources key words:

https://issuu.com/sherifabid1/docs/1405175672metric_20patternc
https://www.slideshare.net/franckblau1/metric-pattern-cutting-womenswear-winifred-aldrich
https://www.pinterest.com/pin/402720391649949608/
https://www.wiley.com/en-us/Metric+Pattern+Cutting+for+Women%27s+Wear%2C+5th+Edition-p-9781444309294
https://www.threadsmagazine.com/2008/11/01/quick-reference-for-cut-and-spread-pattern-grading

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Draping - III
Course Code 33050403
Semester IV **Duration** : 2 Weeks **Category** : SK **Credits** 4

Relevance:

Where Pattern Making teaches referring to Body measurements and transferring them to paperandFabric, Drapinghasadifferent approach.Wecancall it as a technique of draping directly on the body,dress form oraform.Many designerCollections are justinspiredfromdrapes it'sa mediumof Designersexpression as wellas drapes belongtothefarbackhistorytomanykinds.Thismakesitvery muchrelevant for the Fashion Design Studentsto learn Creative Draping.

Objective: To make the students confident enough with their draping skills and creativity. To create a sense ofawareness andappreciationwithdifferent fabric,falls,drapes,bodyforms, tradition, culture and so on.

Content:

- Skirt variations,
- Circular skirt,
- Paneled skirt,
- Pegged skirt,
- Asymmetric skirt.

Methodology:

- Demonstration,
- Discussion,
- Practice,
- Spot.

LearningOutcome: Studentswilllearnpracticallyhowthedifferent type of skirts are formedtheywillbe ableto relate drapes with the evolution of Fashion. It's done andlearn course where students are supposed to learn how the 2d surface of the fabric whenwrapped differently creates various kind of skirts. The learningabout the drapescanbeasdeepaspossiblerelatedtotheoriginsofclothing.TobecontinuedinDraping-IV.

Book Recommended:

"IntegratingDrapingDraftingandDrawing"byBinaAbling,KathleenMaggio "Draping" by AnnetteDuburg "Draping for Fashion Design" by Hilde Jaffel.

SWARNIM STARTUP & INNOVATION UNIVERSITY * SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Garment Construction - III
Course Code 33050404
Semester IV **Duration** : 2 Weeks **Category** : SK **Credits** 4

Relevance

This course provides the knowledge of sewing techniques and its application, which is essential in converting fabrics intoproducts.

Objectives

- To understandthe use of sewing machine asa toolofconstruction
- Todevelopskillsandunderstandingofsewingtechniquesinrelationtoconstructionoftextile products
- To develop aesthetic and construction sensibility to detailing

Course Contents

- Zip fly construction,
- Trouser pocket (cross pocket/inseam/shape pocket),
- Godet attachment, Belt attachments,
- Trouser seam finishes.

Methodology

- Lectures
- Demonstration
- Individual assignments
- Presentation andcritiques

Learning Outcome: Students will be able to achieve skills in stitching. They will be able to understand practically the handling of different fabric materials and its adjustments with machine for a proper outcome.

Book Recommended:

'StitchesandSeams'by'Webster/Laing'
'Clotilde'sSewSmart'byClotilde's
'ApparelProductiontermsandprocesses'byJanaceEBubonia
'Sewingfor ApparelIndustry'byShaeffer,Claire

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Surface techniques - III
Course Code 33050405
Semester IV **Duration** :
2 Weeks **Category** : SK **Credits**
4

Relevance: Increase the value of Garment both by appearance and price. Attract the costumer to by aparticulargarmentofenhancedlook.Thismoduleaddsimmensebeautyandenhancesthelook ofgarment.The mainideaofFabricdecoration is toadd anelementofinterestonthefabric.The mostcommonmaterialusedof embellishmentismirrors,beads,sequence,threads,wiresand buttons.

Objective: Make student go through the hand techniques of embroidery earning several techniques. Define the term surfaceornamentation; recognize the significance ofsurfaceornamentation on textile asvalue addition.Explainthescopeofsurfaceornamentationandembellishmentonfashionand apparelproducts. Classifythetechniquesofsurfaceornamentationandembellishmentbydifferent types of embroideries, appliqué work and more.

Content:

- Kantha embroidery,
- Rabari work,
- Chikankari embroidery,
- Phulkari embroidery,
- Metal and Bead work.

Methodology:

Lectures,

Demonstration,

Individual assignments,

Presentation and critiques

LearningOutcome: Thestudentswillbeabletorecognizeandexecuteworkingpracticewithhand embroidery techniques.

Book Recommended:

'Simple Embroidery' By Elsie Mochrie
'Basic Embroidery Designs' by Nirmala C Mistry
'Embroidery skills and Techniques' by Dorothi wood
'A step by step Guide to more than 200 stitch' by Lucinda Gandertone.

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Design Process - I
Course Code 33050406
Semester IV **Duration** : 2 Week **Category** : DP
Credits 4

Relevance: A study of the history of costume helps understand material culture, its evolution aesthetic,expressionandtechniquethroughtheagestobuildaknowledgelibraryandresearchscope fordesign. The first Design Project in Fashion Design aims at application of all the skills learnt during the twosemestersto achieve a design solution relevant to Fashion design. A designer in the field of Apparel Industry is expected to come up with newness on a regular basis.

Objective:

Todeveloparesearchorientedprojectapproachandlearncontextdevelopmentprocessforapparels. This will start by studying the actualreferences from our own surrounding.

To encourage students to combine hands-on and knowledge of design skills with analytical skills through developing a context, making analogies, developing reference material, presentation and applying visual skills through observation, experience, perception andrepresentation.

Content:

Stage 1 First Week

- FashionResearch:InputsonFashionresearch–understandingtheprocessandmethod
- ApplyingResearch:Client,Consumer,Market(retailtype,merchandise)andProductRange(Type, Price, Color,Silhouette,Fabric/material,Details,Finish),GeneralTrendstudyofbenchmarksand competitor brands/retails
- Research Analysis: Presentation & Feedback
- Synthesis:Synthesisfromanalysis,TrendFocusfrequencypatternfromtheresearch
- Directions:Directiondevelopmentwithsynthesizeddata,Presentation&Feedback
- I:VisualReferenceBoard:Story,Color,Look&Feel(2D&3Dapplication),Material(Swatchreferences and Surface Ideas), Detail directions
- InitialSourcingFabric/material/trimsourcingasreferencefortheconceptdevelopment
- II: Concept Sketches – Silhouette, Garmentand Ensemble -1 Collection
- ConceptPresentation: Feedback, refinements and approvals
- TheCollection:Illustrations,SpecificationandTechPacksfor9finaloutfitsandCostingforoutfits

Stage 2: Prototype development 2nd Week

- Surface idea: Assignment for sample development and trial
- Silhouette pattern/drape and toil development: trial, presentation and refinement

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

- Sourcing for Sample: Sourcing actual materials
- Conversion: Material into Samples/Prototypes as per concepts
- Presentation and Photo shoot: Document submission

Methodology: Inthebeginning,studentswillbeencouragedtoworkingroupsforHistoricalstudy, research,studyandanalysisphase.Laterduringtheconceptualizationstage,eachstudentwillbe expected to select and work on one single idea.
The methodology includes

- Lectures,
- Demonstration
- Research – primary and secondary methods
- Study exploration andobservation
- Application& Practice
- Presentations and discussions, Critique etc.

Learning Outcome: Students are expected to learn the apparel design project process of building upa brief,research,analysis,synthesis,directions,storyandcolors,conceptualization,sourcing, specifications, test fit, anddesignprototypes. Going through a project process helpsstudentsidentify elementsinvolvedinthe projectprocessandlatertodevelopamethodologyoftheirown.Thecourse introduces assignment based learning on a day to daybasis.

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : History of Design - II
Course Code 33050407
Semester IV **Duration** : 1 Week **Category** : TH **Credits** 2

Relevance: Studentsofdesignneedtoengagewithartanddesignhistoryasawayofinforming design practice as well asthinking. This coursewill introduce students to the breadth of art and design history from Indian as well as Western perspectives.

Objective: Theobjectiveofthiscourseistointroducestudentstohistoricaldevelopmentsinartand design againstthebackgroundofmajormovements,stylesandperiodsandwithrelationtosocial, cultural, economic,scientificandphilosophicaldevelopments.Thecoursewillintroducestudentsto Indian as well as Westernperspectivesinhistoryandalso introducestudentstoresources forstudying historythatwillenable themintheirownfutureinvestigations.Itwillcoverhistoricaldevelopments until the Industrial Revolution in the 19th century.

Content:

Middle ages:

- Byzantine,
- Early Christian,
- Later middle ages (Mughal & Rajputs)

Methodology:

- Introductory lectureson session themes, supported by films/videos.
- Visits to localmuseumstoexploreresources availablefordesign students.
- Visitstositesofhistoricalandculturalsignificance helpexamineIndiandesigninitsoriginal context.
- Group Discussions based on readings and field visits.

Book Recommended:

- *Mention the list of reference material including Books, Paper, Documents, Websites etc.*
- H.KumarVyas,*Designthe InternationalMovement withIndian Parallel*,SID,Ahmedabad,2010.
- Henri Bergson, *Creative Evolution*, New York, Random House,1944.
- S. Balaram,"ModernIndianDesign:TheRoots"in*Thinking Design*, NID, Ahmedabad, 1998, 15- 25.
- Sparke,Penny.*An Introduction to Design and Culture: 1900 to Present*.NewYork,Routledge.
- Tristan Tzara, "Dada Manifesto" inEugene Weber, ed. *Movements, Currents, Trends*, Lexington, DC Heath,1992.

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Digital Design - I
Course Code 33050408
Semester IV **Duration** : 1 Weeks **Category** : SK
Credits 2

Relevance: The upcoming era is full of Digital representation. Computer software has become a tool of expressingonescreativitysincelasttwo decades.Designincurrentscenario is not only manual but virtualand digitalto.Itimportantforthestudentstogethandyonsuchsoftwareandunderstandhow electronic can be really fruitful with use.

Objective: Toenablestudentstorecordandpresenttheirworkthroughdigitalcommunication techniques. Toenablestudents to learn new software, compile and save all subjects work in a soft copy and enhancing value through graphic skills.

Content:

- Introduction to digital design techniques and their uses,
- Introduction to Corel-draw (create/save/convert the file),
- Tools of Corel-draw,
- Making and tracing a vector image,
- Writing/editing fonts,
- Fill color in font/shape and objects.

Methodology:

- Lectures and theoreticalinputs,
- Assignments, research, analysis and concept development Discussion, Presentations and
- critiques
- Documentation of the learning process
-

Learning Outcome: Thestudentswillbeabletoworkontheintroducedsoftwareaswellasatthe endof thecoursetheywillbehavingtheirmidsemesterportfoliosonthebasisofthistheycanapplyfor internship and graduation projects to their interestedorganizations.

Book Recommended:

E-Sources key words: Guide to in design, you tube in design tutorials

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

BOS Papers for

SEMESTER V

Year 2020-21

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Fashion Drawing and Illustration - IV
Course Code 33050501 **Semester** V
Duration : 2 Week **Category** : SD
Credits 4

Relevance: Illustration helps the designer to visualize thebody form,proportion, garment pattern, drape,silhouette,colorandmanysuchthings.Stylizedillustrationsarethequickwayofexpressing designer's ideas.

Objective: To learn the standard proportion ofhuman figure for Fashion illustration. Different possess,heights,bodyshapes,expressions,scaling,andproportions in human croquis.

Content:

Wearable collection

- Active wear,
- Sports wear,
- Casual wear,
- Jeans wear,
- Evening wear,
- Formal wear,
- Knit wear,
- Indian wear.

Methodology: Demonstrations,Presentationanddiscussioninclass,Reviewandfeedbackon assignments.

Learning Outcome: Students will learn how to develop own croque for fashion Drawing.At the end of this course, they shouldbe ablerepresent theirideas on paper constructively and more efficiently using any media. Able to draw flat drawings of their collection including fashion accessories.

Book Recommended:

Basic Fashion Design 04: Developing a Collection by Elinor Renfrew.
Fashion Illustration & Design: Methods & Techniques for achieving professional results by Manuela Brambatti, 2017.
Fashion Illustration by Anna Kiper, 1979.
Big Book of Fashion Illustration by Martin Dawber, 2007.
Fashion Illustration for Designers by Kathryn Hagen, 2010.
Fashion Illustration Techniques : A super refernce book for begineers by Zeshu Takamura, 2012.

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Pattern Making - IV
Course Code 33050502
Semester V **Duration** : 2 Week **Category** : SK
Credits 4

Relevance: The2dimensional(2D)fabricdesignedisultimatelyusedformakinggarmentsfor3 dimensional (3D)figures – the human body. The diversification of the industrial need makes it important for an appareldesignertobeabletovisualize,designandconstructgarmentsataquickpace.Advanced intervention into the techniques of pattern making helps them achieve these abilities methodically with the help of measurement specifications.

Objective:

- Tointroducethefundamentalsofflatpatternmakingandtheabilitytouseitforfurther explorations.
- Equipthestudenttoanalyzeandtakethebasicskillsofpatternmakingfurtherinordertomeet challenges of garmentmaking.
- Tounderstandthevariations withcombinations– Sleeve+bodice,bodice+skirt,bi-furcated bottom etc.
- Tounderstandforminrelationtothehumanbodyproportionsandsilhouettes&itsinteraction with the environment.

Content:

- Indian wear,
- Blouses, •

Lehenga,

- Kalidar

Kurta,

- Churidar,
- Corset.

Methodology:

- Lectures & theoreticalinputs
- Demonstrations
- Discussions
- Studio/workshop handson

Learning Outcome: ThisisaSkillorientedtechnicalcourse.Attheendofthiscoursethe students are supposed to learn how to achieve 3d forms from 2d surface that is Fabric identifyingreferencepointsand

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

measurements.Themoduleisdesignedtoenablethelearner workfromadesignbriefanddevelopideasfromtheir drawingandillustrationtofinallyachieve a correct pattern for their garment. The module will develop learners'

practical skills, knowledgeofmaterialsandtechniquesandcompetenceinPatternDraftingthroughself- directed learning.

Book Recommended:

"Metric Pattern Cutting" –Winfred Aldrich
"PatternMakingforFashionDesign"–HellenJosephArmstrong
"PatternDrafting forFashion"–TeresaGilewska
"Fashion & Styles": Reference Book
"AHistoryofPaperPatternIndustry"–JoySpanabelEmery
"PatternDraftingforDressmaking"–PamelaStringer
"AGuidetoFashionSewing"–ConnieAmadenCranford
"FashionPatternMakingTechniques"–Antonio
Donnano

E-Sources key words:

https://issuu.com/sherifabid1/docs/1405175672metric_20patternc
https://www.slideshare.net/franckblau1/metric-pattern-cutting-womenswear-winifred-aldrich
https://www.pinterest.com/pin/402720391649949608/
https://www.wiley.com/en-us/Metric+Pattern+Cutting+for+Women%27s+Wear%2C+5th+Edition-p-9781444309294
https://www.threadsmagazine.com/2008/11/01/quick-reference-for-cut-and-spread-pattern-grading

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Draping - IV
Course Code 33050503
Semester V **Duration** : 2 Weeks **Category** : SK **Credits** 4

Relevance:

Where Pattern Making teaches referring to Body measurements and transferring them to paperandFabric, Drapinghasadifferent approach.Wecancall it as a technique of draping directly on the body,dress form oraform.Many designerCollections are justinspiredfromdrapes it'sa mediumof Designersexpression as wellas drapes belongtothefarbackhistorytomanykinds.Thismakesitvery muchrelevant for the Fashion Design Studentsto learn Creative Draping.

Objective: To make the students confident enough with their draping skills and creativity. To create a sense ofawareness andappreciationwithdifferent fabric,falls,drapes,bodyforms, tradition, culture and so on.

Content:

- Torso drape and its variation,
- Trouser drape and its exploration.

Methodology:

- Demonstration,
- Discussion,
- Practice,
- Spot.

LearningOutcome: Studentswilllearnpracticallyhowthedifferent type of skirts are formedtheywillbe ableto relate drapes with the evolution of Fashion. It's done andlearn course where students are supposed to learn how the 2d surface of the fabric whenwrapped differently creates various kind of skirts. The learningabout the drapescanbeasdeepaspossiblerelatedtotheoriginsofclothing.TobecontinuedinDraping-IV.

Book Recommended:

"IntegratingDrapingDraftingandDrawing"byBinaAbling,KathleenMaggio "Draping" by AnnetteDuburg.
"Draping for Fashion Design" by Hilde Jaffel.

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Garment Construction - IV
Course Code 33050504
Semester V **Duration** : 2 Weeks **Category** : SK **Credits** 4

Relevance

This course provides the knowledge of sewing techniques and its application, which is essential in converting fabrics intoproducts.

Objectives

- To understandthe use of sewing machine asa toolofconstruction
- Todevelopskillsandunderstandingofsewingtechniquesinrelationtoconstructionoftextile products
- To develop aesthetic and construction sensibility to detailing

Course Contents

- Blouse finishes,
- Loops/Dori making,
- Cups attachment,
- Boning insertion,
- Corset closures.

Methodology

- Lectures
- Demonstration
- Individual assignments
- Presentation andcritiques

Learning Outcome: Students will be able to achieve skills in stitching. They will be able to understand practically the handling of different fabric materials and its adjustments with machine for a proper outcome.

Book Recommended:

'StitchesandSeams'by'Webster/Laing'
'Clotilde'sSewSmart'byClotilde's
'ApparelProductiontermsandprocesses'byJanaceEBubonia
'SewingforApparelIndustry'byShaeffer,Claire

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Surface techniques - IV
Course Code 33050505
Semester V **Duration** :
2 Weeks **Category** : SK **Credits**
4

Relevance: Increase the value of Garment both by appearance and price. Attract the costumer to by aparticulargarmentofenhancedlook.Thismoduleaddsimmensebeautyandenhancesthelook ofgarment.The mainideaofFabricdecoration is toadd anelementofinterestonthefabric.The mostcommonmaterialusedof embellishmentismirrors,beads,sequence,threads,wiresand buttons.

Objective: Make student go through the hand techniques of printing earning several techniques. Define the term surfaceornamentation; recognize the significance of surface ornamentation on textile asvalueaddition. Explainthescopeofsurfaceornamentationandembellishmentonfashionand apparelproducts.Classifythe techniquesofsurfaceornamentationandembellishmentbydifferent types of printing and more.

Content:

- Printing techniques,
- Block printing,
- Kalam Kari, Tie & dye,
- Batik.

Methodology:

Lectures,

Demonstration,

Individual assignments,

Presentation and critiques

LearningOutcome: Thestudentswillbeabletorecognizeandexecuteworkingpracticewithhand embroidery techniques.

Book Recommended:

'Simple Embroidery' By Elsie Mochrie
'Basic Embroidery Designs' by Nirmala C Mistry
'Embroidery skills and Techniques' by Dorothi wood
'A step by step Guide to more than 200 stitch' by Lucinda Gandertone.

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Design Process - II
Course Code 33050506
Semester V **Duration** : 2 Week **Category** : DP
Credits 4

Relevance: A study of the history of costume helps understand material culture, its evolution aesthetic,expressionandtechniquethroughtheagestobuildaknowledgelibraryandresearchscope fordesign. The first Design Project in Fashion Design aims at application of all the skills learnt during the twosemestersto achieve a design solution relevant to Fashion design. A designer in the field of Apparel Industry is expected to come up with newness on a regular basis.

Objective:

Todeveloparesearchorientedprojectapproachandlearncontextdevelopmentprocessforapparels. This will start by studying the actualreferences from our own surrounding.

To encourage students to combine hands-on and knowledge of design skills with analytical skills through developing a context, making analogies, developing reference material, presentation and applying visual skills through observation, experience, perception andrepresentation.

Content:

Stage 1 First Week

- FashionResearch:InputsonFashionresearch–understandingtheprocessandmethod
- ApplyingResearch:Client,Consumer,Market(retailtype,merchandise)andProductRange(Type, Price, Color,Silhouette,Fabric/material,Details,Finish),GeneralTrendstudyofbenchmarksand competitor brands/retails
- Research Analysis: Presentation & Feedback
- Synthesis:Synthesisfromanalysis,TrendFocusfrequencypatternfromtheresearch
- Directions:Directiondevelopmentwithsynthesizeddata,Presentation&Feedback
- I:VisualReferenceBoard:Story,Color,Look&Feel(2D&3Dapplication),Material(Swatchreferences and Surface Ideas), Detail directions
- InitialSourcingFabric/material/trimsourcingasreferencefortheconceptdevelopment
- II: Concept Sketches – Silhouette, Garmentand Ensemble -1 Collection
- ConceptPresentation: Feedback, refinements and approvals
- TheCollection:Illustrations,SpecificationandTechPacksfor9finaloutfitsandCostingforoutfits

Stage 2: Prototype development 2nd Week

- Surface idea: Assignment for sample development and trial
- Silhouette pattern/drape and toil development: trial, presentation and refinement

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

- Sourcing for Sample: Sourcing actual materials
- Conversion: Material into Samples/Prototypes as per concepts
- Presentation and Photo shoot: Document submission

Methodology: Inthebeginning,studentswillbeencouragedtoworkingroupsforHistoricalstudy, research,studyandanalysisphase.Laterduringtheconceptualizationstage,eachstudentwillbe expected to select and work on one single idea.
The methodology includes

- Lectures,
- Demonstration
- Research – primary and secondary methods
- Study exploration andobservation
- Application& Practice
- Presentations and discussions, Critique etc.

Learning Outcome: Students are expected to learn the apparel design project process of building upa brief,research,analysis,synthesis,directions,storyandcolors,conceptualization,sourcing, specifications, test fit, anddesignprototypes. Going through a project process helpsstudentsidentify elementsinvolvedinthe projectprocessandlatertodevelopamethodologyoftheirown.Thecourse introduces assignment based learning on a day to daybasis.

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : History of Design - III
Course Code 33050507
Semester V **Duration** : 1 Week **Category** : TH **Credits** 2

Relevance: Studentsofdesignneedtoengagewithartanddesignhistoryasawayofinforming design practice as well asthinking. This coursewill introduce students to the breadth of art and design history from Indian as well as Western perspectives.

Objective: Theobjectiveofthiscourseistointroducestudentstohistoricaldevelopmentsinartand design againstthebackgroundofmajormovements,stylesandperiodsandwithrelationtosocial, cultural, economic,scientificandphilosophicaldevelopments.Thecoursewillintroducestudentsto Indian as well as Westernperspectivesinhistoryandalso introducestudentstoresources forstudying historythatwillenable themintheirownfutureinvestigations.Itwillcoverhistoricaldevelopments until the Industrial Revolution in the 19th century.

Content:

Middle ages:

- 15th-16th - Renaissance,
- Northern Renaissance,
- 17th Baroque,
- 18th Rococo,
- 19th Victorian period,
- Crinoline Period 1850-1870.

Methodology:

- Introductory lectureson session themes, supported by films/videos.
- Visits to localmuseumstoexploreresources availablefordesign students.
- Visitstositesofhistoricalandculturalsignificance helpexamineIndiandesigninitsoriginal context.
- Group Discussions based on readings and field visits.

Book Recommended:

- *Mention the list of reference material including Books, Paper, Documents, Websites etc.*
- H.KumarVyas,*Designthe InternationalMovement withIndian Parallel*,SID,Ahmedabad,2010.
- Henri Bergson, *Creative Evolution*, New York, Random House,1944.

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

- S. Balaram, "Modern Indian Design: The Roots" in *Thinking Design*, NID, Ahmedabad, 1998, 15- 25.
- Sparke, Penny. *An Introduction to Design and Culture: 1900 to Present*. New York, Routledge.
- Tristan Tzara, "Dada Manifesto" in Eugene Weber, ed. *Movements, Currents, Trends*, Lexington 1992.

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Digital Design - II
Course Code 33050508
Semester V **Duration** : 1 Weeks **Category** : SK
Credits 2

Relevance: The upcoming era is full of Digital representation. Computer software has become a tool of expressingonescreativitysincelasttwo decades.Designincurrentscenario is not only manual but virtualand digitalto.Itimportantforthestudentstogethandyonsuchsoftwareandunderstandhow electronic can be really fruitful with use.

Objective: Toenablestudentstorecordandpresenttheirworkthroughdigitalcommunication techniques. Toenablestudents to learn new software, compile and save all subjects work in a soft copy and enhancing value through graphic skills.

Content:

- Introduction to photoshop,
- Basics of photoshop,
- Image editing tools,
- Layers and history,
- Mask layers,
- Combining layers and photos,
- Add effects on text & pictures.

Methodology:

- Lectures and theoreticalinputs,
- Assignments, research, analysis and concept development Discussion, Presentations and
- critiques
- Documentation of the learning process

Learning Outcome: Thestudentswillbeabletoworkontheintroducedsoftwareaswellasatthe endof thecoursetheywillbehavingtheirmidsemesterportfoliosonthebasisofthistheycanapplyfor internship and graduation projects to their interestedorganizations.

Book Recommended:

E-Sources key words: Guide to in design, you tube in design tutorials

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

BOS Papers for

SEMESTER VI

Year 2020-21

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Fashion Drawing and Illustration - V
Course Code 33050601 **Semester** VI
Duration : 2 Week **Category** : SD
Credits 4

Relevance: Illustration helps the designer to visualize thebody form,proportion, garment pattern, drape,silhouette,colorandmanysuchthings.Stylizedillustrationsarethequickwayofexpressing designer's ideas.

Objective: To learn the standard proportion ofhuman figure for Fashion illustration. Different possess,heights,bodyshapes,expressions,scaling,andproportions in human croquis.

Content:

- Fashion Illustration - sketch replica,
- Brand collection - based on research,
- Theme based collection- with research.

Methodology: Demonstrations,Presentationanddiscussioninclass,Reviewandfeedbackon assignments.

Learning Outcome: Students will learn how to develop own croque for fashion Drawing.At the end of this course, they shouldbe ablerepresent theirideas on paper constructively and more efficiently using any media. Able to draw flat drawings of their collection including fashion accessories.

Book Recommended:

Basic Fashion Design 04: Developing a Collection by Elinor Renfrew.
Fashion Illustration & Design: Methods & Techniques for achieving professional results by Manuela Brambatti, 2017.
Fashion Illustration by Anna Kiper, 1979.
Big Book of Fashion Illustration by Martin Dawber, 2007.
Fashion Illustration for Designers by Kathryn Hagen, 2010.
Fashion Illustration Techniques : A super refernce book for begineers by Zeshu Takamura, 2012.

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Pattern Making - V
Course Code 33050602
Semester VI **Duration**
: 2 Week **Category** : SK
Credits 4

Relevance: The 2 dimensional (2D) fabric designed is ultimately used for making garments for 3 dimensional (3D) figures – the human body. The diversification of the industrial need makes it important for an apparel designer to be able to visualize, design and construct garments at a quick pace. Advanced intervention into the techniques of pattern making helps them achieve these abilities methodically with the help of measurement specifications.

Objective:

- To introduce the fundamentals of flat pattern making and the ability to use it for further explorations.
- Equip the student to analyze and take the basic skills of pattern making further in order to meet challenges of garment making.
- To understand the variations with combinations – Sleeve + bodice, bodice + skirt, bi-furcated bottom etc.
- To understand form in relation to the human body proportions and silhouettes & its interaction with the environment.

Content:

Menswear

- Trouser,
- Jeans,
- Jacket, Blazer,
- Shirt,
- Waist coat.

Methodology:

- Lectures & theoretical inputs
- Demonstrations
- Discussions
- Studio/workshop handson

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

Learning Outcome: ThisisaSkillorientedtechnicalcourse.Attheendofthiscoursethe students are supposed to learn how to achieve 3d forms from 2d surface that is Fabric identifyingreferencepointsand measurements.Themoduleisdesignedtoenablethelearner workfromadesignbriefanddevelopideasfromtheir

drawingandillustrationtofinallyachieve a correct pattern for their garment. The module will develop learners' practical skills, knowledgeofmaterialsandtechniquesandcompetenceinPatternDraftingthroughself- directed learning.

Book Recommended:

"Metric Pattern Cutting" –Winfred Aldrich
"PatternMakingforFashionDesign"–HellenJosephArmstrong
"PatternDrafting forFashion"–TeresaGilewska
"Fashion & Styles": Reference Book
"AHistoryofPaperPatternIndustry"–JoySpanabelEmery
"PatternDraftingforDressmaking"–PamelaStringer
"AGuidetoFashionSewing"–ConnieAmadenCranford
"FashionPatternMakingTechniques"–Antonio
Donnano

E-Sources key words:

https://issuu.com/sherifabid1/docs/1405175672metric_20patternc
https://www.slideshare.net/franckblau1/metric-pattern-cutting-womenswear-winifred-aldrich
https://www.pinterest.com/pin/402720391649949608/
https://www.wiley.com/en-us/Metric+Pattern+Cutting+for+Women%27s+Wear%2C+5th+Edition-p-9781444309294
https://www.threadsmagazine.com/2008/11/01/quick-reference-for-cut-and-spread-pattern-grading

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Draping - V
Course Code 33050603
Semester VI **Duration** : 2 Weeks **Category** : SK **Credits** 4

Relevance:

Where Pattern Making teaches referring to Body measurements and transferring them to paperandFabric, Drapinghasadifferent approach.Wecancall it as a technique of draping directly on the body,dress form oraform.Many designerCollections are justinspiredfromdrapes it'sa mediumof Designersexpression as wellas drapes belongtothefarbackhistorytomanykinds.Thismakesitvery muchrelevant for the Fashion Design Studentsto learn Creative Draping.

Objective: To make the students confident enough with their draping skills and creativity. To create a sense ofawareness andappreciationwithdifferent fabric,falls,drapes,bodyforms, tradition, culture and so on.

Content:

- Advance creative draping,
- Evening gown,
- Theme based garment draping,
- 3d draping.

Methodology:

- Demonstration,
- Discussion,
- Practice,
- Spot.

LearningOutcome: Studentswilllearnpracticallyhowthedifferent type of skirts are formedtheywillbe ableto relate drapes with the evolution of Fashion. It's done andlearn course where students are supposed to learn how the 2d surface of the fabric whenwrapped differently creates various kind of skirts. The learningabout the drapescanbeasdeepaspossiblerelatedtotheoriginsofclothing.TobecontinuedinDraping-IV.

Book Recommended:

"IntegratingDrapingDraftingandDrawing"byBinaAbling,KathleenMaggio "Draping" by AnnetteDuburg.
"Draping for Fashion Design" by Hilde Jaffel.

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Garment Construction - V
Course Code 33050604
Semester VI **Duration** : 2 Weeks **Category** : SK **Credits** 4

Relevance

This course provides the knowledge of sewing techniques and its application, which is essential in converting fabrics intoproducts.

Objectives

- To understandthe use of sewing machine asa toolofconstruction
- Todevelopskillsandunderstandingofsewingtechniquesinrelationtoconstructionoftextile products
- To develop aesthetic and construction sensibility to detailing

Course Contents

- Fusing insertion,
- Jacket sleeve (2-piece sleeve),
- Jacket pockets and collar,
- Shirt finishes.

Methodology

- Lectures
- Demonstration
- Individual assignments
- Presentation andcritiques

Learning Outcome: Students will be able to achieve skills in stitching. They will be able to understand practically the handling of different fabric materials and its adjustments with machine for a proper outcome.

Book Recommended:

'StitchesandSeams'by'Webster/Laing'
'Clotilde'sSewSmart'byClotilde's
'ApparelProductiontermsandprocesses'byJanaceEBubonia
'SewingforApparelIndustry'byShaeffer,Claire

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Surface techniques - V
Course Code 33050605
Semester VI **Duration** :
2 Weeks **Category** : SK **Credits**
4

Relevance: Increase the value of Garment both by appearance and price. Attract the costumer to by aparticulargarmentofenhancedlook.Thismoduleaddsimmensebeautyandenhancesthelook ofgarment.The mainideaofFabricdecoration is toadd anelementofinterestonthefabric.The mostcommonmaterialusedof embellishmentismirrors,beads,sequence,threads,wiresand buttons.

Objective: Make student go through the hand techniques of printing earning several techniques. Define the term surfaceornamentation; recognize the significance of surface ornamentation on textile asvalueaddition. Explainthescopeofsurfaceornamentationandembellishmentonfashionand apparelproducts.Classifythe techniquesofsurfaceornamentationandembellishmentbydifferent types of printing and more.

Content:

- Screen printing,
- Digital printing,
- Fabric Manipulation/surface & texture.

Methodology:

Lectures,

Demonstration,

Individual assignments,

Presentation and critiques

LearningOutcome: Thestudentswillbeabletorecognizeandexecuteworkingpracticewithhand embroidery techniques.

Book Recommended:

'Simple Embroidery' By Elsie Mochrie
'Basic Embroidery Designs' by Nirmala C Mistry
'Embroidery skills and Techniques' by Dorothi wood
'A step by step Guide to more than 200 stitch' by Lucinda Gandertone.

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Design Process - III
Course Code 33050606
Semester VI **Duration** : 2 Week **Category** : DP
Credits 4

Relevance: A study of the history of costume helps understand material culture, its evolution aesthetic,expressionandtechniquethroughtheagestobuildaknowledgelibraryandresearchscope fordesign. The first Design Project in Fashion Design aims at application of all the skills learnt during the twosemestersto achieve a design solution relevant to Fashion design. A designer in the field of Apparel Industry is expected to come up with newness on a regular basis.

Objective:

Todeveloparesearchorientedprojectapproachandlearncontextdevelopmentprocessforapparels. This will start by studying the actualreferences from our own surrounding.

To encourage students to combine hands-on and knowledge of design skills with analytical skills through developing a context, making analogies, developing reference material, presentation and applying visual skills through observation, experience, perception andrepresentation.

Content:

Stage 1 First Week

- FashionResearch:InputsonFashionresearch–understandingtheprocessandmethod
- ApplyingResearch:Client,Consumer,Market(retailtype,merchandise)andProductRange(Type, Price, Color,Silhouette,Fabric/material,Details,Finish),GeneralTrendstudyofbenchmarksand competitor brands/retails
- Research Analysis: Presentation & Feedback
- Synthesis:Synthesisfromanalysis,TrendFocusfrequencypatternfromtheresearch
- Directions:Directiondevelopmentwithsynthesizeddata,Presentation&Feedback
- I:VisualReferenceBoard:Story,Color,Look&Feel(2D&3Dapplication),Material(Swatchreferences and Surface Ideas), Detail directions
- InitialSourcingFabric/material/trimsourcingasreferencefortheconceptdevelopment
- II: Concept Sketches – Silhouette, Garmentand Ensemble -1 Collection
- ConceptPresentation: Feedback, refinements and approvals
- TheCollection:Illustrations,SpecificationandTechPacksfor9finaloutfitsandCostingforoutfits

Stage 2: Prototype development 2nd Week

- Surface idea: Assignment for sample development and trial
- Silhouette pattern/drape and toil development: trial, presentation and refinement

SWARNIM STARTUP & INNOVATION UNIVERSITY * SWARNIM INSTITUTE OF DESIGN

- Sourcing for Sample: Sourcing actual materials
- Conversion: Material into Samples/Prototypes as per concepts
- Presentation and Photo shoot: Document submission

Methodology: Inthebeginning,studentswillbeencouragedtoworkingroupsforHistoricalstudy, research,studyandanalysisphase.Laterduringtheconceptualizationstage,eachstudentwillbe expected to select and work on one single idea.
The methodology includes

- Lectures,
- Demonstration
- Research – primary and secondary methods
- Study exploration andobservation
- Application& Practice
- Presentations and discussions, Critique etc.

Learning Outcome: Students are expected to learn the apparel design project process of building upa brief,research,analysis,synthesis,directions,storyandcolors,conceptualization,sourcing, specifications, test fit, anddesignprototypes. Going through a project process helpsstudentsidentify elementsinvolvedinthe projectprocessandlatertodevelopamethodologyoftheirown.Thecourse introduces assignment based learning on a day to daybasis.

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : History of Design - IV
Course Code 33050607
Semester VI **Duration** : 1 Week **Category** : TH **Credits** 2

Relevance: Studentsofdesignneedtoengagewithartanddesignhistoryasawayofinforming design practice as well asthinking. This coursewill introduce students to the breadth of art and design history from Indian as well as Western perspectives.

Objective: Theobjectiveofthiscourseistointroducestudentstohistoricaldevelopmentsinartand design againstthebackgroundofmajormovements,stylesandperiodsandwithrelationtosocial, cultural, economic,scientificandphilosophicaldevelopments.Thecoursewillintroducestudentsto Indian as well as Westernperspectivesinhistoryandalso introducestudentstoresources forstudying historythatwillenable themintheirownfutureinvestigations.Itwillcoverhistoricaldevelopments until the Industrial Revolution in the 19th century.

Content:

Modern ages:

- 1900-1919 -Edwardian era,
- 1920-1939- 20's-30's WW-II,
- 1940-1959- the 40's & 50's,
- 1960-1979- the swinging 60's & 70's (Hippies, Punk etc.),
- 1980-1999- Style tribes (new romantics, power dressing, gothic, preppy, role of Haute Couture).

Methodology:

- Introductory lectureson session themes, supported by films/videos.
- Visits to localmuseumstoexploreresources availablefordesign students.
- Visitstositesofhistoricalandculturalsignificance helpexamineIndiandesigninitsoriginal context.
- Group Discussions based on readings and field visits.

Book Recommended:

- *Mention the list of reference material including Books, Paper, Documents, Websites etc.*
- H.KumarVyas,*Designthe InternationalMovement withIndian Parallel*,SID,Ahmedabad,2010.
- Henri Bergson, *Creative Evolution*, New York, Random House,1944.
- S. Balaram,"ModernIndianDesign:TheRoots"in*Thinking Design*, NID, Ahmedabad, 1998, 15- 25.
- Sparke,Penny.*An Introduction to Design and Culture: 1900 to Present*.NewYork,Routledge.

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

- Tristan Tzara, “Dada Manifesto” inEugene Weber, ed. *Movements, Currents, Trends*, Lexington1992.

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Digital Design - III
Course Code 33050608
Semester VI **Duration** : 1 Weeks **Category** : SK
Credits 2

Relevance: The upcoming era is full of Digital representation. Computer software has become a tool of expressingonescreativitysincelasttwo decades.Designincurrentscenario is not only manual but virtualand digitalto.Itimportantforthestudentstogethandyonsuchsoftwareandunderstandhow electronic can be really fruitful with use.

Objective: Toenablestudentstorecordandpresenttheirworkthroughdigitalcommunication techniques. Toenablestudents to learn new software, compile and save all subjects work in a soft copy and enhancing value through graphic skills.

Content:

- Introduction to illustrator,
- Basics of illustrator (create/open/import/save/convert/export) a file,
- Line drawing, Color filling,
- Basic tools in illustrator,
- Making, illustration/flat sketches using illustrator.

Methodology:

Lectures and theoreticalinputs,
Assignments, research, analysis and concept development Discussion, Presentations and critiques
Documentation of the learning process

Learning Outcome: Thestudentswillbeabletoworkontheintroducedsoftwareaswellasatthe endof thecoursetheywillbehavingtheirmidsemesterportfoliosonthebasisofthistheycanapplyfor internship and graduation projects to their interestedorganizations.

Book Recommended:

E-Sources key words: Guide to in design, you tube in design tutorials

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

BOS Papers for

SEMESTER VII

Year 2020-21

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Industry Work Culture
Course Code 33050701
Semester VII **Duration** : 1 Week **Category** : SK **Credits** 2

Relevance: Industry work culture helps student to learn, how industry works. What processes followed in different types of fashion industries; what kind of steps followed in those industry. How to prepare different kinds of industry related papers like, tack pack, boards, swatches, etc.

Objective:

- Initiate the students to what is Industry work culture.
- Customer/Vendors/Clint Identification & research.
- Industries in India (type of industries) – Market Study.
- A study of Industries/Brands/Export houses/Design houses – Category/Clint/Type.
- Process of designing in various Industries.
- Garment tech-packs/Costing techniques for the garments.
- Understanding buying patterns in garment industry.
- Brand positioning/Terminologies used.
- Garment sampling process.
- Raw materials/trims/Accessories used in garment sampling process.
- Sustainability Approach – Problems/Wastages conversation.

Content:

Unit 1: Introduction and Understanding of Fashion Industry

- What is fashion industry.
- Apparel industry/Brands/Export/Design house.
- Fashion Industry – work /size/scope.
- Gaps in the fashion industry segments.

Unit 2: Study of Different roles in Fashion Industry

- Detail Study Work culture in Export houses/design houses/Buying Houses/Brands etc.
- Designer's role in Export houses/design houses/Buying Houses/Brands etc.
- Process of sampling in price range.
- Process of prepare cost-sheet in price range.

Unit 3: Vendor Development and Management

- Development of Vendors – Trims/Accessories/Weavers/Printers/Embroider etc.
- Fabric sourcing/development.
- Working as a team.

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

- Sustainable approach.

Unit 4: Organized & Unorganized Industries/retail etc.

- Small regional players & Established players.
- Boutiques/Retail/Export/Brands etc.
- Ethics while working in this segment.

Methodology:

- The module is conducted through a combination of lectures.
- Presentation, discussion, practical work.
- Case study presentation and sharing of best practices.
- The students will undertake basic research and documentation.

Learning Outcome: Students will learn how to work in a group and industry environment as well. At the end of this course, they should be able represent their ideas on paper constructively and more efficiently using any media as per industry standards. Able to work step by step as per industry.

Book Recommended:

1. "Fashion: The Industry and its Careers" by Michele M. Granger / Fairchild Books.
2. "The powder Room: The Untold Story of Indian Fashion" by Shefalee Vasudev /Ebury Press.
3. "Indian Retail- All About Indian Consumer for Retailers and Brands -Attitude and Behavior to Fashion" by Ganesh Subramanian / Amazon Digital Services LLC.
4. "Recycling Indian Clothing: Global Contexts of Reuse and Value (Tracking Globalization)" by Lucy Norris /Indian University Press.

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Jeans Culture
Course Code 33050702
Semester VII **Duration** : 2 Week **Category** : SK
Credits 4

Relevance:

Jeans culture is basic understanding for global jeans brands/fashion/types of jeans/different kinds of washes/coatings/processes/trims etc.

Objective:

- To Understand the cultural impact of jeans/denim in global fashion.
- To enable students to design a collection based on a design brief.
- To enhance the garment making skills of the students through prototype development.
- To enthuse independence in students by making this project continual alongside other modules throughout the semester.

Content:

Unit 1: Ideation

- Introduction to the cultural impact of Jeans in global fashion.
- Mind mapping of the ideas for the same.
- Generating briefs and concepts for the design project.

Unit 2: Visualization and Design Development

- Formation of Design Boards for the collection.
- Exploring silhouette and surface-based ideas for the same.
- Refinement of explored silhouettes and surfaces.

Unit 3: Prototyping

- Making of sketches for the collection.
- Finalizing the design and start making flat sketches and tack-packs.
- Wash exploration in swatches.
- Fabric sourcing/development/washes.
- Prototype construction for the collection.

Unit 4: Campaign

- Generating ideas for photoshoot and look-book for the collection.
- Creative and documentation photoshoots.
- Making a look book.

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

Methodology:

- Lectures, demo, field studies, discussions and critiques.
- A/V presentations and screenings.
- Guest Speakers.
- Industry Visit.

Learning Outcome:

The student will able to:

- Gain understanding of Jeans as a culture by developing a collection on the same.
- Apply the learning of terminologies related to the design process.
- Explore and implement their ideas into developing denim-based garments.
- Approach a project step by step, based on the brief.
- Synthesize their learning and work independently on their projects.

Book Recommended:

1. “Denim: Fashion’s Frontier” by Emma McLendon, Fred Dennis/Yale University Press.
2. “Jeans: A Cultural History of an American Icon” by James Sullivan/Avery; 1st edition.
3. “Levi’s Strauss & Co. (CA) Images of America” by Lynn Downey/Arcadia Publishing.
4. “fashion Design: Process, Innovation and Practice” by Kathryn McKelvey Janine Munslow/Wiley.

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Denim Wear
Course Code 33050703
Semester VII **Duration** : 4 Weeks **Category** : SK
Credits 8

Relevance:

Denim wear is introduced fir in-depth understanding of denim fabrics (from-fiber to fabric), indigo prints, surfaces, denim washes and finishes, fits, silhouettes, handing of different weight of fabrics, etc.

Objective:

- Understand Denim and indigo (textile & Garment).
- Brands that are in this domain.
- Retailing of Denim brands, size and scope of denim industry.
- A study of Denim brands in India and overseas.
- Sustainable approach.
- To develop knowledge of fitted garments.
- To develop knowledge and understanding of denim wear garments.
- Understand advanced and complex concepts in pattern making.

Content:

Unit 1: Denim

- Various types of denims used in fashion.
- Various dyeing techniques on denim with key focus on Indigo.
- Various washes in Denim.
- Various surface techniques relevant to denim.

Unit 2: Understanding origins of denim & Indigo

- History of denim explaining its origins as a fabric.
- Origin of jeans as a garment.
- Origin of Indigo as a dye.
- Uses/application of Indigo as a dye.
- Indigo & pop-cultures/subcultures.
- Indigo and its traditional uses for printing and dyeing.

Unit 3: Evolution of denim & Indigo

- Evolution of denim as a fabric.
- Evolution of denim through popular culture-music.
- Evolution of indigo.

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

- Evolution of style.

Unit 4: Analyze & study the transition of styles of jeans with reference to context

- Study the transition of style- jeans & music movements, e.g. Rock & roll/grunge.
- Analyze the transition of popular style.
- Analyze the acceptance of style into newer contexts.

Methodology:

- Lectures and discussions.
- A/V presentations and screenings.
- Field study and critiques.
- Interviews and interactions.
- Individual and group activities.
- Practical demonstration and explorations.

LearningOutcome:

- In-depth understanding of denim fabrics and indigo fabrics.
- Understanding indigo prints and surfaces.
- Washes and finishes (Sustainable approach can be taken)
- Merchandising and costing.
- Understanding fits and silhouettes.
- Able to understand denim and indigo garments.
- Handling different weight of fabrics.
- Ability to apply various inputs to create a garment.

Book Recommended:

1. "Denim Design Lab LE" by Brain Robbins /Denim Design Lab LLC.
2. "Denim Finishes" by Rishabh Manocha /Create space independent publishing platform.
3. "Denim: Manufacture, Finishing and Applications (Woodland publishing series in textiles)" by Roshan Paul /Woodland publishing.
4. "Denim Branded: Jeanswear's Evolving Design Details" by nick Williams, Jenny Corpuz /Schiffer fashion press.
5. "Denim Style" by Horst A. Friedrichs /Prestal.
6. "Icons if Style: Cult Denim" by The Daily Street /Mitchell Beazley.
7. "Denim: Fashion's Frontier" by Emma Mc Clendon, Fred Dennis / Yale University Press.

SWARNIM STARTUP & INNOVATION UNIVERSITY * SWARNIM INSTITUTE OF DESIGN

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Advance Pattern Making
Course Code 33050704
Semester VII **Duration** : 4 Weeks **Category** : SK **Credits** 8

Relevance

This course provides the knowledge of form and structure of any garment pattern, they easily able to insert any shapes to a garment.

Objectives

- To understand form as a key element in fashion and explore structures around it.
- To enable students to design a collection based on a brief.
- Enhance the design/pattern/garment making/stitching skills of the students through prototype development.
- To enthuse independence in students by making this project continual alongside other modules throughout the semester.

Course Contents

Unit 1: Ideation

- Understanding the form and structure of an object.
- Mind mapping of ideas related to the selected object.
- Generating briefs and concepts for design projects.

Unit 2: Visualization and Design Development

- Formation of design boards for the collection.
- Exploring silhouette and surface-based ideas for the same.
- Refinement of explored silhouettes and surfaces.

Unit 3: Prototyping

- Making of tech packs for the collection.
- Fabric sourcing and development.
- Prototype construction for the collection.

Unit 4: Campaign

- Generating ideas for photoshoot and look-book for the collection.
- Creating and documentation of Photoshoots.
- Making a look-book.

Methodology

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

- Lectures, discussions and critiques.
- A/V presentation and screenings.

- Guest speakers.

Learning Outcome:

The student will be able to:

- Gain understanding of form and structure by developing a collection on the same.
- Apply the learning of terminologies related to the design process.
- Explore and implement their ideas into developing form focused garments.
- Approach a project step by step, based on the brief.
- Synthesize their learning and work independently on their projects.

Book Recommended:

1. '"Fashion Design: Process, Innovation and practice" by Kathryn McKelvey Janine Munslow /Wiley.
2. "The Future of Fashion is Now (English)" by J. Brand Eds. J. Teunissen /Boijmans Van Beuningen.
3. "What's the Future of Fashion?" by Frances Corner /Thames & Hudson.
4. "Trend Forecaster's Handbook" by Raymond Martin /Laurence King Publishing.

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : New Age Illustration (Digital)
Course Code 33050705 **Semester**
VII **Duration** : 2 Weeks **Category**
: SK **Credits** 4

Relevance:

In New age illustration students will able to illustrate their idea digitally/more fast and easily, they also able to done their flat sketches in illustrator application, also they learn advanced level of illustration/styling/editing/mix-media techniques digitally.

Objective:

- Introduce the arena of graphic design for the fashion industry, initiating with vector & image-making as a continual input.
- Getting familiar with graphic development of digital illustrations.
- Understanding the advanced features of digital illustration.
- Learning to understand the impact & deeper influences of social-media.

Content:

Unit 1: Graphic Design for Fashion

- Vector Graphics – Design Drawings (body, flat garments etc.).
- Design garments/coloring/adding 3D effects.

Unit 2: Graphical Styling

- Digital/Computerized Styling – as per concept/theme/color.
- Adding/changing color as per concept/theme.
- Adding elements/background as per theme/concept.
- Application & various categories of editing digitally.

Unit 3: Advanced Digital Editing

- Introduction to Professional editing tools & techniques of photos.
- Creative lighting techniques.
- Adding patterns and colors to the garments.

Methodology:

- Lectures, practical demonstration over projection and discussions.
- Classroom exercises.
- A/V presentations and screenings.
- Expert Guests in classroom.

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM INSTITUTE OF DESIGN

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARNIM
INSTITUTE OF
DESIGN

LearningOutcome:

- Understand the basics of using vector graphics & image-making.
- Understand the use of digital media for fashion illustration/range development/garment designing.
- Understand an advanced level of illustration styling/editing/mix-media.
- Understand the advanced level of garment wrapping on illustrations.

Book Recommended:

1. "Digital Fashion Illustration with Photoshop and Illustrator" by Kevin Tallon /Batsford.
2. "Digital Fashion print with photoshop and Illustrator" by Kevin Tallon /Batsford.
3. "Fashion and Textile Design with Photoshop and illustrator: Professional Creative Practice: by Robert Hume /Fairchild Books.
4. Advanced Digital Photography: Techniques & Tips for Creating Professional – Quality Images, Revised Edition" by Tom Ang /Am photo Books; Revised edition.
5. "Adobe Master Class: Advanced Compositing in Adobe Photoshop CC: Bringing the Impossible to Reality – with Bert Malley (2nd Edition)" by Bret Malley /Adobe Press' 2nd edition.
6. "Fashion Illustration: Inspiration and Technique" by Anna Kiper /David & Charles.
7. "Draw Fashion Now: Techniques, Inspiration and Ideas for Illustrating and Imagining your designs – with Fashion paper Dolls and a Customizable, Designer-Inspired Wardrobe" by Danielle Meder /Rockford Publishers.
8. "Fashion Drawing, 2nd Edition: Illustration Techniques for Fashion Designers" by Michele Wrsen Bryant /Laurence King Publishing.

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Fashion Sustainability
Course Code 33050706
Semester VII **Duration** : 1 Week **Category** : TH **Credits** 2

Relevance:

A study of the Fashion Sustainability helps understand, what is sustainability, idea of sustainability within the design process & product development. How to made a sustainable product and also how to make a sustainable brand.

Objective:

- To imbibe in the students, the core concept of sustainability.
- To enable them to understand Fashion from the viewpoint of being sustainable.
- Familiarizing them with different practices that are sustainable.
- International brands & organizations that are advocating sustainability for the fashion industry.

Content:

Unit 1: Concept of Sustainability

- Understanding what is Sustainability.
- Introducing students to the idea of sustainable practices.
- Fashion and sustainability.
- Brands and sustainability.
- Global movements that advocate the sustainability.

Unit 2: Sustainable Fabrics/ Dyeing /Printing

- Fabrics and sustainability – upcycle/ Recycle.
- Sustainable Printing.
- Sustainable Dyeing.
- Sustainability in process and eco-friendliness.

Unit 3: Sustainable Patternmaking

- Subtraction method of pattern making.
- Transformational method of Pattern making.
- Methods of optimizing fabric consumption.

Unit 4: Sustainable Construction & Finishing

- Hand Stitching vs Machine stitching.
- Water-sustaining garment finishes.

- Worldwide sustainable practices for the fashion industry.
- Embellishments – Hand vs machine.

Unit 5: Waste Management

- Use of post-production waste to re-create.
- Theories and Practices of managing industrial wastage.

Methodology:

- Introduction to sustainable practices.
- Demonstrations/workshops etc.
- Lectures from industry representatives.
- Outdoor/Industry visits.

Learning Outcome:

- A generalized understanding of what is sustainability.
- Incorporating the idea of sustainability within the process of design & product development.
- Understanding how "fashion" can be made sustainable.
- Understanding how to create a sustainable "brand".

Book Recommended:

1. "Sustainability in Fashion and Apparels: Challenges and Solutions" by M. Parthiban and M. R. Srikrishnan /Woodhead Publishing India.
2. "Fashion and Sustainability: Design for Change" by Kate Fletcher, Lynda Grose, Paul Hawken /Laurence King Publishing.
3. "Refashioned: Cutting-Edge Clothing from Upcycled Materials" by Sass Brown /Laurence king Publishing.
4. "Fashion Fibers: Designing for Sustainability" by Annie Gullingsrud /Fairchild Books.
5. "The Sustainable Fashion Handbook" by Sandy Black /Thames & Hudson.

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

BOS Papers for

SEMESTER VIII

Year 2020-21

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

FASHION DESIGN COURSE ABSTRACT PROPOSAL

Course Name : Graduation Project (Internship)
Course Code 33050801 **Semester**
VIII **Duration** : 16 Week **Category**
: TH **Credits** 30

Objective:

- As a real-life experience for the students to gain a macro understanding of the nature of the industry, as well as engage with the same.
- To gain a holistic understanding of the industry setup to comprehend the role of the designer as though-leadership.
- Understanding and executing the design process in conjunction with the infrastructure in the industry.

Content:

Unit 1: Study Areas

o In-depth study of the company profile and market positioning of the brand.
o Overview of the target-market segment.
o Development of Project Brief.
o Execution of design process and product development.
o Following through the processing of range/collection development from design idea initiation to various
aspects of construction/production, quality control, marketing and costing.
o Prototypes and Final collection/range (4-8 outfits).
o Understanding the documentation procedures and practices.

Unit 2: Professional Portfolio

o Collecting and composing the Final professional Portfolio and Orientation to the necessary presentation tools and techniques.
o Communication and representation of the final body of the work to a selected Jury panel.

Unit 3: Deliverables

o Tentative plan/schedule and synopsis/project brief for the graduation project (on the suggestions given in task schedule).
o In-depth study and collation of information.
o A complete documentation of the project methodology, processes and outcomes with reference to information, related documents and relevant visuals.
o Digital presentation of the entire process of creating the collection.
o Final showcase of a graduate event, emulating an Industry-level trade event exhibition, conceived and based

upon the institutional event branding.

Final outfits (4-8 garments) to be also displayed on the live models at the event, as a runway show.

Learning Outcome:

Based on the learning of the all of the previous semesters and the knowledge gained thereby; the students are to take up
one of the given pathways:

• Creating a signature clothing brand in entry (brand philosophy, image, fashion direction etc.) following the self-identity and design -vision of an individual student.

• Design collaboration with as Apparel industry/Design House /Craft cluster/ NGO/Ministry of Textiles or Handicrafts/ Khadi and Village Industry commission or similar bodies. (*Students MUST NOT dilute this as a mere internship engagement)*

Book Recommended:

1. “Brandstand: Strategies for retail Brand Building” by Arthur Winters, Peggy Winters, Carole Paul /Visual Reference Publications.
2. “The Business of Fashion” by Burns, Leslie Davis and Nancy O Bryant /New York: Fairchild Publications, 2002.
3. “Future Fashion: Innovative Materials and Technology” by San Martin, Macarena /Palermo: Promo press, 2010.
4. “The Fashion Reader” by Welters, Linda and Abby Lillethun/Oxford: Berg, 2011.
5. “Fashion Design: Process, Innovation and practice” by Kathryn McKelvey, Jannie Munslow, 2012 /2nd Edition. West
Sussex: John Wiley & Sons Publications.
6. “Sphinx of Fashion” by Mear, P, 2008 /Madane Gres: Yale University Press.
7. “Madeleine Vionnet” by Kirke, B, 1998 /San Francisko: Chronicle Books.

CENTRAL COUNCIL OF INDIAN MEDICINE
NEW DELHI

SYLLABUS OF AYURVEDACHARYA (BAMS) COURSE

INDEX

2ND PROFESSIONAL

1.1	DRAVYAGUNA VIGHYAN	2-9
1.2	ROGA NIDAN	10-14
1.3	RASASHATRA	15-23
1.4	CHARAK SAMHITA	24

2.1 DRAVYAGUNA VIGYAN

(PHARMACOLOGY & MATERIA MEDICA)

Lectures: 200 Hrs.

Practicals: 200 Hrs.

Total Marks -400

Theory Two Papers– 100 Marks Each

Practical/Viva voce – 200 Marks

Paper I **100 Marks**

Part A **50 Marks**

1- Dravyaguna Shastra Paribhasa- Lakshana of Sapta Padartha of Dravyaguna Vijnana viz Dravya- Rasa-Guna- Virya- Vipaka- Prabhava and Karma.

2- Dravya:
Etymological derivation, definition, panchbhoutikatwa.
Classification of Dravya according to Samhitas and Nighantus Taxonomical classification.

3- Guna:
Etymological derivation, definition and Classification of Guna.
Detailed knowledge of Gurvadi Guna & Paradi gunas.

4- Rasa:
Etymological derivation, definition, Meaning of "Rasa" in various contexts. Shad Rasas (Madhura, Amla, Lavana, Katu, Tikta, and Kashaya), Panchabhautik constitution of Rasas, Nirvrittiviseshakrama (manifestation in general and particular), Ritu and shad rasa Rasanurasayoh bheda (Difference between rasa and anurasa), Lakshana (characteristics),Guna and Karma of shad Rasas, Kopana and Shamana of Dosha and dushya by Shad rasas. Effects of excess usage of Rasa. Rasopalabdhi, Rasaskandha.

5- Vipaka:
Etymological derivation and definition, difference between Avasthapaka and Vipaka, Types of Vipaka, (Dvividha-Trividha,Panchavidha) Guna and karma of Vipaka.
Grades of Vipaka (taratamya), Vipakopalabdhi hetu (Factors to determineVipaka).

6- Veerya:
Etymological derivation, definition and Swarupa of Virya, Number of Virya.
(Dwividha & Ashtavidha), Panchabhauthikatva
Virya karmani (Effects of Virya), General principles in determination of virya along with exceptions.

7- Prabhava:

Definition, Effects of Prabhava.

8- Interrelation of Rasa-Guna-Virya-Vipaka-Prabhava with respect to their strength (balabal nirupana). Samanapratyayarabdha and Vichitrapratyayarabdha dravyas.

9- Karma:

Lakshana, swaroopa and bheda of karma (Definition, nature and types of action).

Explanation of the following Karmas with examples:

1. Deepana	2. Pachana	3. Samshodhana
4. Samshamana	5. Anulomana	6. Sransana
7. Bhedana	8. Rechana	9. Chhedana
10. Lekhana	11. Grahi	12. Sthambhana
13. Madakari	14. Pramathi	15. Abhishyandi
16. Vyavayi	17. Vikashi	18. Rasayana
19. Vajeekarana	20. Jeevaneeya	21. Balya
22. Brimhana	23. Langhana	24. Medhya

10. Brief information on Karmas of dashemani gana of Charak Samhita.

11- Mishraka Gana:

11a)- Audbhida Gana (Vegetable origin) Brihatpanchamoola, Laghupanchamoola, Vallipanchamoola, Kantakapanchamoola, Trinapanchamoola,Madhyamapanchamoola, Jeevaneeya panchamoola, Panchapallava, Panchavalakala, Triphala, Trikatu,Trimada, Chaturusana, Panchakola, Shadusana, Chaturbeeja, Jeevaniya gana, Ashtavarga, Trijataka, Chaturajataka, Katuchaturjataka Panchatikta, Amlapanchaka, Chaturbhadra,Trikarshika, Swalpatriphala, Madhuratriphala, Mahavisha, Upavisha, Agrya aushadh varga- Knowledge of Agrayaaushadha Varga with example.

11 b)- Jangama Gana (Animal origin)- Ksheerashtaka, Mutrashtaka, Pitta panchaka.

11 c)- Parthiva Gana (Mineral origin) - Lavana Panchaka, Kshara dvaya, Kshara Ashtaka.

12- Basis of nomenclature:

Basis of nomenclature of dravya, Basis and Derivation of synonyms.

13. Bheashaja Pariksha vidhi (as described in Charaka samhita vimana sthana 8), Dravya Sangrahana (collection of dravya)- Ecology- Classification of desha (geographical area) and bhumi (soil), swarupa of sangrahaniya dravya of (Nature and quality of drug to be collected). Sangrahana vidhi (Method of collection) -Vegetable and Animal origin drugs according to part used. Period of collection according to virya, samrakshana vidhi (preservation of collected dravyas), bheshajagara (Storehouse), study on different prayojyanga (useful plant parts).

Part B **50 Marks**

(I) **20 Marks**

14 a) Concept of dravya shodhan (purification of dravya).
14 b) Brief knowledge of Apamishran (adulterants)
14 c) Concept of Abhava pratinidhi dravya (substitutes)

15- Prashasta bheshaja (ideal drug), plant extracts. Concept of viruddha Dravya (incompatibility of the dravya).

16- Introduction to Nighantu Vigyan - Dhanwantari Nighantu, Bhavaprakashanighantu, Rajanighantu.

17- Brief knowledge of cultivation, conservation of medicinal plants and information about endangered species**.**

(II) **30 Marks**

18. - Introduction, Definition & scope of Pharmacology and Principles of general Pharmacology. Brief Knowledge about pharmacology of the following - Anaesthetics, CNS depressants, Sedatives, Hypnotics, Tranquilisers, Antipyretics, Analgesics, Antiepileptics, Antihypertensive, Antianginal, Antiplatelet, Hypolipidaemic, Haemopoetic, Coagulants, Bronchodialators, Aerosols/ Inhalants, Expectorants, Digestants, Carminatives, Antacids, Antiulcer, Laxatives, Antidiarrhoeals, Antiemetic, Hepatoprotective, Diuretic, Antidiuretic, Lithotriptic, Antiinflammatory, Hormonal therapy, Antiobesity, Antidiabetic, Antithyroid, Oxytocic. Galactagogues, Contraceptives, Styptics, Antihistamines, Antimicrobial, Antibiotics, Antimalarial, Amoebicidal, Antifilarial, Anthelmentic, Antifungal,Vitamins, Minerals,Water imbalance and IV fluids, Vaccines, antivenom, antirabbies serum, Local anti septics, drugs in ophthalmic practice, Anti cancer drugs and immunomodulators.

Paper II **100 Marks**

Part A **70 marks**

1-Detailed Knowledge of Following Dravya –

1- Detailed knowledge of following drugs with respect to Basonym of drug, Main Synonyms, Regional Name, Botanical Name, Family, Classification of Dravya (Gana) as described in Charak and Sushrut, External morphology, Useful parts, Important phytoconstituents, Rasa panchaka, Action on Dosha, Dhatu, Mala, Prayogarha vyadhi (therapeutic indications), Amayikaprayoga and Matra (Therapeutic administration and Dose), Vishishta yoga (names of important formulations), Vishakta Lakshan (adverse effects), Chikitsopachara (remedial measures) and Shodhana (as required)

[Alphabetical order and Botanical names to all the drugs are to be added]

Agaru	Guggulu	Pashanabheda
Agnimantha	Haridradvaya	Patala
Agnimantha	Haritaki	Pippali-Pippalimula
Ahiphena	Hingu	Prishniparni
Amalaki	Jambu	Punarnava
Apamarga	Jatamansi	Pushkarmoola
Aragvadha	Jatiphal	Rasna
Aragvadha	Jeerakadvaya	Rasona
Ardraka-Sunti	Jyotishmati	Rohitaka
Arjuna	Kalamegha	Saireyaka
Arjuna	Kampillaka	Sarivadvaya
Arkadvaya	Kanchanara	Sarpagandha
Ashvagandha	Kantakari	Shalaparni
Asoka	Kapikacchu	Shallaki
Ativisha	Karkatakshringi	Shalmali
Bakuchi	Karpura	Shankhapushpi
Baladvayam.	Katuki	Shatavari
Bhallataka	Khadira	Shigru
Bharangi	Kiratatikta	Shirisha
Bhrungaraj	Kumari	Shyonaka
Bibhitaka	Kumkum Kesara	Talisa Patra
Bijak/ Vijaysar	Kupilu	Tila
Bilva	Kushta	Trivrut
Brahmi	Kutaja	Tulasi
Bruhati	Lavanga	Tvak
Chandanadvaya,	Lodhra	Ushira
Chitraka	Madanaphala	Vacha
Dadima	Mandukaparni.	Varahi
Devadaru	Manjishtha	Varahi
Dhataki	Maricha	Varuna
Durva	Musta	Vasa
Eladvayam	Nagakeshara	Vatsanabha
Eranda	Nimba	Vidanga
Gambhari	Nirgundi	Vidari
Gokshura	Palasha	Yastimadhu
Guduchi	Parpata	Yavani

Part B-

II- Brief Knowledge of following dravyas with Respect to Sanskrit Name, Botanical Name, Family, Habit (Samanya Swarupa), Parts Used and Indications.

Agastya	Jati	Palandu
Ajamoda	Jayapala	Parasika Yavani
Akarkarabh	Jeevanti	Parijata
Amlavetasa	Kadali,	Parisha
Amra	Kadamba	Parnabija

Amragandhiharidra
Ankola
Aparajita
Ashvagol
Ashvattha
Asthishrunkhala
Atasi
Avartaki
Avartani
Babbula
Badara
Bakula
Bhumyamalki
Bijapoora
Bola
Chakramarda
Champaka
Chandrashura
Changeri
Chavya
Chirbilva
Chopachini
Danti
Darbha
Dattura
Dhanvayasa
Dhanyaka
Draksha
Dronapushpi
Gandhaprasarini
Garjara
Gojihva,
Gorakshaganja
Gunja
hinsapa
Hinstra
Hribera
Hrutpatri
Ikshu
Indravaruni
Ingudi
Irimeda
Ishvaku
Isvari
Japa
Kaidarya
Kakamachi
Kamala
Kankola
Karanja
Karavellaka
Karavira
Karira
Karpasa
Kasamarda
Kasha
Kasni
Kataka
Katphala
Kebuka
Kharjura
Kitmari
Kokilaksha
Koshataki
Kulatha
Kumuda
Kusha
Kusmanda
Lajjalu
Langali
Latakaranja
Latakasturi
Madayantika
Mahanimba
Mandukaparni
Markandika
Masha
Mashaparni
Matulunga
Mayaphala
Meshashrungi
Methika
Mudgaparni
Mulaka
Murva
Nagabala
Nala
Narikela
Nili
Padmaka
Parnayavani
Parpataka
Parushaka
Patalagarudi
Patha
Patola
Patranga
Pilu
Plaksha
Prasarani
Priyala
Priyangu
Puga
Putiha
Putranjivaka
Rajika/Sarshapa
Rohitaka
Saptachakra
Saptaparna
Saral
Sarja
Shala
Shara
Sharapunkha
Shatahwa
Shati
Snuhi
Sringataka
Svarnakshiri
Tagara .
Tailaparni
Talmuli
Taruni
Tavakshira
Teja Patra
Tuvaraka
Udumbara
urana
Vamsha
Vata
Vatada
Vrudhadaru
Vrukshamla

III .-Introduction, Guna, Karma and Uses of following Jantava Dravya (Drugs of Animal Origin).

1. Kasturi
2. Gorochana
3. Mrigasringa

IV- Introductory Knowledge of Following Annapana Varga:

1. Jala Varga	2. Dugdha Varga	3. Madhu Varga
4. Taila Varga	5. Sukadhanya Varga	6.Shamidhanya Varga
7. Phala Varga	8. Shaka Varga	9. Mamsa Varga
10. Aharayogi		

PRACTICALS

1. A. Study of Macroscopic, Microscopic characters and Demonstration of organoleptic charcteristics and grahya-agrahyatva of following plants and their useful parts.

i. Kanda (stem) - Guduchi or Ashtishrinkhala
ii. Patra (leaves) - Vasa or Kumari
iii. Pushpa (flower and Parts of flower)- Dhataki or Japa
iv. Phala (fruit) – Maricha or Madanaphala or Vidanga
v. Beeja (seeds) – Eranda or Kapikacchhu
vi. Twak (bark) – Kutaja or Arjuna or Ashwattha
vii. Moola(Root)- Punarnava or Chitraka
viii. Niryasa (exudate) – Guggulu or Mocharasa
ix. Jangama dravya - Madhu or Ghrita.

2. Records of Herbarium sheets of 50 medicinal plants Compulsory study tour other state/s for field knowledge and procurement of plant species.

PRACTICAL MARKS DIVISION

1	Herbarium	20 Marks
2	Practical record	20 Marks
3	Drug identification- spotting –Raw/crude drugs	30 marks
4	Plant identification spotting –fresh	30 marks
5	Practical	40 marks
6.	Viva-Voce	60 Marks
Total		**200 marks**

Reference Books

1.	Abhinav Buti Darpan (Vol.1-2)	-	Vd. Roop Lal Vaishya
2.	Aushadna Vigyna Shastra	-	Acharya Pt. Vishvanatha Dwidevi
3.	Ayurvediya Aushadnkarma vigyana	-	Acharya V.J. Thakur
4.	Bedi Vanaspati Kosha	-	Prof. Ramesh Bedi
5.	Bhaishajyaguna Vigyana	-	Dr. Alakhnarayan Singh
6.	Bhav Prakash Nigantu (English)	-	Shreekanthamurti
7.	Bhav Prakash Nighantu	-	With Vd. Krishna Chandra Chunekar commentary
8.	Bhrinad dravyagunadarsha	-	Mahendra Kumar Shastri
9.	Classical Uses of Medicinal Plants	-	Acharya Priyavrata Sharma
10.	Controversial Medicinal Plants	-	Vd. G. Bapa Lal
11.	Dalhana Ka Dravyaguna Shastra Ke Kshetra Me Yogadana	-	Vd. Shiv Kumar Vyas
12.	Dravyaguna Kosha	-	Acharya Priyavrata Sharma
13.	Dravyaguna Sutram	-	Acharya Priyavrata Sharma
14.	Dravyaguna Vigyana	-	Dr. Gyanendra Pandey
15.	Dravyaguna Vigyana(Vol. 1-2)	-	Acharya Yadavji Tikram Ji
16.	Dravyaguna Vijyana	-	Dr. V.M. Gogate
17.	Dravyaguna Vigyana (Vol. 1-5)	-	Acharya Priyavrata Sharma
18.	Dravyaguna Shastrum	-	Vaidya G.A. Phadake
19.	Dravyaguna Vijyana	-	Dr. A.P. Deshpande
20.	Dravyagunavijnana basic Principles	-	Prof.D.S.Lucas
21.	Forgotten Healers (Indian Medicinal Plants)	-	Dr. Prakash Pranjape
22.	Glossry of Vegetable Drugs in Bhrittrayis	-	Thakur Balwant Singh & Vd. Krishna Chandra Chunekar
23.	Introduction to Dravyaguna	-	Acharya Priyavrata Sharma
24.	Kriyatamka Aushadi Parichaya	-	Acharya Pt. Vishvanath Dwidevi
25.	Materia Medica	-	Acharya Ghosh
26.	Nighantu Adarsh (Vol. 1-2)	-	Vd. Bapa Lal
27.	Pharmacological basis of Medical Practice	-	Goodman & Gillman
28.	Pharmacology and Pharmacotherapeutics	-	Satoskar Bhandarkar & Ainapure
29.	Prayogatamaka Dravyaguna Vigyana	-	Dr. Maya Ram Uniyal
30.	Priya nighantu	-	Acharya Priyavrata Sharma
31.	Raspanchaka/Dravyaguna Siddhanta	-	Prof. Shivcharan Dhyani
32.	System of Plant Nomenclature in Ayurveda	-	Dr. Gyanendra Panday
33.	Text Book of Pharmacognosy	-	Trees & Valis
34.	Textbook of Dravyaguna	-	Dr.K.Nishteswar
35.	Unani Dravyaguna Vigyana	-	Hakim Daljeet Singh

36.	Useful parts of Charaka, Sushurut, and Vagbhata.	-	
37.	Uttarakand Ki Vanaspatiya	-	Dr. Gyanendra Pandey
38.	Vanoaushadi Darshika	-	Thakur Balwant Singh
39.	Vanoaushadi Nidarshika	-	Dr. Ram Sushil Singh
40.	Vedic Vanaspatiyan	-	Dr. Dinesh Chandra Sharma

*****
***
*

2.2 ROGA NIDANA

Theory Two Papers – 100 Marks Each
Practical/Viva voce – 100 Marks

PAPER -1 **100 Marks**

Part A **50 Marks**

I. Dosha Dushyadi Vigyan

1. Definition and importance of Roganidana.
2. Samanya Nidana and Samanya Lakshana of Dosha Vriddhi, Kshaya and Prakopa.
3. Dosha Dhatu Ashraya Ashrayi Bhava.
4. Dhatu Kshaya Vriddhi Lakshana.
6. Mala Kshaya Vriddhi Lakshana.
7. Hetu, Bheda and Lakshana of Agni Dushti.
8. Definitions and Samanya Lakshana of Ama.
9. Sama and nirama Dosha, Dushya Lakshana.
10. Dosha Paka and Dhatu Paka Lakshana.
11. Concept, classification, diagnosis and general complications of Avarana.
12. Doshagati and Rogmarga.
13. Detailed study of Srotomoola and Srotodushti Samanya and Vishishta Hetu Lakshana of all Srotas. Differences between Sroto Dushti and Kha Vaigunya.

II. Vyadhi Vigyan

1. Definition, synonyms and classification of Vyadhi & Vyadhi Ghatak.
2. Criteria for nomenclature of Diseases in Ayurveda (Vyadhinamakarana).
3. Bija, Bija Bhaga and Bija Bhaga Avayava Dushti.
4. Basic knowledge of Hereditary, Congenital, Acquired, Multifactorial, Traumatic and Environmental disorders.
5. Introduction to ICD Classification of Diseases of WHO and DSM classification.
6. Samanyaja and Nanatmaja Vikara. NidanarthakaraVyadhi, Hetu Sankara, Lingasankara, Vyadhisankara, Vyadhi Awastha.
7. Dhatu, Updhatu, Mala and Indriya Pradoshaj Vikara.
8. Concept of AshtaMahagada .
9. Introduction to Ashta Nindita.
10. Definition and classification of Vyadhikshamatva.
11. Ojas – types of Ojo Dushti- Visrimsa- Vyapad & Kshaya & It's Diseases.

III. Basic Pathology

1. Introduction to pathology and its sub-divisions.
2. Introduction to Cell Injury and Cellular adaptations.
3. Definition and brief description of inflammation – Healing/repair.
4. Definition and brief description of edema – shock – hemorrhage, Thrombosis , embolism, Ischemia and Infarction.
5. Types of Immunity – different types of immune responses in the body – Basic knowledge of auto immune diseases, Acquired immune deficiency disease and hypersensitivity.
6. Nomenclature and classification of tumors - difference between benign and malignant tumors.
7. Introduction to Nutritional disorders – disorders of macro and micro nutrients.
8. Introduction to infections.

9. Introduction and classification of microorganisms such as virus- bacteria-fungus.

Part B **50 Marks**

IV. Nidana Panchaka Vigyana

1. Difference between Roga and Rogi Pariksha.
2. Importance of Nidan Panchaka.
3. Hetu - Definition, Synonyms and Classification.
4. Purva Rupa – Definition, Synonyms, Samanya and Vishishta Purvarupa.
5. Rupa - Definition, Synonyms, Samanya and Pratyatma Lakshana. Difference between Vyadhi and Lakshana.
6. Upashaya / Anupashaya– Definition, Types and its importance in diagnosis.
7. Samprapti – Definition, Synonyms and Type and Samprapti Ghataka.
8. Shat Kriyakaala. Relationship between Nidana Panchaka and Shat Kriyakaala.
9. Upadrava and Udarka.
10. ArishtaVigyan – Definition, Types and its importance.
11. Sadhyasadhyatwa – Types, their parameters and importance.
12. General diagnostic principles of AnuktaVyadhi (Ch. Vi. 4).

V. Pariksha Vigyana

1. Importance and knowledge of Aptopadeshadi & Darshanadi Trividha, Chaturvidha, and Shadvidha Pariksha.
2. Importance and Knowledge of Ashtasthana Pariksha.
3. Importance and Knowledge of Karanadi Dashavidha Parikshya Bhava.
4. Importance and Knowledge of Dashavidha Pariksha.
5. Basic knowledge of ECG, USG, X Ray, CT Scan,MRI.

Paper II **100 Marks**

Part A **50 Marks**

Systematic study of Nidana Panchaka of following diseases (Including Upadrava, Arishta and Sadhyasadhyata).

I. Diseases of Rasavaha Srotas

1(a) Jwara(Jwarabheda-Ama, Pachyamana and Nirama Jwara,Agantukajwara, Punaravartaka Jwara,Vishama Jwara, Dhatugata Jwara, Charakokta Sannipata Jwara.

1(b) General mechanism of Fever, Introduction to the Aetiopathogenesis of Malaria,Typhoid, Dengue fever, Influenza and Chikungunya.

2(a) Pandu, Amavata, Hridroga, Shotha.

2(b) Introduction to Anaemia & its Classification, Rheumatic fever, Rheumatoid Arthritis, Hypertension, Angina, Ischaemic Heart Disease, Myocardial Infarction and CCF.

II. Diseases of Raktavaha Srotas

1. Kamala - Raktapitta - Vatarakta – Kroshtuksheersha - Shitapitta – Maha Kushtha – Visarpa – Shwitra and Introduction to Kshudra Kushtha.
2. Introduction to Hepatomegaly, Spleenomegaly, Leukaemia, Thalessemia, Sickle cell Anaemia.
3. Introduction to Urticaria, Psoriasis, Eczema, Pemphigus.

III. Diseases of Mamsavaha Srotas

(a) Galganda
(b) Introduction to Thyroid disorders

IV. Diseases of Medovaha Srotas

1. Sthoulya - Karshya – Prameha.
2. Introduction to Obesity and Diabetes Mellitus.

V. Diseases of Asthi – Majjavaha Srotas

1. Vatavyadhi - Akshepaka - Apatanaka - Ardita - Pakshaghata – Gridhrasi –Vishwachi, Avabahuka, - Manyasthambha ,Katigraha**,**Pangutwa
2. Sandhigatavata, Asthi-Majjagata vata.
3. Introduction to Osteo- Arthritis, Osteoporosis.
4. Introduction to Parkinson's disease, Stroke, Lumbago- Sciatica syndrome, Bell's Palsy, Cervical- Lumber & Ankylosing Spondylitis.

VI. Diseases of Shukravaha Srotas

1. Introduction to Klaibya and Vandhyatva.
2. Introduction to male and female infertility.

Part B

50 Marks

VII. Diseases of Pranavaha Srotas

1(a). Kasa - Shwasa - Hikka – Urahkshata – Shosha – Rajayakshma.
1(b). Introduction to the aetiopathogenesis of Pneumonia, Pleural effusion, Bronchitis, Bronchiectasis, Bronchial Asthma.

VIII. Diseases of Annavaha- PureeshavahaSrotas

1. Agnimandya - Ajirna - Aruchi- Chhardi - Amlapitta- Shoola – Parinama Shoola – AnnadravaShoola- Atisara – Pravahika - Grahani –Gulma- Udara Roga.
2. Introduction to Anaha, Adhmana, Atopa, Visuchika Alasaka, Vilambika.
3. Introduction to Peptic Ulcer, Irritable Bowel Syndrome (IBS) Diarrhoea, Dysentry, Constipation, Inflammatory Bowel Diseases.

IX. Diseases of Udakavaha Srotas

1(a) Introduction to Trishna, Daha.
1(b) Introduction to water and electrolyte imbalance disorders.

X. Diseases of Mutravaha Srotas

1(a) Mutrakrichha – Mutraghata.
1(b) Introduction to Urinary Tract Infection, Nephropathies.

XI. Diseases of Swedavaha Srotas

1(a) Introduction to Khalitya, Palitya.

XII. Diseases of Manovaha Srotas

1(a) Apasmara, Unmada, Atatwabhinivesha-Vishada, Anidra, Mada, Murchha, Sanyasa.
1(b) Introduction to Epilepsy, Depression, Anxiety neurosis.

XIII. Upasargajanya Vyadhi (Communicable diseases)

1(a) Romantika – Masurika – Upadamsha – Phiranga.
1(b) Introduction to Measels, Chickenpox, Leprosy, Tuberculosis and AIDS**.**

XIV. Krimi Vigyana

1) Definition, classification of Krimi and features of Krimiroga
2) Snayuka, Shleepada.
3) Introduction of Filariasis and classification of common parasites.

PRACTICAL **(100 Marks)**

i) Fundamental Principles of Laboratory Tests

Introduction to laboratory, Sterilization, glass wares, solutions reagents and safety procedures, Disposal of biomedical wastes.

ii) Haematology

1 Haemoglobin estimation.
2 Blood cells counting - WBC, RBC, platelets.
3 Hematocrit /Packed cell volume (PCV).
4 Erythrocyte indices - MCV, MCH, MCHC.
5 Peripheral blood smear, staining technique and differential leucocyte count.
6 Peripheral blood film examination in Anemia, Leukemia, Malaria, Filaria (Demonstration).
7 ESR.
8 Screening test for bleeding disorders- bleeding time (BT)**,** Clotting time (CT), Demonstration of Prothrombin time (PT).
9 Blood grouping - ABO system, Rh typing (Rhesus system).

iii) Urine Examination

1. Ayurveda anusara mutrapariksha.
2. Physical Examination - Volume, Reaction (Ph) & Specific Gravity.
3. Chemical Examination for - Proteins, Glucose, Phosphate, Ketone, Bile salts, Bile pigment.
4. Dipstick examination
5. Demonstration of Microscopic Examination.

iv) Stool Examination

1 Ayurveda anusara purishapariksha.
2 Physical examination, Sama-Nirama Pariksha.
3 Microscopic examination of ova & cyst (Demonstration)
4 Occult Blood Test.

v) Demonstration of Sputum Examination

1 Ayurveda anusara sthivanapariksha.
2 Physical, Chemical and Microscopic Examination of the sputum.
3 Sample collection and Demonstration of AFB.

vi) Demonstration of Semen examination

1 Ayurveda anusara Retaspariksha.
2 Semen examination.

vii) Biochemical Examination – (Demonstration)

Blood Glucose, Serum Bilirubin, Blood Urea, Lipid Profile, Serum Creatinine, Serum Uric acid etc.

viii) Demonstration of different staining techniques in microbiology.

ix) Demonstration of Sero-immunological Investigations: RA and Widal.

x) Laboratory record – maintenance of laboratory record book.

Bed side Practical (Clinical Methods)

1. Introduction and demonstration of clinical methods (General and Systemic Examination).
2. Practical demonstration of examination of Roga based on Pancha Nidana.
3. Demonstration of instruments used for clinical examination.
4. Practical records of clinical examination of at least 20 long cases in I.P.D including Atur-bala-pramana pareeksha.
5. Practical records of clinical examination of at least 20 short Cases based on Ashta vidha pariksha in O.P.D.

6. Demonstration of ECG, USG and Radio imaging techniques.

Distribution of Marks for final Practical Examination

1. Daily Record -10 Marks
2. Indentification of Instruments -10 Marks
3. Laboratory Experiments -20 Marks
4. Short Case -10 Marks
5. Long Case -20 Marks
6. Viva - Voce -30 Marks

Total 100 Marks

Reference Books

1. Madhava Nidana (Madhukosha Pt. Yadunandan Upadhyay Commentary) Part 1 – 2
2. Doshakaranatwa Mimamsa - Acharya P.V. Sharma
3. Nadi Darshan - Vd. Tara Shankar Mishra
4. Nadi Vigyana Vidyotini Hindi Tika
5. Nadi Vigyan- Shri Satya Dev Vashisht
6. Nadi Vigyan- Gangadhar Tika
7. Rogi Pariksha vidhi Acharya- Priyavrata Sharma
8. Ayurvediya Roga Vargikaran- Vd. Ramanath Dwivedi & Vd. Gurdip Singh.
9. Ayurvediya Nidan Evum Chikitsa Ke Siddhanta - Prof. Ram Harsh Singh.
10. Relevant portions of Charak Samhita, Sushrut Samhita and Vagbhata.
11. Text Book of Pathology- William Boyds.
12. Text Book of Pathology- Harsh Mohan.
13. Text Book of Pathology- Dey and Dey.
14. Text Book of Parasitology -Ramnik Sood.
15. Clinical Pathology and Bacteriology- S.P. Gupta.
16. Clinical methods in Ayurveda- K. R . S. Murthy.
17. Parameswarappa's Ayurvediya Vikriti Vigyan and Roga Vikriti Vigyan-Dr. P.S. Byadgi.
18. Oxford Handbook of Clinical Examination Oxford Handbooks and Practical Skills.
19. Advanced Clinical Evaluation System for Practical Assessment of Clinical Examination Skills.
20. Symptoms & Signs in Clinical Medicine - Chamberlains.
21. Clinical Methods- Hutchison's.
22. Bedside Clinics in Medicine Part- I & II-Kundu.
23. Common Medical Symptoms- Mehta.
24. Advances in Pathology & Lab Med- Weimstean, Gralem, Anderson, Cortan, Wick, Zumwelt.
25. Clinical Laboratory medicine Edited by Kenneth D Mc. Chately.
26. General Pathology- Walter & Israel Churchill Living stone.
27. A Comprehensive Dictionary of Pathology- Chris Newann.
28. Practical Pathology- Dr. K. Uma Chaturvedi.
29. Clinical examination- Douglas/Macleod's.
30. Pathology Practical book for Undergraduates- Harsh Mohan.
31. Medical Laboratory Technology - R. Sood.
32. Clinical Diagnosis and Management by Todd, Sanford and Davidson Laboratory methods
33. Clinical Hematology In Medical Practice- Degruchy's.
34. Robbins Basic Pathology- Kumar, Abbas, Fausto at al.

2.3. Rasashastra Evam Bhaishajyakalpana

(IATROCHEMISTRY AND AYURVEDIC PHARMACEUTICS)

Theory -Two Papers
Total Marks- 200
Teaching hours-200
Practical :-
Total Marks-200
Teaching hours-200

RASASHASTRA

Paper 1 **100 Marks**
Part A **50 Marks**

1. Definition and etymology of Rasa, History of Rasashastra, Importance of Rasaushadhi, Concept of Rasa-Rasayana, Concept of Raseshwar Darshana. Concept of Rasashala and Rasamandap.

2. Brief Description and Application of Technical terminologies (Paribhasha): Avapa, Nirvapa, Dhalana, Bhavana, Jarana, Murchana, Shodhana, Marana, Amrutikarana, Lohitikarana, Mruta Loha, Satwa Patana, Druti, Apunarbhava, Niruttha, Rekhapurna, Varitara.

3. Dravya Varga: Amlavarga, Panchamrittika, Panchagavya, Panchamrita, Ksharashtaka, Dravakagana, Mitra panchaka, Rakta varga, Lavanapanchaka.

4. Brief description of Yantras and their application Ulukhala Yantra, Khalwa Yantra, Kachhapa Yantra, Damaru Yantra - Vidhyadhara Yantra- Urdhwapatan, Addhapatan & Tiryakpatana Yantra, Jaranartha Tulayantra, Dolayantra, Patalayantra, Palika Yantra, Baluka Yantra, Bhudhara Yantra, Sthali Yantra, Swedana Yantra.

5. Brief description & application of Musha (Crucible): Samanya Musha, Gostani musha, Vajra Musha, Maha musha, Yoga musha, Vrintaka Musha, Malla / Pakwa musha. Different types of crucibles e.g. Silica crucible, platinum crucible. Mudra and Sandhi Bandhana.

6. Brief description & applications of Chullika, Satwapatana Koshthi, Patala Kosthi, Gara Koshthi, Angarakoshthi and knowledge of various heating appliances viz. Gas stove, Hot plate, Heating mantle, Induction Stove, Hot Air Oven.

7. Concept, definition and types of Puta: Suryaputa, Chandraputa, Gomayaputa, Lawakaputa, Kukkutaputa, Kapotaputa, Varahaputa, Gajaputa, Mahaputa, Kumbhaputa, Valukaputa, Bhudharaputa, Applications of Electric muffle furnace and fuel (diesel) dependent furnace. Brief introduction to thermocouple and pyrometer.

8. Knowledge of Parada: Synonyms, Occurrence, natural and artificial sources of Parada, Hingulottha parada, Types of Parada, Parada Dosha: Naisargika, Yougika, Aupadhika

(Kanchuka). Grahya-Agrahya Parada, Parada gati, Parada bandha, Shodhana of Parada. Parada sanskara and brief description of Ashtasamskara.

9. Concept of Murchhana and Jarana of Parada, Preparation of Kajjali, Classification of Rasaushadhi: Khalvi rasa e.g. Tribhuvana Keerti Rasa, Parpati Rasa- Rasa Parpati, Kupipakva Rasa- Rasa sindur, Pottali rasa - Hemagarbha pottali. Rasa sevana vidhi and pathya and apathya.

10. Brief introduction of quality control , standardization and GMP of Rasaoushadhies.

Part B **50 Marks**

Occurrence, Synonyms, Minerological identification, Sources, Types, Grahya and Agrahyata, Shodhana, Marana and other processing techniques. Properties, dose, anupan and therapeutic uses, pathya – apathya and ashuddha, apakwa and avidhee sevanjanya dosha and its management, important formulations of the following:

1. **Maharasa –**Abhraka (Biotite Mica), Vaikrantha, Makshika (Chalco-pyrite), Vimala (Iron Pyrite), Shilajatu, Sasyaka (Peacock ore), Chapala and Rasaka (Sphalerite).

2. **Uparasa –** Gandhaka (Sulfur), Gairika (Red Ochre), Kasisa (Green Vitriol), Kankshi (Alum), Haratala (Orpiment), Manahshila (Realgar), Anjana and Kankustha.

3. **Sadharana Rasa –** Kampillaka, Gauri pashana (Arsenic oxide), Navasadara (Ammonium chloride), Kaparda (Cowry), Agnijara, Giri Sindura (Red oxide of Hg), Hingula (Red Cinnabar) and Mriddara shringa (Litharge).

4. **Dhatu -**Swarna (Gold), Rajata (Silver), Tamra (Copper), Loha (Iron), Vanga (Tin), Naga (Lead), Yashada (Zinc), Kamsya (Bronze), Pittala (Brass), Vartaloha. Dhatu -graha sambandha.

5. **Ratna** - Manikya (Ruby), Mukta (Pearl), Pravala (Coral), Tarkshya (Emerald), Pushparaga (Topaz), Vajra (Diamond), Nilam (Sapphire), Gomeda (Zircon or Cinnamone stone), Vaidurya (Cats eye). Ratnapariksha, Ratnadosha, Ratna-graha sambandha.

6. **Uparatna-** Vaikranta (Tourmaline), Suryakanta (Sun stone), Chandrakanta (Moon stone), Rajavarta (Lapis lazuli), Perojaka (Turquise), Sphatikamani (Quartz), Trinakanta, Palanka, Putika, Rudhir.

7. **Sudha varga –** Sudha (Lime stone), Kaparda (Cowries), Shukti (Oyster Shell) , Shankh (Conch Shell), Mriga shringa (Stag horn), Khatika, Godanti (Gypsum) and Samudraphena (Cattle Fish bone), Kukkutanda twak (Hen's Egg Shell).

8. **Sikata varga -** Sikata (Silica), Dugdhapashana (Talc), Nagapashana / Jaharmohara (Serpentine), Badarshama (silicate of lime), Vyomashma (Sangeyashab - Jade), Kousheyashma (Asbestos) and Akika (Agate).

9. **Kshara varga** - Sarja kshara (Sodium bicarbonate), Yava kshara, Tankana kshara (Borax), Surya Kshara (Potassium Nitrate).

10. **Miscellaneous** - Mandura, Bola, Dam-ul Akhawayan (Raktabandhini), Kasturi, Bhoonag, Mayurpiccha, Sarjarasa, Madhoocchishta.

11. **Visha and Upavisha-**Introduction, collection and storage, classification, synonyms, shodhana, antidote, therapeutic and toxic doses, anupan, therapeutic uses, and formulations of following Visha and Upavisha-Vatsanabha, Kuchala, Jayapala, Dhattura, Bhanga, Bhallataka, Gunja, Arka, Snuhi. Langali, Karaveera, Ahiphena and Chitrakmool.

12. **Aushadhi Yoga Gyanam- ingredients, manufacturing process, and bheshajprayogvidhi.** Arogya Vardhini Gutika, Kasturibhairava Rasa, Kumara Kalyana Rasa, Garbhapala Rasa, Chandraprabha Vati, Chandramrita Rasa, Pratapalankeshwara Rasa, Pravalapanchamrita Rasa, Anandbhairava Rasa, Yogendra Rasa, Laxmivilas Rasa, Vasantakusumakara, Vasantamalati Rasa, Brihat Vata Chintamani Rasa, Shankha vati, Shwaskuthara Rasa, Hinguleswara Rasa, Hemagarbhapottali, Hridyarnava Rasa, Swarnavanga, Makaradhwaja, Putapakwavaisham Jwarantaka Loha, Vatvidhvamsan Rasa, Kamadugha Rasa, Laghusutshekhar Rasa, Navayasa Loha, Saptamrita Loha, Tamra Parpati, Panchamrita Parpati, Sveta Parpati.

13. **Introduction to** pharamcovigilance and its status in India, with reference to Ayurvedic drugs.
    A) Necessary to know – From part A and B : S. No. 1 to 9
    B) Desired to know – From part B : S. No. 10

Practical **100 Marks**

Minimum Twenty five practicals to be performed

1.	**Rasa [Parada]**	Samanya Shodhana of Parada Kajjali Mugdha rasa
2	**Maharasa varga**	Shodhana of Abhraka Dhanyabhraka nirmana Shodhana of Makshika Shodhana of Shilajatu Shodhana of Sasyaka.
3.	**Uparasa varga**	Shodhana of Gandhaka Shodhana of Gairika Shodhana of Kasisa Shodhana of Kankshi Shodhana of Haratala Rasa manikya nirman Shodana of Manashila

4.	**Sadharana rasa varga**	Shodhana of Hingula Sodhana of Navasadar Shodhana of Kapardika
5.	**Sudha Varga**	Shodhana of Shankha Shodhana of Shukti Shodhana of Pravala mula Shodhana of Godanti
6.	**Dhatu varga**	Samanya Shodhana of Lauha Shodhana of Mandura Samanya Shodhana of Tamra Shodhana of Naga Shodhana of Vanga Shodhana of Yashada
7.	**Kshara Varga**	Shodhana of Tankana
8.	**Parpati**	Preparation of Rasaparpati, Bola Parpati and Swetaparpati
9.	**Visha varga**	Shodhana of Vatsanabha, Bhallataka, Kupilu, Dhattura beeja, Jayapala, Gunja, Chitrakamoola.

PRACTICAL FOR DEMONSTRATION / GROUP PRACTICALS

1. Hingulad rasakrishti (Hingulottha Parada).

2. Bhasma: 4 (One from each group)
- i. Abhraka bhasma, Swarna Makshika bhasma, Tamra bhasma
- ii. Vanga bhasma, Naga bhasma, Yashada bhasma
- iii. Mandura bhasma, Kasisa bhasma
- iv. Shankha bhasma, Kapardika bhasma, Godanti bhasma.

3. Pishti : 1 Pravala pishti, Jaharmohara / Akika pishti, Trina kantha mani pishti, Mukta pishti.

4. Druti : 1 Gandhaka druti.

5. Formulations 4 (one from each group)
- i. Rasasindura, Swarna vanga, Sameer pannaga rasa
- ii. Saptamruta lauha, Punarnava mandura, Navayasa lauha
- iii. Agnitundi vati, Tribhuvana kirti rasa, Sootshekhara rasa, Laghusutashekhara Rasa
- iv. Arogyavardhini vati, Laghumalinivasanta rasa, Hinguleshwar rasa, Anandbhairav rasa, Rajapravartini vati

BHAISHAJYAKALPANA

Paper II **100 Marks**

Part A **50 Marks**

1. **History and Chronological (kramika vikasa) development** of Bhaishajyakalpana. Concept of Aushadha and Bheshaja.

2. **Fundamental principles of Bhaishajya Kalpana.**

3. **Study of Ancient and Contemporary systems of 'Maana' (Units of measurement), Shushka -ardra –drava- dravya grahan niyam (**Rules of measures of dry, fresh, liquid drugs); Grahyagrahyatva, Nava Puran dravya grahan niyam.

4. Guidelines and Methods of collection, storage, preservation of Aushadhi dravya. Concept of Saviryatavadhi (shelf life) and stability in ancient and contemporary science.

5. **Bheshajprayogavidhi : Aushadha Matra, Anupana and sahapan and Aushadh sevan kaala. (Posology).**

6. **Panchavidha kashaya kalpana and Other kalpana :** Kashaya Yoni, Swarasa, Kalka, Kwatha, Hima and Phanta, Pramathya, Aushadha siddha paniya, Tandulodaka, Laksha rasa, Mantha, Panaka, Arka, Churna, Rasakriya, Ghana, Phanita, Avaleha, Prasha, Gudapaka, Sharkara, Syrups, Ksheerapaka, Satva, Guggulu kalpana, Vati, Guti, Pinda, Modaka, Varti Preparation of Tablets, pills, capsule and Suppositories. Masi kalpana, Lavana kalpana, Kshara kalpana and Kshara sutra.

7. **Introduction and general knowledge of useful instruments/ Equipments -** Disintegrator, Mixer, Grinder, End Runner, Edge Runner, Sieve-Shaker, Granulator, Tableting machine, Pill making machines, coating and polishing pan, capsule filling machine, sieves and mesh.

8. **Sneha kalpana :** Sneha yoni, Types of Sneha, Sneha murchana vidhi, Sneha paka vidhi, patra paka, types and their use. Sneha siddhi lakshana, dose, Preparation and uses of Triphala Ghrita, Bramhighrita, Narayana taila, Anutaila.

9. **Sandhana Kalpana and its types:** Madya Kalpana, Asava, Arishta, Sura (Prasanna - Kadambari - Medaka - Jagala - Bakkasa), Maireya, Surasava, Shukta, Kanjika, Sauviraka, Tushodaka, Sidhu kalpana their methods of preparation, siddhi lakshana, properties, uses, doses. Takrarishta, Draksharishta, Ashokarishta, Dashamoolarishta, Kumaryasava, Chandanasava.

10. **Kritanna and Aushadhisiddha anna Kalpana:** Definition of Kritanna, Concept of Pathya and Apathya, Yavagu –types of yavagu, Manda, Peya, Vilepi, Anna, Bhakta, Odan, Yush -types, Krishara, Mansa rasa, Vesavara, Khad Kamblika, Raga, Shadava, Dadhi and Takra Varga – Takra, Udasvita, Katvar, Mathita, Chhachika.

PART B

1. **Bahyopacharartha kalpana (External Applications)**-**Lepa** -Types of Lepa, methods of preparation and mode of application. Udvartan and Avachurnan, Method of preparation of Siktha Taila, Malahara – Sarjarasa Malahara, Gandhak Malahara, Upanaha, Atasi upanaha, Shatadhouta and Sahastradhouta Ghrita. Brief introduction of semi solid dosage forms- Ointments, Creams, Emulsions, Gels, Lotions.

2. **Principles and precautions for preparation of formulations for following**:
   - **2.1 Netraupacharartha kalpana (Opthalmic preparations)** – Seka, Drava, Pindi, Anjana - Ashchyotana - Tarpana - Putapaka and Vidalaka, Methods of preparation of eye drops, eye ointments.
   - **2.2 Nasyopacharartha Kalpana** - Classification of Nasya, Navana, Avapidana, Pradhaman, Marsha and Pratimarsha nasya.
   - **2.3 Dhumapanarth kalpana** - Classification of dhumpaan, Method of preparation of dhumvarti and it's therapeutic uses. Dhupan: Vranadhupan, arshodhupan.
   - **2.4 Mukhaprayogarth kalpana** - Gandoosha - Kavala - Pratisaran, Tooth paste, Tooth powders and Mouth wash.
   - **2.5 Basti kalpana**- Classification, Method of preparation of Niruha and Anuvasana, Basti Therapeutic properties and uses of Basti.

3 Brief knowledge of Standardization of Ayurvedic formulations- Kasthaushadhi.

4 Brief introduction of Drug and Cosmetics Act 1940 and Rules 1945.

5 Concept of, Aushadhi Nirmanshala, with respect to Good Manufacturing Practices (GMP) in accordance to Schedule T.

Practical Bhaishajya Kalpana **50 Marks**

Following practicals to be performed- (Minimum one from each category)

Method of preparation, therapeutic uses, dose and anupana of the following

1. Swarasa- Ardraka swarasa, Tulasi swarasa, Kumari Swarasa, Vasa putapaka swarasa
2. Kalka- Nimba kalka, Rasona kalka.
3. Kwatha- Punarnavasthaka kwatha, Rasna Sapthaka kwatha, Kulattha kwath.
4. Hima- Dhanyaka hima, Sarivadi hima .
5. Phanta- Panchakola phanta,Yastimadhu Phanta.

6. Pramathya- Mustadi pramathya
7. Mantha- Kharjuradi mantha
8. Aushadh siddha paniya- Shadanga paniya
9. Laksha Rasa.
10. Arka - Yavani arka, Gulab arka, Misreya arka
11. Panaka- Chincha panaka, Chandan panaka.
12. Sharkara- Banapsha sharkara, Nimbu sarkara.
13. Churna- Sitopaladi Churna, Hinguwashtaka Churna.
14. Gutika- Chitrakadi Gutika, Sanjivani Vati.
15. Guggulu-Triphala Guggulu, Kaishora Guggulu.
16. Avaleha- Chyavanaprashavaleha, Vasavaleha, Vyaghri Haritaki avaleha, Manibadra avaleha.
17. Rasa kriya - Darvi Rasakriya, Guduchi Ghana, Kutaja Ghana.
18. Khanda- Haridra khanda, Narikela khanda, Sowbhagya shunti paka
19. Satva- Amruta satva,
20. Varti- Phala varti, Chandrodaya varthi
21. Lavana- Arka lavana, Narikela lavana
22. Masi- Triphala masi, Mayurpiccha Masi
23. Ksheerapaka- Arjuna ksheerapaka, Rasona ksheerapaka, Shunthi Ksheerpaka
24. Kshara- Apamarga kshara, Snuhi kshara, Ksharasutra. .
25. Manda, Peya, Vilepi, Yavagu, Krishra, Vesavara
26. Yusha - Mudga yusha, Saptamushtika yusha, Kulattha yusha
27. Aristha- Kutajarishta, Takrarishta .
28. Asava - Kumaryasava, Kanakasava
29. Sukta kalpana- Kanji
30. Udaka- Tandulodaka
31. Upanaha- Atasi Upanaha
32. Siktha Taila Nirmaan
33. Malahara- Sarjarasa malahara, Gandaka malahara, Cream, Emulsion. Sneha Kalpana

Sneha Murchhana - Ghrita Murchana, Taila Moorchhana, Ghrita kalpana: Jatyadi ghrita, Triphala ghrita, ksheerashatphala ghrita- Taila kalpana-Panchaguna taila,Arka **t**aila, Bala taila,Jatyadi taila

35. Taila patana- Bhallataka taila patana, Jayapala taila patana
36. Shodhana- Guggulu, Hingu.

II. Visit of minimum three GMP approved Ayurvedic manufacturing units.

Distribution of Practical Marks: Total 200 Marks

Rasashastra - 100

1. Record Book - 10 Marks
2. Experiment - 30 Marks
3. Spotting - 20 Marks
4. Viva-voce - 40 Marks

Bhaishajyakalpana - 100

1. Record Book - 10 Marks
2. Experiment - 30 Marks
3. Spotting - 20 Marks
4. Viva-voce - 40 Marks

Reference Books

1. Adyatan Rasa Shastra	R.K. Goyal
2. Abhinav Rasa Shastra	Vaidya Somadev Sharma
3. Asava Arishta Vigyanam	Dr. Pakshdhar Jha
4. Ayurvediya Rasa Shastra (Sachitra)	Chandrabhusan Jha
5. Ayurvediya Rasa Shastra	Badrinarayan Pandey
6. Rasa Bhaishajya Paribhasa	Sureshananda Thapaliyal
7. Ayurvediya Rasa Shastra	Prof. Siddhi Nandan Mishra
8. Ayurved Prakash	Vaidya Gujrat Mishra
9. Drugs and Cosmetic Act - 1940	
10. Paka Darpana	Dr. Indradev Tripathi
11. The Paka-darpana of King Nala	Dr. Madhulika critical study
12. Parada Vigyaniyam	Vasudev M. Dwivedi
13. Pratyaksha Aushadh Nirmanam	Acharya VishwanathDwivdei
14. Bhaishjyakalpana Vigyanam	Dr. Agnihotri
15. Rasa Tarangini	Sadanand Sharma
16. Rasa Darpan	Prof. Bhajan Das Swami
17. Rasa Bindu	Dr. Sanjay Sharma
20. Rasa Bhaishajya Kalpana Vigyan Vaidya	Santosh Kumar Khandal
21. Rasa Mitra	Dr. Tryambak Nath Sharma
22. Rasa Ratna Samuchchaya (Hindi)	Dattattreya Ananta Kulkarni.
23. Rasaratna samuchchaya-	Ambikadatta shastri
24.Rasaratna samuchchaya -	Damodar Joshi
25. Rasa Shastra Prayogiki Srivastava,	Yadav and Prof. Ramesh Saxena
26. Rasamritam	Vaidya Yadavji Tirkramji Acharya
25. Rasayan Sara	Vaidya Shyam Sunderacharya

	Vaishya
26. Rasendra Sampradaya	Vaidya Hajari Lal Sukul
27. Rasendra Sara Sangraha	Vaidya Gopal Krishna
29. Vaidyak Paribhasha Pradeep (Hindi Translation)	Dr. Indradev Tripathi
30. Sharangadhara Samhita	Dr. Radhakrishna Parashar
31. Bharatiya Bhaishajya Kalpana Vigyana	Gananath Vishwanath Dwivedi
32. Bhaishajya Kalpana Vijnanam	Dr. K Ramachandra Reddy
33. Rasa Shastra (English)	Prof. Damodar Joshi
34. Rasa Ratna Samuchchaya (English)	Prof. Damodar Joshi
35. Rasendra Chintamani (Hindi)	Prof. Siddhinandan Mishra
36. Ayurvedic formulary of India	
38.Ayurvedic Pharmacopiea of India , CCRAS	
39. Bhaishjya Kalpana Vigyan	Siddhi Nandan Mishra
40. Textbook of Rasashasra	Dr. K Ramachandra Reddy.
41. Ashadhayoga Vigyanam	Dr. K. Ramachandra reddy
42. Vaidyaka Paribhasha Pradipa (Enlgish Translation)	Dr. K. Ramachndra Reddy & Dr. P. Suresh
43. Relevant parts of Brihatrayee	
44.Text book of Bhaishjya Kalpana -	Dr Shobha G Hiremath
45. Text Book of Rasa Shastra	Dr P H C Murthy
46.Rasa Chandashu	Prof S S Savirkar (CCRAS Publication)
47 .Bhaishjya Ratnawali	Prof S N Mishra
48 Yoga Ratnakar	

*****
***
*

2.4 CHARAKASAMHITA -PURVARDHA

(Sutrasthana, Nidanasthana, Vimanasthana, Sharirasthana and Indriyasthana)

Theory- One Paper– 100 Marks
Lectures – 200 Hours

Part A

1. Sutrasthana - 40 Marks
2. Indriyasthana - 10 Marks

Part B

1. Nidanasthana - 15 Marks
2. Vimanasthana - 20 Marks
3. Sharirasthana - 15 Marks

Reference Books

1. Charakasamhita –Ayurveda Dipika commentary by Chakrapani.
2. Charakasamhita (Hindi Commentary): Vaidya Jayadev Vidyalankar or Vd. Atridev Vidyalankar or Prof. Gorakha Nath Chaturvedi & Kashinath Shastri or Dr. Brahmanand Tripathy or Dr. Ravi Dutta Tripathy
3. Charakasamhita (English Commentary): Dr. Ram Karan Sharma & Vd. Bhagwan Dash or Acharya Priyavrata Sharma.
4. Charakasamhita-Ayurveda Dipika Commentary-Hindi Translation by Dr. B L Gaur, published by Rashtriya Ayurved Vidyapeeth.

*****
***
*

Principal
Aarihant Ayurvedic Medical
College and Research Institute

Aarihant Ayurvedic Medical College and Research Institute
Bhoyan Rathod,
Ghandhinagar

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS - Master of Business Administration

Semester – I

Principles of Management

Code: 16040104

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Module	Topics	Hours
1	Basic concepts of management: Definition – Need and Scope – Different schools of management thought – Behavioural, Scientific, Systems, and Contingency, Contribution of Management Thinkers: Taylor, Fayol, Elton Mayo	10
2	Functions of Management – a) Planning – Concept, Nature, Importance, Steps, Limitations, Management by objectives b) Organizing - Concept, Nature, Importance, Principles, Centralization, Decentralization, Organization Structures- Line and Staff Authority, Functional, Product, Matrix, Geographical, Customer, New Forms of Organization – Virtual, Organizations as Networks - Types of Network Organizations/Clusters - Self- Organizing Systems. Organizational Designs for Change and Innovation - Designing Principles for New Forms of Organizations c) Staffing - Concept, Nature, Importance, Steps. Concept of knowledge worker. d)	10

SWARNIM SCHOOL OF BUSINESS

	Directing – Concept, Nature, Importance. e) Controlling - Concept, Nature, Importance, Process of controlling, Control Techniques.	
3	Leadership: Concept, Nature, Importance, Attributes of a leader, developing 10 leaders across the organization, Leadership Grid.	10
4	Decision making: Concept, Nature, Importance, and Process. Types of decisions. Problems in decision making, Case Study: Planning, Decision Making, Leadership	10
	Total	**40**

Note: Wherever the standard books are not available for the topic appropriate print and online resources, journals and books published by different authors may be prescribed.

Reference Books:

1. Essentials of Management – Koontz – TMGH
2. Principles & Practices of Management - Saxena
3. Principles and Practices of Management - Shejwalkar and Ghanekar
4. Management Concepts & Practices - Hannagan

SWARNIM SCHOOL OF BUSINESS

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF MANAGEMENT

Master of Business Administration

Managerial Economics
Code: 16040105
MBA 1st SEM

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Th	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	30	-	70	-	100

Objective:

- To expose students to basic micro economic concepts.
- To apply economic analysis in the formulation of business policies.
- To use economic reasoning to problems of business.

Module	Topics
1.	• Definitions of Economics: Scarcity and Growth definitions • Introduction to Micro Economics: Definition, Scope, Importance and Limitations of Micro Economics • Important Concepts: Economic goods and Free Goods, Price and Value, Want and Demand, Production Possibility Curve • Economic Systems: Planned Economy, Free Market Economy and Mixed Economy

SWARNIM SCHOOL OF BUSINESS

2.	**Theory of Demand:** • Meaning of Demand and Determinants of Demand – Demand Function • Law of Demand, Expansion and Contraction of Demand, Increase and Decrease in Demand, Usefulness of Law of Demand, Exceptions to the Law of Demand , • Utility Analysis: Concept of Utility, Law of Diminishing Marginal Utility, Derivation of Demand Curve on the basis of the Utility analysis , Consumer's Surplus
3.	**Theory of Supply**: • Meaning of Supply, Determinants of Supply, Expansion and Contraction of Supply, Increase and Decrease in Supply • Demand and Supply as determinants of Price • Meaning of Market, Types of Market and their important features: Perfect Competition, Monopoly, Monopolistic Competition and oligopoly
4.	**Theory of Distribution :** • Marginal Productivity Theory of Distribution • Rent: Concepts of Differential Rent and Scarcity Rent, Economic and Contract Rent, Quasi Rent, Pure Rent and Quasi Rent • Wages: Concepts of Time Wages, Piece Wages, Money wages, Real Wages, factors determining real Wages. • Interest: Gross and Net Interest. Components of Gross Interest • Profit: Theories of profit – risk, uncertainty, innovation

Text Book:

(1) Micro Economic Theory by R. Cauvery (S.Chand Publication.)
(2) Micro Economics by M.John Kennedy (Himalaya Publication)

Reference Books:

(1) Modern Micro Economics by H.L Ahuja (S Chand Publication)
(2) Modern Economic Theory by K.K Dewett (S. Chand Publication)
(3) Elementary Theory by K.K. Deweet & J.D.Verma.(S.ChandPublication.)
(4) Principles of Economics by D.M.Mithani (Himalaya Publication)

SWARNIM SCHOOL OF BUSINESS

Topics for assignments:

1. Discuss Basic Economic Problems.

2. Explain the nature of Economics.
3. Explain the Main Types of Demand (Price, Income, Cross).
4. Distinguish between Giffen Paradox and Veblen effect.
5. Distinguish between Composite Supply and Joint Supply.
6. Explain the special features of Factor Pricing.
7. Explain the Constituents of gross profit.

Suggested topics for seminars and presentations:

1. Features of Modern Economy
2. Relevance of floor and ceiling prices in modern economic system
3. Regulated and unregulated markets and their consequences
4. Public goods and private goods

SWARNIM SCHOOL OF BUSINESS

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS - Master of Business Administration

Semester – I

Organizational Behaviour

Code: 16040106

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objectives:-

This course is designed in such a way as to provide the students an understanding of the different contemporary and relevant topics in the subject organizational behavior.

Module	Topics	Hours
1	**Introduction to Organizational Behaviour: Definition, Importance, Scope, Fundamental Concepts of OB, Different models of OB - autocratic, custodial, supportive, collegial and SOBC.** Personality & Attitudes: Meaning of personality, attitude - Development of personality – Attributes of personality- Transactional Analysis – Ego states – Johari window - Nature and dimensions of attitude – Developing the right attitude	10
2	Motivation: Definition, Importance, Motives – Characteristics, Classification of motives - Primary & Secondary motives. Theories of Motivation - Maslow's Theory of need hierarchy - Herzberg's theory. Morale - Definition and relationship with productivity - Morale Indicators. Stress management: Definition, Causes, Managing stress, Stress as a motivator. Work life balance.	10
3	Group Dynamics and Team building: Concept of Group & Team. Theories of Group	10

SWARNIM SCHOOL OF BUSINESS

	Formation - Formal and Informal Groups. Importance of Team building. (4) 5. Conflict Management: Definition. Traditional vis-à-vis Modern view of conflict – Types of conflict – Intrapersonal, Interpersonal, Organizational. Constructive and Destructive conflict. Conflict management	
4	Change management: Concept of change, change as a natural process, Importance & Causes of change – social, economic, technological, organizational. Learning – unlearning, Concept of learning organizations Cases studies on above topics	10
	Total	**40**

Note: Wherever the standard books are not available for the topic appropriate print and online resources, journals and books published by different authors may be prescribed.

Reference Books:

1. Organizational Behaviour, 9th Ed. - Stephen Robbins
2. Human Behaviour at work - Davis and Newstorm
3. Organizational Behaviour - Uma Sekaran
4. Organizational Behaviour - Fred Luthans
5. Organizational Behaviour - K.Aswathappa
6. Human Behaviour at Work - Keith Davis
7. Organizational Behaviour - Jit S.Chandran
8. Human Relations & Organizational Behaviour - R.S.Dwivedi
9. Organizational Behaviour - McShane
10. Organizational Behaviour - Sharma

SWARNIM SCHOOL OF BUSINESS

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS – Master of Business Administration
Semester – I
Financial Statement Analysis
Code: 16040107

Module	Topics	Hours
1	Defination-Objective and users of financial statements –elements of financial statements – articulation of financial statements – elements from which financial statements are constructed-techniques of financial statement analysis	10
2	Basic Accounting Concepts – Trial balance –balance sheet– Income statements – Depreciation -Cash flow statement - purpose - uses - structure - format of cash flow statement - preparing cash flow statement - interpreting the cash flow statement	10
3	Corporate Acquisitions: Mergers –Types – Reasons –Mechanics –Cost and Benefit – Timing of Merger Activity – the role of exchange rates and takeover process – Evaluating Merger as Capital Budgeting Proposal –Terms of Mergers – Takeovers – Signs of Takeovers.	10
4	Corporate Restructuring: Joint Ventures –Financing and Evaluation –Rationale and Role of Joint Ventures – Sell Offs –Change in Ownership –Divestitures – Spin-off –Split-off – Going Public –Privatization –Leveraged Buyouts –Buyback of Shares –Alignment of Interest	10
	Total	**40**

SWARNIM SCHOOL OF BUSINESS

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS - Master of Business Administration

Semester – I

Marketing Management

Code: 16040108

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

1. Course Objective:

The changing dynamics of the national and global economies have created a challenging scenario for all marketers. The technological updations have opened the doors of global market place where the businesses are now boundary less in real sense. So, this course is aimed to provide the basic understanding of marketing and the related concepts to the management students. The course will also provide the brief idea on latest technological trends and digital aspects in area of marketing. By learning this course, students will get the insights regarding important fundamental aspects of marketing from the managerial perspective. The students will get a holistic approach of marketing as an important function in the business environment and its applications to achieve the organizational goals.

2. Course Duration: The course duration is of **36 sessions of 75 minutes** each.

3. Course Contents:

Module No.	Contents	No. of Sessions

SWARNIM SCHOOL OF BUSINESS

I	• Basic Concepts of Marketing • Customer Value and delivery • Components of Modern marketing Information System • Marketing Environment • Forecasting and Demand measurement	11
II	• Understanding the Consumer Market • Understanding industrial markets • Segmenting and Targeting markets • Brief on Positioning	9
III	• Understanding Product concepts • Packaging, labelling, Warranties and Guarantees • Introducing New market offerings	10
	• Pricing Concepts	
IV	• Integrated Marketing Communications • Designing and managing integrated marketing channels	10

4. Case Studies:

Faculties can refer the case studies (preferably Indian cases) from reputed books/journals/other reading material for the discussion. It is strongly recommended that the theoretical discussion of each concept has to be supported with the discussion of case studies in specific area.

5. Teaching Methods:

The course will use the following pedagogical tools:
(a) Lectures and Discussions.
(b) Assignments and PPT Presentations.
(c) Case Studies.

6. Evaluation:

The evaluation of participants will be on continuous basis comprising of the following Elements:

A	Continuous Evaluation Component comprising of Projects/Quiz/Test/Class Attendance/ Participation (List of activities)	(Internal Assessment- 50 Marks)
C	End –Semester Examination	(External Assessment-50 Marks)

7. Textbooks:

Author	Name of the Book	Publisher	Year of Publication
Kotler, Keller, Koshy & Jha	Marketing Management	Pearson	14th ed.
Lamb, Hair, Sharma & McDaniel	MKTG - Principles of Marketing	CENGAGE Learning	South Asian Edition - 2016

SWARNIM SCHOOL OF BUSINESS

7. Other Readings

Author	Name of the Book	Publisher	Year of Publication
Kotler & Armstrong	Principles of marketing	Pearson	Latest edition
Paul Baines	Essentials of Marketing	Oxford University Press	Latest edition
Charles W Lamb	Principles of Marketing	Cengage Learning	Latest edition
Neeru Kapoor	Principles of Marketing	PHI	Latest edition
S A Sherlekar	Marketing Management	Himalaya Publishing House	Latest edition

7. List of Journals/Periodicals/Magazines/Newspapers, etc.

1. Journal of Marketing
2. Marketing Science
3. European Journal of Marketing
4. Journal of Marketing Management
5. Journal of Consumer Marketing
6. Marketing Intelligence & Planning
7. Journal of Business & Industrial Marketing
8. Brand Equity (ET - Wednesday Supplement)
9. 4Ps magazine
10. Various web based magazines and e resources

Note: The list of reading sources are the only the suggestive list of reading material for the course. It should not be considered as the exclusive prescribed sources. The students and faculty have the freedom to choose any of the other reading material for the teaching and learning process.

8. Session Plan:

Session No.	Topics to be covered
1-3	Basic Concepts of Marketing: Defining marketing, Scope, Core marketing concepts, Company orientations towards the marketplace
4-5	Customer Value and delivery: Marketing and customer value, value delivery process, value chain, core competencies, customer perceived value, total customer satisfaction, monitoring satisfaction , maximizing customer lifetime value

SWARNIM SCHOOL OF BUSINESS

6-7	Components of Modern marketing Information System: Internal records, Marketing intelligence
8-9	Marketing Environment :Needs and trends, Major macro - environmental forces
10-11	Forecasting and Demand measurement: Measures of market demand, Vocabulary for demand measurement, Estimating current and future demand
12-14	Understanding the Consumer Market: Consumer behavior, Key Psychological process, Buying decision process, Behavioral decision theory and behavioral economics
15-16	Understanding industrial markets: Organizational buying, Participants in business buying process, Purchasing process stages in buying process, Developing and managing B to B marketing programs, Institutional and government markets
17-20	Segmenting and Targeting markets: Understanding market segmentation, Bases for segmenting consumer markets, Bases for segmenting business markets, Steps in segmenting markets, Selecting target markets Brief on Positioning
21-23	Product: Product characteristics and classifications, Product differentiation, Product design, Luxury products, Product and brand relationship, Packaging, labelling, Warranties and Guarantees.
24-27	Introducing New market offerings: New product options, Challenges in new product development, Organizational arrangements, Managing new product development process: Idea Generation, Idea Screening, business analysis, product development, market testing, commercialization
28-30	Pricing concepts : Important of price, Pricing objectives, Demand determines of price, Other determinants of price, How to set a price on a product, Legality and ethics of price strategies, Tactics for fine-tuning the base price, Product line pricing, Pricing during difficult economic scenario
31-33	Integrated Marketing Communications : Role of promotion in marketing mix, The promotional mix, Marketing communication, The goal and tasks for promotion, Promotional goals and AIDA concept, Factors affecting promotional mix
34-40	Designing and managing integrated marketing channels : Marketing channels and value network, Role of marketing channels, Channel design decisions, Channel management decisions, Channel integration and systems, E-commerce, M-Commerce, Conflicts, cooperation and competition

****

SWARNIM SCHOOL OF BUSINESS

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS - Master of Business Administration

Semester – I

Quantitative Methods

Code: 16040109

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Module	Topics	Hours
1	Arranging data to convey meaning - Tables, Graphs and Frequency Distribution, Measures of Central Tendency – Arithmetic Mean, Median, Mode. Measures of Dispersion – Range, Quartile, Mean Deviation, Standard Deviation, Coefficient of Variation	10
2	Correlation – Karl Pearson coefficient & Rank correlation – Partial & Multiple correlation. Simple and Multiple Regression (Linear) – Equation and prediction , Association of Attributes: Yule's coefficient & Coefficient of colligation	10
3	Measures of Central Tendency and Dispersion: Introduction, Objectives of statistical average, Requisites of a Good Average, Statistical Averages - Arithmetic mean - Properties of arithmetic mean - Merits and demerits of arithmetic mean ,Median - Merits	10

SWARNIM SCHOOL OF BUSINESS

	and demerits of median , Mode - Merits and demerits of mode , Geometric Mean , Harmonic Mean , Appropriate Situations for the Use of Various Averages , Positional Averages , Dispersion – Range - Quartile deviations, Mean deviation ,Standard Deviation - Properties of standard deviation Coefficient of Variance Theory of Probability: Introduction - Definition of probability - Basic terminology used in probability theory, Approaches to probability , Rules of Probability - Addition rule - Multiplication rule , Conditional Probability, Steps Involved in Solving Problems on Probability , Bayes' Probability , Random Variables Theoretical Probability Distributions: Introduction - Random variables , Probability Distributions - Discrete probability distributions - Continuous probability distributions , Bernoulli Distribution - Repetition of a Bernoulli experiment , Binomial Distribution - Assumptions for applying a binomial distribution - Examples of binomial variate - Recurrence formula in case of binomial distribution - Case study on binomial distribution Poisson Distribution - Assumptions for applying the Poisson distribution - Real life examples of Poisson variate - Recurrence relation -Case study on Poisson distribution , Normal Distribution - Standard Normal Distribution	
4	Markov Chains & simulation techniques. Monte Carlo Simulation. Games Theory - 2x2 zero sum game with dominance - Pure Strategy and Mixed Strategy, Decision Theory - Decision making under risk (EMV criteria) and Decision making under uncertainty	10
	Total	**40**

SWARNIM SCHOOL OF BUSINESS

Note: Wherever the standard books are not available for the topic appropriate print and online resources, journals and books published by different authors may be prescribed.

Reference Books:

1. Statistical and Quantitative Methods – By Ranjit Chitale

2. Statistical Methods - S.P.Gupta
3. Statistics for Management - Levin and Rubin
4. Quantitative Techniques Vol. 1 and 2 - L.C.Jhamb
5. Statistics and Quantitative Techniques - M.G.Dhaygude 6. Quantitative Techniques - N.D.Vohra

SWARNIM SCHOOL OF BUSINESS

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS - Master of Business Administration

Semester – I

Business Research Methods

Code: 14040110

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Module	Topics	Hours
1	Foundations of Research: Meaning, Objectives, Motivation, Utility. Concept of theory, empiricism, deductive and inductive theory. Characteristics of scientific method - Understanding the language of research - Concept, Construct, Definition, Variable. Research Process Problem Identification & Formulation – Management Question – Research Question – Investigation Question – Measurement Issues - Hypothesis - Qualities of a good Hypothesis –Null Hypothesis & Alternative Hypothesis. Hypothesis Testing - Logic & Importance	10
2	Research Design: Concept and Importance in Research - Features of a good research design – Exploratory Research Design – concept, types and uses, Descriptive Research Designs - concept, types and uses. Experimental Design: Causal relationships, Concept of Independent & Dependent variables, concomitant variable,	10

SWARNIM SCHOOL OF BUSINESS

	extraneous variable, Treatment, Control group, Qualitative and quantitative research: Qualitative research - Quantitative research – Concept of measurement, causality, generalization, replication. Merging the two approaches.	
3	Measurement: Concept of measurement– what is measured? Problems in measurement in management research - Validity and Reliability. Levels of measurement - Nominal, Ordinal, Interval, Ratio, Attitude Scaling Techniques: Concept of Scale – Rating Scales viz. Likert Scales, Semantic Differential Scales, Constant Sum Scales, Graphic Rating Scales – Ranking Scales – Paired Comparison & Forced Ranking. Types of Data: Secondary Data - Definition, Sources, Characteristics. Primary Data - Definition, Advantages and disadvantages over secondary data, Observation method, Questionnaire Construction, Personal Interviews, Telephonic Interview, Mail Survey, Email/Internet survey.	10
4	Sampling: Concepts of Statistical Population, Sample, Sampling Frame, Sampling Error, Sample Size, Non Response. Characteristics of a good sample. Probability Sample – Simple Random Sample, Systematic Sample, Stratified Random Sample & Multi-stage sampling. Non Probability Sample – Judgment, Convenience, Quota & Snowballing methods. Determining size of the sample - Practical considerations in sampling and sample size. Data Analysis: Data preliminary questionnaire screening, editing, coding and data entry (using statistical software), Research Writing: - Research Proposal Synopsis, Research Report	10
	Total	**40**

Note: Wherever the standard books are not available for the topic appropriate print and online resources, journals and books published by different authors may be prescribed.

SWARNIM SCHOOL OF BUSINESS

Pedagogy:

- ICT enabled Classroom teaching
- Case study

- Practical / live assignment
- Interactive class room discussions

Evaluation:

Students shall be evaluated on the following components:

A	**Internal Evaluation**	**(Internal Assessment- 50 Marks)**
	• Continuous Evaluation Component (Class Presence, Presentation, Overall Behavior)	50 marks
C	**End –Semester Examination**	**(External Assessment-50 Marks)**

Reference Books:

No.	Author	Name of the Book	Publisher	Year of Publication / Edition
1	Naval Bajpai	Business Research Methods	Pearson	Latest
2	Naresh Malhotra and Satyabhusan Dash	Marketing Research – An applied orientation	Pearson	Latest
3	Donald R. Cooper and Pamela S. Schindler	Business Research Methods	TMH	Latest
4	Zikmund Willium	Business Research Methods	Thomson	Latest
5	Uma Sekaran	Research methods for business: A skill building approach	Wiley India	Latest
6	Panneerselvam R.	Business Research Methods	John Wiley and Sons	Latest
7	D. K. Bhattacharyya	Research Methodology	Excel	Latest
8	J. K. Sachdeva	Business Research Methodology	Himalaya	Latest
9	Adithan Bhujange	Research Methodology for Management and social Science	Excel	Latest
10	Alan Bryman	Business Research Methods	Oxford University Press	Latest

Note: Wherever the standard books are not available for the topic appropriate print and online resources, journals and books published by different authors may be prescribed.

1. Business Research Methods - Donald Cooper & Pamela Schindler, TMGH, 9th edition.
2. Business Research Methods – Alan Bryman & Emma Bell, Oxford University Press.
3. Research Methodology - C.R.Kothari

List of Journals/Periodicals/Magazines/Newspapers / Web resources, etc.

1. Journal of Indian Business Research
2. International Journal of Statistics and Analysis
3. Sankhya – Indian Journal of Statistics
4. Economic Times
5. Financial Express
6. Business Standard

SWARNIM SCHOOL OF BUSINESS

7. Economic & Political Weekly
8. Vikalpa

SWARNIM SCHOOL OF
BUSINESS

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS - Master of Business Administration

Semester – I

Computing Skills - 1

Code: 16040102

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objectives:-

This course is designed in such a way as to provide the students an understanding of the different contemporary and relevant topics in the subject of Computing Skills with deeper penetration so that the students are aware about the basics of computers..

Module	Topics	Hours
1	Introduction to Computers: Hardware - Software - Systems Software, Application Software and Packages - Introduction to Embedded Software. Fundamentals of operating system- Windows, Unix/Linux. Introduction to World Wide Web - Internet operations. Emerging communication technologies	10
2	Microsoft Word – Mail merge (2) 2.2 Microsoft Excel – Formulas, Graphs, Basis statistical formulae. (4) 2.3 Microsoft Power Point – Creating effective presentations (4) 2.4 Microsoft Access - Introduction to DBMS concepts, Creating a database, Basic queries	10

SWARNIM SCHOOL OF BUSINESS

3	BASICS OF INFORMATION TECHNOLOGY: Introduction to Information Technology: Basic concepts of IT, Data and Information. Introduction to computer, Classification and History of computer, Block Diagram of The Computer System, Introduction to various units. Anatomy of Digital Computer, Computer Hardware and Software APPLICATIONS OF IT: Wide range of applications in: Home, Education and Training, Entertainment, Science, Medicine, Engineering etc	10
4	NETWORKING Brief Introduction to Networking, Types of networking, Different topologies Introduction to Internet and World Wide Web, Uses of internet, Electronic Mail. Cloud computing, Internet security, Firewall and Anti-Virus	10
	Total	**40**

Note: Wherever the standard books are not available for the topic appropriate print and online resources, journals and books published by different authors may be prescribed.

Reference Books:

1. Alexis Leon & Mathews Leon Fundamentals of Information Technology
2. John Walkenbach, Herb Tyson,
3. Michael R. Groh, Faithe Wempen,
4. Buck Microsoft office 2010
5. bible Wiley india 2010
6. ITL Education Solutions Limited Introduction to Information Technology
7. Norton and Peter, Introduction to Computers

SWARNIM SCHOOL OF BUSINESS

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF MANAGEMENT

Master of Business administration

Semester 2

Macro Economics
Code: 16040204

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Th	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	30	-	70	-	100

Objective:

Macro Economics is a broad field of study. It is a branch of Economics dealing with the performance, structure, behavior & decision making of the entire Economy.

Module	Topics
1	**Introduction to Macro Economics:** Definition, Scope, Importance and Limitations of Macro Economics **National Income (NI) Accounting:** Meaning of NI and Circular Flow of NI (in Four sector economy Stock and flow concept, NI at Current Price and NI at Constant Price Various concepts of NI (GNP, GDP, NNP, NDP), Personal Income, Disposable Income Methods for measurement of NI Difficulties in measurement of NI
2	Theory of Income and Employment Keynes' consumption function Investment function, Keynesian theory of Income and employment, Investment multiplier Interest rate theory - Liquidity Preference Theory
3	Money, Definition and Functions Stocks of Money (M1, M2, M3 and M4) Credit creation by Commercial Banks Inflation

SWARNIM SCHOOL OF BUSINESS

	Meaning of Inflation, Deflation, Stagflation and Causes of inflation, Measures to Control Inflation Business cycle Meaning, characteristics and phases
4	Monetary policy Meaning, Objectives and Tools Fiscal policy Meaning, Objectives and Tools Balance of Payments Meaning, Structure, Causes of Disequilibrium and Methods of Correcting Disequilibrium.

Text Book

D. Macro Economics by D.M.Mithani (Himalaya Publication)
E. Macro Economics by R. Cauvery (S.Chand Publication.)

Topics for Assignment

13. Functions of Commercial Banks
14. Functions of Central Banks
15. Factors affecting Business Cycle
16. Use of National Income Data
17. Difference between BOT and BOP

Topics for Seminar

5. Inflation in India
6. Economic Growth and Economic Development
7. Role of Economic Policies in Economic Growth
8. Relationship between Inflation and unemployment

SWARNIM SCHOOL OF BUSINESS

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS - Master of Business Administration

Semester – II

Human Resource Management

Code: 16040205

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objectives:-

This course is designed in such a way as to provide the students an understanding of the different contemporary and relevant topics in the subject of marketing management with deeper penetration so that the students can choose the particular area of specialization even under the Marketing Management as per their interest in future.

Module	Topics	Hours
1	*ntroduction to Human Resource Management:* Introduction, Concept of Human Resource Management, Scope of Human Resource Management, History of Human Resource Management, Function of Human Resource Management, Role of HR Executives *Unit 2- HRM in India:* Introduction, Changing Role of Human Resource in India, Globalization, Its Impact on HR	10
2	*Human Resource Planning:* Process of Human Resource Planning, Need for Human Resource Planning, HR Forecasting Techniques, Successful Human Resource Planning *Unit 4- Recruitment and Selection:* Concept of Recruitment, Factors Affecting	10

SWARNIM SCHOOL OF BUSINESS

	Recruitment, Sources of Recruitment, Recruitment Policy, Selection, Selection Process, Application Forms, Selection Test, Interviews, Evaluation, Placement, Induction *Unit 5- Training and Management Development:* Meaning of Training, Area of Training, Methods of Training, Concept of Management Development, Management Development Methods, Differences Between Training and Development, Evaluation of Training and Management Development	
3	*Unit 6- Employee Career Planning and Growth:* Concept of Employee Growth, Managing Career Planning, Elements of a Career Planning Programme, Succession Planning *Unit 7- Performance Appraisal:* Concept and Need for Performance, Reviews, Overview of Performance Appraisal, Types of Appraisal Methods, 360 degree appraisal, Benefits *Unit 8- Compensation Management:* Wage and Salary Administration, Managing Wages, Concept of Rewards and Incentives, Managing Benefits in Organisations *Unit 9- Job Evaluation:* Concept of Job Evaluation, Objectives, Techniques, Advantages and Limitations, Introduction to Competency	10
4	*Unit 10- Human Resource Information System:* Introduction, Concept, Components, Types, Application, Implementation, Benefits, Impact, *Unit 11- Job Analysis and Design:* Concept of Job Analysis and Design, Process of Job Analysis, Methods of Job Analysis, Job Analysis Information, Concept of Job Design *Unit 13 - Grievance and Grievance Procedure:* Concept of Grievance, Causes of Grievances, Forms and Effects of Grievance, the Grievance Handling Procedure, Need for Grievance Redressal Procedure *Unit 14 - Employee Welfare and Working Conditions:* Concept of Employee Welfare, Welfare Measures, Types, Employee Welfare Responsibility, the Business Benefits of Employee Welfare Activities *Unit 15 - Emerging Trends in HRM:* Competency Mapping, Business Process Outsourcing, Right Sizing of Workforce, Flexi time, Talent Management, Employee Engagement	10

SWARNIM SCHOOL OF BUSINESS

	Total	**40**

Note: Wherever the standard books are not available for the topic appropriate print and online resources, journals and books published by different authors may be prescribed.

Reference Books:

Personnel Management – C.B Mamoria 3. Managing Human Resources - R.S. Dwiwedi 4. Human Resources Management-V.P.Michael 5. Human Resources Management – Dr.P.C.Pardeshi 6. Human Resources Management – Mirza & Zaiyadin 7. Human Resources Management – L.M.Prasad 8. Human Resources Management - Ashwathappa 9. Managing Human Resources - Arun Monppa

SWARNIM SCHOOL OF BUSINESS

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS - Master of Business Administration

Financial Management
Code: 16040206

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objective:

- To familiarize students with the concepts, tools and practices of financial management.
- To understand the decisions to be taken by financial managers of business firms.

Module	Topics	Hours
1	**Finance Function:** Meaning, Scope, and Classification of functions (Long term-short term; Executive-Routine). Organization of Finance Function (status and duties of a Financial manager: Treasurer and Controller). Objectives/Goals of Financial Management. **Time Value of Money:** Concept and numerical of Compounding and Discounting including annuity (excluding valuation of securities).	10
2	**Management of working capital:** Concept, Types, Factors affecting workingcapital needs, Operating cycle approach, Dangers of excessive and inadequate working capital. **Cash Management:** Meaning, Motives of holding cash, Functions/objectives ofcash management, Cash budget (with numerical). **Inventory Management:** Meaning, Objectives of holding inventory, Factors affecting inventory, Techniques of inventory	15

SWARNIM SCHOOL OF BUSINESS

	management :**(1) EOQ** (with numericals including discount concept), ABC Analysis(without numericals) **(2)Reorder point** (without numericals), **Recievables Management:** Meaning, Cost and benefits, size of of receivables,optimum credit policy and credit policy variables, (only simple numericals of receivables are expected.)	
3	**Leverage:** (numericals and theory) Operating leverage: Meaning, degree and effects of operating leverage on profits. Financial leverage: Meaning and degree Trading on equity: Meaning, benefits and risks (including EBIT-EPS analysis) Combined leverage. Concept and numericals on : (a) Financial Break-Even, (b) Indifference point	10
4	**Capital budgeting:** Meaning and significance ofcapital budgeting, Types of capital budgeting decisions. Techniques: (Meaning, Accept-Reject criterion, Advantages and Disadvantages, comparison and numericals based on each method.) Payback period Average Rate of Return Net present value Profitability Index Internal Rate of Return	10
	Total	**45**

Text Books:

- Financial Management-Principles and Practice: C.Sudarsana Reddy, Himalaya Publishing House.

Reference Books:

- Financial Management: Text, Problems and cases: M.Y.Khan and P.K.JainTata McGraw Hill Education Pvt. Ltd.
- Financial Management P.V. Kulkarni and B.G. Satyaprasad.
- Essentials of Financial Management: I.M.Pandey, Vikas Publishing House Pvt. Ltd.
- Financial Management :Prasanna Chandra.
- Financial Management : Dr. V.k. Palanivelu, S. Chand.
- Financial Management :SheebaKapil, Pearson.
- Financial Management : Rajiv Srivastav and Anil Mishra, Oxford university press.

Topics for Assignment :

Introduction to Contemporary issues like: JIT systems, Out sourcing, Computerised inventory control system.
Techniques of controlling inflows and outflows in modern times.
Captial Rationing and its relevance in capital budgeting decisions.
Capital Structure: Meaning and Features of an ideal capital structure.
Relationship of finance with economics, accounts and other disciplines.

SWARNIM SCHOOL OF BUSINESS

Topics for Presentation/Seminar:

Managment of working capital in India.
Emerging role of finance managers in India.
Effect of high and low operating and financial leverage for a business.
ABC analysis of debtors.

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS - Bachelor of Business Administration

Semester – II

Production & Operations Management

Code: 16040207

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Module	Topics	Hours
1	Production Management: Integrated Production Management, System Productivity, Capital Productivity, Labour Productivity, Personnel Productivity, Training Operations Management: Introduction, Operations Management and Strategy, Tools for Implementation of Operations, Industry Best Practices Operations Strategy: Operations Strategy, Competitive Capabilities and Core Competencies, Operations Strategy as a Competitive Weapon, Linkage Between Corporate, Business, and Operations Strategy, Developing Operations Strategy, Elements or Components of Operations Strategy, Competitive Priorities, Manufacturing Strategies, Service Strategies, Global Strategies and Role of Operations Strategy	10
2	Location Strategies: Introduction, Location Planning Process Facility or Layout Planning and Analysis: Introduction, Objectives of Layout, Classification of Facilities, Basis for Types of Layouts, Why Layout decisions are important, Nature of layout problems, Redesigning of a layout, Manufacturing facility layouts, Types of Layouts, Layout Planning, Evaluating Plant Layouts, Assembly Line Balancing, Material handling Operations Scheduling: Introduction, Purpose of Operations Scheduling, Factors Considered while Scheduling, Scheduling Activity under PPC, Scheduling Strategies, Scheduling Guidelines, Approaches to Scheduling, Scheduling Methodology [Quantitative], Scheduling in Services	10

SWARNIM SCHOOL OF BUSINESS

3	Business Process Modeling: Introduction, Importance of Business Process Modelling, Business Process Modelling, Data Driven Approach to Process Definition. Logical vs. Physical Database Modelling, Business Process, the Way Forward Value Engineering: Introduction, Value Engineering/Value Analysis, Relevance of VE in Modern Manufacturing, Process of Value Analysis, VE – Approaches and Aim, Providing Value to the Customers, Benefits	10
4	Total Quality Management: Introduction, Meaning and Dimensions of Quality, Quality Control Techniques, Quality Based Strategy, Total Quality Management (TQM), Towards TQM – ISO 9000 as a Platform – Working with Intranet, Total Productive Maintenance (TPM)	10
	Total	**40**

Pedagogy:

- ICT enabled Classroom teaching
- Case study
- Practical / live assignment
- Interactive class room discussions

Evaluation:

Students shall be evaluated on the following components:

Internal Continuous Evaluation	(Internal Assessment- 50 Marks)
End –Semester Examination	(External Assessment-70 Marks)

Reference Books:

No.	Author	Name of the Book	Publisher	Year of Publication / Edition
1	Chase R. B., Jacobs, F. R., Aquilano, N. J. and Agarwal N. K.,	Operations Management for Competitive Advantage	TMH	Latest
2	Kanishka Bedi	Production and Operation Management	Oxford	Latest
4	Roberta S. Russell, Bernard W. Taylor	Operations and Supply Chain Management	Wiley	Latest
5	Arun Kumar, N.MeenakshiP.	Production and Operation Management	Cengage	Latest
6	Heizer, Jay and Render, Barry	Operations Management	Pearson	Latest

SWARNIM SCHOOL OF BUSINESS

7	Elwood S. Buffa and Rakesh K.Sarin	Modern Production and Operations Management	Wiley	Latest
8	David A. Collier, James R. Evans and Kunal Ganguly	Operation Management	Cengage	Latest
9	S. A. Chunawala, Dr. R. Patel	Production and Operations Management	Himalaya	Latest
10	Martin K. Starr	Production and Operation	Cengage	Latest

Note: Wherever the standard books are not available for the topic appropriate print and online resources, journals and books published by different authors may be prescribed.

List of Journals / Periodicals / Magazines / Newspapers / Web resources, etc.

1. International Journal of Production Economics
2. Journal of Production Research and Management
3. Journal of Operations Management

SWARNIM SCHOOL OF BUSINESS

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS - Master of Business Administration

Semester – II

PROJECT MANAGEMENT (PM)

Code: 16040208

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

1. Objectives:

- To develop an awareness of the need for project planning and management
- To apply professional attitudes and techniques to managing a project
- Provide students with a basic understanding of project management principles and practices.
- Increase the student's ability to function effectively on a project team.
- Increase the student's ability to function effectively as a project manager.

2. Course Duration: The course duration is of 36 sessions of 75 minutes each, i.e. 45 hours

3. Course Contents:

Module No:	Module Content
I	Concept of project – classifications – project risk – scopeProject management – definitions – overview – project plan –management project management life cycles and uncertainty Project planning – scope – problem statement – project goals –objectives – success criteria – assumptions – risks – obstacles –approval process – projects and strategic planning

SWARNIM SCHOOL OF BUSINESS

II	Project implementation – project resource requirements – Types of resources – men – materials– finance Project monitoring – evaluation – control – project network technique –planning for monitoring and evaluation – project audits – project management information system – project scheduling – PERT & CPM – project communication – post project reviews
III	Project team management – recruitment – organizing – human resources – team operating rules – project organization – various forms of project organizations – project organization charting – project contracts – principles – compilation o contracts – practical aspects – legal aspects – global tender - negotiations – insurance Closing the project – types of projec termination – strategic implications – project in trouble – termination strategies – evaluation of termination possibilities – termination procedures
IV	Project Financing : Rights and obligations of Fund providers; Types of ownership Securities (Equity Shares, Preference Shares,deferred shares) Types of Debt Securities: Term loans, lease, debentures and bonds Hybrid Securities: Preference Shares, convertible bonds, bonds with warrants, Project Financing In India – SBI Guidelines, Financing of Export oriented units, Financing of small scale units, Financing of Infrastructure Projects
V	**Practical Module:** Prepare a project of your choice using the theoretical fundamentals in above modules and also prepare a project report under the guidance of your subject teacher.

4. Teaching Method: The following pedagogical tools will be used to teach this course: (1) Lectures and Discussions

(2) Role Playing

(3) Assignments and Presentations

5. Evaluation:

A	Projects/ Assignments/ Quizzes/ Individual or group Presentation/ Class participation/ Case studies etc	Weightage 50 marks (Internal Assessment)
B	End –Semester Examination	Weightage 50 marks (External Assessment)

6. Text Books:

Sr. No.	Author	Name of the Book	Publisher	Edition

SWARNIM SCHOOL OF BUSINESS

T1	Clifford F Gray, Erik W Larson	"Project Management-The Managerial Process"	Mcgraw-Hill Publishing	Latest edition
T2	Khatua	Project Management and Appraisal	Oxford Publication	Latest Edition

7. Reference Books:

Sr. No.	Author	Name of the Book	Publisher	Edition
R1	P K Joy	Total Project Management-The Indian Context	Macmillan India Ltd	Latest edition
R2	Prasanna Chandra	Project Planning Concept	TMH Publication	Latest Edition
R3	Pinto	Project Management	Pearson	Latest Edition
R4	Jack Meredith, Samuel J. Mantel Jr	"Project Management- A Managerial Approach"	John Wiley and Sons	Latest edition
R5	David I Cleland	Project management	Mcgraw Hill International Edition	Latest edition
R6	Gopalakrishnan	Project Management	Mcmillan India Ltd	Latest edition
R7	John M Nicholas	"Project Management For Business And Technology"	Prentice Hall Of India Pvt Ltd	Latest edition

8. List of Journals/Periodicals/Magazines/Newspapers, etc.

Project Management Journals and Articles published in India and internationally, use of
Software like M.S. Project, SAP, etc. is encouraged.

9. Session Plan:

Session no.	Topic
1-2	Introduction – Definitions – classifications – project risk – scope Project management – definitions – overview – project plan
3-4	management principles applied to project management – project management life cycles and uncertainty
5-6	Project planning – scope – problem statement – project goals – objectives – success criteria – assumptions – risks – obstacles – approval process
7	projects and strategic planning
8-9	Project implementation – project resource requirements-types of resources – men – materials – finance

SWARNIM SCHOOL OF BUSINESS

10-11	Project monitoring – evaluation – control-project network technique
12-13	planning for monitoring and evaluation – project audits- project management information system – project scheduling – PERT & CPM
14	project communication – post project reviews
15-16	Project team management – recruitment
17-18	organizing – human resources – team operating rules – project organization – various forms of project organizations
19-21	project organization charting – project contracts – principles – compilation of contracts – practical aspects – legal aspects – global tender – negotiations – insurance
22-23	Closing the project – types of project termination – strategic implications – project in trouble
24-25	termination strategies – evaluation of termination possibilities – termination procedures
26-28	Project Financing : Rights and obligations of Fund providers; Types of ownership Securities (Equity Shares, Preference Shares, deferred shares) Types of Debt Securities: Term loans, lease, debentures and bonds Hybrid Securities: Preference Shares, convertible bonds, bonds with warrants, Project Financing In India – SBI Guidelines, Financing of Export oriented units, Financing of small scale units, Financing of Infrastructure Projects
29-36	**Practical** **Module:** Prepare a project of your choice using the theoretical fundamentals in above modules and also prepare a project report under the guidance of your subject

SWARNIM SCHOOL OF BUSINESS

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS – Master of Business Administration

Semester – II

Entrepreneur innovation and motivation

Subject Code: 16040203

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
2	-	-	2	2	50	-	50	-	100

Course Objective:

a) The prime motive of the course is to expose, excite and elevate the motivation of the students to the field of entrepreneurship.
b) To create entrepreneurial managers for corporates to enhance business performance and create sustainable competitive advantage for the corporate.
c) To provide conceptual theoretical frameworks and tools, to enable students to make good decisions and realistic action plans about entrepreneurship.

2. Course Duration: The course duration is of **40sessions of 60 minutes** each.

3. Course Contents:

Module No.	Modules with its Contents/Chapters	No. of Sessions
I	**Entrepreneurship:** Concepts, Importance; Characteristics of a Successful Entrepreneur, Problems faced by Entrepreneurs, Myths and Mindset, Theories & Types of Entrepreneur, Creativity, Innovation and Entrepreneurship, Gujarati Entrepreneur and Contribution to India and World Economy	10
II	**Formalities For Setting Up of A Small Business Enterprise**: Identifying The Business Opportunity; Growth of a Business Idea; Selection of a Project (Product/ Service Selection, Location Selection, Project Feasibility Study, Business Plan Preparation, Preparation of a Project Profile). Decide on the Constitution, Registration, Clearances from specific Departments, Arrange for Land, Arrange for Plant & Machinery, Arrange for Infrastructure, Prepare Project Report, Apply & Obtain Finance, Implement the Project & Obtain Final Clearances	10

SWARRNIM SCHOOL OF BUSINESS

III	**Understanding of Ecosystem & MSME:** Introduction to Central – level Institutions, State –level Institutions, Other Institutions (NABARD, TCOs, SIDBI) supporting business enterprises for financial assistance, technical consultancy, marketing input and research & development support, Process of raising finance from Bank and Other Institutes	10
IV	**Government Support for Entrepreneurship Development:** Initiatives for Start-up India, Stand up India and Skill India, Government of Gujarat schemes for Start-up, Start-up and ecosystem, Stand-up India: Women and Minority Entrepreneurship **Ease of Doing Business (EoDB)** – Overview, Ranking, Determinants of EoDB	10

SWARRIM SCHOOL OF BUSINESS

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF COMMERCE

MBA

Semester – II

COST ACCOUNTING

Code: 16040202

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objective*:*

To make students acquainted with cost accounting and equip them to prepare cost statement.

Course Content:

Module	Topics	Hours
1	**Introduction to Cost Accounting :** Meaning and definition; Need for Cost Accounting; Advantage and limitations; Cost Accounting and Financial Accounting; Cost concepts and cost objects; Elements of cost and classification of costs; methods of costing; Techniques of costing (*with emphasis on Uniform costing*) ; Cost centre and Cost unit; Installation of good cost accountingsystem.	10
2	**Materials:** Definition of inventory; Materials and material control; Objectives of material control; Its necessity and advantages; Purchase and stores routine; Control of inventory through EOQ, determination of various stock levels, JIT and ABC system; Methods of pricings of issues of material - FIFO, LIFO, Base Stock price, Weighted average price, periodic weighted average price, standard price and replacement price; Meaning and treatment of Waste, Scrap, Spoilage and Defectives;	10

SWARNIM SCHOOL OF BUSINESS

	.	
3	**Labour :** Direct and Indirect Labour cost; Labour cost accounting and Labour records; Remuneration methods - Time wage system and piece wage system; Bonus systems (Individual and Group incentive plans) -; Holiday & Leave with pay;Cost of Apprentice; Employee welfare cost; Fringe benefits; Bonus and Gratuity	10
4	**(A) Overheads including Activity Based Costing :** Definition; Classification of overheads; Techniques for segregation of Semi variable overheads; Cost allocation and apportionment; Basis of apportionment of Factory overheads and Re apportionment of service centre cost; Overhead absorption on the basis of Direct Material cost, Direct labour cost, Prime cost, Concept and Treatment in cost accounts of - Over absorption, Under absorption, Setting up time and Idle time; Absorption of Administration overheads and Selling & Distribution overheads (*In theoryonly*) **Conceptual Understanding of Activity Based Costing**	10
	Total	**40**

Reference Books

Cost accounting By M.C. Shukla

Cost Accounting By M.N.Arora

Cost accounting Book B.S.Shah Prakashan

SWARNIM SCHOOL OF BUSINESS

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS -Master of Business administration

Semester – III

BUSINESS LAW

Code: 16040302

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Teaching & Evaluation Scheme:

Objectives:-

To make students understand the concept, theories and application of business Law for the Development of the Society.

UNIT -1

What is Law, various sources of Law, significance of law, business law, impact of law on society & business economic aspects of Constitution & its implications. Law of Contract – Definition & Nature of Contract, types of contract, offer & acceptance, consideration & capacity to contract, free constant, legality of object & consideration, contingent contract, quasi contract, discharge of contract, remedies for breach of contract, indemnity & guarantee, pledge, Principal – agent relationship & rights & obligation of Principal & agent. Law of Indemnity and guarantee

SWARNIM SCHOOL OF BUSINESS

UNIT – 2 The Negotiable Instruments Act, 1881 (incorporating latest amendments) ,

Meaning and characteristics of Negotiable Instruments, Classification of Negotiable Instruments, Promissory Note and Bill of Exchange, essential elements, Distinguish between Promissory note and bill of exchange, acceptance and acceptor Acceptance for honour, absolute and qualified acceptance, Drawer, drawee in case of need, payee, dishonor , Cheques, crossings of cheques, distinguish between Bill of Exchange and cheque, penalties in case of dishonor of cheques

UNIT – 3 - The Sale of Goods Act, 1930

The Sale of Goods Act, 1930, nature of contract of sale, conditions & warranties, Transfer of ownership, performance of contract of sale, rights of unpaid seller, Remedies for breach of contract Auction sale Law of negotiable instruments – nature of N. I., Promissory notes, BOE, Cheque , Parties of NI.

SWARNIM SCHOOL OF BUSINESS

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF MANAGEMENT- Master of Business Administration

Semester – 3

STRATEGIC MANAGEMENT

Code: 16040303

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	30	-	70	-	100

Objectives:-

- To know core concepts of Strategy and Strategic Management and its scope.
- To know various external factors and its effect business policy or business strategy
- To know and execute the process of internal analysis any business unit of Industry.
- To understand various steps of formulation and implementation of various business

SWARNIM SCHOOL OF BUSINESS

Module	Topics	Hours
1	**INTRODUCTION TO STRATEGIC MANAGEMENT** • Meaning of strategy, strategic management (process of S.M) • Importance of Strategic Management • Strategic Fit and Intent • Levels of Strategy and their characteristics • Vision & Mission • Vision : Nature (elements), definition and benefits • Mission : Definition, characteristics of mission statement	10
2	**EXTERNAL ENVIRONMENT ANALYSIS** • Concept of Environment • SWOT • PESTEL • 5 Force Model • Approaches to Environmental Scanning • Sources used for Environmental Scanning • Techniques of Environmental Scanning	10
3	**INTERNAL ANALYSIS** • Resources, Capabilities, Competencies, Core Competencies • Competitive Advantage • Why are resources important • Value chain(organization and industry) • Ansoff Model	10
4	**STRATEGY FORMULATION** • 5 Generic Strategies (cost leadership, differentiation, combined, focus, best cost provider) • Interrelationship between formulation and implementation • Integration: Forward and Backward, Diversification : Horizontal, Conglomerate, Concentric	10
	Total	**40**

SWARNIM SCHOOL OF BUSINESS

Pedagogy:

- ICT enabled Classroom teaching Lectures
- Case Discussions and Role Playing.
- Audio-visual Material (Using CDs/Clippings/ online videos).
- Assignments and Presentations.

Evaluation:

Students shall be evaluated on the following components:

A	**Internal Evaluation**	**(Internal Assessment- 50 Marks)**
	Continuous Evaluation Component (Class Presence, Presentation, Overall Behavior)	30 marks
C	**End –Semester Examination**	**(External Assessment-70 Marks)**

TEXTBOOKS:

1) Strategic Management & Business Policy by Azhar Kazmi, 3rd Edition Mc Graw Hill Publication Pvt Ltd.

2) Business Policy & Strategic Management by P. Subba Rao , GTU Edition Himalaya Publication.

REFERENCE BOOKS:

Name of the Book	**Author**	**Publication**	**Edition**
Strategic Management	R Srinivasan	The Indian Context- PHI, Latest Edition	Latest
Strategic Management	N. Chandrasekaran and P.S. Ananthanarayanan	Oxford University Press (Latest Edition)	Latest
Strategic Management: Analysis, Implementation , Control	A Nag	Vikas Publishing (Latest Edition)	Latest
Strategic Management	N. Sengupta	Vision Books (Latest Edition)	Latest
Strategic Management: Text and Cases	V.S.P. Rao, Hari V. Krishna,	Excel Books	Latest

SWARNIM SCHOOL OF BUSINESS

Strategic Management and Business Policy	Azhar Kazmi	Tata McGraw-Hill (Latest Edition)	Latest

1. Crafting and Executing Strategy by Thomson, , Gamble, Strickland, & Jain, 18th Edition Tata Mc Grahill Education Pvt. Ltd.
2. Strategic management By: Pierce & Robinson, Tata Mc Grahill Education Pvt. Ltd.
3. Competitive Advantage by Michael Porter, Free Press Publication,USA ,

SWARNIM SCHOOL OF BUSINESS

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS - Master of Business Administration

Semester – III

Integrated Marketing Communication

Code: 16050302

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Module	Topics	Hours
1	Concept and Process of Integrated Marketing Communications (IMC): Elements of IMC & Developing respective communication campaign a) Advertising – Classification of advertising, types, advertising appropriation, advertising campaigns b) Sales Promotion – Different types of Sales Promotion, relationship between Sales promotion and advertising c) Publicity – Types of Publicity, relationship between advertising and publicity d) Personal Selling e) Direct marketing and direct response methods f) Event Management g) E-Commerce h) Corporate Communication I) Public Relations – Types of PR j) Media relations k) Community relations l) Industrial relations and m) Government relations n) Employee relations (House Journals / Newsletter)	10

SWARNIM SCHOOL OF BUSINESS

2	IMC Message Design: AIDA model Considerations for creative idea Visualization	10
3	Media Management - Media Process - Media Jargons - Media Buying - Strategies and execution, Suppliers in IMC: Hoarding Contractors/Printers etc., Ad Agency – Departments of Ad. Agency, Client Servicing-client Agency relationship, account Planning	10
4	Ethics and social responsibility in IMC campaigns. Evaluating Marketing	10
5	Communication Programs	
Total		**40**

Note: Wherever the standard books are not available for the topic appropriate print and online resources, journals and books published by different authors may be prescribed.

Reference Books:

1. Integrated Marketing Communications - Kenneth Clown& Donald Bach
2. Advertising and Promotions - Belch & Belch, Tata McGraw Hill
3. Advertising Management - Rajeev Batra, John G.Myers & David A Aaker-PHI
4. Otto Kleepner's advertising Procedure - PH
5. International Edition - Contemporary Advertising Irwin/McGraw –Hill
6. Integrated Marketing Communications - Duncon- TMH
7. Foundations of Advertising Theory & Practice- S.A.Chunawalla & K.C.Sethia- Himalaya Publishing

SWARNIM SCHOOL OF BUSINESS

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS - Master of Business Administration

Semester – III

Compensation Benefits

Code: 16070302

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Module	Topics	Hours
1	Compensation management – An Introduction: Compensation Management, Compensation and Non-compensation Dimensions, 3-P Concept in Compensation Management, Compensation as Retention Strategy, Compensation for Special Groups, Significant Compensation Issues Job Evaluation, Grading and Compensation Structure: Concept of Salary Structure, Salary Progression, Methods of Payment, Limitations of Job Related Compensation, Competency based Compensation (Broad pay bands and 360 degree feedback) Wages and Salary Administration at Macro (National) Level: Wage Concept, Wage Policy, Institutional Mechanisms for Wage Determination, Pay Commission, Wage Boards, Public Sector	10

SWARNIM SCHOOL OF BUSINESS

2	Job Evaluation: Compensation Strategy at Micro Level, Concept of Equity, Job Evaluation - Methods of job evaluation and System of job evaluation, Process of Job Evaluation, Problems Involved in Job Evaluation Incentive Schemes: Pay for Performance: Types of Incentive Schemes, Wage Incentive Plans, Pre-requisites of Effective Incentive Schemes, Merits.	10
	Demerits of Incentives, Pay for Performance Plans Benefits and Services: Concept and Nature of Benefits, Classification of Employee Benefits, Employee Benefit Programs, Long term Incentive plans, Strategic Perspectives on Benefits, Factors Influencing Choice of Benefit Program, Administration of Benefits and Services, Employee Services – Designing a Benefit Package Voluntary Retirement Scheme: Concept of Voluntary Retirement Scheme (VRS), Approaches to Deal with Workforce Redundancy, Costs and Benefits to the Company, VRS for Public Sector Employees, The Worker Adjustment and Retraining Notification Act (WARN)	
3	Tax Planning: Concept of Tax Planning, Role of Tax Planning in Compensation Benefits, Tax-efficient Compensation Package, Tax Implications of Employee Compensation Package to Employer, Fixation of Tax Liability, Salary Restructuring, Recent Trends in Taxation Compensation Strategy: New Thinking for the New Millennium: Pay the Person, Reward Excellence, Individualizing the Pay System, Organisational and External Factors Affecting Compensation Strategies, Compensation Strategies as an Integral Part of HRM, Compensation Policies Managerial Remuneration: Managerial Remuneration – Concept and Elements, Executive Compensation: Methodology, CEO-to-worker pay ratio, Rewarding – A New Approach, Remuneration Ceilings, Remuneration Ceilings under Section XIII, Benchmark Compensation Package as per the Industry Standards.	10

SWARNIM SCHOOL OF BUSINESS

4	Pay Structures: Performance Based and Pay Based Structures, Designing Pay Structures, Comparison in Evaluation of Different Types of Pay Structures, Designing Pay Ranges and Bands, Significance of Factors Affecting Pay Levels Rewards & Recognition: Concept of Reward Management, Developing Reward Policies, Reward Strategy, Developing Total Reward Approach, Reward Management in Service Sector, Total Reward Framework of Service Industries in India, Factors affecting Reward Management Policies in Service Sector, Process of Designing a Successful Reward Strategy Reward Management in Service Sector at Micro Level: Concept of Reward System in Service Organisations, Elements of Reward System, Designing Reward Systems, Recognizing and Rewarding Service Excellence, Reward Strategy and Performance Management in Insurance International Compensation: Expatriate Compensation and its Objectives, Elements of Expatriate's Compensation Package, Problems in Compensation Management	10

SWARNIM SCHOOL OF BUSINESS

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF MANAGEMENT - MASTERS OF Business Administration

Semester – III

STRATEGIC HUMAN RESOURCE MANAGEMENT

Code: 16070301

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	30	-	70	-	100

Objectives:-

To provide students an understanding of:

1. The strategic Role of HRM,
2. The environment in which the HRM function is performed,
3. The meaning and difference between Performance Appraisal and Performance Management
4. How strategic pay plans and employee benefits are determined.

SWARNIM SCHOOL OF BUSINESS

Module	Topics	Hours
1	**EVOLUTION OF STRATEGIC HUMAN RESOURCE MANAGEMENT** -Personnel management -> HRM -> SHRM - Definition and components of SHRM - Objectives of SHRM - Difference between traditional HRM and SHRM - Difference between SHRM and HR strategies - Link between HR strategy and business strategy - Investment perspective of HR - Risk involved in investment in Human Assets - Factors determining the investment orientation of an organization ***(Strategic Human Resource Management by Tanuja Agarwala)***	10
2	**UNDERSTANDING THE CONCEPT OF SHRM AND HR ENVIRONMENT** - Barriers to strategic HR - Benefits of SHRM - Competencies required of HR department to become a strategic partner - Essential elements of strategic HR - Environmental trends affecting HRM: • Trends in Business Environment • Changing nature of work • Demographic, Societal and workforce trends • Changing nature of Employment Relationship - HRM a changing function • Roles associated with Management of HR (Classification given by Ulrich) • Partnership of HR and Line Managers ***(Strategic Human Resource Management by Tanuja Agarwala)***	10

SWARNIM SCHOOL OF BUSINESS

3	**PERFORMANCE MANAGEMENT AND APPRAISAL** - Comparison between the two - Why Performance Management? - Supervisor's Role in appraising performance - Methods of Performance Appraisal with important advantages and disadvantages • Alteration Ranking Method • Paired Comparison Method • Computerised and web Based Performance Appraisal • Electronic Performance Monitoring (EPM) - How to avoid appraisal problems? ***(Human Resource Management by Dessler & Varkkey)***	10
4	**DETERMING STRATEGIC PAY PLANS AND EMPLOYEE EMPLOYEE BENEFITS** - Basic factors in determining pay rates • Legal consideration in compensation • Union influence on compensation decisions • Competitive strategy, corporate policies and compensation • Equity and its impact of pay rates - Process of establishing pay rates: • Salary Survey • Gob Evaluation • Grouping similar jobs together • Pricing each pay grade • Fine tuning pay rates - Competency Based Pay – meaning, reasons, advantages and disadvantages - Flexible benefits programme 1. Cafeteria Approach 2. Flexible Work Arrangements - Flexi time and its effectiveness - Compressed work week and its effectiveness	10

SWARNIM SCHOOL OF BUSINESS

	3. Other flexible work arrangement - Job sharing - Work sharing - Telecommuting ***(Human Resource Management by Dessler & Varkkey)***	
Total		**40**

Topics for Assignment:

1. Four levels of integration between the HR functions and the Strategic Management function.
2. Linking of HR systems to organization maturity
   (Essentials of Strategic Human Resource Management by Dr. Anjali Ghanekar)
3. Compensating Executives and Managers
4. Compensating professional employees.

(Human Resource Management by Dessler & Varkkey)

Topic for Seminar

1. Designing Performance Management Systems.
2. Balance Score Card and HR Score Card.
3. HR manager as a change agent

Reference Books:

1. Human Resource Management By Gary Dessler and Biju Varkkey Pearson Prentice Hall 12th Edition

2. Strategic Human Resource Management By Tanuja Agarwala Oxford University Press2007 Edition

3. Human Resource Management (Text and Cases) By S. S. Khanka S. Chand and Company Limited Reprint 2007.

4. Essentials of Strategic Human Resource Management by Dr. Anjali Ghanekar Everest Publishing House First Edition 2009

SWARNIM SCHOOL OF BUSINESS

SWARNIM STARTUP & INNOVATION UNIVERSITY
SCHOOL OF MANAGEMENT MBA
Semester – III
Management of Financial Services
Code: 16060301

1. **Course Contents:**

Module No.	Modules with its Contents/Chapters	No. of Sessions
I	**Introduction to Financial Services:** Meaning, Characteristics, Distinctiveness and Classification of Financial Services. **Introduction to Indian Financial System** Formal and Informal Sectors, Components of Formal Financial System including Financial Markets, Financial Institutions, Financial Services and Financial Instruments. Financial Inclusion and Exclusion **Types of Financial Markets** *Money Market* and Instruments , *Capital Market:*Primary and Secondary Market, Overview of Foreign Exchange Market **Regulation of Financial System:** Role of RBI, SEBI, IRDA	12
II	Factoring and Forfaiting, Housing finance, Merchant Banking and Issue Management**,** Stock Broking, Credit Rating, Custodial and Depository Service.	10
III	**Basics of Insurance Services -** Principles of Insurance Services, Life Insurance, General Insurance. **Specialized**	6

SWARNIM SCHOOL OF BUSINESS

	Financial Services – Microfinance, Venture Capital, Securitization & Asset Reconstruction Company.		
IV	**Mutual Fund:** Concept, Types, Structure of Mutual Fund, Mutual Fund Schemes, Calculation of NAV, SIP, SWP. **Crowd-funding:** Concept of crowd-funding, types of crowd-funding platforms, crowd-funding in India. Basics of Crypto currency	8	21

2. **Teaching Methods:**

The course will use the following pedagogical tools:

(a) Classroom Discussion of Concepts and Applications
(b) Case Discussions
(c) Discussion on articles and news from Financial Daily such as Business Standard or Economic Times, blogs and other websites on daily basis
(d) Management Exercise / Stimulations /Games/ learning from Movies

3. **Evaluation:**

The evaluation of participants will be on continuous basis comprising of the following elements:

A	Continuous Evaluation Component comprising of Projects / Assignments / Quiz / Class Participation / Class test / Presentation on specific topic etc	(Internal Assessment-50 Marks)
B	Mid-Semester examination	(Internal Assessment-30 Marks)
C	End –Semester Examination	(External Assessment-70 Marks)

4. **Reference Books:**

Sr. No.	Author	Name of the Book	Publisher	Year of Publication
1	Thummuluri Siddiah	Financial Services	Pearson	Latest Edition

SWARNIM SCHOOL OF BUSINESS

2	Bharti Pathak	The Indian Financial System: Markets, Institutions and Services	Pearson	Latest Edition
3	K Sasidharan	Financial Services & System	McGraw Hill	Latest Edition
4	M Y Khan	Financial Services	McGraw Hill	Latest Edition
5	M Y Khan	Indian Financial Systems	McGraw Hill	Latest Edition
6	E. Gordon & K. Natrajan	Financial Markets & Services	Himalaya Publication	Latest Edition
7	L M Bhole	Financial Institutions and Markets	McGraw Hill	Latest Edition

Note: Wherever the standard books are not available for the topic, appropriate print and online resources, journals and books published by different authors may be prescribed.

5. **List of Journals / Periodicals / Magazines / Newspapers, etc.**

1. Journal of Financial Services Research
2. Chartered Financial Analyst
3. Economic Times
4. Business Standard
5. Financial Express
6. Harvard Business Review

6. List of Websites (Link):

1. https://www.rbi.org.in/scripts/paymentsystems.aspx
2. www.kickstatrer.com
3. http://www.npci.org.in/home.aspx
4. http://www.idrbt.ac.in/
5. http://www.bis.org/cpss/index.htm

SWARNIM SCHOOL OF BUSINESS

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS - Master of Business Administration

Semester – III

Security Analysis & Portfolio Management

Code: 16060302

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Module	T	Hours
1	Investment – A Conceptual Framework: Investment process, risks of investment and the common mistakes made in investment management Investment Environment: Features and composition of money market and capital market, money market, capital market instruments and financial derivatives Risk and Return: Concepts of risk and return, how risk is measured in terms of standard deviation and variance, the relationship between risk	10

SWARNIM SCHOOL OF BUSINESS

2	Fundamental Analysis: Economy analysis, industry analysis and company analysis, weaknesses of fundamental analysis Technical Analysis: Tools of technical analysis, important chart formations or price patterns and technical indicators Efficient Market Hypothesis: Concept of 'Efficient Market' and its implications for security analysis and portfolio management. Behavioral Finance: Meaning of Behavioral finance, deals with when, how and why psychology influences investment decisions	10
3	Valuation of bonds and shares: Elements of investment, bond features and prices, call provisions on corporate bonds, convertible bonds and valuation of bonds Portfolio Management – Risks and Returns: Concept of portfolio and portfolio management, concept of risk, types of portfolio management Markowitz Portfolio Selection Model: Concept of portfolio analysis and diversification of risk. Also discusses Markowitz Model and Efficient Frontier Capital Asset Pricing Model (CAPM): Deals with the assumptions of CAPM and the inputs required for applying CAPM and the limitations of this Model.	10
4	Sharpe-The Single Index Model: Measurement of return on an individual stock, measurement of portfolio return and measurement of individual stock risk Factor Models and Arbitrage Pricing Theory: Arbitrage Pricing Theory and its principles, Comparison of Arbitrage Pricing Theory with the Capital Asset Pricing Model. International Portfolio Investments: Investment avenues for foreign portfolio investors, risks and returns associated with such investment. Mutual Fund Operations: Mutual funds as a key financial intermediary, mobilizing savings and investing them in capital markets.	10
Total		**40**

SWARNIM SCHOOL OF BUSINESS

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS – Master of Business Administration

Semester III

New Enterprise and Innovation Management (NE&IM)

Code: 16040301

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
2	-	-	2	2	50	-	50	-	100

Objectives:-

A) Awareness regarding the problem of environmental pollution and Law as a means of prevention of environmental pollution and protection of environment.

B) A spirit of inquiry to explore the development of international environmental law and its application in India for the protection of environment.

C) To make the students aware about the provisions under the Indian Constitution for protection of environment and the various legislative measures. It also provides an opportunity to the students to understand the activist role played by Indian Judiciary in protection of environment and evolution of different principles such as polluter pay principle, precautionary principle, inter-generational equity and sustainable development.

Course Duration: the course duration is 40 session of 60 minutes each i.e. 40 hour.

Module	Topics	Hours
1	Introduction of New Enterprise and Innovation Management	10
2	**Financial management for Innovation & Enterprise.**	10
3	Marketing Management & Strategy	10
4	**Legal Aspects for Enterprise & Entrepreneur.**	10
	Total	**40**

Note: Wherever the standard books are not available for the topic appropriate print and online resources, journals and books published by different authors may be prescribed.

Teaching Method:

- Classroom teaching
- Case study

SWARRNIM SCHOOL OF BUSINESS

- Group discussion
- Presentation

Evaluation: students shall be evaluated on the following components.

	Internal Evaluation	Internal Assessment 50 Marks
A	Continuous Evaluation Component	**50 Marks**
B	End Semester Examination	**External Assesment 50 Marks**

Reference Books:

- Robert D. Hisrich, Michael P Peters and Dean A Shepherd Entrepreneurship Tata McGraw Hill Latest Edition P C Jain Handbook of New Entrepreneurs Oxford University Press Latest edition
- Paul Trot Innovation Management and New Product Development Pearson Education Latest Edition
- S Nagendra and V S Manjunath Entrepreneurship and Management Pearson Education Latest Edition
- R2 P Narayana Reddy Entrepreneurship : Text and Cases Cengage Latest Edition
- R3 T W Zimmerer and N M Scarborough Essentials of Entrepreneurship and Small Business Management Prentice Hall Latest Edition
- R4 W A Sahlman, H H Stevenson, M J Roberts and Amar Bhinde Entrepreneurial Ventures Harvard Business School Press Latest Edition.

SWARNIM SCHOOL OF BUSINESS

SWARNIM STARTUP & INNOVATION UNIVERSITY
SCHOOL OF MANAGEMENT
Master of Business Administration
Semester – IV
Global Marketing Management
Code: 16040402

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	30	-	70	-	100

1. **Objectives:**
   The course is intended to provide an opportunity to learn and understand how business is conducted in international arena. It aimed at making the students realize that international business is applicable to multiple business functions like Marketing, Human Resource Management, and Financial Management.

2. **Course Duration:** The course duration is 36 sessions of 60 minutes each. i.e. 36 hours.

3. **Course Contents:**

Module No.	Module Content	No. of Sessions	70 Marks (External Evaluation)
1	**Globalization:** What is Globalization, Drivers of Globalization, Managing in the Global Market Place **Differences in Culture:** What is Culture, Values & Norms, Social Structure, Culture – Language, Culture – Education, Culture – Workplace	05	12

2	**International Trade Theory:** An Overview of Trade Theory, Absolute Advantage, Comparative Advantage, Heckscher – Ohin Theory, National Competitive Advantage: Porter's Diamond, Global Competitive Alignment Matrix. **Foreign Direct Investment:** FDI in the world economy, Horizontal FDI and Vertical FDI	08	15
3	**The Foreign Exchange Market:** The Functions and Nature of foreign exchange market, Economic Theory of Exchange Rate Determination, Exchange Rate Forecasting, Currency Convertibility **The International Monetary System:** The Gold Standard, The Bretton Woods System, The Collapse of the Fixed Exchange Rate System, The Floating Exchange Rate Regime, Fixed V/S Floating Exchange Rates, IMF: Origin and Objectives, Crisis Management by the IMF, The Spot and Forward Market	07	15
4	**Entry Strategy and Strategic Alliances:** Basic Entry Decisions, Selecting an Entry Mode, Entry Strategies in India, Greenfield Venture or Acquisition, Strategic Alliances **Exporting, Importing and Counter Trade:** The Promise and Pitfalls of Exporting, Improving Export Performance, Exporting with a Little Government Help, Export and Import Financing, Export and Import Financing, Export Assistance	08	13
5	**Global Marketing and R & D:** The Globalization of Market and Brands, Market Segmentation, Product Attributes, Distribution Strategy, Communication Strategy, Pricing Strategy, New Product Development **Global Human Resource Management:** The Strategic Role of International HRM, Staffing Policy, Managing Expatriate, Training and Management Development, Performance Appraisal, Compensation, International Labour Relations	08	15

4. Teaching Method:

The following pedagogical tools will be used to teach this course:

- Lectures
- Case Discussions
- Audio – visual Material
- Assignments and Presentations

5. Evaluation:

A	Projects/Assignments/Quiz/Class participation	Weightage (50%) (Internal Assessment)
B	Mid – Semester Examination	Weightage (30%) (Internal Assessment)

6. Basic Textbooks:

Sr. No.	Author	Name of the Book	Publisher	Edition
T1	Charles W L Hill and Arun K Jain	International Business : Competing in the Global Marketplace	Tata McGraw Hill – 6th Edition	Latest
T2	Daniels, Radebaugh, Sullivan and Salwan	International Business – Elements and Operations	Pearson Education	Latest

7. Reference Books:

Sr. No.	Author	Name of the Book	Publisher	Edition
R1	Mike Peng and Deepak Srivastava	Global Business	Cengage Learning	Latest
R2	K Aswathappa	International Business	The McGraw Hill	Latest
R3	P. SubbaRao	International Business : Text & Cases	Himalaya	Latest
R5	O P Agarwal	International Business	Himalaya	Latest
R6	Hyun Sooklee, R K Srivastava	Internal Business : Country Culture and Corporate Culture	Excel	Latest

SWARNIM SCHOOL OF BUSINESS

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS - Master of Business Administration

Semester – IV

Service Marketing

Code: 16050402

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Module	Topics	Hours
1	Introduction to Services: Nature of Services; Characteristics of Services – Intangibility, Inconsistency, Inseparability and Inventory; Search, experience and credence attributes, Classification of Services; Consumer versus Industrial Services. Global and Indian Scenario in services sector: Importance of Services Marketing; Every business a service business; Service as key differentiator for manufacturing industries.	10
2	Services Marketing Mix: Introduction to the 7 Ps of Services Marketing Mix Product-Service Continuum; Standalone service products; Service products bundled with tangible products; Service Life Cycle. Distribution: Place – Distribution Strategies for Services; Challenges in distribution of Services; Role of Internet in distribution of Services. Promotion: Promotion objective for Services; Personnel Selling, Advertising and Sales Promotion; Role of Relationship Marketing in promoting services. Pricing: Factors involved in pricing a service product; demand variation and capacity constraints; Capacity Planning, Measuresto respond to changes in demand; Reshaping demand using effective pricing.	10

3	People: The key role of service employees in a service business; Services marketing triangle; Service profit chain, Concept of Service encounter – Moment of Truth; Training and development of employees; Motivation and empowerment. Physical evidence: Nature of physical evidence; Importance of physical evidence in services; Tangibilizing through physical evidence; Service scapes. Process: Service as a process & as a system - Different process aspects and managerial challenges - Strategies for managing inconsistency – Customer role in services - Customers as 'co-producers'; Self Service Technologies, – Customer Service in ServiceMarketing	10
4	Customer Satisfaction & Service Quality: Monitoring and Measuring customer satisfaction, Order taking and fulfillment; Service Guarantee - Handling complaints effectively; Defects, Failures and Recovery. Concept and Importance of quality in Services; How customers evaluate service performance, Service Quality Models Parsuraman-Zeithamal-Bitner (PZB) Gaps Model, SERVQUAL, and SERVPERF – Gronroos model (10) 11. Technology & Service Strategy: Applying technology to service settings, e-services	10
	Total	**40**

Note: Wherever the standard books are not available for the topic appropriate print and online resources, journals and books published by different authors may be prescribed.

Reference Books:

1. Services Marketing - Zeithaml, Bitner, Gremler & Pandit, TMGH, 4th ed.
2. Services Marketing - Christopher Lovelock
3. Services Marketing - Rampal & Gupta
4. Essence of Services Marketing - Ardian Payne
5. Services Marketing - Helen Woodruff

SWARNIM SCHOOL OF BUSINESS

SWARNIM STARTUP & INNOVATION UNIVERSITY
SCHOOL OF MANAGEMENT
Master of Business Administration
Semester – IV
PRODUCT AND BRAND MANAGEMENT
Code: 16050401

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	30	-	70	-	100

Course Objective: The purpose of the Brand Marketing course is to provide a fundamental understanding of how to build, measure, and manage a brand. Understand the terminology, concepts and activities of brand marketing. Understand the brand equity concept, Enhance awareness and knowledge about branding issues in industries. To Increase the understanding of the important issues in planning, implementing and evaluating brand strategies.

Module	Topics	Hours
I	**Introduction** • Introduction to Product Management • Role of a Product Manager **Competition & Product Strategy:** • Life Cycle Analysis • Managing Competition – Product Strategy is central (5 Forces Model & Strategy Options) **Extended Product life cycle:** • Concept, Seven Stages of PLC • Managerial Implications of PLC **Product Portfolio:** • Concept, Factors influencing Product Portfolio • Shell's Directional Policy Matrix **New Product Development:** • Brief overview of NPD Process	10

II	**New product Strategy:** • The need for Product Innovation Strategy • The components of new Product Strategy **Commercialization:** • Test Marketing • Time to Market • Breaking into the Market **Managing Growth** • Resistance to Change • Leveraging new Product Growth • Sustaining Differentiation **Managing the mature Product:** • Offensive Strategies • Extending the product life cycle • Customer Relationship Management **Managing Product Elimination:** • Importance of Product Deletion & the reasons for neglect • Product Deletion Process (Briefly) • Triggers in Product Deletion	10
III	**Branding & Brand Management:** • What Is a Brand? Why Do Brands Matter? Can Anything Be Branded? Branding Challenges and Opportunities, The Brand Equity Concept, Strategic Brand Management Process **Customer-Based Brand Equity and Brand Positioning:** • Customer-Based Brand Equity (Sources of Brand Equity & Building Strong Brand), Identifying and Establishing Brand Positioning, Positioning Guidelines, Defining a Brand Mantra **Choosing Brand Elements to Build Brand Equity:** • Criteria for Choosing Brand Elements • Options and Tactics for Brand Elements **Leveraging Secondary Brand Associations to Build Brand Equity:** • Conceptualizing the Leveraging Process • Sources of secondary Brand Associations	10
IV	**Measuring and Interpreting Brand Performance** **Developing a Brand Equity Measurement and Management System:** • The Brand Value Chain • Designing Brand Tracking Studies • Establishing a Brand Equity Management System **Measuring Sources of Brand Equity: Capturing Customer Mind-Set: Overview**	9

	• Qualitative Research Techniques • Quantitative Research Techniques • Comprehensive Models of Consumer-Based Brand Equity **Designing and Implementing Branding Strategies:** • Brand Architecture & Brand Hierarchy • Designing Branding Strategies • Using Cause Marketing to Build Brand Equity • Brand Extension (Advantages & Disadvantages, how consumers evaluate brand extensions) **Managing Brands over Time:** • Reinforcing Brands • Revitalizing Brands **Managing Brands over Geographic Boundaries:** • Global Brand Strategies	

Pedagogy:

- ICT enabled Classroom teaching Lectures
- Case Discussions and Role Playing.
- Audio-visual Material (Using CDs/Clippings/ online videos).
- Assignments and Presentations.

Evaluation:

Students shall be evaluated on the following components:

A	**Internal Evaluation** • Continuous Evaluation Component (Class Presence, Presentation, Overall Behavior)	**(Internal Assessment- 50 Marks)** 30 marks
C	**End –Semester Examination**	**(External Assessment-70 Marks)**

Reference Books:

Sr. No.	Author	Name of the Book	Publisher	Year of Publication / Edition
1	Michael Baker & Susan Hart	Product Strategy and Management	Pearson	Latest Edition
2	Kevin Lane Keller, M.G. Rameswaram, Isaac Jacob	Strategic Brand Management	Pearson	2015 / 4th
3	Kirti Dutta	Brand Management-Principles and Practices	Oxford University Press	Latest Edition
4	Tapan Panda	Product and Brand Management	Oxford University Press	2016 / 1st
5	S. Ramesh Kumar	Managing Indian Brand, Marketing Concepts & Strategies	Vikas	Latest Edition
6	Donald R. Lehman and Russell S. Winer	Product Management	Tata McGraw Hill	Latest Edition
7	Ramanuj Majumdar	Product Management in India	PHI EEE	Latest Edition

8	Y.L.R. Moorthi	Brand Management, The Indian Context	Vikas	Latest Edition
9	Al Ries	The 22 Immutable Laws of Branding: How to Build a Product or Service into a World Class Brand	Harper	2002
10	David A. Aaker	Managing Brand Equity	Free Press	1991
11	Harsh V Verma	Brand Management	Excel	2013 / 3rd

Note: Wherever the standard books are not available for the topic appropriate print and online resources, journals and books published by different authors may be prescribed.

List of Journals / Periodicals / Magazines / Newspapers / Web resources etc.

1. International Journal of Product Management
2. Journal of Product and Brand Management
3. Indian Journal of Marketing
4. Journal of Brand Management
5. Brand Reporter
6. Product Management Today
7. The IUP Journal of Brand Management
8. https://www.thedrum.com/location/india
9. www.afaws.com

SWARNIM SCHOOL OF BUSINESS

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS - Master of Business Administration

Semester – 4

INTERNATIONAL HUMAN RESOURCE MANGEMENT

Code: 16070401

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objectives:-

This course is designed in such a way as to provide the students an understanding of the different contemporary and relevant topics in the subject organizational behavior.

Module	Topics	Hours
1	UNIT I : International Human Resource management : Concept, Scope and Significance , Approaches to International Human Resource Management ; Differences between – Domestic and international HR activities; Organizational Structure of Multinational Corporations ; Theories and Models of Human Resource Management in MNC's...	
2	UNIT II : International Human Resource : Recruitment and Selection ; Cross National Differences in Personnel and Organization Policies ; Sources of Human Resources ; Home – Country, Host –Country, Third-Country Nationals ; Selection Criteria for International Assignment; Adaptability to Cultural Change, Motivation for a Foreign Assignment and Leadership Ability. UNIT III: Training and Development: Methods of training, Process of Expatriate and Repatriation Management Development in International Settings; Global Leadership Development; Process of Repatriation	

3	UNIT IV: Compensation: Rewards and Benefits; Multinational Corporations and Compensation Systems, Performance Management in MNCs	
4	UNIT V: Labour Relations and Conflict Resolution in Multinational Corporations; Forms of Industrial Democracy in Multinational Corporations; Issues and Challenges of IHRM.	
	Total	**40**

Note: Wherever the standard books are not available for the topic appropriate print and online resources, journals and books published by different authors may be prescribed.

Reference Books:

1. Dowling Welch, Schuler, International Human Resource Management, Thomson, New Delhi.

2. Anne Wil Harzing et al., International Human Resource Management, Sage, New Delhi.

3. Hodgetts, Ricn M., and Luthan, Fred, International Human Resource Management, The McGraw Hill Companies Inc., New York

. 4. Mead, Flichard, International Management, Blackwell Business,USA

. 5. ILO Multinational Enterprises and Social Policy, ILO, Geneva.

6. Briscoe, Dennis R., International HRM, Prenticse Hall, NJ.

7. Torrington, D., International HRM: Think Globally and Act Locally, Hemel Hempstead, Prentice Hall.

8. Evans, P.et al., (ed.), HRM in International Firms: Change, Globalization and Innovation; Macmillan, London, 1989.

9. Storey, John, Managing Human Resources : Preparing for the 21st Century, Beacon Booms, New Delhi.

10. Dr.Nilanjan Sengupta, Dr.Mousuni S.Bhattacharya International Human Resource Management Excel Books New Delhi 2007

SWARNIM SCHOOL OF BUSINESS

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS - Master of Business Administration

Semester – 4

ORGANISATIONAL CHANGE AND DEVELOPMENT

Code: 16070402

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objectives:-

This course is designed in such a way as to provide the students an understanding of the different contemporary and relevant topics in the subject organizational behavior.

Module	Topics	Hours
1	UNIT – 1 Organizational Change: Concept and Significance; Managing Change; Concept of Analyzing the Environment; Perspectives on Change: Contingency; Resource Dependence; Population Ecology; Implications of Change.	
2	UNIT – 2 Types of Change: Continuous or Incremental Change; Discontinuous or Radial Change; Participate Change and Directive Change; Change Levers; Levels of Change: Knowledge Changes; Attitudinal Changes; Individual Behaviour Changes and Organizational Performance Changes.	
3	UNIT – 3 HR and Technological change: Introduction special features of new technology; organizational implications of technological change; Emerging profile HR; Employee Empowerment, Emotional Intelligence and employee productivity; Managing work stress	
4	UNIT - 4 Organizational Development (OD): Concept and Evolution; OD Interventions: Diagnostic Activities; Team Building; Sensitivity Training; Third Party and Inter Group Interventions; Educational and Structural Interventions; Indian Experiences of OD in Public and Private Enterprises	
	Total	**40**

Note: Wherever the standard books are not available for the topic appropriate print and online resources, journals and books published by different authors may be prescribed.

Reference Books:

1. Nilakant, V. and Ramnaryan, S., Managing Organisational Change, Response Books, New Delhi .

2. Beckhanrd, Richard and Harris, Reuben T., Organisational Transitions : Managing Complex Change, Addision, - Wesley, Mass

3. Kanter, R.M., Stein, B.A and Jick, T.D., The Challenge of Organisational Change, Free Press, New York .

4. Hammer, Michael and Champy, James, Reengineering the Corporation : A Manifesto for Business Revolution, Harper Business, New York .

5. Hurst , David K., Crisis and Renewal : Meeting the Challenge of Organisational Change, Harvard University Press, Mass

6. Pattanayak, Biswajeet and Kumar Pravash, Change for Growth, Wheeler Publications, New Delhi .

7. Morgan, Gareth, Imagination, Response Books, New Delhi .

8. Madhukar Shukla, Competing Through knowledge, Response Books, New Delhi .

9. Storey, John, International Cases in Human Resources Mangement, Beacon Books, New Delhi .

10. Venkataratnam C.S., Varma, Anil (ed) : Challenge of Change : Industrial Relations in Indian Industry : Allied Pub. Ltd., New Delhi .

11. Kavitha Singh Organisational change and Development , Excel Books New Delhi,2010

SWARNIM SCHOOL OF BUSINESS

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS - Master of Business Administration

Semester – IV

Mergers &Acquisitions

Code: 16060402

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Module	Topics	Hours
1	Introduction to Merger and Acquisition: Meaning of mergers and acquisitions (M & A), motives behind the M & A, advantages and disadvantages of M & A, types of mergers and steps for a successful merger. Strategic Evaluation of M & A Opportunities- selection approaches and criteria, modalities of fixing the acquisition price, key steps in the strategic planning of a merger, feasibility analysis in respect of cash and stock deals, describes fair value: institutional criteria and special features of acquisition of sick companies. Strategising and Structuring M & A Activity- Merger process right from planning the merger till implementation, five-stage model, methods of financial mergers and capital budgeting decision Synergy and Value Creation in Mergers - synergy and its different types, role of industry life cycle, value creation in synergy, theoretical factors that would affect M & A activity	10

2	Corporate Restructuring- meaning of corporate restructuring, need for corporate restructuring, methods of corporate restructuring. Demergers- Meaning of demerger, characteristics of demerger, structure of demerger, and tax implication of demergers LBOs, MBOs, MLPs and ESOPs - meaning of LBO, MBO, MLP, ESOP, governance and mode of purchase in LBO, key motives behind an MBO, structure of MBO, types of MLP and ESOP, regulations that govern ESOPs. Joint Ventures - Meaning of joint ventures, characteristics of a joint venture, states the rationale for joint ventures, role of joint ventures in business strategy, defines joint venture and complex learning, tax aspects of joint ventures, international joint ventures, reasons for failure of joint ventures, and joint venture vis-à-vis anti-trust Policy.	10
3	International M & A –Introduction of international M & A activity, the opportunities and threats, role of M & A in international trade growth, the external advantages in differential products, impact of government policies and political and economic stability on international M&A decisions, recommendation for effective cross-border M & A. SECTION B: THE PROCESSES IN M&A Takeover Defences - types of takeovers, techniques of bidding for a takeover, defences against takeover bids, regulations and amendments, and guidelines for takeovers Valuation - valuation approaches, basis of valuation, different methods of valuation, valuation of synergy, corporate control and LBO Accounting for Amalgamation –Meaning of amalgamation, types of amalgamation, methods of accounting for amalgamation, meaning of consideration, treatment of goodwill, reserves and other profits	10

4	Legal and Regulatory Framework of M & A -Provisions of the Companies Act, 1956 relating to M & A, buyback of shares, provisions of SEBI act, 1992 and 1997, provisions relevant to M & A activity in the Income Tax Act, and Foreign Exchange Management Act. Post-Merger Integration - integration planning, factors in post-merger integration model, post-merger integration model, strategic interdependence and autonomy, political and cultural aspects in integration, cultural profiling and assessment of cultural compatibility, HRM issues, and problems in integration and five rules of integration process SECTION C: ILLUSTRATIONS OF NOTED M&A'S Prominent Cases of Mergers and Acquisitions - examples of M & A in the Indian and international contexts	10
	Total	**40**

SWARNIM SCHOOL OF BUSINESS

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF MANAGEMENT

Master of Business Administration

Semester – IV

Risk Management

Code: 16060401

Module	Topics	Hours
1	**Introduction to risk management:** • Defining and managing risk • Upside and downside risks • Commodity price risk • Interest rate risk • Approaches to risk management **Introduction to derivatives:** • Defining derivatives and derivative markets • Spot v/s Derivatives markets • Forward, Futures, Options, Swaps • Uses of derivatives	10
2	**Derivatives Market:** • International and Indian derivatives market • Derivative exchanges • Trading system and types of traders • Trading process, online trading Clearing and settlement system **Forward Contracts:** • Meaning, purpose, advantages and problems • Pricing of commodity forward contracts • Interest rate forwards **Future Contracts:** • Meaning, difference between forward and future contracts • Specifications of future contracts • Closing the position • Margins and marking-to-market • Cost of Carry Models • Price quotes, settlement price, open interest • Types of orders	10
3	**Fundamentals of Options:** • Options issued by corporations (introduction) • Meaning of options contract, options	10

	terminologies • Moneyness in options (ITM, ATM, OTM) • Factors affecting Options premium • Exchange traded options **Call and Put options. Options Trading Strategies:** • Uncovered • Covered • Spread • Combination **Put-Call Parity:** • Risk free security • Put-call relationship	
4	**Black-Scholes Options Pricing model:** • Stock price behavior • Assumptions in Black-Scholes model • Black-Scholes model for pricing call and put options **Binomial Options Pricing Model:** • Binomial Options Pricing model for call and put options • Single period and two-period binomial options pricing model	10
Total		**40**

SWARNIM SCHOOL OF BUSINESS

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS

Master of Business Administration

Semester –4

Legal Aspects of Business

Code: 16040401

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-		3	3	50		50	-	100

Objectives: To impart expert knowledge of the various provisions of Companies Act, its schedules, rules, notifications, circulars including secretarial practice, case laws and secretarial standards.

Unit-1 Introduction of Company Act 2013-Meaning and Nature of Company, Classification of Companies, Formation of Company. Memorandum of Association, Articles of Association.

Unit-2 Prospectus, Introduction & Contents. Winding-up of Companies-Different Modes, Oppression & Mis. Management

Unit -3 Appointment, Rights, Duties & Liabilities of Directors, Managing Director and Manager.

Unit -4 Company Secretary- Definition, Appointment, Qualities, Responsibilities, Position and Duties

Unit-5 General Procedure of Meetings, Notice, Agenda, Chairman, Quorum, Motions and Resolution, Types of resolution Methods of Voting, Minutes etc.

Text books:

1. Agarwal&Khatri: Company Law & Secretarial Practice.
2. Chundawat&Khicha: Company Law & Secretarial Practice.
3. Kuchhal, S.C.: Secretarial Practic

SWARNIM SCHOOL OF BUSINESS

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS – Bachelor of Business Administration

Semester – I

Business Mathematics

Code: 13020103 /1402 0103

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objectives:-

This course is designed in such a way as to provide the students an understanding of the different contemporary and relevant topics in the subject of mathematics and help them in future decision making process as managers.

Module	Topics	Hours
1	Ratio, Proportion and Percentage 08 Ratio- Definition, Continued Ratio, Inverse Ratio, Proportion, Continued Proportion, Direct Proportion, Inverse Proportion, Variation, Inverse Variation, Joint Variation, PercentageMeaning and Computations of Percentages	10
2	Profit And Loss 08 Terms and Formulae, Trade discount, Cash discount, Problems involving cost price, Selling Price, Trade discount and Cash Discount. Introduction to Commission and brokerage, Problems on Commission and brokerage.	10
3	Interest 06 Simple Interest, Compound interest (reducing balance & Flat Interest rate of interest), Equated Monthly Installments(EMI), Problems	10
4	Matrices And Determinants (upto order 3 only) : 14 Multivariable data, Definition of a Matrix, Types of Matrices, Algebra of Matrices, Determinants, Adjoint of a Matrix, Inverse of a Matrix via adjoint Matrix, Homogeneous System of Linear equations, Condition for Uniqueness for the homogeneous system, Solution of Non-homogeneous System of Linear equations (not more than three variables). Condition for existence and uniqueness of solution, Solution using inverse of the coefficient matrix, Problems. Permutations and Combinations : 06 Permutations of 'n' dissimilar objects taken 'r' at a time (with or without repetition). n Pr = n! / (n-r)! (without proof). Combinations of 'r' objects taken from 'n' objects. nCr = n! / r! (n-r)! (without proof) problems, Applications.	10

CamScanner

Total	**40**

Note: Wherever the standard books are not available for the topic appropriate print and online resources journals and books published by different authors may be prescribed.

Reference Books:

1. Business Mathematics by Dr. Amarnath Dikshit & Dr. Jinendra Kumar Jain.
2. Business Mathematics by V. K. Kapoor - Sultan chand & sons, Delhi
3. Business Mathematics by Bari - New Literature publishing company, Mumbai

CamScanner

SWARNIM STARTUP & INNOVATION UNIVERSITY

School Of Business

Bachelor of Business Administration

Principles of Micro Economics

Code: 14020102

B.B.A 1st SEM

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Th	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objective:

- To expose students to basic micro economic concepts.
- To apply economic analysis in the formulation of business policies.
- To use economic reasoning to problems of business.

Module	Topics
1.	• Definitions of Economics: Scarcity and Growth definitions • Introduction to Micro Economics: Definition, Scope, Importance and Limitations of Micro Economics • Important Concepts: Economic goods and Free Goods, Price and Value, Want and Demand, Production Possibility Curve • Economic Systems: Planned Economy, Free Market Economy and Mixed Economy
2.	**Theory of Demand:** • Meaning of Demand and Determinants of Demand – Demand Function • Law of Demand, Elasticity of Demand , measurement of demand, Exceptions to the Law of Demand • Utility Analysis: Concept of Utility, Law of Diminishing Marginal Utility, Consumer's Surplus, Indifference curve. • Meaning of Supply, Determinants of Supply, Expansion and

CamScanner

	Contraction of Supply • Demand and Supply as determinants of Price
3.	**Theory of Production** • Factor of Production • Law of return • Ppc • Meaning of Market, Types of Market and their important features: Perfect Competition, Monopoly, Monopolistic Competition and oligopoly
4.	**Theory of Distribution :** • Marginal Productivity Theory of Distribution • Rent: Concepts of Differential Rent and Scarcity Rent, Economic and Contract Rent, Quasi Rent, Pure Rent and Quasi Rent • Wages: Concepts of Time Wages, Piece Wages, Money wages, Real Wages, factors determining real Wages. • Interest: Gross and Net Interest. Components of Gross Interest • Profit: Theories of profit – risk, uncertainty, innovation

Text Book:

(1) Micro Economic Theory by R. Cauvery (S.Chand Publication.)
(2) Micro Economics by M.John Kennedy (Himalaya Publication)

Reference Books:

(1) Modern Micro Economics by H.L Ahuja (S Chand Publication)
(2) Modern Economic Theory by K.K Dewett (S. Chand Publication)
(3) Elementary Theory by K.K. Deweet & J.D.Verma.(S.ChandPublication.)
(4) Principles of Economics by D.M.Mithani (Himalaya Publication)

Topics for assignments:

1. Discuss Basic Economic Problems.
2. Explain the nature of Economics.
3. Explain the Main Types of Demand (Price, Income, Cross).
4. Distinguish between Giffen Paradox and Veblen effect.
5. Distinguish between Composite Supply and Joint Supply.
6. Explain the special features of Factor Pricing.
7. Explain the Constituents of gross profit.

CamScanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS

Bachelor of Business Administration

PRINCIPLE OF MANAGEMENT-1

CODE : 14020101

B.B.A 1st SEM

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objectives: - This subject is designed to provide a basic understanding to the students with reference to working of business organizations through the process of management. The first part of this course (offered in the first semester) will give a brief understanding of the managerial functions of planning (including decision making) and organizing. The second part (offered in the second semester) will throw light on the managerial functions of staffing, directing and controlling.

Course outline:-

Sr.No.	Course Contents
1	**Introduction to Management and Planning** Management: Meaning and process of management. Planning: Meaning; planning process; planning premises; types of plans – based on breadth and use.
2	**Forecasting, Decision making** Forecasting: Meaning; techniques of forecasting – Historical analogy method, survey method, business barometers, time series analysis, regression analysis, significance and limitations of forecasting Decision making: Meaning; decision making process; techniques of decision making – Decision Tree, PERT and CPM.
3	**Organizing – Part 1** A. Introduction - Meaning of organizing; principles of organizing. B. Departmentation – Meaning; bases of departmentation – function wise, product wise, territory wise, process wise and customer wise. C. Delegation – Meaning; elements of delegation; principles of effective Delegation. D. Centralization and decentralization – Meaning; factors affecting degree of centralization and decentralization.
4	**Organizing – Part 2**

CamScanner

	Types of Organizations A. Formal organizations: Line; Functional; Line and staff; Committee (only the meaning, advantages and limitations of all the four forms) B. Informal organizations: Meaning; benefits; problems.

Learning Outcomes:-

* Inspiring business mentors.
* Innovation and creativity in business.
* Current business environment.
* Management by Objectives.

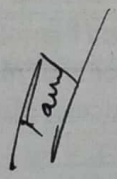
Teaching & Learning Methodology:- Chalk and Talk, Group Discussion

Books Recommended:-

1, L. M. Prasad; Principles of Management; Sultan Chand and Sons, 6th edition.
2, Karminder Ghuman and K. Aswathapa; Management – Concept, Practice and Cases; Tata McGraw Hill; 1st edition (2010)
3, Gupta, Sharma and Bhalla; Principles of Business Management; Kalyani Publications; 1st edition.

Assignment List:-

Sr. No.	Assignment
1	Levels of management and the combination of skills required at each level.
2	Management – an art, a science or a profession?
3	Methods of business forecasting – opinion poll method, extrapolation method, input-output analysis and econometric models.
4	Types of managerial decisions.
5	Span of management and factors affecting the same.



CamScanner

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS

Bachelor of Business Administration

Semester – II

Marketing Management

Code: 14020202

1. **Learning Outcome :** The objective of the course is to make students aware about the concept and practice of marketing management, which will help the students to get knowledge about researching and satisfying customer needs, through product and service development, planning, pricing, advertising, promotion and distribution.

2. Teaching & Evaluation Scheme

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

2.

3. **Course Duration:** The course duration is 40 sessions of 60 minutes each.

4. Course Contents:

Module No:	Module Content	No. of Sessions
1	**MODULE 1- INTRODUCTION TO MARKETING** Marketing Concepts Nature of Marketing Scope of Marketing Importance of Marketing Approaches to Marketing Marketing Process Functions of Marketing Marketing in twenty first century: Challenges	10

CamScanner

2	**MODULE 2- MARKETING MIX & MARKETING ENVIRONMENT** Elements of Marketing Mix (Product, price, place, promotion) Expanded Elements of Marketing Mix for Services (people, process, Physical ambience) Importance of Marketing Mix Marketing Environment: Internal and ExternalThe Changing Marketing Environment Analyzing Needs and Trends in Macro Environment and Micro –Marketing Environment	**10**
3	**MODULE 3-CONSUMER BEHAVIOUR AND MARKET SEGMENTATION** Concept of Consumer Behavior Consumer Decision Making Process Factors Affecting Consumer Behavior Concept of Market Segmentation Segmentation of Markets Market Targeting, Positioning Product differentiation and Market Segmentation	**10**
4	**MODULE 4-PRODUCT MANAGEMENT** Product Concept Classification of ProductsProduct Decisions Branding, Packaging, Labeling and After Sales Services Product life cycle process New Product Development Process Concept of Product Life Cycle Stages, usefulness and limitations of product life cycle **PRICING, PROMOTION ANDDISTRIBUTION STRATEGY** Concept of Price and Pricing Methods of Price DeterminationMajor Pricing Strategies New Product Pricing strategy Product Line Pricing strategy Psychological Pricing strategy Promotional Pricing strategy Differential Pricing strategy Price adjustment Pricing strategy Promotion and Promotion Mix Integrated Marketing Communication Tools of Promotion: Advertising, Personal Selling, Public Relation and Publicity, Sales Promotion, Direct Marketing	**10**
	Total	**40**

CamScanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS – Bachelor of Business administration

Semester – II

Corporate Social Responsibility

Code: 14020205

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objectives:-

To make students understand the concept, theories and application of CSR for the Development of the Society.

Course Contents:

Unit I: Corporate Social Responsibility- Definition, concept, linkages to development Growth of CSR-historical & contemporary perspectives, National & International scenario Factors influencing growth of CSR in societiesideological, socio-economic, legal & environmental perspectives Government initiatives for promoting CSR Impact of globalization & liberalization on CSR initiatives

Unit II:CSR & Development: -CSR activities–nature, types, impact on development programmes- CSR& development organisations–relationships, functioning & impact on organisational functioning Stakeholders' participation & perspectives about CSR

Unit III:CSR Strategy and Leadership 13 Corporate motivations &Behaviour for CSR – factors influencing national & international perspectives Theories & principles of CSR- Corporate governance, style, leadership & CSR- CSR Strategies-objectives, approaches, roles and tasks of a corporate managers Strategic corporate planning - steps to make CSR Work for Business Corporate Social Responsibility: programmes& initiatives – national and international.

Unit IV: Standards and Codes (ISO – 14001, OHSAS – 18001- SA – 8000, OECD Guidelines for Multinational Companies, Global Compact, AA – 1000, BS / ISO Guideline on CSR Management ISO-26000) Evaluating & reporting performance of CSR initiatives - Social accounting, environment audits and performance measurement RECOMMENDED

CamScanner

References Books

1. Grayson D., Hodges A. (2004).Corporate Social Responsibility- Seven Steps to Make Corporate Social Responsibility Work for Your Business. UK: Greenleaf Publishing Limited 2. Narang R.K. (2009). Corporate Social Responsibility-Replicable Models on Sustainable Development. New Delhi: The Energy & Resources Institute.

3. William B Werther, Jr, David Chandler, 2010 Strategic Corporate Social Responsibility, Stakeholders in a Global Environment, Second Edition, SAGE Publications, New Delhi.

4. Sanjay K Agarwal (2008), Corporate Social Responsibility, SAGE Publications, New Delhi.

5.William B. Werther Jr. and David Chandler, Strategic Corporate Social Responsibility: Stakeholders in a Global Environment, Second Edition, Sage Publications, 2011

6. Sanjay K Agarwal, Corporate Social Responsibility in India, Sage Publications, 2008

CamScanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS

Bachelor of Business Management

Principle of Macro Economics

Code: 14020201

BBA 2nd SEM

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Th	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objective:

Macro Economics is a broad field of study. It is a branch of Economics dealing with the performance, structure, behavior & decision making of the entire Economy.

Course Duration: The Course Durationis of 40 Session of 60 Minutes each.

Module	Topics	Hour
1	**Introduction to Macro Economics:** Definition, Scope, Importance and Limitations of Macro Economics **National Income (NI) Accounting:** Meaning of NI and Circular Flow of NI (in Four sector economy Stock and flow concept, NI at Current Price and NI at Constant Price Various concepts of NI (GNP, GDP, NNP, NDP), Personal Income, Disposable Income Methods for measurement of NI Difficulties in measurement of NI	10
2	Theory of Income and Employment Keynes' consumption function Investment function, Keynesian theory of Income and employment, Investment multiplier Interest rate theory - Liquidity Preference Theory	10
3	Money, Definition and Functions Stocks of Money (M1, M2, M3 and M4) Credit creation by Commercial Banks Inflation Meaning of Inflation, Deflation, Stagflation and Causes of inflation, Measures to Control Inflation	10

CamScanner

	Business cycle Meaning, characteristics and phases	
4	Monetary policy Meaning, Objectives and Tools Fiscal policy Meaning, Objectives and Tools Balance of Payments Meaning, Structure, Causes of Disequilibrium and Methods of Correcting Disequilibrium.	10

1. Teaching Method:

The following pedagogical tools will be used to teach this course:

- Lectures
- Case Discussions
- Audio – visual Material
- Assignments and Presentations

2. Evaluation:

A	Internal Evaluation	(Internal Assessment- 50 Marks)
	Continuous Evaluation Component (Class Presence, Presentation, Overall Behavior)	50 marks
B	End –Semester Examination	(External Assessment-50 Marks)

Text Book

D. Macro Economics by D.M.Mithani (Himalaya Publication)
E. Macro Economics by R. Cauvery (S.Chand Publication.)

Topics for Assignment

13. Functions of Commercial Banks
14. Functions of Central Banks
15. Factors affecting Business Cycle
16. Use of National Income Data
17. Difference between BOT and BOP

Topics for Seminar

5. Inflation in India
6. Economic Growth and Economic Development
7. Role of Economic Policies in Economic Growth
8. Relationship between Inflation and unemployment

CamScanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS-

Bachelor of Business Administration

Semester – II

Organizational Behaviour

Code: 14020204

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objectives:-

This course is designed in such a way as to provide the students an understanding of the different contemporary and relevant topics in the subject organizational behavior.

Module	Topics	Hours
1	**Introduction to Organizational Behaviour: Definition, Importance, Scope, Fundamental Concepts of OB, Different models of OB - autocratic, custodial, supportive, collegial and SOBC.** Personality & Attitudes: Meaning of personality, attitude - Development of personality – Attributes of personality- Transactional Analysis – Ego states – Johari window - Nature and dimensions of attitude – Developing the right attitude	10
2	Motivation: Definition, Importance, Motives – Characteristics, Classification of motives - Primary & Secondary motives. Theories of Motivation - Maslow's Theory of need hierarchy - Herzberg's theory. Morale - Definition and relationship with productivity - Morale Indicators. Stress management: Definition, Causes, Managing stress, Stress as a motivator. Work life balance.	10
3	Group Dynamics and Team building: Concept of Group & Team. Theories of Group Formation - Formal and Informal Groups. Importance of Team building. (4) 5. Conflict Management: Definition. Traditional vis-à-vis Modern view of conflict – Types of conflict – Intrapersonal, Interpersonal, Organizational. Constructive and	10

CamScanner

	Destructive conflict. Conflict management	
4	Change management: Concept of change, change as a natural process, Importance &Causes of change – social, economic, technological, organizational. Learning – unlearning, Concept of learning organizations Cases studies on above topics	10
	Total	**40**

Note: Wherever the standard books are not available for the topic appropriate print and online resources journals and books published by different authors may be prescribed.

Reference Books:

1. Organizational Behaviour, 9th Ed. - Stephen Robbins
2. Human Behaviour at work - Davis and Newstorm
3. Organizational Behaviour - Uma Sekaran
4. Organizational Behaviour - Fred Luthans
5. Organizational Behaviour - K.Aswathappa
6. Human Behaviour at Work - Keith Davis
7. Organizational Behaviour - JitS.Chandran
8. Human Relations & Organizational Behaviour - R.S.Dwivedi
9. Organizational Behaviour - McShane
10. Organizational Behaviour - Sharma

CamScanner

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS – Bachelor's of Business Administration

Family Business Management (FBM)

Code: 14010306

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

1. **Learning Outcomes:**
   - Detailed understanding of the various family business models and structures and their complexities.
   - Getting sensitized towards the need for professionalism in family business management and how to go about achieving the same.
   - Understanding of succession planning management.

2. **Course Duration:** The course duration is of **36 sessions of 75 minutes** each.

3. **Course Contents:**

Module No.	Modules with its Contents/Chapters	No. of Sessions	Marks (out of 70)
I	**Family Business Management - Basics** • Uniqueness & Dynamics – People, Women in Family Business, Systems & Life Cycles • Structural Management of the Family Business • Family Complexity, Culture and Value Systems • Business Complexity • Effects of Complexity on the Family Business Structure.	8	15
II	**Family Business Models** • Captain Model, Emperor Model, Family Team Model, Professional Family Model, Corporation Model • Family Investment Group (FIG) Model • Comparative Analysis of the Models • Mindset and Structure: How Thoughts Influence Deeds?	8	15
III	**Professional Management of Family Business** • Non-family Managers • Non-Executive Directors • Professional Advisors & Consultants • The role of balanced board of directors • Family Constitution for better management	10	20

CamScanner

	Family Governance in multigenerational family firms • Change and adaptation in family business • Trans-generational value creation • Changing roles of family members **Conflict Management** • Social Structure in family Business • Interpersonal dynamics in family business • Justice Perceptions • Types of conflicts • Conflict dynamics and conflict management strategies		
IV	**Succession Planning** • Understanding Succession Planning • Defining Objectives • Choosing the Right Ownership Structure • Promoting Stewardship • Getting help from Board of Directors **Management Succession:** Management Succession Issues • Employment of Family Members • Grooming Family Managers to be Successors • Assessing Family Member Managers • Compensation for Family Members • Managing Family Disagreements • Integrating the Family Component in Business Planning **Developing Successors** • Preserving Company Values • Support for Senior Managers • Help for Employees, Suppliers, Customers • From Second to Third Generations **Transferring Control and Ownership** • Match Ownership to Control • Tools for Transferring Ownership • Trusting the Firm to Trustees • Incentives for Nonfamily Caretakers **Letting Go** • The Deep Reasons for Founders Resistance • Letting Go with Grace and Style	10	20
V	**Practical** • Discussion of Live cases of successful family business. • Studying the succession planning undertaken by a corporate house / small business and bringing those learning to class via discussions.		(30 marks CEC)

CamScanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS – Bachelor of Business Administration

Semester – III

Financial Statement Analysis

Code: 14020301

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objectives:-

- To give an insight to the students from the basic level to higher level of analysis
- To introduce the students to various interpretations towards financial statements.

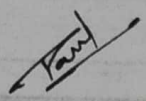
Course Contents:-

Module	Topics	Hours
1	Defination-Objective and users of financial statements –elements of financial statements –articulation of financial statements – elements from which financial statements are constructed-techniques of financial statement analysis	10
2	Basic Accounting Concepts – Trial balance –balance sheet– Income statements – Depreciation -Cash flow statement - purpose - uses - structure - format of cash flow statement - preparing cash flow statement - interpreting the cash flow statement	10
3	Corporate Acquisitions: Mergers –Types – Reasons –Mechanics –Cost and Benefit – Timing of Merger Activity – the role of exchange rates and takeover process – Evaluating Merger as Capital Budgeting Proposal –Terms of Mergers – Takeovers – Signs of Takeovers.	10
4	Corporate Restructuring: Joint Ventures –Financing and Evaluation –Rationale and Role of Joint Ventures – Sell Offs –Change in Ownership –Divestitures – Spin-off –Split-off – Going Public –Privatization –Leveraged Buyouts –Buyback of Shares –Alignment of Interest	10
	Total	**40**

CamScanner

Reference Books:-

- Financial Statement Analysis: A Practitioner's Guide, 4th Edition by Martin S. Fridson, Fernando Alvarez.
- Financial Statement Analysis: 11th Edition by K. R subramanyam.



CamScanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS – Bachelor of Business Administration

Semester – III

Advertising and Sales Management

Code: 14010304

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Unit		Details of Topics
Unit 1	**An Introduction to Integrated Marketing Communication (IMC)**	Meaning and Role of IMC in Marketing process, one voice communication v/s IMC, Introduction to IMC tools, Role of Advertising Agencies and other marketing organizations Providing marketing services and perspectives on consumer behavior.
Unit 2	**Understanding communication process**	Source, Message, Channel factors, Communication response hierarchy – AIDA model, Hierarchy of effect model, Innovation Adoption mode, Information Processing Model, The Standard learning Hierarchy, Attribution Hierarchy, and low involvement hierarch. Consumer Involvement – The Elaboration Likelihood (ELM) Model, the Foote, Cone and Belding (FCB) Model.
Unit 3	**Planning for Marketing Communication (Marcom)**	Establishing Marcom Objectives and Budgeting for Promotional Programmes – Setting communication objectives, Sales as marcom objective, DAGMAR approach for setting ad objectives. Budgeting for marcom- Factors influencing budget, Theoretical approach to budgeting viz, Marginal analysis and Sales response curve, Method to determine marcom budget.
Unit 4	**Developing the Integrated Marketing Communication Programme and Measuring Effectiveness**	Planning and development of creative marcom. Creative strategies in advertising, sales promotion, publicity, event sponsorships etc. Creative strategy in implementation and evaluation of marcom – Types of appeals and execution styles. Media planning and selection decisions – steps involved and information needed for media planning. Measuring the effectiveness of all promotional tools and IMC.

Books Recommended:

1. Geroge Belch, Michael Belch, and KeyoorPurani, Advertising & Promotion – an Integrated Marketing Communications Perspective, Tata Mcgraw Hill,
2. Kruti Shah & Alan DSouza, Advertising and Promotions: An IMC Perspective, Tata Mcgraw Hill,

CamScanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS

Bachelor of Business Administration

Semester –III

Employee Behavior & Relationship Management

Code: 14020303

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objectives:-

The main aim of this course is to introduce students to the theories and practices of Industrial Relations and employee behavior. The module examines the relationship existing between employer and employee.

Module	Topics	Hours
1	**INTRODUCTION** Basic Behavioural Process, Cognitive Functions – IntelligenceCreativity, Learning and its Process – Attitude and Values, Personality – Concepts counselling – importance and relevance	10
2	EMPLOYEE BEHAVIOUR INTRODUCTION: Factors Affecting Employee Behaviour, TYPES OF EMPLOYEE BEHAVIOUR, EMPLOYEE BEHAVIOURAL ISSUE, ROLE OF MOTIVATION IN EMPLOYEE BEHAVIOUR	10
3	**INDUSTRIAL CONFLICT**: Causes of Industrial Disputes, Machinery for settling of disputes Negotiation, Arbitration andAdjudication. Grievance Handling: Causes of grievances – Guidelines for grievance handling – Grievances Redressal procedures. Employee Discipline: Causes of indiscipline – Codeof discipline – Disciplinary procedure – Code of conduct.	

CamScanner

4	**TRADE UNIONISM AND INDUSTRIAL RELATIONS**: Labour movement: Trade union movement, Functions and problems of trade unions. International Labour, InternationalLabor Organization's (ILO). Worker's Participation in Management – Forms.	
	Total	**40**

Text Book/Reference Books :

1. Mamoria C.B and Sathish Mamoria, "Dynamics of Industrial Relations", Himalaya Publishing House, New Delhi, 1998.

2. P.N. Singh and Neeraj Kumar, "Employee Relations Management", 2010, Pearson Education, New Delhi.

3. Pylee. M.V and Simon George, "Industrial Relations and Personnel Management" ,Vikas Publishing House (P) Ltd., New Delhi,1995

4. Michael Armstrong, "Essential Human Resource Management Practice" Kogan Page Limited, 2010

5. Srivastava, "Industrial Relations and Labour Laws", Vikas, 4TH edition, 2000

CamScanner

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS – Bachelor of Business Administration

Semester – III

Environmental Studies

Code: 14020305

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
2	-	-	2	2	50	-	50	-	100

Objectives:-

A) Awareness regarding the problem of environmental pollution and Law as a means of prevention of environmental pollution and protection of environment.

B) A spirit of inquiry to explore the development of international environmental law and its application in India for the protection of environment.

C) To make the students aware about the provisions under the Indian Constitution for protection of environment and the various legislative measures. It also provides an opportunity to the students to understand the activist role played by Indian Judiciary in protection of environment and evolution of different principles such as polluter pay principle, precautionary principle, inter-generational equity and sustainable development.

Course Duration: the course duration is 40 session of 60 minutes each i.e. 40 hour.

Module	Topics	Hours
1	**Introduction** ➢ The multidisciplinary nature of environmental studies: Definition, scope and importance ➢ Concept of Pollution – Sources of Pollution, Types of Pollution, and Effects of Pollution.	10
2	➢ **Environment Protection Act**	10
3	Environmental study and Human rights ➢ Dynamic Interpretation of Article 21, 14 & 19 of the Constitution ➢ Right to Wholesome Environment – Right to Clean and Pollution-free Environment, Right to Sweet Water .	10
4	**Environmental Protection and General Civil and Criminal Laws**	10

CamScanner

	➢ Environmental Protection and Law of Torts – Tort of Nuisance: Public and Private – Tort of Negligence – Tort of Trespass – Environmental Torts ➢ Provisions under Indian Penal Code & Under Code of Criminal Procedure.	
	Total	**40**

Note: Wherever the standard books are not available for the topic appropriate print and online resources, journals and books published by different authors may be prescribed.

Teaching Method:

- Classroom teaching
- Case study
- Group discussion
- Presentation

Evaluation: students shall be evaluated on the following components:

	Internal Evaluation	Internal Assessment 50 Marks
A	Continuous Evaluation Component	**50 Marks**
B	End Semester Examination	**External Assesment – 50 Marks**

Reference Books:

1. I.A. Khan, Environmental Law, (2nd Edn.), Central Law Agency, Allahabad, 2002.
2. D.K. Asthana and Meera Asthana, Environment Problems and Solutions, (2nd Edn.), S.Chand & Co. Ltd., New Delhi, 2001.
3. S.C. Shastri, Environmental Law, (3rd Edn.), Eastern Book Company, Lucknow, 2008 {Chapter 1}.
4. Maheshwara Swamy, Textbook on Environmental Law, (2nd Edn.), Asia Law House, Hyderabad, 2008.
5. Akshay Sarathi, 'Sustainable Development: Implementation Issues', A Socio-Political Journal of Symbiosis Society, Vol. 3, 2006.
6. Ratanlal & Dhirajlal, The Law of Torts, 24th Edn-2004, Wadhwa, Nagpur.

CamScanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS – Bachelor of Business Administration

Semester – IV

Financial Management

Code: 14020404

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objective:

- To familiarize students with the concepts, tools and practices of financial management.
- To understand the decisions to be taken by financial managers of business firms.

Course Contents:

Module	Topics	Hours
1	**Finance Function:** Meaning, Scope, and Classification of functions (Long term-short term; Executive-Routine). Organization of Finance Function (status and duties of a Financial manager: Treasurer and Controller). Objectives/Goals of Financial Management, agency problems. **Time Value of Money:** Concept and numerical of Compounding and Discounting including annuity (excluding valuation of securities).	10
2	**Management of working capital:** Concept, Types, Factors affecting workingcapital needs, Operating cycle approach, Dangers of excessive and inadequate working capital. **Cash Management:** Meaning, Motives of holding cash, Functions/objectives ofcash management, Cash budget (with numerical). **Inventory Management:** Meaning, Objectives of holding inventory, Factors affecting inventory, Techniques of inventory management :**(1) EOQ** (with numericals including discount concept), ABC Analysis(without numericals) **(2)Reorder point** (without numericals), **Recievables Management:** Meaning, Cost and benefits, size of of receivables,optimum credit policy and credit policy variables,	15

CamScanner

	(only simple numericals of receivables are expected.)	
3	**Leverage:** (numericals and theory) Operating leverage: Meaning, degree and effects of operating leverage on profits. Financial leverage: Meaning and degree Trading on equity: Meaning, benefits and risks (including EBIT-EPS analysis) Combined leverage. Concept and numericals on : (a) Financial Break-Even, (b) Indifference point	10
4	**Capital budgeting:** Meaning and significance ofcapital budgeting. Types of capital budgeting decisions. Techniques: (Meaning, Accept-Reject criterion, Advantages and Disadvantages, comparison and numericals based on each method.) Payback period Average Rate of Return Net present value Profitability Index Internal Rate of Return	10
	Total	**45**

Text Books:

- Financial Management-Principles and Practice: C.Sudarsana Reddy, Himalaya Publishing House.

Reference Books:

- Financial Management: Text, Problems and cases: M.Y.Khan and P.K.JainTata McGraw Hill Education Pvt. Ltd.
- Financial Management P.V. Kulkarni and B.G. Satyaprasad.
- Essentials of Financial Management: I.M.Pandey, Vikas Publishing House Pvt. Ltd.
- Financial Management :Prasanna Chandra.
- Financial Management : Dr. V.k. Palanivelu, S. Chand.
- Financial Management :Sheeba Kapil, Pearson.
- Financial Management : Rajiv Srivastav and Anil Mishra, Oxford university press.

Topics for Assignment :

Introduction to Contemporary issues like: JIT systems, Out sourcing.
Computerised inventory control system.
Techniques of controlling inflows and outflows in modern times.
Captial Rationing and its relevance in capital budgeting decisions.
Capital Structure: Meaning and Features of an ideal capital structure.
Relationship of finance with economics, accounts and other disciplines.

Topics for Presentation/Seminar:

Managment of working capital in India.
Emerging role of finance managers in India.
Effect of high and low operating and financial leverage for a business.

CamScanner

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS

Bachelor of Business Administration

Semester – IV

Business Research Methods

Code: 14020403

1. **Learning outcome:**
   - To familiarize the students with the types of problems often faced by Business Organizations
   - To help students understand the importance of systematic approach to problem solving
   - Introduce basic concepts of Research Design and Methodology aimed at solving Business Problems
   - To enable students to analyze and interpret data using various statistical tools
2. **Teaching & Evaluation Scheme**

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

3. **Course Duration: The course duration is of 40 sessions of 60 minutes each**
4. **Course content:**

Module	Topics	Hours
1	Foundations of Research: Meaning, Objectives, Motivation, Utility. Concept of theory, empiricism, deductive and inductive theory. Characteristics of scientific method - Understanding the language of research - Concept, Construct, Definition, Variable. Research Process Problem Identification & Formulation – Management Question – Research Question – Investigation Question – Measurement Issues - Hypothesis - Qualities of a good Hypothesis –Null Hypothesis & Alternative Hypothesis. Hypothesis Testing - Logic & Importance	10
2	Research Design: Concept and Importance in Research - Features of a good research design – Exploratory Research Design – concept, types and uses, Descriptive Research Designs - concept, types and uses. Experimental Design: Causal relationships, Concept of Independent &	10

CamScanner

	Dependent variables, concomitant variable, extraneous variable, Treatment, Control group, Qualitative and quantitative research: Qualitative research - Quantitative research – Concept of measurement, causality, generalization, replication. Merging the two approaches.	
3	Measurement: Concept of measurement– what is measured? Problems in measurement in management research - Validity and Reliability. Levels of measurement - Nominal, Ordinal, Interval, Ratio, Attitude Scaling Techniques: Concept of Scale – Rating Scales viz. Likert Scales, Semantic Differential Scales, Constant Sum Scales, Graphic Rating Scales – Ranking Scales – Paired Comparison & Forced Ranking. Types of Data: Secondary Data - Definition, Sources, Characteristics. Primary Data - Definition, Advantages and disadvantages over secondary data, Observation method, Questionnaire Construction, Personal Interviews, Telephonic Interview, Mail Survey, Email/Internet survey.	10
4	Sampling: Concepts of Statistical Population, Sample, Sampling Frame, Sampling Error, Sample Size, Non Response. Characteristics of a good sample. Probability Sample – Simple Random Sample, Systematic Sample, Stratified Random Sample & Multi-stage sampling. Non Probability Sample – Judgment, Convenience, Quota & Snowballing methods. Determining size of the sample - Practical considerations in sampling and sample size. Data Analysis: Data preliminary questionnaire screening, editing, coding and data entry (using statistical software), Research Writing: - Research Proposal Synopsis, Research Report	10
	Total	**40**

Note: Wherever the standard books are not available for the topic appropriate print and online resources journals and books published by different authors may be prescribed.

5. Teaching Methods:

- ICT enabled Classroom teaching
- Case study
- Practical / live assignment
- Interactive class room discussions

CamScanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS

Bachelor of Business Administration **Semester – IV**

Global Marketing Management

Code: 14020402

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

1. **Objectives:**
   The course is intended to provide an opportunity to learn and understand how business is conducted in international arena. It aimed at making the students realize that international business is applicable to multiple business functions like Marketing, Human Resource Management, and Financial Management.

2. **Course Duration:** The course duration is 36 sessions of 60 minutes each. i.e. 36 hours.

3. **Course Contents:**

Module No.	Module Content	No. of Sessions	50 Marks (External Evaluation)
1	**Globalization:** What is Globalization, Drivers of Globalization, Managing in the Global Market Place **Differences in Culture:** What is Culture, Values & Norms, Social Structure, Culture – Language, Culture – Education, Culture – Workplace	05	12
2	**International Trade Theory:** An Overview of Trade Theory, Absolute Advantage, Comparative Advantage, Heckscher – Ohin Theory, National Competitive Advantage: Porter's Diamond, Global Competitive Alignment Matrix. **Foreign Direct Investment:** FDI in the world economy, Horizontal FDI and Vertical FDI	08	15

CamScanner

3	**The Foreign Exchange Market:** The Functions and Nature of foreign exchange market, Economic Theory of Exchange Rate Determination, Exchange Rate Forecasting, Currency Convertibility **The International Monetary System:** The Gold Standard, The Bretton Woods System, The Collapse of the Fixed Exchange Rate System, The Floating Exchange Rate Regime, Fixed V/S Floating Exchange Rates, IMF: Origin and Objectives, Crisis Management by the IMF, The Spot and Forward Market	07	15
4	**Entry Strategy and Strategic Alliances:** Basic Entry Decisions, Selecting an Entry Mode, Entry Strategies in India, Greenfield Venture or Acquisition, Strategic Alliances **Exporting, Importing and Counter Trade:** The Promise and Pitfalls of Exporting, Improving Export Performance, Exporting with a Little Government Help, Export and Import Financing, Export and Import Financing, Export Assistance	08	13
5	**Global Marketing and R & D:** The Globalization of Market and Brands, Market Segmentation, Product Attributes, Distribution Strategy, Communication Strategy, Pricing Strategy, New Product Development **Global Human Resource Management:** The Strategic Role of International HRM, Staffing Policy, Managing Expatriate, Training and Management Development, Performance Appraisal, Compensation, International Labour Relations	08	15

4. Teaching Method:

The following pedagogical tools will be used to teach this course:

- Lectures
- Case Discussions
- Audio – visual Material
- Assignments and Presentations

5. Evaluation:

A	Projects/Assignments/Quiz/Class participation	Weightage (50%) (Internal Assessment)
B	Mid – Semester Examination	Weightage (30%) (Internal Assessment)

CamScanner

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS – Bachelor of Business Administration

Semester – IV

Introduction to Business Law

Code: 14020401

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objectives:-

1. To make students understand the concept, theories and application of business Law for the Development of the Society.

Course Duration: The Course Durationis of 40 Session of 60 Minutes each.

Module	Topic	Hour
UNIT -1	What is Law, various sources of Law, significance of law, business law, impact of law on society & business economic aspects of Constitution & its implications.	5
UNIT – 2	Law of Contract – Definition & Nature of Contract, types of contract, offer & acceptance, consideration & capacity to contract, free constant, legality of object & consideration, contingent contract, quasi contract, discharge of contract, remedies for breach of contract, indemnity & guarantee, pledge, Principal – agent relationship & rights & obligation of Principal & agent.Law of Indemnity and guarantee	15
UNIT – 3	The Negotiable Instruments Act, 1881 (incorporating latest amendments) Meaning and characteristics of Negotiable Instruments, Classification of Negotiable Instruments, Promissory Note and Bill of Exchange, essential elements, Distinguish between Promissory note and bill of exchange, acceptance and acceptor Acceptance for honour, absolute and qualified acceptance, Drawer, drawee in case of need, payee, dishonor , Cheques, crossings of cheques, distinguish between Bill of Exchange and cheque,	10

CamScanner

	penalties in case of dishonor of cheques	
UNIT – 4	The Sale of Goods Act, 1930 The Sale of Goods Act, 1930, nature of contract of sale, conditions & warranties, Transfer of ownership, performance of contract of sale, rights of unpaid seller, Remedies for breach of contract Auction sale Law of negotiable instruments – nature of N. I., Promissory notes, BOE, Cheque , Parties of NI.	10

1. Teaching Method:

The following pedagogical tools will be used to teach this course:

- Lectures
- Case Discussions
- Audio – visual Material
- Assignments and Presentations

2. Evaluation:

A	Internal Evaluation Continuous Evaluation Component (Class Presence, Presentation, Overall Behavior)	(Internal Assessment- 50 Marks) 50 marks
B	End –Semester Examination	(External Assessment-50 Marks)

Basic Reading List

Business Law- P.K. Pandey

Business Law D. Chandra Bose

Bare act

indiankanoon.org

CamScanner

4. **Teaching Methods:**

The course will use the following pedagogical tools:

- Lectures
- Case Discussions and Role Playing
- Audio-visual Material (Using CDs/Clippings/ online videos)
- Assignments and Presentations

5. **Evaluation:**

The evaluation of participants will be on continuous basis comprising of the following elements:

A	Continuous Evaluation Component comprising of Projects / Assignments / Quiz / Class Participation / Class test / Presentation on specific topic etc.	(Internal Assessment- 50 Marks)
B	End-Semester Examination	(External Assessment-50 Marks)

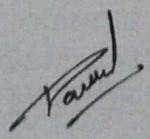
6. **Reference Books:**

Sr. No.	Author	Name of the Book	Publisher	Year of Publication
1	Zellweger Thomas	Managing the Family Business – Theory & Practices	Edward Elgar Publishing Ltd	Latest Edition
2	Peter Leach	Family Businesses – The Essentials	Profile Books Ltd.	Latest Edition
3	Alberto Gimeno, Gemma Baulenas & Joan Coma-Cros	Family Business Models – Practical Solutions for the Family Business	Palgrave Macmillan	Latest Edition
4	Mark Fischetti	The Family Business Succession Handbook	Family Business Publishing Co.	Latest Edition

Note: Wherever the standard books are not available for the topic, appropriate print and online resources, journals and books published by different authors may be prescribed.

7. **List of Journals/Periodicals/Magazines/Newspapers, etc.**

1. Family Business Review
2. Journal of Family Business Management
3. Journal of Family Business Strategy
4. Indian Management
5. Journal of Consumer Behaviour



CamScanner

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS

Bachelor of Business Administration

Semester – IV

SUPPLY CHAIN MANAGEMENT

Code: 14020406

1. **Learning outcome:** The main aim of the course is to acquaint students to basics of supply chain management on planning, replenishment and execution. The approach of this course is practical and contemporary in nature. It emphasizes on understanding the contemporary and cutting edge supply chain management practices by study of fundamentals of Supply Chain Management.

2. **Teaching & Evaluation Scheme**

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

3. **Course Duration:** The course duration is of 40 sessions of 60 minutes each.

4. **Course Content:**

Module No:	Module Content	No. of Sessions
I	**Introduction and Strategic View:** Meaning, Role of supply chain management, Supply chain strategy and performance measures, Supply Chain Drivers and Metrics, Outsourcing – Make or Buy	10
II	**Managing Material Flow:** Inventory Management, Production Planning and Scheduling, Transportation, Network Design and Operations, Distribution Networks	10
III	**Managing Material Flow:** Inventory Management, Production Planning and Scheduling, Transportation, Network Design and Operations, Distribution Networks **Managing Information Flow:** Demand Forecasting, Supply Chain Data Management, Information Technology in Supply Chain Management	10

CamScanner

IV	**Supply Chain Innovations:** Supply Chain Integration, Supply Chain Restructuring, Agile Supply Chains, Pricing and Revenue Management , Global Supply Chain	10
	Total	40

5. Teaching Methods: Following pedagogical tools will be used for teaching the course:

a) Case discussions.

b) Discussion on issues and techniques

c) Projects/Assignments/Quiz/Class Participation, etc.

6. Evaluation:

A	**Internal Evaluation**	**(Internal Assessment- 50 Marks)**
	Continuous Evaluation Component (Class Presence, Presentation, Overall Behavior)	50 marks
B	**End –Semester Examination**	**(External Assessment-50 Marks)**

7. Text Books:

Sr. No.	Author	Name of the Book	Publisher	Edition
T1	Shah Janat	Supply Chain Management: Text and Cases	Pearson Education	Latest edition
T2	Sinha Amit, Herbert Kotzab	Supply Chain Management	Tata McGraw Hill	2011
T3	Chopra Sunil, Meindle Peter and Kalra D. V.	Supply Chain Management: Strategy Planning and Operation	Pearson Education	Fourth Edition 2011

8. Reference Books:

Sr. No.	Author	Name of the Book	Publisher	Edition
R1	Sarika Kulkarni	Supply Chain Management	Tata McGraw-Hill	Latest Edition
R2	Coyle, Bardi, Longley	The management of Business Logistics – A supply Chain Perspective	Thomson Press	Latest Edition
R3	Donald J Bowersox, Dand J Closs, M Bixby Coluper	Supply Chain Logistics Management	Tata McGraw-Hill	Latest Edition

CamScanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS

Bachelor of Business Administration

Semester – IV

Human Resource Management

Code: 14020405

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objective: To provide students an understanding of:

1. The strategic Role of HRM,
2. The environment in which the HRM function is performed,
3. The meaning and difference between Performance Appraisal and Performance Management
4. How strategic pay plans and employee benefits are determined

Module	Topics	Hours
1	HR function at the organization, its values Organizational structure of HR department and its pyramidal breakup into levels and qualifications Training and Development practices Performance appraisal and Job evaluation.	10
2	HR planning; Job Design classified into Job Description and Job Specification; Recruitment, Selection, Orientation and Placement. Career mgt, performance mgt, career mgt	10
3	Promotions, Transfers and Separations Industrial Relations Remuneration policies and its relation to Minimum Wages Act	10
4	Employee welfare, Safety and Health practices Trade Unions Disputes and their resolution	10
	Total	**40**

REFERRENCE BOOKS

Human Resource Management (Text and Cases)
By S. S. Khanka
S. Chand and Company Limited
Reprint 2007.

. Human Resource Management
By Gary Dessler and Biju Varkkey
Pearson Prentice Hall
12th Edition

CamScanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS

Bachelor of Business Administration

Semester – V

RETAIL MANAGEMENT

Code: 14020507

1. **Learning Outcome:**
   - To know core concepts of retail Management and its scope.
   - To know the consumer and retail market segmentation strategy
   - To know and execute the retail operation strategies about location and pricing.
   - To understand retail marketing and merchandise management

2. **Teaching & Evaluation Scheme:**

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

3. **Course Duration: The course duration is of 40 sessions of 60 minutes each**

4. **Course content:**

Module	Topics	Hours
1	**Introduction to Retailing:** Concept of retailing, Functions of retailing, Terms & Definition, Retail formats and types, Retailing Channels, Retail Industry in India, Importance of retailing, Changing trends in retailing. **Understanding the Retail Consumer:** Retail consumer behavior, Factors influencing the Retail consumer, Customer decision making process, Types of decision making, Market research for understanding retail consume	10
2	**Retail Market Segmentation and Strategies:** Market Segmentation and its benefits, Kinds of markets, Definition of Retail strategy, Strategy for effective market segmentation, Strategies for penetration of new markets, Growth strategies, Retail value chain. **Retail Location Selection:** Importance of Retail locations, Types of retail locations, Factors determining the location	10

CamScanner

	decision, Steps involved in choosing a retail locations, Measurement of success of location	
3	**Merchandise Management:** Meaning of Merchandising, Factors influencing Merchandising, Functions of Merchandising Manager, Merchandise planning, Merchandise buying, Analyzing Merchandise performance **Retail Operations and Retail Pricing:** Store administration, Premises management, Inventory Management, Store Management, Receipt Management, Customer service, Retail Pricing, Factors influencing retail prices, pricing strategies, controlling costs	10
4	**Retail Space Management and Marketing:** Definition of Space Management, Store layout and Design, Visual Merchandising, Promotions Strategy, Relationship Marketing Strategies, CRM, Retail Marketing Mix, Retail Communication Mix, POP Displays **Emerging trends in retailing:** Changing nature of retailing, organized retailing, Modern retail formats, E-tailing, Challenges faced by the retail sector	10
	Total	**40**

5. Teaching Methods:

- ICT enabled Classroom teaching Lectures
- Case Discussions and Role Playing.
- Audio-visual Material (Using CDs/Clippings/ online videos).
- Assignments and Presentations.

6. Evaluation:

The evaluation of participants will be on continuous basis comprising of the following elements:

A	Internal Evaluation	(Internal Assessment- 50 Marks)
	Continuous Evaluation Component (Class Presence, Presentation, Overall Behavior)	50 marks
B	End –Semester Examination	(External Assessment-50 Marks)

CamScanner

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS

Bachelor of Business Administration

Semester – V

CORPORATE STRATEGY

Code: 14020506

1. **Learning Outcome:**
   - To know core concepts of Strategy and Strategic Management and its scope.
   - To know various external factors and its effect business policy or business strategy
   - To know and execute the process of internal analysis any business unit of Industry.
   - To understand various steps of formulation and implementation of various business

2. **Teaching & Evaluation Scheme:-**

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

3. **Course Duration: The course duration is of 40 sessions of 60 minutes each**

4. **Course content:**

Module	Topics	Hours
1	**INTRODUCTION TO STRATEGIC MANAGEMENT** • Meaning of strategy, strategic management (process of S.M) • Importance of Strategic Management • Strategic Fit and Intent • Levels of Strategy and their characteristics • Vision & Mission • Vision : Nature (elements), definition and benefits • Mission : Definition, characteristics of mission statement • Difference between vision and mission	10
2	**EXTERNAL ENVIRONMENT ANALYSIS** • Concept of Environment • SWOT • PESTEL • 5 Force Model • Approaches to Environmental Scanning • Sources used for Environmental Scanning • Techniques of Environmental Scanning	10
3	**INTERNAL ANALYSIS** • Resources, Capabilities, Competencies, Core Competencies • Competitive Advantage	10

CamScanner

	• Why are resources important • Value chain(organization and industry) • Ansoff Model • BCG Model	
4	**STRATEGY FORMULATION** • 5 Generic Strategies (cost leadership, differentiation, combined, focus, best cost provider) • Interrelationship between formulation and implementation • Integration : Forward and Backward Diversification : Horizontal, Conglomerate, Concentric	10
	Total	**40**

5. Teaching Methods:

- ICT enabled Classroom teaching Lectures
- Case Discussions and Role Playing.
- Audio-visual Material (Using CDs/Clippings/ online videos).
- Assignments and Presentations.

6. Evaluation:

The evaluation of participants will be on continuous basis comprising of the following elements:

A	Internal Evaluation	(Internal Assessment- 50 Marks)
	Continuous Evaluation Component (Class Presence, Presentation, Overall Behavior)	50 marks
B	End –Semester Examination	(External Assessment-50 Marks)

7. TEXTBOOKS:

1) Strategic Management & Business Policy by Azhar Kazmi, 3rd Edition Mc Graw Hill Publication Pvt Ltd.
2) Business Policy & Strategic Management by P. Subba Rao , GTU Edition Himalaya Publication.

8. REFERENCE BOOKS:

Name of the Book	Author	Publication	Edition
Strategic Management	R Srinivasan	The Indian Context-PHI, Latest Edition	Latest
Strategic Management	N. Chandrasekaran and P.S. Ananthanarayanan	Oxford University Press (Latest Edition)	Latest
Strategic Management: Analysis, Implementation , Control	A Nag	Vikas Publishing (Latest Edition)	Latest
Strategic Management	N. Sengupta	Vision Books (Latest Edition)	Latest
Strategic Management: Text and Cases	V.S.P. Rao, Hari V. Krishna,	Excel Books	Latest

CamScanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS

Bachelor of Business Administration

Semester –5

COMPANY LAW

Code: 14020501

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-		3	3	50		50	-	100

Objectives: To impart expert knowledge of the various provisions of Companies Act, its schedules, rules, notifications, circulars including secretarial practice, case laws and secretarial standards.

Course Duration: The course duration is 36 sessions of 60 minutes each. i.e. 36 hours.

Module	Topic	Hour
Unit-1	Introduction of Company Act 2013-Meaning and Nature of Company, Classification of Companies, Formation of Company. Memorandum of Association, Articles of Association	10
Unit-2	Prospectus, Introduction & Contents.Winding-up of Companies-Different Modes, Oppression & Mis. Management	10
Unit -3	Appointment, Rights, Duties & Liabilities of Directors, Managing Director and Manager.	10
Unit -4	Company Secretary- Definition, Appointment, Qualities, Responsibilities, Position and Duties General Procedure of Meetings, Notice, Agenda, Chairman, Quorum, Motions and Resolution, Types of resolution Methods of Voting, Minutes etc.	10

CamScanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS- Bachelor of Business Administration

Negotiation Skills & Corporate Relation

Semester- V

Code: 14020502

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Course Contents:-

Module	Topics	Hours
1	Negotiation: Introduction, Nature and need for negotiation, negotiation process, Types and styles of negotiation; strategies and tactics; barriers in effective negotiation, Communication Style, Breaking Deadlocks.	10
2	Role of trust in negotiations; negotiation and IT; ethics in negotiation; cultural differences in negotiation styles; gender in negotiations; context of mediation; negotiation as persuasion.	10
3	Corporate Relations: Public relations with the Government: Public relation for private sector. Employee Relations: Interaction between management & employees, internal Communication media. Media & press relations: Importance of press and its role in building the corporate image, press visits, arranging for press coverage, preparing a press kit, feature stories, articles, press note, press communiqué & press release.	10
4	Financial Public Relations: Types of financial public, role of PR in maintaining contact with financial publics; Annual reports and financial coverage, Arranging for annual general meetings. Distributor & Dealer Relations: Objectives of distributor - dealer relation program, tools and	10

CamScanner

	media of communication. Supplier Relations: Functions of PR department, objectives of supplier relation program, tools and media of communication. Consumer Relations: Objectives of consumer relations program, planning of consumer relations program, media communication and special events. Community Relations: Community relations program, objectives & policy, media of communication with community. Introduction to International Public Relations & its importance	
		Total 40

Note: Wherever the standard books are not available for the topic appropriate print and online resource journals and books published by different authors may be prescribed.

CamScanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS

Bachelor of Business Administration

Semester –5

INDUSTRIAL RELATION

Code: _14020504

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
	-3		3	3	50		50	-	100

Objectives:-

1. To impart the students with the knowledge about complexities between labour and management relationships.
2. To make the students aware about mechanisms of Industrial Dispute and friendly interventions to deal with employee-employer problems.
3. To impart the students with the knowledge of laws & how law affects the industry & labour.

Module	Topics	Hours
1	INDUSTRIAL RELATION **Introduction to Industrial Relations**: Meaning, definition, importance, scope of Industrial Relations and factors in Industrial Relations Approaches towards the study of Industrial Relations (Psychological Approach , Sociological Approach, Socio Ethical Approach, Gandhi an Approach, Industrial Relations Approach and HR Approach)	10
2	Industrial Disputes, Collective Bargaining & Workers Participation in Management: Meaning, definition & Causes of Industrial Disputes Û Model Grievance Procedure Û Types of Conflict Resolution: Negotiation, Investigation, Mediation, Conciliation, arbitration & Adjudication.	10
3	The Payment of Wages Act, 1936 & The Minimum Wages Act, 1948: The Payment of Wages Act, 1936 -	10

CamScanner

	Û Definitions, Provisions, Penalties. The Minimum Wages Act, 1948 - Û Definitions, Provisions, Penalties.	
4	Trade Union Laws: Û The Trade Union Act 1926: Definitions, authorities and all provisions. Û Maharashtra Recognition of Trade Union and Prevention of 19 of 31 Unfair Labor practices Act, 1971: Definition, authorities and all provisions under the Act.	10
	Total	**40**

Text Book/Reference Books :

1. Dynamics of IR – Mamoria,Mamoria and Gankar
2. Industrial Relations -ArunMonappa
3. Personnel and HRM- P Subbarao
4. Industrial &Labour Laws -S.P.Jain
5. Industrial Law - P.L. Malik

CamScanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS

Bachelor of Business Administration

Semester –5

RECRUITMENT AND SELECTION

Code: _14020505

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-		3	3	50		50		100

Objectives:-

At the end of the course students are able to:

1. Gain the insights of various principles and practices of recruitment and selection in an industry.

2. Equip students with various selection procedure practiced in industry.

3. Develop students with latest selection tools in the corporate sector.

4. Develop students with various testing of job recruitment and selection

Module	Topics	Hours
1	**Job Analysis:** Meaning, definition and purpose. Methods of job analysis: job analysis interviews, job analysis questionnaire, task analysis inventory, position analysis questionnaire, subject expert workshops, critical incident technique, Human recourse planning, process of HRP **Hiring Process & Hiring decision:** Nature of hiring: regular, temporary, full time, part time, apprentice, contractual, and outsourcing, Existing post or new post to be created, Need analysis, cost analysis and job analysis.	10

CamScanner

2	**Hiring internally:**Meaning and definition of internal recruitment, Advantages and disadvantages in terms of cost, time, quality and suitability. Sources of internal recruitment: - circulars, intranet advertisements, employee referrals, Appointment or promotion,. **External Hiring:**Meaning and definition of external recruitment. Sources of recruitment:- advertisement, in newspaper, TV/Radio, Internet, search on the internet, wanted signboards, consultants, employment exchange, campus recruitment, employee referrals and unsolicited applications.	10
3	**Screening the candidates:** Application Forms: bio-data / resume / curriculum vitae and Weighted application blanks: meaning definition, purpose, advantages and disadvantages – taking a Behavioral approach to recruitment: spotting personality patterns, making basic assumptions, Predicting the future, strategy Vs. Technique, Pinning down what is needed: targeted interviewing, focusing on behavior, assessing how person performs, assuming they have been hired. – Identifying the ingredients of success: the winning candidate's profile, challenges in the Interview, the starting point, day to day execution, dealing with people.	10
4	**Testing, Reference checking & Appointment orders:**Meaning, definition, purpose, advantages and disadvantages, Ability tests clerical ability test, mechanical ability test, mental ability test, physical ability test, personality assessment test, typing test, shorthand test, computer proficiency test	10
	Total	**40**

RECOMMENDED BOOKS:

- Human Resource Selection, Robert D. Gatewood and Hubert S. I, South western Cengage Learning, Mason, Ohio, 2001.
- Staffing Organization, Herbert G. Heneman III, Timothy A. Judge, 5th Edition, McGraw Hill International.
- Recruitment and Selection, Elearn, Revised Edition, Routledge, 2009, ISBN: 1136369317, 9781136369315.

CamScanner

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF MANAGEMENT

Batchlor of Business Administration

Semester – V

Management & Bhagavad Gita(MBG)

Code: _____

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

1. Introduction

Business Management curriculum provides a variety of theoretical inputs that enables an individual to take decisions for effective running of an organization. In the current state of affairs theses inputs are characterized by two peculiar aspects. Firstly, these are based mainly on the western paradigm of the "world view". While this is one aspect of the knowledge, it is worthwhile to understand alternative "world views". Secondly, the current management theories are by and large prescriptions for the business organizations. Even when issues pertaining to individuals are addressed they are in the context of organizational performance. For instance, theories on motivation are developed to improve the organizational performance. This overwhelming focus on organizations has over time pushed the "individuals" to the residual in the equations.

It is increasingly felt that the current ideas do not adequately cover all the issues of major concern to individuals and organizations. Many feel the need for alternative perspectives on the problems and possible solutions. Ancient Indian wisdom has a set of ideas that present a different perspective of the problems that individuals and organizations face and proposes alternative ways of understanding several aspects pertaining to the domain of management. This course is an attempt to bring these perspectives using Bhagavad Gita as the main reference frame for culling out ideas from Ancient Indian wisdom.

2. Objectives

The course is designed with the following main objectives:

CamScanner

a) To identify some of the commonly felt problems that individuals, organizations and the society faces
b) To illustrate the usefulness of Gita in addressing some of these problems
c) To demonstrate how alternative world views and paradigms of management could be developed with a knowledge of Ancient Indian wisdom such as Gita
d) To provide a good introduction to Ancient Indian wisdom using Gita as a vehicle

CamScanner

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS–Bachelor's of Business Administration

(Semester–V)

Subject Name: Project Management (PM)
Subject Code:14020510

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

1. **Learning Outcome:**
   - Acquaintance with basics of Project management and execution.
   - Understanding the contemporary and cutting edge Project Management.

2. **Course Duration:** The course duration is of 36 sessions of 75 minutes each

3. **Course Content:**

Module No.	Modules/Sub-Modules
I	**Basics of Project Management:** • Concept of Project, Attributes of a Project • Importance of Project Management • Project Management Process, Project Life cycle • Project Stakeholders • Project Management Structures, Choosing Appropriate Project Management Structure • Implications of Organizational Culture • Main Causes of Project Failure **Project Definition:** • Defining Scope, Establishing Priorities • Creating the Work Breakdown Structure(WBS),integrating the WBS with the organization • Coding the WBS for information system • Project Roll Up, Process Break down Structure, Responsibility Matrices

II	**Project Identification:** • Selection of product, identification of market preparation of feasibility study/report Project formulation -– Evaluation of risks preparation of Project report. **Selection of location & site of the project:** • Factors affecting location - policies of Central –State Government towards location–Legal aspects of project management. **Project Planning - Estimating Project Times and Costs:** • Factors Influencing Quality of Estimates • Estimation Guidelines for Time, Costs and resources • Macro versus Micro Estimating • Methods for Estimating Project Times and Costs • Level of detail, Developing Budgets • Types of Costs, Refining estimates and contingency funds. **Developing a Project Plan:** • Developing the Project Network • From Work Package to Network • Constructing a Project Network • Activity-On-Node, Fundamentals, Network Computation process • Using the Forward and Backward pass information • Level of Detail for activities • Extended Network techniques.
III	**Project Scheduling & Risk Management Scheduling Resources and Reducing Project Duration:** • Types of Project Constraints Classification of Scheduling Problem • Resource Allocation Methods, Splitting, Multitasking Benefits of scheduling resources • Multi Project resource Schedules, Rationale for reducing project duration Options for accelerating Project Completion, Concept and construction of a Project Cost–Duration Graph, Practical considerations. • Managing Risk: Risk Management process–Risk Identification, Risk Assessment, Risk Response • Development, Contingency Planning, Risk Response Control, Change Control Management • Project Organization: The Project Manager: Role and Responsibilities of the project Manager, Planning, Organizing, Controlling, Skills of the Project Manager
IV	**Project Evaluation** Progress and Performance Management and Evaluation: Structure of a Project Monitoring Information System, Project Control Process, Monitoring Time Performance, Need for an Integrated Information System, Developing a status report and index to monitor progress, Forecasting final project cost, Other control issues. Project Audit and Closure: Project Audit, Project Audit Process, Project Closure, Team, Team member and Project Manager Evaluations. Financial Analysis:–Profitability Analysis – Social cost Benefit Analysis preparation of Budget and Cash Flows. Materials Management in Project Planning – Procurement – storage – disposal. Financing of the Project:-Source of Finance–Cost Implications thereof

	Financial Institutions –Guidelines for funding projects,

Reference Book

Sr. No.	Author	Name of the Book	Publisher	Year of Publication
1	Kimi Heldman	PMP-Project Management Professional -"Study Guide"	Wiley India	2016 Edition
2	Sadhan Choudhary	Project Management	McGraw Hill	Latest Edition
3	Prasanna Chandra	Project Management	McGraw Hill	Latest Edition
4	P.K.Mattoo	Project Appraisal		First
5	Vasant Desai	Project Management	Himalaya	Latest
6	Sitanshu Khatua	Project Management& Appraisal	Oxford Publications	Second Edition
7	R.Panneerselvam,P Senthilkumar	Project Management	PHI	Latest
8	Rajiv M Gupta	Project Management	PHI	Latest

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF MANAGEMENT

Bachelor of Business Administration

Semester – V

Advance Financial Management

Code: _____

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	30	-	70	-	100

Objectives:-

- The Course aims to develop a thorough understanding of the concepts and theories in Financial Management.
- It intends to give an understanding of various financial decisions which has impact on shareholders and wealth creation.
- To develop familiarity with the analytical techniques helpful in financial decision making.

Module	Topics	Hours
1	**Cost of Capital** – Meaning and importance of Cost of Capital – Explicit and Implicit Costs – Measurement of Specific Costs – Weighted Average and Marginal Cost of Capital (including sums using market and book value weights) – Capital Asset Pricing Model (excluding sums)	10
2	**Valuation of Securities** – Valuation of bonds/debentures – Yield to Maturity (YTM) Short-cut Method (as per Khan and Jain) – Valuation of Preference Shares – Valuation of Equity Shares: no growth, constant growth and multi-stage growth models	10
3	**Risk Management and Derivatives** – Concept of Risk and Uncertainty – Meaning and Characteristics of Derivatives – Meaning of:	10

	Spot Forward Contracts Future Contracts Options: Call and Put – Difference between Forwards and Futures – Difference between Futures and Options – Risk Evaluation Approaches in Capital Budgeting Risk Adjusted Discount Rate Certainty Equivalent Approach Decision Tree	
4	**Dividend Theory** – Meaning of Dividend – Types of Dividend Policy – Determinants of Dividend Policy – Dividend Theories: Walter Model Gordon Model Modigliani-Miller (MM) Model	10
	Total	**40**

Topics for Assignment

- Practical Application of Cost of Capital
- Concepts of Value
- Important terms in Options Contract
- Financial Engineering

Topics for Seminar and Presentation

- Shareholder Value Creation
- A Study on trends in dividend policy in Indian Companies
- Foreign Exchange markets and Dealings
- Foreign Exchange Risk Management.

Recommended Textbooks:

- Financial Management by Khan & Jain (5^{th} Edition), McGraw Hill – For Units 1, 2 & 3
- Strategic Financial Management by Ravi M Kishore (2^{nd} Edition), Taxmann – For Units 3 & 4

Reference Books:

- Financial Management by Prasanna Chandra (7^{th} Edition), Tata McGraw Hill
- Financial Management by I M Pandey (9^{th} Edition), Vikas Publishing

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS – Bachelor of Commerce / Management
Semester – V
Banking & Financial Institutions
Code: _____

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Module	Topics	Hours
1	1. Developments since 1991-Recent Trends-Role of Financial Intermediaries in a financial system-Various financial intermediaries -Introduction to banking system - Types of bank -Instruments -Terms like NPAs	10
2	2. Study of various interest rates Short Term-Emergence of Repose rate as the benchmarks rate in the short term-Floating and fixed rates of interest-LIBOR, MIBOR and MIBID	10
3	3. RBI-Role played by them-Salient features of status governed by them- Monetary Policy, Fiscal Policy, Union (Government) Budget and its Implications (9) 45 4. Commercial Banking-Management of assets and liabilities- Effect of RBI policies on the operations commercial banks-Recent reforms in Banking sector-Recovery of debts Calculation of EMIs Emerging trends in banking like e banking, mobile banking, credit banking	10
4	5. Non-Banking Financial Companies- Functions of NBFCs Types and RBI Guidelines (6) 6. Pricing of products and services in financial service sector.	10
	Total	**40**

Note: Wherever the standard books are not available for the topic appropriate print and online resources, journals and books published by different authors may be prescribed.

Reference Books:

1. Financial Institutions & Markets- L.M. Bhole

2. Indian Financial System- M.Y.Khan

3. Indian Financial System- H.R. Machiraju

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF MANAGEMENT

Bachelor of Business Administration

Semester – VI

INDUSTRIAL LAWS

Code: 14020601

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objectives:-

- To gain knowledge of various Industrial Laws and also understand the application of Industrial lawsto practical situations.
- To acquaint students from various labour laws.

1. Course Duration: The course duration is 36 sessions of 60 minutes each. i.e. 36 hours.

Module	Topics	Hours
1	Industrial Dispute Act	12
2	Factories Act	7
3	ESIC Act	6
4	Workmen's Compensation Act	6
5	P.F. and Miscellaneous Act	6
6	Payment of Wages Act, 1936	3
	Total	**40**

1. Teaching Method:

The following pedagogical tools will be used to teach this course:

- Lectures
- Case Discussions
- Audio – visual Material
- Assignments and Presentations
-

CamScanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS

Bachelor of Business Administration

Semester – 6

INTERNATIONAL HRM

Code: 14020604

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objectives:-

The main study objective is to learn how to conduct strategic human resource management in an international setting. The course aims at equipping the students of business management with concepts, processes and practical techniques of Managing people in cross cultural context To create awareness about the cross cultural issues• To provide a theoretical background for supplementing the• understanding the issues of Managing people in globalized working environment

Module	Topics	Hours
1	Introduction to IHRM *The internationalization of business. Internationalization of HRM. The development of IHRM. Differences between international and domestic HRM. Creating the international organizations: Strategy and structure. Stages in the development of MNCs. Factors influencing how MNCs organize for global business.*	10
2	Global HRM: Functions & Practices, Global Business implications: How global HRM is different from domestic HRM, Global Management Process-Culture, Cross cultural Communications, info tech & E-Communication-Cross cultural ethics	10
3	Characteristics of a Global Manager, Skills of a global	10

CamScanner

	manager, Ethical Constraints, Global Strategies & Tactical Objectives, International HRM-Managing across Borders	
4	International Recruitment & Selection, Training &Development, Multinational teams and cross cultural training,	10
	Total	**40**

Text Book/Reference Books :

Jackson, T. (2002). International HRM: A cross-cultural approach. Sage.

Thomas, D. C. (2002). Essentials of international management: A crosscultural perspective. Sage Publications, Inc.

Hodgetts, R. M., Luthans, F., & Doh, J. P. (2006). International management: Culture, strategy, and behavior. McGraw-Hill Companies.

Sinha, J. B. (2009). Culture and organizational behaviour. SAGE Publications India.

Dessler, G., & Varkkey, B. (2011). Human Resource Management: Dorling Kindersley (India) Pvt. Ltd, New Delhi.

CamScanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS

Bachelor of Business Administration

Semester – 6

TRAINING AND DEVELOPMENT

Code: 14020605

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objectives:-

Objective: The purpose of this paper is to provide and in-depth understanding of the role of Training in the HRD, and to enable the course participants to manage the Training systems and processes..

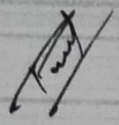
Module	Topics	Hours
– 1	UNIT-I : Introduction Concepts of Training and development – Identifying Training Needs – Structure and Functions of Training Department – Evaluation of Training Programme – Role, Responsibilities and Challenges to Training Managers.	10
2	UNIT-II : Training Techniques Techniques of on the job training – Coaching – Apprenticeship – Job Rotation – Job Instruction Training – Training by Supervisors – Techniques of off the job Training, Lecturers, Conferences, Group Discussion., Training evaluation technique	10
3	UNIT-III : Career – Planning Concept of Career – Career Stages – Career Planning and Development – Need Steps in Career Planning – Methods of Career Planning and Development.	10
4	UNIT-IV : MDP Concept of Management Development – Need and importance of Management Development – Management Development Process – Components of MD Programme. UNIT-V : Training Institutions Need for Training in India – Government – Policy on Training – Training Institutes in India –	10

CamScanner

	Management Development Programmes.	**Total**	**40**

Text Book/Reference Books :

- Rolf Lynton, Udai Pareek: Training for Development, New Delhi, Sage Publications India (P) Ltd., 1990 2. Raymond Andrew Noe:
- Employee Training & Development, New Delhi, Tata McGraw Hiss, International Ed., 1999
- 3. Lynton, R Pareek, U.: Training for Development, New Delhi, Vistaar, 2nd ed., 1990



CamScanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS – Bachelor of Business Administration

Semester – VI

Security Analysis

Code: 14020608

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objectives:-

- To provide theoretical as well as practical exposure on security analysis.
- EIC framework knowledge based on projects and assignments.

Course Contents:-

Module	Topics	Hours
1	Investment – A Conceptual Framework: Investment process, risks of investment and the common mistakes made in investment management Investment Environment: Features and composition of money market and capital market, money market, capital market instruments and financial derivatives	10
2	Fundamental Analysis: Economy analysis, industry analysis and company analysis, weaknesses of fundamental analysis Technical Analysis: Tools of technical analysis, important chart formations or price patterns and technical indicators Efficient Market Hypothesis: Concept of 'Efficient Market' and its implications for security analysis and portfolio management.	10
3	Valuation of bonds and shares: Elements of investment, bond features and prices, call provisions on corporate bonds, convertible bonds and valuation of bonds	10
4	Behavioral Finance: Meaning of Behavioral finance, deals with when, how and why psychology influences investment decisions	10

CamScanner

	Risk and Return: Concepts of risk and return, how risk is measured in terms of standard deviation and variance, the relationship between risk and return	
	Total	**40**

Reference Books:-

- Security Analysis: Sixth Edition, Foreword by Warren Buffett.
- Security Analysis: The Classic 1940 Edition Book by Benjamin Graham and David Dodd.

CamScanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS

Bachelor of Business Administration

Semester – VI

DIGITAL MARKETING

Code: 14020606

1. **Learning Outcome:**
   - Students gain an overall understanding of Digital Marketing
   - Develop insight on Current Trends – Digital and Social Statistics (Infographics)
   - Provide an introduction to Digital Marketing Platforms like Facebook, Twitter, YouTube, Pinterest, etc.
   - Introduction to the basics of Search Engine Optimization (SEO) and Mobile Marketing
   - Introduction to various strategies involved in Marketing products and Services Digitally.

2. **Teaching & Evaluation Scheme:**

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

3. **Course Duration:** The course duration will be of 60 sessions of 60 minutes each.

4. **Course Contents:**

Module	Content	No. of Sessions	Marks out of 70
I	**Introduction to Digital Marketing-** Evolution of Digital Marketing from traditional to modern era, Role of Internet;Current trends, Info-graphics, implications for business & society; Emergence of digital marketing as a tool; Drivers of the new marketing environment; Digital marketing strategy; P.O.E.M. framework, Digital landscape, Digital marketing plan, Digital marketing models.	10	14

CamScanner

II	**Internet Marketing and Digital MarketingMix –** Internet Marketing, opportunities and challenges; Digital marketing framework; Digital Marketing mix,Impact of digital channels on IMC; **Search Engine Advertising:** - Pay for Search Advertisements, Ad Placement, Ad Ranks, Creating Ad Campaigns, Campaign Report Generation **Display marketing:** - Types of Display Ads - Buying Models - Programmable Digital Marketing - Analytical Tools - YouTube marketing	10	21
III	**Social Media Marketing – Role of Influencer Marketing, Tools & Plan–** Introduction to social media platforms, penetration & characteristics; Building a successful social media marketing strategy **Facebook Marketing:** - Business through Facebook Marketing, Creating Advertising Campaigns, Adverts, Facebook Marketing Tools **Linkedin Marketing:** - Introduction and Importance of Linkedin Marketing, Framing Linkedin Strategy, Lead Generation through Linkedin, Content Strategy, Analytics and Targeting **Twitter Marketing:** - Introduction to Twitter Marketing, how twitter Marketing is different than other forms of digital marketing, framing content strategy, Twitter Advertising Campaigns **Instagram and Snapchat:** - Digital Marketing Strategies through Instagram and Snapchat **Mobile Marketing:** - Mobile Advertising, Forms of Mobile Marketing, Features, Mobile Campaign Development, Mobile Advertising Analytics **Introduction to social media metrics**	10	21
IV	**Introduction to SEO, SEM, Web Analytics, Mobile Marketing, Trends in Digital Advertising–** - Introduction and need for SEO, How to use internet & search engines; search engine and its working pattern, On-page and off-page optimization, SEO Tactics - Introduction to SEM **Web Analytics:** - Google Analytics & Google AdWords; data collection for web analytics, multichannel attribution, Universal analytics, Tracking code **Trends in digital advertising**	10	14

CamScanner

	Total	40	

5. Teaching Methods

The course may use the following pedagogical tools:

a. Lectures and Discussions
b. Assignments & PPT presentations
c. Case Studies
d. Audio-Visual Material

6. Evaluation:

The evaluation of the students will be on continuous basis as follows:

A	Internal Evaluation Continuous Evaluation Component (Class Presence, Presentation, Overall Behavior)	(Internal Assessment- 50 Marks) 50 marks
B	End –Semester Examination	(External Assessment-50 Marks)

7. Reference Books:

S. No.	Author	Name of the Book	Publisher	Edition
1	Seema Gupta	Digital Marketing	Mc-Graw Hill	1st Edition - 2017
2	Ian Dodson	The Art of Digital Marketing	Wiley	Latest Edition
3	Puneet Singh Bhatia	Fundamentals of Digital Marketing	Pearson	1st Edition - 2017
4.	Vandana Ahuja	Digital Marketing	Oxford University Press	Latest Edition
5.	Philip Kotler	Marketing 4.0: – Moving from Traditional to Digital	Wiley	2017
6.	Melissa S. Barker | Donald I. Barker | Nicholas F. Bormann | Debra Zahay | Mary Lou Roberts	Social Media Marketing: A Strategic Approach	Cengage	Latest Edition
7.	Ward Hanson , KirthiKalyanam	Internet Marketing & e-Commerce	Cengage	Latest Edition
8.	Roberts andZahay	Internet Marketing: Integrating Online & Offline Strategies	Cengage	Latest Edition
9.	Dr.Ragavendra K. and Shruthi P.	Digital Marketing	Himalaya Publishing House Pvt. Ltd.	Latest Edition
10.	Prof. Nitin C. Kamat, Mr.ChinmayNitinKamat	Digital Social Media Marketing	Himalaya Publishing House Pvt. Ltd.	Latest Edition

CamScanner

Note: Wherever the standard books are not available for the topic appropriate print and online resources, journals and books published by different authors may be prescribed.

8. List of Journals / Magazines / Periodicals / Newspapers / e-resources, etc.

1 https://learndigital.withgoogle.com/digitalunlocked/
2 https://digitalskills.fb.com/en-in/
3 https://www.hubspot.com/digital-marketing
4 http://www.afaqs.com/
5 https://www.linkedin.com/learning/
6 Journal of Marketing
7 ET-Brand Equity
8 HBR

CamScanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS

Bachelor of Business Administration

Semester – VI

SERVICE MARKETING

Code: 14020607

1. Objective: Services are becoming a dominant economic driver in the Indian economy. With increasing competition and discerning buyers, it has become inevitable for the marketers to go for relationship management to attract, retain and grow customers. The course is designed to develop insights into emerging trends in the service sector in a developing economy and tackle issues involved in the management of services on a national basis. The course intends to supplement basic marketing and marketing strategy courses by focusing on problems and strategies specific to marketing of services. It deals with the problems commonly encountered in marketing services -- such as intangibility (inability to inventory), difficulty in synchronizing demand and supply, difficulty in controlling quality and retaining customers. Strategies used by successful services marketers to overcome these difficulties are addressed to by the course contents.

2. Teaching & Evaluation Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

3. Course Duration: The course duration is of 40 sessions of 60 minutes each.

4. Course Contents:

Module No:	Module Content	No. of Sessions
I	**Basics of Services Marketing:** What are Services? ; Why Study Services? ; Role of services in the economy; Services and Technology - technology in service encounter, emergence of self service, automation in services, Internet services; Distinctions between Services and Goods; Services Marketing Mix; **Customer Behavior in Service Encounter:** Four Categories of Services – People-Processing, Mental-Stimulus Processing, Possession-Processing, and Information-Processing;; Customer Decision Making –Pre-purchase Stage, Service-Encounter Stage and Post-Encounter Stage; ; Customer Expectations and Perceptions of Services – Zone of Tolerance	10

CamScanner

II	**Services Marketing Mix:** Product – Core and Supplementary Elements, BrandingService Products ; Price – Role of Non-monetary Costs, Pricing Strategy Pricingand Revenue Management, Yield Management, Place – Service Distribution, Role of Customers in Service Delivery, Delivery through Intermediaries, Franchising, Electronic Channels, Self-Service Technologies; Promotion – Role of Marketing Communication,	10
III	**Expanded Marketing Mix:** People – Employees' Role in Service Delivery, ServiceLeadership and Culture, Process – Service Blueprinting, Service ProcessRedesign Physical Evidence - Services cape, ServiceEnvironments, **Managing Capacity and Demand:** Understanding Capacity, Demand Patterns, Strategies forMatching Capacity and Demands	10
IV	**Service Quality and Relationship Management:**Services Quality: Gaps Model; Measuring and Improving Service Quality; Relationship Management: Defining Customer Relationships; The Basics; External Relationships;Supplier Relations; Internal Relationships **Relationship Marketing:** Customer Retention; Customer Loyalty; Strategies for reducing Customer Defections; and Customer RelationshipManagement (CRM), CRM Software Exposure	10

5. Teaching Methods: The following pedagogical tools will be used to teach this course:

1. Lectures
2. Case Discussions and Role Playing
3. Audio-visual Material (Using CDs/ Clippings)
4. Assignments and Presentations

6. Evaluation:

A	Internal Evaluation	(Internal Assessment- 50 Marks)
	Continuous Evaluation Component (Class Presence, Presentation, Overall Behavior)	50 marks
B	End –Semester Examination	(External Assessment-50 Marks)

7. Text Books:

Sr. No.	Author	Name of the Book	Publisher	Edition
T1	Lovelock Christopher, Wirtz Jochen and Chatterjee Jayanta	Services Marketing: People, Technology, Strategy	Pearson Prentice Hall	Latest Edition,

CamScanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS – Bachelor of Business Administration

Semester – VI

Security Analysis

Code: 14020608

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objectives:-

- To provide theoretical as well as practical exposure on security analysis.
- EIC framework knowledge based on projects and assignments.

Course Contents:-

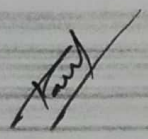
Module	Topics	Hours
1	Investment – A Conceptual Framework: Investment process, risks of investment and the common mistakes made in investment management Investment Environment: Features and composition of money market and capital market, money market, capital market instruments and financial derivatives	10
2	Fundamental Analysis: Economy analysis, industry analysis and company analysis, weaknesses of fundamental analysis Technical Analysis: Tools of technical analysis, important chart formations or price patterns and technical indicators Efficient Market Hypothesis: Concept of 'Efficient Market' and its implications for security analysis and portfolio management.	10
3	Valuation of bonds and shares: Elements of investment, bond features and prices, call provisions on corporate bonds, convertible bonds and valuation of bonds	10
4	Behavioral Finance: Meaning of Behavioral finance, deals with when, how and why psychology influences investment decisions	10

CamScanner

	Risk and Return: Concepts of risk and return, how risk is measured in terms of standard deviation and variance, the relationship between risk and return	
	Total	**40**

Reference Books:-

- Security Analysis: Sixth Edition, Foreword by Warren Buffett.
- Security Analysis: The Classic 1940 Edition Book by Benjamin Graham and David Dodd.



CamScanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS – Bachelor of Business Administration

Semester – VI

Portfolio Management

Code: 14020609

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objectives:-

- To provide deep understanding on various models applied for managing portfolio.
- Brief analysis on risk and return policy.

Course Contents:-

Module	Topics	Hours
1	Portfolio Management – Risks and Returns: Concept of portfolio and portfolio management, concept of risk, types of portfolio management	10
2	Capital Asset Pricing Model (CAPM): Deals with the assumptions of CAPM and the inputs required for applying CAPM and the limitations of this Model. Factor Models and Arbitrage Pricing Theory: Arbitrage Pricing Theory and its principles, Comparison of Arbitrage Pricing Theory with the Capital Asset Pricing Model.	10
3	Markowitz Portfolio Selection Model: Concept of portfolio analysis and diversification of risk. Also discusses Markowitz Model and Efficient Frontier	10
4	Sharpe-The Single Index Model: Measurement of return on an individual stock, measurement of portfolio return and measurement of individual stock risk International Portfolio Investments: Investment avenues for foreign portfolio investors, risks and returns associated with such investment. Mutual Fund Operations: Mutual funds as a key financial intermediary,	10

CamScanner

	mobilizing savings and investing them in capital markets.	
	Total	**40**

Reference Books:-

- **Security Analysis And Portfolio Management 6Th Edition by Fischer, PEARSON INDIA.**
- PORFOLIO MANAGEMENT Book by S. KEVIN

CamScanner

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF MANAGEMENT

Bachelor Of Business Administration

Semester –VI

Business Ethics

Code: 14020603

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objectives:-

The objective of this module is to provide students with an understanding of the role of commerce in market Commerce education is aimed at giving adequate knowledge about the wholesale trade, retail, export trade, import trade and entire- port trade. More-over it provides some knowledge about the movement of goods etc.,

Sr. No.	Modules / Units
1.	Introduction to Business Ethics

CamScanner

	• Business Ethics – Concept, Characteristics, Importance and Need for business ethics. Indian Ethos, Ethics and Values, Work Ethos, • Sources of Ethics, Concept of Corporate Ethics, code of Ethics-Guidelines for developing code of ethics, Ethics Management Programme, Ethics Committee. • Various approaches to Business Ethics - Theories of Ethics- Friedman's Economic theory, Kant's Deontological theory, Mill & Bentham's Utilitarianism theory • Gandhian Approach in Management and Trusteeship, Importance and relevance of trusteeship principle in Modern Business, Gandhi's Doctrine of Satya and Ahimsa, • Emergence of new values in Indian Industries after economic reforms of 1991
2.	**Indian Ethical Practices and Corporate Governance**
	• Ethics in Marketing and Advertising, Human Resources Management, Finance and Accounting, Production, Information Technology, Copyrights and Patents • Corporate Governance: Concept, Importance, Evolution of Corporate Governance, Principles of Corporate Governance,

CamScanner

	• Regulatory Framework of Corporate Governance in India, SEBI Guidelines and clause 49, Audit Committee, Role of Independent Directors,Protection of Stake Holders, Changing roles of corporate Boards. • Elements of Good Corporate Governance, Failure of Corporate Governance and its consequences
3.	**Introduction to Corporate Social Responsibility**
	• Corporate Social Responsibility: Concept, Scope & Relevance and Importance of CSR in Contemporary Society. • Corporate philanthropy, Models for Implementation of CSR, Drivers of CSR, Prestigious awards for CSR in India. • CSR and Indian Corporations- Legal Provisions and Specification on CSR, A Score Card, Future of CSR in India. • Role of NGO's and International Agencies in CSR, Integrating CSR into Business
4.	**Areas of CSR and CSR Policy**
	• CSR towards Stakeholders-- Shareholders, Creditors and Financial Institutions, Government, Consumers, Employees and Workers, Local Community and Society. • CSR and environmental concerns. • Designing CSR Policy- Factors influencing CSR Policy, Role of HR Professionals in CSR • Global Recognitions of CSR- ISO- 14000-SA 8000 – AA 1000 – Codes formulated by UN Global Compact – UNDP, Global Reporting Initiative; major codes on CSR. • CSR and Sustainable Development • CSR through Triple Bottom Line in Business

Reference Books

- *Sharma J.P ' Corporate Governance, business ethics and CSR, Ane Books Pvt Ltd, New Delhi*
- *Sharma J.P. Corporate Governance and Social Responsibility of business, Ane Books Pvt ltd, New Delhi*
- *S.K.Bhatia, Business Ethics and Corporate Governance*
- *William Shaw, Business Ethics, Wordsworth Publishing Company, International Thomson Publishing Company.*

CamScanner

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF MANAGEMENT

Bachelor of Business Administration

Semester – VI

BUSINESS PLAN

Code: _____

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
Th	Tut	Pr	Total		Internal		External		Total
					Th	Pr	Th	Pr	
3	-	-	3	3	30	-	70	-	100

Objectives:- To understand how to create a unique plan for future aspects

UNIT – 1

The Business Plan Nature and scope of Business plan, Writing Business Plan, Evaluating Business plans, Using and implementing business plans. Marketing plan, financial plan and the organizational plan, Launching formalities.

UNIT – 2

Entrepreneurial management, launching a new business venture: CD-ROM simulation ("Venture Out")

(CLASS ASSIGNMENT - Group Project (weeks 1 and 2): Venture Out As founding members of new technology venture ("Radiophone"), small teams go through process of starting new venture: evaluate product idea, obtain financing, hire HR, and balance needs of growing business. Teams make decisions in increasingly complex environment and try to beat competing teams. Teams make end-of-class presentations)

UNIT – 3

Evaluating new venture opportunities

Opportunity analysis & building business models/basic questions Case study (3): Cisco: Novel approach to entrepreneurial ventures

UNIT – 4

new business plan presentation

SWARNIM STARTUP & INNOVATION UNIVERSITY

School Of Business

Bachelor of Commerce

Principles of Micro Economics
Code: 14010102
B.Com 1st SEM

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Th	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objective:

- To expose students to basic micro economic concepts.
- To apply economic analysis in the formulation of business policies.
- To use economic reasoning to problems of business.

Module	Topics
1.	• Definitions of Economics: Scarcity and Growth definitions • Introduction to Micro Economics: Definition, Scope, Importance and Limitations of Micro Economics • Important Concepts: Economic goods and Free Goods, Price and Value, Want and Demand, Production Possibility Curve • Economic Systems: Planned Economy, Free Market Economy and Mixed Economy
2.	**Theory of Demand:** • Meaning of Demand and Determinants of Demand – Demand Function • Law of Demand, Elasticity of Demand , measurement of demand, Exceptions to the Law of Demand • Utility Analysis: Concept of Utility, Law of Diminishing

Scanned with OKEN Scanner

	Marginal Utility, Consumer's Surplus, Indifference curve. • Meaning of Supply, Determinants of Supply, Expansion and Contraction of Supply • Demand and Supply as determinants of Price
3.	**Theory of Production** • Factor of Production • Law of return • Ppc • Meaning of Market, Types of Market and their important features: Perfect Competition, Monopoly, Monopolistic Competition and oligopoly
4.	**Theory of Distribution :** • Marginal Productivity Theory of Distribution • Rent: Concepts of Differential Rent and Scarcity Rent, Economic and Contract Rent, Quasi Rent, Pure Rent and Quasi Rent • Wages: Concepts of Time Wages, Piece Wages, Money wages, Real Wages, factors determining real Wages. • Interest: Gross and Net Interest. Components of Gross Interest • Profit: Theories of profit – risk, uncertainty, innovation

Text Book:

(1) Micro Economic Theory by R. Cauvery (S.Chand Publication.)
(2) Micro Economics by M.John Kennedy (Himalaya Publication)

Reference Books:

(1) Modern Micro Economics by H.L Ahuja (S Chand Publication)
(2) Modern Economic Theory by K.K Dewett (S. Chand Publication)
(3) Elementary Theory by K.K. Deweet & J.D.Verma.(S.ChandPublication.)
(4) Principles of Economics by D.M.Mithani (Himalaya Publication)

Topics for assignments:

1. Discuss Basic Economic Problems.
2. Explain the nature of Economics.
3. Explain the Main Types of Demand (Price, Income, Cross).
4. Distinguish between Giffen Paradox and Veblen effect.

Scanned with OKEN Scanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS

Bachelor of Commerce

PRINCIPLE OF MANAGEMENT-1

CODE: 14010101

B.COM 1st SEM

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objectives: - This subject is designed to provide a basic understanding to the students with reference to working of business organizations through the process of management. The first part of this course (offered in the first semester) will give a brief understanding of the managerial functions of planning (including decision making) and organizing. The second part (offered in the second semester) will throw light on the managerial functions of staffing, directing and controlling.

Course outline:-

Sr.No.	Course Contents
1	**Introduction to Management and Planning** Management: Meaning and process of management. Planning: Meaning; planning process; planning premises; types of plans – based on breadth and use.
2	**Forecasting, Decision making** Forecasting: Meaning; techniques of forecasting – Historical analogy method, survey method, business barometers, time series analysis, regression analysis, significance and limitations of forecasting Decision making: Meaning; decision making process; techniques of decision making – Decision Tree, PERT and CPM.
3	**Organizing – Part 1** A. Introduction - Meaning of organizing; principles of organizing. B. Departmentation – Meaning; bases of departmentation – function wise, product wise, territory wise, process wise and customer wise. C. Delegation – Meaning; elements of delegation; principles of effective Delegation. D. Centralization and decentralization – Meaning; factors affecting degree of centralization and decentralization.
4	**Organizing – Part 2**

Scanned with OKEN Scanner

	Types of organizations A. Formal organizations: Line; Functional; Line and staff; Committee (only the meaning, advantages and limitations of all the four forms) B. Informal organizations: Meaning; benefits; problems.

Learning Outcomes:-

* Inspiring business mentors.
* Innovation and creativity in business.
* Current business environment.
* Management by Objectives.

Teaching & Learning Methodology:- Chalk and Talk, Group Discussion

Books Recommended:-

1, L. M. Prasad; Principles of Management; Sultan Chand and Sons, 6th edition.
2, Karminder Ghuman and K. Aswathapa; Management – Concept, Practice and Cases; McGraw Hill; 1st edition (2010)
3, Gupta, Sharma and Bhalla; Principles of Business Management; Kalyani Publications edition.

Assignment List:-

Sr. No.	Assignment
1	Levels of management and the combination of skills required at each level.
2	Management – an art, a science or a profession?
3	Methods of business forecasting – opinion poll method, extrapolation method, input-output analysis and econometric models.
4	Types of managerial decisions.
5	Span of management and factors affecting the same.

Scanned with OKEN Sca

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS - BACHELOR OF COMMERCE

FINANCIAL ACCOUNTING
Code: 14010107
SEMESTER- I

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objectives:-

This course is designed in such a way as to provide the students an understanding of the different contemporary and relevant topics in the subject of financial management by applying the concepts learned.

Module	Topics	Hours
1	INTRODUCTION: • Meaning & Scope of Accounting • Book-Keeping and Accounting • Branches of Accounting • Objectives of Accounting • Functions and Limitations of Financial Accounting • Concepts and Conventions • Fundamentals Accounting Assumptions • Classification of Accounts	10
2	BOOK KEEPING: • Accounting Cycle • Rules of Debit and Credit • Journal, Compound Journal Entry • Ledger and Various Subsidiary Books • Rules Regarding Posting • Trial Balance	10
3	STOCK INVENTORY VALUATION : • Methods of Valuation of Inventory • FIFO, LIFO and Average Method of Stock/ Inventory Valuation DEPRECIATION: • Meaning of Depreciation • Objectives and Causes of Depreciation • Methods of recording Depreciation and Depreciation Policy	10

Scanned with OKEN Scanner

4	BANK RECONCILIATION STATEMENT	1
	Total	4

Note: Wherever the standard books are not available for the topic appropriate print and online resou journals and books published by different authors may be prescribed.

Reference Books:

1. Grewal T. S. Introduction to Accountancy S. Chand & Co.
2. Gupta R. Principles of Accounting. Sultan Chand & Co.
3. Maheshwri S. N. Advanced Accountancy Vikas Publishing House.
4. Mukharjee A. &Hanif, M & Grewal T. S. Modern Accountancy. Tata McGraw Hill
5. Shukla M. C. & Grewal T. S. - Financial Accounting

Scanned with OKEN Scanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS

Bachelor of Commerce

Principle of Macro Economics
Code: 14010201

BCOM 2nd SEM

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Th	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objective:

Macro Economics is a broad field of study. It is a branch of Economics dealing with the performance, structure, behavior & decision making of the entire Economy.

Course Duration: The Course Durationis of 40 Session of 60 Minutes each.

Module	Topics	Hour
1	**Introduction to Macro Economics:** Definition, Scope, Importance and Limitations of Macro Economics **National Income (NI) Accounting:** Meaning of NI and Circular Flow of NI (in Four sector economy Stock and flow concept, NI at Current Price and NI at Constant Price Various concepts of NI (GNP, GDP, NNP, NDP), Personal Income, Disposable Income Methods for measurement of NI Difficulties in measurement of NI	10
2	Theory of Income and Employment Keynes' consumption function Investment function, Keynesian theory of Income and employment, Investment multiplier Interest rate theory - Liquidity Preference Theory	10
3	Money, Definition and Functions Stocks of Money (M1, M2, M3 and M4) Credit creation by Commercial Banks Inflation Meaning of Inflation, Deflation, Stagflation and Causes of inflation, Measures to Control Inflation	10

Scanned with OKEN Scanner

	Business cycle Meaning, characteristics and phases	
4	Monetary policy Meaning, Objectives and Tools Fiscal policy Meaning, Objectives and Tools Balance of Payments Meaning, Structure, Causes of Disequilibrium and Methods of Correcting Disequilibrium.	10

1. Teaching Method:

The following pedagogical tools will be used to teach this course:

- Lectures
- Case Discussions
- Audio – visual Material
- Assignments and Presentations

2. Evaluation:

A	Internal Evaluation Continuous Evaluation Component (Class Presence, Presentation, Overall Behavior)	(Internal Assessment- 50 Marks) 50 marks
B	End –Semester Examination	(External Assessment-50 Marks)

Text Book

D. Macro Economics by D.M.Mithani (Himalaya Publication)
E. Macro Economics by R. Cauvery (S.Chand Publication.)

Topics for Assignment

13. Functions of Commercial Banks
14. Functions of Central Banks
15. Factors affecting Business Cycle
16. Use of National Income Data
17. Difference between BOT and BOP

Topics for Seminar

5. Inflation in India
6. Economic Growth and Economic Development
7. Role of Economic Policies in Economic Growth
8. Relationship between Inflation and unemployment

Scanned with OKEN Scanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESSS -Bachelor Of Commerce

Semester –II

Elements of Commerce

Code: 14010203

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objectives:-

The objective of this module is to provide students with an understanding of the role of commerce in market Commerce education is aimed at giving adequate knowledge about the wholesale trade, retail, export trade, import trade and entire- port trade. More-over it provides some knowledge about the movement of goods etc..

Module	Topics	Hours
1	**Fundaments of Business activity** Characteristics of Business Activities. Business as an Activity – How it is different from (i) Profession (ii) Employment Characteristics of vocational activities Factors affecting business (i) Economic (ii) Social (iii) Political	10
2	**Operative Activities in Business** Industry – concept, Commerce Concepts Industry Types Characteristics and Nature Commerce – Banking, Insurance, Transportation ,Trade	10
3	**Steps Involved in Establishing Business** Nature & Forms Of Business Organization Sole proprietorship Meaning and Features Partnership Meaning Features and Types	10
4	**Fundamental Areas of Business** Finance Meaning Marketing Meaning Human Resources Manning	10
	Total	40

Scanned with OKEN Scanner

Reference Books

1 Elements of Commerce by Varun Kumar Rai

2 E-Commerce Fundamentals and Applications by Henry Chan

Scanned with OKEN Scanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS – Bachelor of Commerce

Semester – II

Auditing

Code: 14010204

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objectives:-

The objective of this module is to provide students with an understanding of the role of Auditing. Thus the main objective of auditing is to form an independent judgement and opinion about the reliability of accounts and truth and fairness of financial state of affairs and working results.

Module	Topics	Hours
1	Introduction: Meaning and Objectives of Auditing. Types of Audit, Internal Audit. Audit Process: Audit Programme, Audit and book, working papers and evidence, Preparation before commencing of Audit.	10
2	Internal Check System: Routine Checking, Internal Check and Test Checking Internal Control and Audit Procedure.	10
3	Vouching, Verification of Assets and Liabilities	10
4	Company audit: Appointment of auditor, Powers, Duties and Liabilities. Divisible Profits and Dividend. Auditor's report: Cleaned and Qualified report.	10
	Total	**40**

Scanned with OKEN Scanner

Reference Books:

1 PRINCIPLES AND PRACTICE OF AUDITING by DINKAR PAGARE
2 Auditing By Dr. T.R. Sharma

3 Auditing (Thoroughly revised on the basis of the Companies Act 2013, and the Companies Amanedment Act, 2019) - Sahitya Bhawan Publications

Scanned with OKEN Scanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS - BACHELOR OF COMMERCE

Management Accounting
Code: 14010205

SEMESTER- II

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objectives:-

The objective of this module is to provide students with an understanding of the roleof management accounting in the context of business. It tries to show how accounting information is used by managers and senior executives to plan and control business activities and make decisions.

Module	Topics	Hours
1	**Introduction:** Meaning of Management Accounting, DifferencebetweenFinancial Accounting and Management Accounting, Difference between Cost Accounting and Management. Tools and Techniques of Management Accounting – Meaning and list of tools and techniques. **Budgetary Control:** Meaning and Significance. Preparation of Flexible Budgets. Preparation of Functional Budgets – Sales, Production and Purchase Budgets. Concept of Cash Budget (excluding sums.)	10
2	**Standard Costing** – Meaning, Benefits and Limitations. Calculation of Variances- Material, Labor (Excluding Idle time) and Sales Introduction to overhead variance (excluding sums)	10

Scanned with OKEN Scanner

3	**Cost Volume Profit Analysis-** Meaning and Assumptions, Concept of Break even analysis, Sums of C-V-P Analysis (Including Key Factor) **Decision Making –** Make/Buy, Shut Down and Export Proposal.	10
4	**Responsibility Accounting** - Meaning and significance, Type of responsibility centre. **Transfer Pricing** – Meaning and Methods of transfer pricing. **Contemporary Issues in Management Accounting:** • Target Costing • Life-cycle Costing • Activity Based Costing	10
	Total	**40**

Topics for Seminar:

- Concept and Utility of Balance Score Card.
- Installation of a Budgetary Control system .
- Management Information Systems.

Recommended Books:

- Managerial Accounting – By JawaharLal - Himalaya Publication.
- A Text Book of Cost and Management Accounting By M. N. Arora – 8th Edition – Vikas Publishing House Pvt. Ltd.

Reference Books:

- Advanced Management Accounting, Text, Problems and Cases By JawaharLal – S. Chand
- Accounting for Management – by M. N. Arora&Khanna – Himalaya Publication.
- Management Accounting – Principles & Practice by M. A. Sahaf – Vikas Publishing House Pvt. Ltd
- Management Accounting, Text, Problems and Cases by M. Y. Khan & P.K. Jain, 5th Edition, Tata McGraw Hill Education Pvt. Ltd.
- Accounting for Management - by JawaharLal, 5th Edition – Himalaya Publishing House
- Management Accounting by J. Made Gowda (2007) Himalaya Publication.
- Management Accounting, Text, Problems and Cases by M. Y. Khan & P.K. Jain, 5th Edition, Tata McGraw Hill Education Pvt. Ltd.

Scanned with OKEN Scanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS – Bachelor of Commerce

Semester – III

Financial Statement Analysis

Code: 14010301

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objectives:-

- To give an insight to the students from the basic level to higher level of analysis
- To introduce the students to various interpretations towards financial statements.

Course Contents:-

Module	Topics	Hours
1	Defination-Objective and users of financial statements –elements of financial statements –articulation of financial statements – elements from which financial statements are constructed-techniques of financial statement analysis	10
2	Basic Accounting Concepts – Trial balance –balance sheet– Income statements – Depreciation -Cash flow statement - purpose - uses - structure - format of cash flow statement - preparing cash flow statement - interpreting the cash flow statement	10
3	Corporate Acquisitions: Mergers –Types – Reasons –Mechanics –Cost and Benefit – Timing of Merger Activity – the role of exchange rates and takeover process – Evaluating Merger as Capital Budgeting Proposal –Terms of Mergers – Takeovers – Signs of Takeovers.	10
4	Corporate Restructuring: Joint Ventures –Financing and Evaluation –Rationale and Role of Joint Ventures – Sell Offs –Change in Ownership –Divestitures – Spin-off –Split-off – Going Public –Privatization –Leveraged Buyouts –Buyback of Shares –Alignment of Interest	10
	Total	40

Scanned with OKEN Scanner

Reference Books:-

- Financial Statement Analysis: A Practitioner's Guide, 4th Edition by Martin S. Fridson, Fernando Alvarez.
- Financial Statement Analysis: 11th Edition by K. R subramanyam.

Scanned with OKEN Scanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS – Bachlor of Commerce

Semester – III

Public Finance

Code: 14010302

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objective:

Public Finance is a broad field of study. It is a branch of Economics dealing with the performance, structure, behavior & decision making of the entire Economy.

Course Duration: The Course Durationis of 40 Session of 60 Minutes each.

Scanned with OKEN Scanner

Unit		
1	**Unit-I: Public Finance, Demography and Social Sector** • Indian Public Finance- Recent fiscal trends revenue, expenditure and fiscal imbalance, Fiscal reforms, Issues in fiscal federalism, Demographic features and trends- National population policies; Social Sector- Issues in Health and Education.	10
2	**Unit-II: Theories of Public Goods, Public Expenditures** • The Theory of Public Goods: Provision of Private Goods and Public Goods: Markets and Government, The Demand for a pure Public good, Efficient output of a pure public good- Partial and General Equilibrium Analysis, • . The Theory of Public Expenditure: Pure Theories of Public Expenditures: Tiebout, Samuelson and Buchanan's Contributions.	10
3	**Unit-III : Public Revenue** • Public Revenue – Introduction • Taxation , Theories of Taxation: Tax Neutrality, Direct versus Indirect Taxes and Equity, Buoyancy and Elasticity Estimates of Taxation, Tax Efforts, The impact of taxes on Market prices and Efficiency.	10
4	**Unit-IV: Budgeting Fiscal Policies** • Program Budgeting: It's Application, Zero-Based Budgeting, and Budgeting Policies; Theory of Fiscal Policy: Fiscal Policy with Special Reference to Under-developed Countries, Federal-Fiscal Relation in India.	10

1. Teaching Method:

The following pedagogical tools will be used to teach this course:

- Lectures
- Case Discussions

Scanned with OKEN Scanner

- Audio – visual Material
- Assignments and Presentations

2. Evaluation:

A	Internal Evaluation Continuous Evaluation Component (Class Presence, Presentation, Ove al lBehav ior)	(Internal Assessment- 50 Marks) 50 marks
B	End –Semester Examination	(External Assessment-50 Marks)

Basic Reading List

1. Bowers, P.F. (1974): Private Choice and Public Welfare, Dryden Press, NY.

2. Buiter, W.H. (1990): Principles of Budget and Fiscal Policy, MIT Press.

3. David, N. and Nicholas, S. (eds.) (1987): The Theory of Taxation for Developing Countries, OUP.

4. Hyman, D.N. (2007): Public Finance: A Contemporary Application of Theory to Policy, Thomson Asia Pvt. Ltd., Singapore.

5. Jha, Raghbendra (1987): Modern Theory of Public Finance, Wiley Eastern, Delhi.

6. Maxdowell, A., Anderson and J. Richard (1973): Financing State and Local Governments.

7. Musgrave, Richard A. (1959): The Theory of Public Finance, Tata McGraw Hill, N.Y.

8. Mishra, B. (2006): Economics of Taxation: Theory and Application, Akansha Publishing House, ND.

Scanned with OKEN Scanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS

Bachelor of Commerce
Semester –III
Employee Behavior & Relationship Management
Code: 14010303

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objectives:-

The main aim of this course is to introduce students to the theories and practices of Industrial Relations and employee behavior. The module examines the relationship existing between employer and employee.

Module	Topics	Hours
1	**INTRODUCTION** Basic Behavioural Process, Cognitive Functions – IntelligenceCreativity, Learning and its Process – Attitude and Values, Personality – Concepts counselling – importance and relevance	10
2	EMPLOYEE BEHAVIOUR INTRODUCTION: Factors Affecting Employee Behaviour, TYPES OF EMPLOYEE BEHAVIOUR, EMPLOYEE BEHAVIOURAL ISSUE, ROLE OF MOTIVATION IN EMPLOYEE BEHAVIOUR	10
3	**INDUSTRIAL CONFLICT**: Causes of Industrial Disputes, Machinery for settling of disputes – Negotiation, Arbitration andAdjudication. Grievance Handling: Causes of grievances – Guidelines for grievance handling – Grievances Redressal procedures. Employee Discipline: Causes of indiscipline – Codeof discipline – Disciplinary procedure – Code of conduct.	

Scanned with OKEN Scanner

4	**TRADE UNIONISM AND INDUSTRIAL RELATIONS:** Labour movement: Trade union movement, Functions and problems of trade unions. International Labour, InternationalLabor Organization's (ILO). Worker's Participation in Management – Forms.	
		Total 40

Text Book/Reference Books :

1. Mamoria C.B and Sathish Mamoria, "Dynamics of Industrial Relations", Himalaya Publishing House, New Delhi, 1998.

2. P.N. Singh and Neeraj Kumar, "Employee Relations Management", 2010, Pearson Education, New Delhi.

3. Pylee. M.V and Simon George, "Industrial Relations and Personnel Management" ,Vikas Publishing House (P) Ltd., New Delhi,1995

4. Michael Armstrong, "Essential Human Resource Management Practice" Kogan Page Limited. 2010

5. Srivastava, "Industrial Relations and Labour Laws", Vikas, 4TH edition, 2000

Scanned with OKEN Scanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS - BACHELOR OF COMMERCE

TAXATION I

Code: 14010304

SEMESTER- III

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objective:-

After the Bachelor's, students can develop a successful career in the field of taxation. Students, who want to be tax consultants, should opt for this course for developing a company's strategies. Students will learn skills like management and quantitative techniques to open more wide opportunities.

Course Content:

Module	Topics	Hours
1	(1) Objectives of Income Taxation; The History of Income - tax and Brief introduction of the following Direct and Indirect tax laws: Income Tax, Gujarat Value Added Tax, Custom Duty, Excise Duty and ServiceTax; (2) Definitions as per the Income tax Act : Income, Agricultural income, Assessee, Person, Previous Year, Assessment Year and other terms relevant to the syllabus;	10

Scanned with OKEN Scanner

	(3) Income - tax Authorities (sections 116 to 120 and 124only).	
2	(1) Basis of charge of income - tax : Scope of total income and residential status of an individual assessee (sections 4 to9); (2) Individual assessee's incomes exempt from income - tax (section10); (3) Procedure for assessment of income - tax (sections 139, 139A, 140, 140A, 142 to 145, 147 to 149, 154 and 156 only) and collection oftax.	10
3	Salary Income: Computation of taxable salary (sections 14 to 17); Taxability of various provident funds affecting the computation of taxable salary income only shall be included. Note :Practical problems may include the valuation of fully or partly rent-free accommodation and conveyance facility only; Separate small/objective type questions on other perquisites may be asked. Separate questions on determination of qualifying amount under section 80 C shall not beasked.	10
4	Income from House Property :Computation of Taxable Income from House Property (sections 22 to 27). Note: Problems requiring computation of three or more let-out house properties are not expected.	10
	Total	40

Scanned with OKEN Scann

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS - BACHELOR OF COMMERCE

INDIAN BANKING SYSTEM

Code: 14010405

SEMESTER- IV

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Module	Topics	Hours
1	Developments since 1991-Recent Trends-Role of Financial Intermediaries in a financial system-Various financial intermediaries - Introduction to banking system -Types of bank -Instruments	10
2	Study of various interest rates Short Term-Emergence of Repose rate as the benchmarks rate in the short term-Floating and fixed rates of interest-LIBOR, MIBOR and MIBID	10
3	RBI-Role played by them-Salient features of status governed by them-Monetary Policy, Fiscal Policy, Union (Government) Budget and its Implications (9) 45 4. Commercial Banking-Management of assets and liabilities- Effect of RBI policies on the operations commercial banks-Recent reforms in Banking sector-Recovery of debts Calculation of EMIs Emerging trends in banking like e banking, mobile banking, credit banking	10

Scanned with OKEN Scanner

4	Non-Banking Financial Companies- Functions of NBFCs Types an RBI Guidelines (6) 6. Pricing of products and services in financial service sector.
	T

Note: Wherever the standard books are not available for the topic appropriate print and onli journals and books published by different authors may be prescribed.

Reference Books:

1. Financial Institutions & Markets- L.M. Bhole
2. Indian Financial System- M.Y.Khan
3. Indian Financial System- H.R. Machiraju

Scanned with OKEN Scanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS – Bachelors of Commerce

Semester – IV

Financial Management

Code: 14010404

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objective:

- To familiarize students with the concepts, tools and practices of financial management.
- To understand the decisions to be taken by financial managers of business firms.

Course Contents:

Module	Topics	Hours
1	**Finance Function:** Meaning, Scope, and Classification of functions (Long term-short term; Executive-Routine). Organization of Finance Function (status and duties of a Financial manager: Treasurer and Controller). Objectives/Goals of Financial Management, agency problems. **Time Value of Money:** Concept and numerical of Compounding and Discounting including annuity (excluding valuation of securities).	10
2	**Management of working capital:** Concept, Types, Factors affecting workingcapital needs, Operating cycle approach, Dangers of excessive and inadequate working capital. **Cash Management:** Meaning, Motives of holding cash, Functions/objectives ofcash management, Cash budget (with numerical). **Inventory Management:** Meaning, Objectives of holding inventory, Factors affecting inventory, Techniques of inventory management :**(1) EOQ** (with numericals including discount concept), ABC Analysis(without numericals) **(2)Reorder point** (without numericals), **Recievables Management:** Meaning, Cost and benefits, size of of receivables,optimum credit policy and credit policy variables,	15

Scanned with OKEN Scanner

	(only simple numericals of receivables are expected.)	
3	**Leverage:** (numericals and theory) Operating leverage: Meaning, degree and effects of operating leverage on profits. Financial leverage: Meaning and degree Trading on equity: Meaning, benefits and risks (including EBIT-EPS analysis) Combined leverage. Concept and numericals on : (a) Financial Break-Even, (b) Indifference point	
4	**Capital budgeting:** Meaning and significance ofcapital budgeting, Types of capital budgeting decisions. Techniques: (Meaning, Accept-Reject criterion, Advantages and Disadvantages, comparison and numericals based on each method.) Payback period Average Rate of Return Net present value Profitability Index Internal Rate of Return	10
	Total	45

Text Books:

- Financial Management-Principles and Practice: C.Sudarsana Reddy, Himalaya Publishing House.

Reference Books:

- Financial Management: Text, Problems and cases: M.Y.Khan and P.K.JainTata McGraw Hill Education Pvt. Ltd.
- Financial Management P.V. Kulkarni and B.G. Satyaprasad.
- Essentials of Financial Management: I.M.Pandey, Vikas Publishing House Pvt. Ltd.
- Financial Management :Prasanna Chandra.
- Financial Management : Dr. V.k. Palanivelu, S. Chand.
- Financial Management :SheebaKapil, Pearson.
- Financial Management : Rajiv Srivastav and Anil Mishra, Oxford university press.

Topics for Assignment :

Introduction to Contemporary issues like: JIT systems, Out sourcing, Computerised inventory control system.
Techniques of controlling inflows and outflows in modern times.
Captial Rationing and its relevance in capital budgeting decisions.
Capital Structure: Meaning and Features of an ideal capital structure.
Relationship of finance with economics, accounts and other disciplines.

Topics for Presentation/Seminar:

Managment of working capital in India.
Emerging role of finance managers in India.
Effect of high and low operating and financial leverage for a business.

Scanned with OKEN Scanner

Reference Books:

Sr. No.	Author	Name of the Book	Publisher	Edition
R1	Mike Peng and Deepak Srivastava	Global Business	Cengage Learning	Latest
R2	K Aswathappa	International Business	The McGraw Hill	Latest
R3	P. SubbaRao	International Business : Text & Cases	Himalaya	Latest
R5	O P Agarwal	International Business	Himalaya	Latest
R6	Hyun Sooklee, R K Srivastava	Internal Business : Country Culture and Corporate Culture	Excel	Latest

Scanned with OKEN Scanner

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS

Bachelor of Commerce **Semester – IV**

Global Business Management

Code: 14010403

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

1. **Objectives:**
The course is intended to provide an opportunity to learn and understand how business is conducted in international arena. It aimed at making the students realize that international business is applicable to multiple business functions like Marketing, Human Resource Management, and Financial Management.

2. **Course Duration:** The course duration is 36 sessions of 60 minutes each. i.e. 36 hours.

3. **Course Contents:**

Module No.	Module Content	No. of Sessions	50 Marks (External Evaluation)
1	**Globalization:** What is Globalization, Drivers of Globalization, Managing in the Global Market Place **Differences in Culture:** What is Culture, Values & Norms, Social Structure, Culture – Language, Culture – Education, Culture – Workplace	05	12
2	**International Trade Theory:** An Overview of Trade Theory, Absolute Advantage, Comparative Advantage, Heckscher – Ohin Theory, National Competitive Advantage: Porter's Diamond, Global Competitive Alignment Matrix. **Foreign Direct Investment:** FDI in the world economy, Horizontal FDI and Vertical FDI	08	15

Scanned with OKEN Scanner

3	**The Foreign Exchange Market:** The Functions and Nature of foreign exchange market, Economic Theory of Exchange Rate Determination, Exchange Rate Forecasting, Currency Convertibility **The International Monetary System:** The Gold Standard, The Bretton Woods System, The Collapse of the Fixed Exchange Rate System, The Floating Exchange Rate Regime, Fixed V/S Floating Exchange Rates, IMF: Origin and Objectives, Crisis Management by the IMF, The Spot and Forward Market	07	
4	**Entry Strategy and Strategic Alliances:** Basic Entry Decisions, Selecting an Entry Mode, Entry Strategies in India, Greenfield Venture or Acquisition, Strategic Alliances **Exporting, Importing and Counter Trade:** The Promise and Pitfalls of Exporting, Improving Export Performance, Exporting with a Little Government Help, Export and Import Financing, Export and Import Financing, Export Assistance	08	
5	**Global Marketing and R & D:** The Globalization of Market and Brands, Market Segmentation, Product Attributes, Distribution Strategy, Communication Strategy, Pricing Strategy, New Product Development **Global Human Resource Management:** The Strategic Role of International HRM, Staffing Policy, Managing Expatriate, Training and Management Development, Performance Appraisal, Compensation, International Labour Relations	08	

4. Teaching Method:

The following pedagogical tools will be used to teach this course:

- Lectures
- Case Discussions
- Audio – visual Material
- Assignments and Presentations

5. Evaluation:

A	Projects/Assignments/Quiz/Class participation	Weightage (50%) (Internal Assessment)
B	Mid – Semester Examination	Weightage (30%) (Internal Assessment)

Scanned with OKEN Scanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS - BACHELOR OF COMMERCE

TAXATION II
Code: 14010402

SEMESTER- IV

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objective:

After the Bachelor's, students can develop a successful career in the field of taxation. Students, who want to be tax consultants, should opt for this course for developing a company's strategies. Students will learn skills like management and quantitative techniques to open more wide opportunities.

Course Content:

Module	Topics	Hours
1	Profits and Gains of Business or Profession: Computation of taxable profit under the head (sections 28, 29, 30, 31, 32, 34, 35, 36, 37 and40). Comprehensive problems on computation of taxable profit of business or profession involving detailed computation of admissible depreciation shall not be asked.	10
2	(A) Capital Gains: Computation of taxable capital profit under the head (sections 45, 47, 49 to 51, 54, 54B, 54EC, 54F and55).	10

Scanned with OKEN Scanner

	Note: Relevant cost-inflation index numbers must be provided in the question paper. (B) Income from Other Sources: Computation of taxable income under the head (sections 56 to59). Note: In case of securities and other investments, the rate of TDS and type of security (listed or un-listed) must be explained in the question paper.	
3	Income of other persons included in assessee's total income (Sections 60 to65); (B) Deductions to be made in computing Total Income of an individual assessee (sections 80C, 80CCC, 80CCD, 80CCF, 80D, 80DD, 80DDB, 80E, 80G, 80QQB, 80RRB and80U). Note: Only theoretical/small practical and objective type questions shall be asked from	10
4	Basic idea of value added tax levied under Gujarat Value Added Tax Act, 2003 and Sales Tax under Central Sales Tax Act to cover taxable event, payment of tax, filing of return, registration and records relating thereto (in theoryonly); Service Tax: Basic idea of service tax law to cover taxable event, person liable to pay service tax, manner of payment of service tax, filing of return, registration and records relating thereto (theoryonly).	10
	Total	40

Notes:

(i) While setting a question paper, the topic/aspect shall be indicated rather than the sectionnumber.

(ii) Provisions of respective laws applicable (to individual assesses only) as on 31st March immediately preceding the date of commencement of current academic year shall beconsidered.

Scanned with OKEN Scanner

(iii) Whenever any section (included in the present syllabus) is deleted or replaced by a new section as per the amendments made / to be made by a Finance Act, it shall automatically amend the syllabus and shall be implemented in the relevant academicyear.

(iv) Questions from any **Unit / Sub - Unit** shall not be set in option of questions from other **Units / Sub - Units**. Internal option questions may be set from the same **Unit / Sub - Unit**. Wherever a **Unit** is divided into **Sub - Units**, questions from each **Sub - Unit** shall be asked.

(v) Question paper shall contain a compulsory 'Multiple choice question' carrying **14 marks** out of **70** marks (which shall be divided into **seven**sub - questions of **2 marks** each and shall be drawn from each unit / sub -unit of Units **1** to **4,** i.e. **1** sub - question from **Unit 1** and **2** sub - questions each from **other 3 Units) - without providing any internal option,**

requiring the students to select correct option supported by necessary workings / explanations.

Reference: (1) Students' Guide to Income Tax, By DrVinod K Singhania/Dr Monica Singhania- Taxmann's publication.

Scanned with OKEN Scanner

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS – Bachelor of Commerce

Semester – IV

Business Law

Code: 14010401

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objectives:-

1. To make students understand the concept, theories and application of business Law for the Development of the Society.

Course Duration: The Course Durationis of 40 Session of 60 Minutes each.

Module	Topic	Hour
UNIT -1	What is Law, various sources of Law, significance of law, business law, impact of law on society & business economic aspects of Constitution & its implications.	5
UNIT – 2	Law of Contract – Definition & Nature of Contract, types of contract, offer & acceptance, consideration & capacity to contract, free constant, legality of object & consideration, contingent contract, quasi contract, discharge of contract, remedies for breach of contract, indemnity & guarantee, pledge, Principal – agent relationship & rights & obligation of Principal & agent.Law of Indemnity and guarantee	15
UNIT – 3	The Negotiable Instruments Act, 1881 (incorporating latest amendments) Meaning and characteristics of Negotiable Instruments, Classification of Negotiable Instruments, Promissory Note and Bill of Exchange, essential elements, Distinguish between Promissory note and bill of exchange, acceptance and acceptor Acceptance for honour, absolute and qualified acceptance, Drawer, drawee in case of need, payee, dishonor , Cheques, crossings of cheques, distinguish between Bill of Exchange and cheque,	10

Scanned with OKEN Scanner

	penalties in case of dishonor of cheques
UNIT – 4	The Sale of Goods Act, 1930 The Sale of Goods Act, 1930, nature of contract of sale, conditions & warranties, Transfer of ownership, performance of contract of sale, rights of unpaid seller, Remedies for breach of contract Auction sale Law of negotiable instruments – nature of N. I., Promissory notes, BOE, Cheque Parties of NI.

1. Teaching Method:

The following pedagogical tools will be used to teach this course:

- Lectures
- Case Discussions
- Audio – visual Material
- Assignments and Presentations

2. Evaluation:

A	Internal Evaluation	(Internal Assessment- 50 Mar
	Continuous Evaluation Component (Class Presence, Presentation, Overall Behavior)	50 marks
B	End –Semester Examination	(External Assessment-50 Mar

Basic Reading List

Business Law- P.K. Pandey

Business Law D. Chandra Bose

Bare act

indiankanoon.org

Scanned with OKEN Scanner

4. Teaching Methods:

The course will use the following pedagogical tools:

- Lectures
- Case Discussions and Role Playing
- Audio-visual Material (Using CDs/Clippings/ online videos)
- Assignments and Presentations

5. Evaluation:

The evaluation of participants will be on continuous basis comprising of the following elements:

A	Continuous Evaluation Component comprising of Projects / Assignments / Quiz / Class Participation / Class test / Presentation on specific topic etc.	(Internal Assessment- 50 Marks)
B	End-Semester Examination	(External Assessment-50 Marks)

6. Reference Books:

Sr. No.	Author	Name of the Book	Publisher	Year of Publication
1	Zellweger Thomas	Managing the Family Business – Theory & Practices	Edward Elgar Publishing Ltd	Latest Edition
2	Peter Leach	Family Businesses – The Essentials	Profile Books Ltd.	Latest Edition
3	Alberto Gimeno, Gemma Baulenas & Joan Coma-Cros	Family Business Models – Practical Solutions for the Family Business	Palgrave Macmillan	Latest Edition
4	Mark Fischetti	The Family Business Succession Handbook	Family Business Publishing Co.	Latest Edition

Note: Wherever the standard books are not available for the topic, appropriate print and online resources, journals and books published by different authors may be prescribed.

7. List of Journals/Periodicals/Magazines/Newspapers, etc.

1. Family Business Review
2. Journal of Family Business Management
3. Journal of Family Business Strategy
4. Indian Management
5. Journal of Consumer Behaviour

Scanned with OKEN Scanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS- Bachelor of Commerce

Negotiation Skills & Corporate Relation

Semester- V

Code: 14010506

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Course Contents:-

Module	Topics	Hours
1	Negotiation: Introduction, Nature and need for negotiation, negotiation process, Types and styles of negotiation; strategies and tactics; barriers in effective negotiation, Communication Style, Breaking Deadlocks.	10
2	Role of trust in negotiations; negotiation and IT; ethics in negotiation; cultural differences in negotiation styles; gender in negotiations; context of mediation; negotiation as persuasion.	10
3	Corporate Relations: Public relations with the Government: Public relation for the private sector. Employee Relations: Interaction between management & employees, internal Communication media. Media & press relations: Importance of press and its role in building the corporate image, press visits, arranging for press coverage, preparing a press kit, feature stories, articles, press note, press communiqué & press release.	10
4	Financial Public Relations: Types of financial public, role of PR in maintaining contact with financial publics; Annual reports and financial coverage, Arranging for annual general meetings.	10

Scanned with OKEN Scanner

	Distributor & Dealer Relations: Objectives of distributor - deale relation program, tools and media of communication. Supplie Relations: Functions of PR department, objectives of supplier relatio program, tools and media of communication. Consumer Relations Objectives of consumer relations program, planning of consumer relations program, media communication and special events. Community Relations: Community relations program, objectives & policy, media of communication with community. Introduction to International Public Relations & its importance
	Total

Note: Wherever the standard books are not available for the topic appropriate print and online r journals and books published by different authors may be prescribed.

Scanned with OKEN Scanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS- Bachelors of Commerce

SEMESTER - V

INDIAN FINANCIAL SYSTEM

Code: 14010504

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objectives:

- Overview study of Indian financial system including all its components in detail.
- Brief study on regulatory bodies.

Course Content:

Module	Topics	Hours
1	**Overview of the Indian Financial System :** Pre and post liberalization overview of Indian Financial system, Organizational structure of Indian financial system, Major components - Financial Markets, Financial Institutions / Intermediaries, Financial Instruments, Functions and role of financial system. **Regulatory and Promotional Institutions:** Objectives and functions of Reserve bank of India, Security Exchange Board of India, Insurance Regulatory Development Authority.	10
2	**Financial Markets: [25%]** **Primary Market**: Meaning, Types of primary issues-public, Right and Private placement, Issue Mechanism. **Secondary market**: Functions, Organizations, Management and Membership	10

Scanned with OKEN Scanner

	of Stock exchanges, Listing and trading of securities, Stock exchanges in India.	
3	**Financial Institutions:** [25%] **Commercial Banking: Functions** of Commercial banks, Nationalization of commercial banks. Issue of nonperforming assets and their management, Non banking finance companies: Meaning, Types, Growth and regulation. Insurance : Introduction to LIC, GIC and Private insurance companies. Mutual funds: Concept, Advantages, History of MFs in India.	10
4	**Financial Instruments:** [25%] **Capital Market instruments: Equities**, Preference shares, Debentures and Bonds. New Instruments. **Money market instruments :** Call / Notice Money Market, Treasury Bills, commercial Papers, Certificate of Deposit, Commercial bills.	10
	Total	40

References:

(1) Pathak Bharati (2008) : The Indian Financial System, Pearson Education

(2) M Y Khan (2007) : Indian Financial System, The McGraw - Hill Companies

Scanned with OKEN Scanner

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS

Bachelor of Commerce

Semester –5

COMPANY LAW

Code: 14010503

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-		3	3	50		50	-	100

Objectives: To impart expert knowledge of the various provisions of Companies Act, its schedules, rules, notifications, circulars including secretarial practice, case laws and secretarial standards.

Course Duration: The course duration is 36 sessions of 60 minutes each. i.e. 36 hours.

Module	Topic	Hour
Unit-1	Introduction of Company Act 2013-Meaning and Nature of Company, Classification of Companies, Formation of Company. Memorandum of Association, Articles of Association	10
Unit-2	Prospectus, Introduction & Contents. Winding-up of Companies-Different Modes, Oppression & Mis. Management	10
Unit -3	Appointment, Rights, Duties & Liabilities of Directors, Managing Director and Manager.	10
Unit -4	Company Secretary- Definition, Appointment, Qualities, Responsibilities, Position and Duties General Procedure of Meetings, Notice, Agenda, Chairman, Quorum, Motions and Resolution, Types of resolution Methods of Voting, Minutes etc.	10

Scanned with OKEN Scanner

1. . **Teaching Method:**

The following pedagogical tools will be used to teach this course:

- Lectures
- Case Discussions
- Audio – visual Material
- Assignments and Presentations

2. Evaluation:

A	Projects/Assignments/Quiz/Class participation	Weightage (50%) (Internal Assessment)
B	Mid – Semester Examination	Weightage (30%) (Internal Assessment)

Text books:

1. Agarwal&Khatri: Company Law & Secretarial Practice.
2. Chundawat&Khicha: Company Law & Secretarial Practice.
3. Kuchhal, S.C.: Secretarial Practice

Scanned with OKEN Scanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY
SCHOOL OF BUSINESS - BACHELOR OF COMMERCE
COST ACCOUNTING II
Code: 14010501
SEMESTER- V

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objective:

To supplement and consolidate the cost accounting concept and costing methods and equip he students to make use of various costing methods.

Course Content:

Module	Topics	Hours
1	Single or Unit Costing : Components of total cost; Expenses that are not treated as cost in cost sheet; Imputed costs; Treatment of work-in progress; Defective materials; Sale of scrap; Defective product; Normal & abnormal Loss of materials; Treatment of Finished goods; Preparation of Historical cost sheet, Estimated cost sheet, Estimate for work order (Tender/Quotation).	10
2	Reconciliation of profit as per cost accounts with profits as per financial accounts : Reasons for disagreement in profits; Procedure for reconciliation;PreparationofReconciliationStatementand Memorandum Reconciliation Account;	10

Scanned with OKEN Scanner

3	Operating Costing or Service Costing : Meaning of Operating Costing or Service Costing, Features of Operating Costing, Users of Service Costing, Cost Unit, Cost Analysis, Transport Costing, Hospital Costing, Staff canteen Costing. Practical Problems to be asked on Transport Costing, and Hospital Costing only.	10
4	Job, Batch and Contract costing : Definition and Features of Job costing; Pre requisites of Job costing; Source documents, procedure for recording under Job costing: Definition of Batch costing andit accounting procedure; Method of determination of economic batch quantity (EBQ); Definition of Contract costing; Difference between Job & Contract costing; Features of Contract costing; Work certified, work uncertified and Retention money; Method of valuation of work in progress; Profit on incomplete contracts; Accounting entries; Preparation of relevant ledger accounts and Final Accounts of a Contractor; Brief introduction of AS-7 (in theory only).	10
	Total	40

References :

(1) Cost Accounting: Principles & Practice
M N Arora
Vikas Publishing House

(2) Practical Costing
N Ksharma
Shree Niwas Publication

(3) Cost Accounting
Dr P CTulsian
S. Chand

(4) CostAccounting
Dr Murthy & S GurusamyThe
McGraw Hill Companies

Scanned with OKEN Scanner

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS – Bachelor's of Commerce

Family Business Management (FBM)

Code: 14010306

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

1. **Learning Outcomes:**
   - Detailed understanding of the various family business models and structures and their complexities.
   - Getting sensitized towards the need for professionalism in family business management and how to go about achieving the same.
   - Understanding of succession planning management.

2. **Course Duration:** The course duration is of **36 sessions of 75 minutes** each.

3. **Course Contents:**

Module No.	Modules with its Contents/Chapters	No. of Sessions	Marks (out of 70)
I	**Family Business Management - Basics** • Uniqueness & Dynamics – People, Women in Family Business, Systems & Life Cycles • Structural Management of the Family Business • Family Complexity, Culture and Value Systems • Business Complexity • Effects of Complexity on the Family Business Structure.	8	15
II	**Family Business Models** • Captain Model, Emperor Model, Family Team Model, Professional Family Model, Corporation Model • Family Investment Group (FIG) Model • Comparative Analysis of the Models • Mindset and Structure: How Thoughts Influence Deeds?	8	15
III	**Professional Management of Family Business** • Non-family Managers • Non-Executive Directors • Professional Advisors & Consultants • The role of balanced board of directors • Family Constitution for better management	10	20

Scanned with OKEN Scanner

	Family Governance in multigenerational family firms • Change and adaptation in family business • Trans-generational value creation • Changing roles of family members ***Conflict Management*** • Social Structure in family Business • Interpersonal dynamics in family business • Justice Perceptions • Types of conflicts • Conflict dynamics and conflict management strategies		
IV	**Succession Planning** • Understanding Succession Planning • Defining Objectives • Choosing the Right Ownership Structure • Promoting Stewardship • Getting help from Board of Directors ***Management Succession:*** Management Succession Issues • Employment of Family Members • Grooming Family Managers to be Successors • Assessing Family Member Managers • Compensation for Family Members • Managing Family Disagreements • Integrating the Family Component in Business Planning ***Developing Successors*** • Preserving Company Values • Support for Senior Managers • Help for Employees, Suppliers, Customers • From Second to Third Generations ***Transferring Control and Ownership*** • Match Ownership to Control • Tools for Transferring Ownership • Trusting the Firm to Trustees • Incentives for Nonfamily Caretakers **Letting Go** • The Deep Reasons for Founders Resistance • Letting Go with Grace and Style	10	20
V	**Practical** • Discussion of Live cases of successful family business. • Studying the succession planning undertaken by a corporate house / small business and bringing those learning to class via discussions.		(30 marks CEC)

SWARRNIM STARTUP &

SCHOOL OF BUSINESS -

CORPORAT

Code

SEM

Teaching & Evaluation Sch

Teaching Scheme			
Th	Tut	Pr	Total
3	-	-	3

Objective:

- To familiarize student accounts.
- To understand the Pro managers of business

Module	
1	Accounting Meaning ar Issue and Forfei Split of S
2	Account Introduc Provisi SEBI I Journa
3	Acc Issue term

Scanned with OKEN Scanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS – Bachelors of Commerce

Semester – VI

Portfolio Management

Code: 14010606

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objectives:-

- To provide deep understanding on various models applied for managing portfolio.
- Brief analysis on risk and return policy.

Course Contents:-

Module	Topics	Hours
1	Portfolio Management – Risks and Returns: Concept of portfolio and portfolio management, concept of risk, types of portfolio management	10
2	Capital Asset Pricing Model (CAPM): Deals with the assumptions of CAPM and the inputs required for applying CAPM and the limitations of this Model. Factor Models and Arbitrage Pricing Theory: Arbitrage Pricing Theory and its principles, Comparison of Arbitrage Pricing Theory with the Capital Asset Pricing Model.	10
3	Markowitz Portfolio Selection Model: Concept of portfolio analysis and diversification of risk. Also discusses Markowitz Model and Efficient Frontier	10
4	Sharpe-The Single Index Model: Measurement of return on an individual stock, measurement of portfolio return and measurement of individual stock risk International Portfolio Investments: Investment avenues for foreign portfolio investors, risks and returns associated with such investment. Mutual Fund Operations: Mutual funds as a key financial intermediary,	10

Scanned with OKEN Scanner

	mobilizing savings and investing them in capital markets.
	Tota

Reference Books:-

- **Security Analysis And Portfolio Management 6Th Edition by Fischer, PEARSON INDIA.**
- PORFOLIO MANAGEMENT Book by S. KEVIN

Scanned with OKEN Scanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF BUSINESS– Bachelors of Commerce

Semester – VI

Security Analysis

Code: 14010605

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objectives:-

- To provide theoretical as well as practical exposure on security analysis.
- EIC framework knowledge based on projects and assignments.

Course Contents:-

Module	Topics	Hours
1	Investment – A Conceptual Framework: Investment process, risks of investment and the common mistakes made in investment management Investment Environment: Features and composition of money market and capital market, money market, capital market instruments and financial derivatives	10
2	Fundamental Analysis: Economy analysis, industry analysis and company analysis, weaknesses of fundamental analysis Technical Analysis: Tools of technical analysis, important chart formations or price patterns and technical indicators Efficient Market Hypothesis: Concept of 'Efficient Market' and its implications for security analysis and portfolio management.	10
3	Valuation of bonds and shares: Elements of investment, bond features and prices, call provisions on corporate bonds, convertible bonds and valuation of bonds	10
4	Behavioral Finance: Meaning of Behavioral finance, deals with when, how and why psychology influences investment decisions	10

Scanned with OKEN Scanner

	Risk and Return: Concepts of risk and return, how risk is measured in term of standard deviation and variance, the relationship between risk and return
	Total

Reference Books:-

- Security Analysis: Sixth Edition, Foreword by Warren Buffett.
- Security Analysis: The Classic 1940 Edition Book by Benjamin Graham and David Dodd

Scanned with OKEN Scanner

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF MANAGEMENT

Bachelor of Commerce

Semester – VI

INDUSTRIAL LAWS

Code: 14010604

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Objectives:-

- To gain knowledge of various Industrial Laws and also understand the application of Industrial lawsto practical situations.
- To acquaint students from various labour laws.

1. Course Duration: The course duration is 36 sessions of 60 minutes each. i.e. 36 hours.

Module	Topics	Hours
1	Industrial Dispute Act	12
2	Factories Act	7
3	ESIC Act	6
4	Workmen's Compensation Act	6
5	P.F. and Miscellaneous Act	6
6	Payment of Wages Act, 1936	3
	Total	**40**

1. Teaching Method:

The following pedagogical tools will be used to teach this course:

- Lectures
- Case Discussions
- Audio – visual Material
- Assignments and Presentations
-

Scanned with OKEN Scanner

Scanned with OKEN Scanner

2. Evaluation:

A	Projects/Assignments/Quiz/Class participation	Weightage (50%) (Internal Assessment)
B	Mid – Semester Examination	Weightage (30%) (Internal Assessment)

TEXTBOOKS :

1. Labour Laws for Managers By: B.D. Singh 2nd edition Excel Books

Assignment

1. Discuss the scope of Factories act with reference to the definition given by the act and various case laws.
2. Discuss the meaning of Industrial Dispute and explain how it is different as to Personal Dispute.
3. Discuss the Present Scheme of PF by government and Semi-Government Organisation and PF scheme offered by Private Insurance Company
4. Prepare a chart showing procedure under Factories act for getting licence and annual renewal of license.

Topics for Seminar/Presentation:

1. Discuss the Case of Maruti Udyog Ltd and Labour Union.
2. Discuss recent case of Strike and its resolution system adopted by respective organisation.
3. Discuss the Liability of Employer in different industries for different situations. (Accident, Death etc.)
4. Discuss the procedure of claim with ESIC for Accidental Death.
5. Discuss different schemes under P.F. act.

REFERENCE BOOKS:

1. Industrial Relations and Labour Laws by: S.C. Srivastava, 6th Revised Edition, Vikas Publishing House New Delhi.
2. Industrial Law: By: K.C. Garg, V.K. Sareen, Mukesh Sharma, R. C. Chawala, Klayani Publishers, Ludhiyana.
3. Labour Laws By: H.L Kumar Universal Laws Publishing Co. Pvt. Ltd, New Delhi
4. Legal Aspects of Business , Text, Jurisprudence, and Cases, By: Daniel Albuquerque, Oxford University Press, New Delhi.

Reference books

1 . Mergers and Acquisitions for Dummies

2 Mergers, Acquisitions and Prasant Godbole Vikas Publication

3 P. Rajesh Kumar Tata McGraw- Hill Latest Edition

4 Nishikantha Jha Merger and Acquisitions Himalaya Latest Edition

Scanned with OKEN Scanner

SWARNIM STARTUP & INNOVATION UNIVERSITY
SCHOOL OF BUSINESS – BACHELOR OF COMMERCE
Semester – VI
MERGER & ACQUSITIONS
Code: 14010602

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

Learning Objectives:

To provide students with an understanding of: The highly practical "planning-based" approach to managing the acquisition process; and. The issues associated with each phase of the M&A process.

Module	Topics	Hours
1	Introduction to Merger and Acquisition: Meaning of mergers and acquisitions (M & A), motives behind the M & A, advantages and disadvantages of M & A, types of mergers and steps for a successful merger. Strategic Evaluation of M & A Opportunities- selection approaches and criteria, modalities of fixing the acquisition price, key steps in the strategic planning of a merger, feasibility analysis in respect of cash and stock deals, describes fair value: institutional criteria and special features of acquisition of sick companies. Strategising and Structuring M & A Activity- Merger process right from planning the merger till implementation, five-stage model, methods of financial mergers and capital budgeting decision Synergy and Value Creation in Mergers - synergy and its different types, role of industry life cycle, value creation in synergy, theoretical factors that would affect M & A activity	10
2	Corporate Restructuring- meaning of corporate restructuring, need for corporate restructuring, methods of corporate restructuring. Demergers- Meaning of demerger, characteristics of demerger, structure of demerger, and tax implication of demergers	10

Scanned with OKEN Scanner

	LBOs, MBOs, MLPs and ESOPs - meaning of LBO, MBO, MLP , ESOP governance and mode of purchase in LBO, key motives behind an MBO, structure of MBO, types of MLP and ESOP, regulations that govern ESOPs. Joint Ventures - Meaning of joint ventures, characteristics of a joint venture, states the rationale for joint ventures, role of joint ventures in business strategy, defines joint venture and complex learning, tax aspects of joint ventures, international joint ventures, reasons for failure of joint ventures, and joint venture vis-à-vis anti-trust policy	
3	International M & A –Introduction of international M & A activity, the opportunities and threats, role of M & A in international trade growth, the external advantages in differential products, impact of government policies and political and economic stability on international M&A decisions, recommendation for effective cross-border M & A. SECTION B: THE PROCESSES IN M&A Takeover Defences - types of takeovers, techniques of bidding for a takeover, defences against takeover bids, regulations and amendments, and guidelines for takeovers Valuation - valuation approaches, basis of valuation, different methods of valuation, valuation of synergy, corporate control and LBO Accounting for Amalgamation –Meaning of amalgamation, types of amalgamation, methods of accounting for amalgamation, meaning of consideration, treatment of goodwill, reserves and other profits	
4	Legal and Regulatory Framework of M & A -Provisions of the Companies Act, 1956 relating to M & A, buyback of shares, provisions of SEBI act, 1992 and 1997, provisions relevant to M & A activity in the Income Tax Act, and Foreign Exchange Management Act. Post-Merger Integration - integration planning, factors in post-merger integration model, post-merger integration model, strategic interdependence and autonomy, political and cultural aspects in integration, cultural profiling and assessment of cultural compatibility, HRM issues, and problems in integration and five rules of integration process	10
	Total	**40**

Scanned with OKEN Scanner

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF MANAGEMENT

Bachelor of Commerce

Semester – VI

Corporate Economics of India

Code: 14010601

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	50	-	50	-	100

1. **Objectives:**
The course is intended to provide an opportunity to learn and understand how business is conducted in international arena. It aimed at making the students realize that international business is applicable to multiple business functions like Marketing, Human Resource Management, and Financial Management.

2. **Course Duration:** The course duration is 36 sessions of 60 minutes each. i.e. 36 hours.

		Hour
UNIT – I	Introductions- Various types of Business organizations - Sole Trading - Partnership - Joint stock companies - Cooperatives - Advantages and disadvantages of various forms.	10
UNIT-II	Joint sector management contribution and participation.	10
UNIT-III	Meaning of Development and Relevant Concepts : Distinction between growth and development, human development, Human Development Index, Gender Development Index, Sen's capabilities approach, environmental sustainablity and development, Market and State as agencies of development.	10
UNIT-IV	Classical Theories of Development : Rostow's stages of growth, Harrod-Domar growth model, Structural change and Lewis' model of unlimited supplies of labour, Solow's growth theory. 3. Contemporary Models of Development and Underdevelopment : Theories of endogenous growth with special reference to Romer's model, underdevelopment as coordination failure, multiple equilibria, the big push theory and Lebenstence Theory of Critical Minimum Efforts.	10

Scanned with OKEN Scanner

Teaching Method:

The following pedagogical tools will be used to teach this course:

- Lectures
- Case Discussions
- Audio – visual Material
- Assignments and Presentations

3. Evaluation:

A	Projects/Assignments/Quiz/Class participation	Weightage (50%) (Internal Assessment)
B	Mid – Semester Examination	Weightage (30%) (Internal Assessment)

Agrawal.A.N : Indian Economy, Vikas Publishing House, New Delhi.

2. Alak Ghosh : Indian Economy, The World Press, Kolkatta.

3. Arora, R.C : Integrated Rural Development, S.chand & Co.,

4. Arthur Lewis : The Theory of Economic Growth.

5. Arun Ghosh : India in Transition, Economic Policy Options, S.Chand & Co.,

6. Bimal Jalan : India Economic Crisis, Oxford Univesity Press Chennai.

7. Bright Singh : Economics of Development. 8. Dewett, Verma & Sharma : Indian Economomics, S.Chand & Co.,

8. Kasmi – Business Policy and Strategic Management – TMH

9. AzharKasmi – Business Policy

10. Batachariya S T – Strategic Management and Cases – S.Chand

11.Dr. Sankaran – Strategic Management – Margham Publication

12. Jay.Shree Suresh - Entrepreneural Development – Margham Pub.

13.Gupta C. B – Entrepreneural Development 7.Saini – Entrepreneruship

Scanned with OKEN Scanner

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING

DEPARTMENT OF COMPUTER ENGINEERING

ARTIFICIAL INTELLIGENCE

CODE: 2304070l

DEGREE: 7TH SEMESTER

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	P	Total		Th	Pr	Th	Pr	
4	-	4	8	6	30	-	70	50	150

Objectives:

The basic objective of AI is to enable computers to perform such intellectual tasks as decision making, problem solving, perception, understanding human communication (in any language, and translate among them), and the like.

Prerequisites:

Before learning this course students must know the basics of Programming language and algorithms.

Course outline:-

Sr.No.	Course Contents	Number of Hours
1	**INTRODUCTION OF AI:** The AI Problems, What is an AI technique, Application of AI, The Underlying Assumption.	6

2	**PROBLEM SPACE AND SEARCH:** State space search, Uninformed - DFS, BFS, Iterative Deepening and informed search techniques: heuristic Functions, Generate and Test Hill Climbing, Problem Reduction ,Constraint Satisfaction ,Mean-Ends Analysis ,Simulated Annealing, A*, variations of A*	8
3	**KNOWLEDGE REPRESENTATION AND REASONING:** Introduction To Logic, Propositional Logic, Reasoning in Propositional logic, First Order Logic: Syntax and Semantics, Inference in First Order Logic, Unification, Forward and backward chaining, Resolution	5
4	**ADVERSARIAL SEARCH AND GAME PAYING:** Games, Minimax algorithm, alpha beta pruning, Constraint-satisfaction problems	7
5	**INTRODUCTION TO PROLOG:** Syntax of Prolog ,Facts and predicates, data types, goal finding, backtracking, simple object, compound objects, use of cut and fail predicates, recursion, lists, simple input/output, implementing AI problem in Prolog, dynamic database	7
6	**NATURAL LANGUAGE PROCESSING:** Introduction, Syntactic Processing, Semantic Analysis, Semantic Analysis, Discourse And Pragmatic Processing, Spell Checking	8
7	**EXPERT SYSTEM ARCHITECTURE & TOOL:** Introduction, Rule Based System Architecture, Nonproduction System Architecture, Dealing with Uncertainty, Knowledge Acquisition & Validation, System Building Tools	

Learning Outcomes:-

Upon successful completion of the course, the student should be able to:

- Be familiar with Artificial Intelligence, its foundation and principles.
- Examine the useful search techniques; learn their advantages, disadvantages and comparison.
- Learn programming language to program intelligent systems.
- Understand important concepts like Expert Systems, AI applications.
- Be exposed to the role of AI in different areas like NLP, Pattern Recognition etc.
- Learn the practical applicability of intelligent systems, specifically its applications.
- Be able to develop intelligent systems

Teaching & Learning Methodology:-

At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.

- Lectures will be conducted with the aid of multi-media projector, black board, OHP etc.
- Attendance is compulsory in lecture and laboratory which carries 10 marks in overall evaluation.
- One internal exam will be conducted as a part of internal theory evaluation.

- Assignments based on the course content will be given to the students for each unit and will be evaluated at regular interval evaluation.
- Surprise tests/Quizzes/Seminar/tutorial will be conducted having a share of five marks in the overall internal evaluation.
- The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.
- Experiments shall be performed in the laboratory related to course contents.

Books Recommended:-

1. Artificial Intelligence, Elaine Rich & Kevin Knight, TMH Publication
2. Stuart Russell and Peter Norvig, Artificial Intelligence: A Modern Approach, 2nd Edition, Pearson Publication.
3. George Lugar, "AI-Structures and Strategies for Complex Problem Solving", 4/e, 2002, Pearson Educations.
4. Introduction to Turbo PROLOG, Carl Townsend, BPB Publication.
5. Introduction to AI & Expert Systems, Dan W. Patterson, PHI Publication.
6. "PROLOG Programming For Artificial Intelligence" -By Ivan Bratko(Addison-Wesley)

E-Resources:-

https://nptel.ac.in/courses/106106126/

Practical List:-

Sr. No.	Practical's
1	Study of facts, objects, predicates and variables, Rules, Unification in PROLOG.
2	Write a program to implement "cut" and "fail" predicate in PROLOG
3	Write a program to implement arithmetic operators, simple input/output and compound goals in PROLOG.
4	Write a program to implement recursion in PROLOG.
5	Write a program to implement Lists in PROLOG.
6	Write a program to implement string operations in PROLOG. Implement string operations like substring, String position, palindrome etc.)
7	Write a program to solve travelling salesman problem using Prolog.
8	Study of dynamic database in PROLOG.
9	Write a program to implement BFS (for 8 puzzle problem or Water Jug problem or any AI search problem)
10	Write a program to implement DFS (for 8 puzzle problem or Water Jug problem or any AI search problem)

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING
DEPARTMENT OF COMPUTER ENGINEERING
PYTHON PROGRAMMING
CODE: 2304702
DEGREE 7th SEMESTER

Teaching & Evaluation Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	4	7	5	30	--	70	50	150

Objectives:

Python is a modern language useful for writing compact codes specifically for programming in the area of Server-side Web development, Data Analytics, AI and scientific computing as well as production tools and game programming. This course covers the basics and advanced Python programming to harness its potential for modern computing requirements.

Prerequisites: Required Basic Knowledge of Object-Oriented Concepts.

Course Outline:-

Sr. No	Course Contents	Number of Hours
1	**Introduction to Python Programming Language:** • Strengths andWeaknesses, • IDLE, DynamicTypes, • NamingConventions, • StringValues, • StringOperations, • StringSlices, • StringOperators, • Numeric DataTypes, • Conversions	4

	• Built inFunctions	
2	**Data Collections and Functions, Scoping and Abstraction:** • Tuples • set • Lists and Dictionaries • Lists and Mutability • Functions as Objects • Functions and scoping • Global keyword • Modules • System Functions and Parameters • Strings and Input • Iteration • Control Structures	8
3	**Classes and Object-Oriented Programming:** • Classes inPython • Principles of ObjectOrientation • CreatingClasses • InstanceMethods • SpecialMethods • ClassVariables • Inheritance • Polymorphism • TypeIdentification • Custom ExceptionClasses	8
4	**Functions, Scoping and Abstraction:** • Functions and scoping • Specifications • Recursion • Global variables • Modules • Files • System Functions and Parameters	7
5	**I/O and Error Handling inPython:** • Introduction • DataStreams • Creating Your Own Data Streams • AccessModes • Writing Data to aFile • Reading Data from aFile • Additional FileMethods • Using Pipes as DataStreams • Handling IO Exceptions • Working withDirectories • Metadata • Errors • Run TimeErrors • The ExceptionModel • ExceptionHierarchy	8

	• Handling MultipleExceptions • Types of testing – Black-box and Glass-box • Debugging	
6	**Advance Topics:** • Application of AI, Future of AI, Introduction of Machine Learning, Introduction of Deep Learning, Machine Learning vs Deep Learning. • Deep Learning Libraries. • Neural Networks • Security – Encryption and Decryption, Classical Cyphers • Graphics and GUI Programming – Drawing using Turtle, Tkinter and Python, Other GUIs • Plotting using PyLab • Networking and Multithreaded Programming, Sockets, Threads and Processes, Chat Application	5

Learning Outcomes:

After learning the course, the student will be able:

- To develop proficiency in creating based applications using the Python Programming Language.
- To be able to understand the various data structures available in Python programming language and apply them in solving computational problems.
- To be able to do testing and debugging of code written in Python.
- To be able to draw various kinds of plots using PyLab.
- To be able to do text filtering with regular expressions in Python
- To be able to create socket applications in Python
- To be able to create GUI applications in Python
- To be able to build Artificial neural network model in Python

Teaching & Learning Methodology:-

- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
- Lectures will be conducted with the aid of multi-media projector, black board.
- Attendance is compulsory in lecture and laboratory which carries 10 marks in overall evaluation.
- One internal exam will be conducted as a part of internal theory evaluation.
- Assignments based on the course content will be given to the students for each unit and will be evaluated at regular interval evaluation.
- Surprise tests/Quizzes/Seminar/tutorial will be conducted having a share of five marks in the overall internal evaluation.
- The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.
- Experiments shall be performed in the laboratory related to course contents.

Books Recommended:-

1. John V. Guttag, "Introduction to Computation and Programming Using Python", Prentice Hall of India
2. R. Nageswara Rao, "Core Python Programming", dreamtech
3. Wesley J. Chun, "Core Python Programming, Second Edition", Prentice Hall
4. Michael T. Goodrich, Roberto Tamassia, Michael H. Goldwasser, "Data Structures and Algorithms in Python", Wiley
5. Kenneth A. Lambert, "Fundamentals of Python – First Programs", CENGAGE Publication
6. Luke Sneeringer, "Professional Python", Wrox
7. "Hacking Secret Ciphers with Python", Al Sweigart, URL- https://inventwithpython.com/hacking/chapters

E-Resources:-

https://www.tutorialspoint.com/python/index.htm
https://www.javatpoint.com/python-tutorial

Practical List:-

Sr. No	Practical's
1	Write python program to print Hello World
2	Write python program to Hello World using string variable
3	Write python program to store data in list and then try to print them.
4	Write python program to do basic trim and slice on string.
5	Write python program to print list of numbers using range and for loop
6	Write python program to store strings in list and then print them.
7	Write python program to let user enter some data in string and then verify data and print welcome to user.
8	Write python program in which a function is defined and calling that function prints Hello World
9	Write python program in which a function(with single string parameter) is defined and calling that function prints the string parameters given to function.
10	Write python program in which a class is define, then create object of that class and call simple print function define in class.
11	Write a python program to demonstrate the python libraries for machine learning and deep learning
12	Develop programs to learn regular expressions using python.
13	Develop chat room application using multithreading.
14	Learn to plot different types of graphs using PyPlot.
15	Implement classical ciphers using python.
16	Draw graphics using Turtle.
17	Develop programs to learn GUI programming using Tkinter.

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING

DEPARTMENT OF COMPUTER ENGINEERING

IOT AND APPLICATIONS

CODE: 2304070 3

B.E. 7TH SEMESTER

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	4	7	5	30	--	70	50	150

Objectives: -

To assess the vision and Introduction of IOT. To Understand IOT Market perspective. To Implement Data and Knowledge Management and use of Devices in IoT Technology. To Understand State of the Art - IoT Architecture. To classify Real World IoT Design Constraints, Industrial Automation in IoT.

Prerequisite:-

Fundamentals of computer network, wireless sensor network, communication & internet technology, web technology, information security.

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Introduction to IoT:** The Internet of Things Today, Towards the IoT Universe, Defining IoT, Characteristics of IoT, Physical design of IoT, Logical design of IoT, Functional blocks of IoT, Communication models & APIs.	08
2	**IoT& M2M:** Machine to Machine, Difference between IoT and M2M, Software define Network.	06
3	**Network & Communication aspects:** Wireless medium access issues, MAC protocol survey, Survey	

	routing protocols, Sensor ... aggregation & dissemination.	
4	**Challenges in IoT:** Design challenges, Development challenges, Security ... Other challenges.	07
5	**Domain specific applications of IoT:** Home automation, Industry applications, Surveillance applications, Other IoT applications	
6	**Developing IoTs:** Introduction to Python, Introduction to different IoT tools, Developing applications through IoT tools, Developing sensor based application through embedded system platform, Implementing IoT concepts with python	06

Learning Outcomes:-

After learning the course, the student will be able:

1. Understand the vision of IoT from a global context.
2. Understand the application of IoT.
3. Determine the Market perspective of IoT.
4. Use of Devices, Gateways and Data Management in IoT.
5. Building state of the art architecture in IoT.
6. Application of IoT in Industrial and Commercial Building Automation and Real World Design Constraints.

Teaching & Learning Methodology:-

At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.

1. Lectures will be conducted with the aid of multi-media projector, black board, OHP etc
2. Attendance is compulsory in lecture and laboratory which carries 10 marks in overall evaluation.
3. One internal exam will be conducted as a part of internal theory evaluation.
4. Assignments based on the course content will be given to the students for each unit and will be evaluated at regular interval evaluation.
5. Surprise tests/Quizzes/Seminar/tutorial will be conducted having a share of five marks in the overall internal evaluation.
6. The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.
7. Experiments shall be performed in the laboratory related to course contents.

	routing protocols, Sensor deployment & Node discovery, Data aggregation & dissemination	07
4	**Challenges in IoT**: Design challenges, Development challenges, Security challenges, Other challenges.	06
5	**Domain specific applications of IoT**: Home automation, Industry applications, Surveillance applications, Other IoT applications	07
6	**Developing IoTs**: Introduction to Python, Introduction to different IoT tools, Developing applications through IoT tools, Developing sensor based application through embedded system platform, Implementing IoT concepts with python	06

Learning Outcomes:-

After learning the course, the student will be able:

1. Understand the vision of IoT from a global context.
2. Understand the application of IoT.
3. Determine the Market perspective of IoT.
4. Use of Devices, Gateways and Data Management in IoT.
5. Building state of the art architecture in IoT.
6. Application of IoT in Industrial and Commercial Building Automation and Real World Design Constraints.

Teaching & Learning Methodology:-

At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.

1. Lectures will be conducted with the aid of multi-media projector, black board, OHP etc.
2. Attendance is compulsory in lecture and laboratory which carries 10 marks in overall evaluation.
3. One internal exam will be conducted as a part of internal theory evaluation.
4. Assignments based on the course content will be given to the students for each unit and will be evaluated at regular interval evaluation.
5. Surprise tests/Quizzes/Seminar/tutorial will be conducted having a share of five marks in the overall internal evaluation.
6. The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.
7. Experiments shall be performed in the laboratory related to course contents.

Books Recommended:-

1. Vijay Madisetti, ArshdeepBahga, "Internet of Things: A Hands On Approach"
2. WaltenegusDargie,ChristianPoellabauer, "Fundamentals of Wireless Sensor Networks; Theory and Practice"

E-Resources:-

1) https://www.udemy.com/internet-of-things-iot-for-beginners-getting-started/

2) http://playground.arduino.cc/Projects/Ideas

3) http://runtimeprojects.com

4) http://www.megunolink.com/articles/arduino-garage-door-opener

5) http://www.willward1.com/arduino-wifi-tutorial

Practical List:-

Sr. No.	Practical's
1	Define and Explain Eclipse IoT Project
2	List and summarize few Eclipse IoT Projects
3	Sketch the architecture of IoT Toolkit and explain each entity in brief
4	Demonstrate a smart object API gateway service reference implementation in IoT toolkit
5	Write and explain working of an HTTP- to-CoAP semantic mapping proxy in IoT toolkit.
6	Describe gateway-as-a-service deployment in IoT toolkit.
7	Explain application framework and embedded software agents for IoTtoolkiit
8	Explain working of Raspberry Pi.
9	Connect Raspberry Pi with your existing system components.
10	Give overview of Zetta

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING

DEPARTMENT OF COMPUTER ENGINEERING

NETWORK PROGRAMMING

CODE: 2304704

B.E. 7th SEMESTER

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	-	4	7	5	30	-	70	50	150

Objectives:

This course provides the student with fundamental knowledge of the various aspects of computer networking and enables students to appreciate recent developments in the area. The course will be driven from the engineering perspective.

- The learning objectives of this course are to:
- Understand uses of TCP/IP protocol suite.
- Understand, design and implement Advanced Applications
- Utilize the concepts of TCP/IP protocol to develop client-server applications.

Prerequisites:-

Brief knowledge about Data Communication & Networking concepts such as Network Topology, Network Models-OSI,TCP-IP, network categories and network connecting devices, Internetworking, Internetworking Infrastructure, Internetworking Routing, Socket Interface.

Course outline:-

Sr.No.	Course Contents	Number of Hours
1	**Layering Model and Physical Interface:** Introduction, Protocols and Standards, Standards Organization, Internet Standards, Internet Administration, A Brief History, The OSI Model, Layers in the OSI Model, TCP/IP Protocol suite, Addressing, TCP/IP versions, Underlying Technologies: Local Area Networks (LAN), Point-to-Point WAN, Switched WAN, Connecting Devices.	06
2	**Internetworking Infrastructure:** Subnetting and Supernetting, Subnetting, Masking, Example of subnetting, Variable-length Subnetting, Supernetting, Internet Protocol :-Datagram, Fragmentation, Options, Checksum, IP Design, IP Addressing :- Datagram, Fragmentation, Options, Checksum, IP Design, IP Addressing - Introduction, Classful Addressing, Other Issues, A sample internet with classful addresses, Bridging and Interfacing: ARP, RARP, BOOTP, DHCP .	9
3	**Internetworking Routing:** Delivery and Routing of IP Packets ,Routing Protocols -Interior and Exterior Routing, RIP, OSPF, BGP, Internet Control Message Protocol (ICMP) ,Internet Group Message Protocol (IGMP),Multicast Routing, Multicast Trees, Multicast Routing Protocols, DVMRP, MOSPF, CBT, PIM, MBONE.	10
4	**Transport and Application Services:** User Datagram Protocol (UDP)-Process-to- Process Communication, User Datagram, Checksum, UDP Operation, Use of UDP, UDP Design, Transmission Control Protocol (TCP) -Process-to-Process Communication, TCP Services, Segment, Options, Checksum, Flow Control, Error Control, TCP Timers, Connection, State Transition Diagram, Congestion Control, TCP Operation, TCP Design, Domain Name System ,File Transfer Protocol ,Application Layer and Client-Server Model	9
5	**Socket Interface:** Definitions, Sockets, Byte Ordering, Address Transformation, Byte Manipulation Functions, Information about remote host, Socket System Calls, Connectionless Iterative Server, UDP Client-Server Programs, Connection Oriented Concurrent Server, TCP Client-Server Programs.	06

Learning Outcomes:-

After completing this course, students will be able to:

- Know how internet exchanges data
- Know various addressing standards of internet
- Know various routing algorithm
- Know about Socket

Teaching & Learning Methodology:-

- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
- The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.
- Experiments shall be performed in the laboratory related to course contents.
- describe major technologies and protocols used in network communications
- demonstrate advanced knowledge of networking.
- demonstrate advanced knowledge of programming for network communications
- make use of various solutions to perform inter-process communications

Books Recommended:-

1. TCP/IP Protocol Suite by **Behrouz A. Forouzan**, Tata McGraw Hill.
2. UNIX Network Programming Volume-1 by **W. Richard Stevens, Bill Fenner and Andrew M. Rudoff**, Addision-Wesley.
3. High-Speed Networks and Internets, Performance and Quality of Service, Second Edition,**William Stallings**, Pearson
4. Internetworking with TCP/IP Volume-2, Client-Server Programming and Applications by **Douglas E. Comer and David L. Stevens**, Prentice Hall

Practical List:-

Sr. No.	Practical's
1	Understanding and using of commands like ifconfig, netstat, ping, arp, telnet, ftp, finger, traceroute, whois
2	Socket Programming: Implementation of Connection-Oriented Service using standard ports.
3	Implementation of Connection-Less Service using standard ports
4	Implementation of Connection-Oriented Iterative Echo-Server, date and time, character generation using user-defined ports
5	Implementation of Connectionless Iterative Echo-server, date and time, character generation using user-defined ports.
6	Implementation of Connection-Oriented Concurrent Echo-server, date and time, character generation using user-defined ports

7	Program for connection-oriented Iterative Service in which server reverses the string sent by the client and sends it back
8	Program for connection-oriented Iterative service in which server changes the case of the strings sent by the client and sends back (Case Server).
9	Program for Connection-Oriented Iterative service in which server calculates the Net-salary of an Employee based on the following details sent by the client i)basic-sal ii) hra iii) da
10	Program for file access using sockets.
11	Program for Remote Command Execution using sockets.
12	Implementation of DNS .
13	Program to implement Web Server using sockets

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING

DEPARTMENT OF COMPUTER ENGINEERING

ANDROID PROGRAMMING

CODE : 2304080l

B.E.: 8th Semester

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
4	-	4	8	6	30	--	70	50	150

Objectives:

Android programming is a hands-on course which is designed for providing essential skills and experiences to the learners in developing applications on mobile platform. The hands-on training is effective for beginners and experienced developers for practical Android Code Application. The course suits the JAVA developers who seek a fast track to the Android API and best practices. Throughout the duration of program, the students are helped to develop a real-life application which acts as a basis for future projections. Throughout the class Eclipse and SDK are used as the development environment.

Prerequisites:-

Java programming and Object-oriented programming, Knowledge of RDBMS and OLTP

	Android SDK Features, Introduction to Develop of ANDROID, Developing for ANDROID, developing for mobile and embedded devices, ANDROID development tools, How to setup Android Development Environment, Android development Framework Android-SDK, Eclipse Emulators, What is an Emulator / Android AVD ? Creating & setting up custom Android emulator Android Project Framework My First Android Application, Creating Applications using ANDROID, Basics of an ANDROID application, introduction to manifest, externalizing resources, application life cycle, ANDROID activities	
2	**Android Activities and UI Design :** Introduction to layouts, introduction to fragments, creating new views, introduction to adapters, Intents and broadcast receivers, Introduction to intents, creating intents and broadcast receivers, Using Internet resources , User Input Controls: Getting user input , Changing keyboards , Buttons , Dialogs and pickers , Spinners, checkboxes, and radio buttons , Gestures , Speech recognition (not done), Sensors (not done), Menus: Options menu, contextual menus (floating and action bar), and popup menu, Adding menu items. Handling on Clicks from menus.	10
3	**Files, saving state and preferences :** Creating, saving and retrieving shares preferences, including static files as resources, working with the file system Database and content providers: Introducing ANDROID databases, content values and cursors, working with SQLite databases, Content Providers: When to implement content providers , How to implement content providers (overview), Content URIs , UriMatcher, Content Provider authorities , Required methods on Content Provider (query, insert, delete, update) , MIME types , Contracts , Making content provider data accessible to other apps by modifying manifest, and protecting data with permissions.	10

Course outline:-

Sr.No.	Course Contents	Number of Hours
1	**Introduction to ANDROID :** ANDROID SDK Features, Introduction to Development Features, Basics of ANDROID, Developing for ANDROID, developing for mobile and embedded devices, ANDROID development tools, How to setup Android Development Environment, Android development Framework Android-SDK, Eclipse Emulators, What is an Emulator / Android AVD ? Creating & setting up custom Android emulator Android Project Framework My First Android Application, Creating Applications using ANDROID, Basics of an ANDROID application, introduction to manifest, externalizing resources, application life cycle, ANDROID activities	10
2	**Android Activities and UI Design :** Introduction to layouts, introduction to fragments, creating new views, Introduction to adapters, Intents and broadcast receivers, Introduction to intents, creating intents and broadcast receivers, Using Internet resources , User Input Controls: Getting user input , Changing keyboards , Buttons , Dialogs and pickers , Spinners, checkboxes, and radio buttons , Gestures , Speech recognition (not done), Sensors (not done), Menus: Options menu, contextual menus (floating and action bar), and popup menu, Adding menu items. Handling on Clicks from menus.	10
3	**Files, saving state and preferences :** Creating, saving and retrieving shares preferences, including static files as resources, working with the file system Database and content providers: Introducing ANDROID databases, content values and cursors, working with SQLite databases, Content Providers: When to implement content providers , How to implement content providers (overview), Content URIs , UriMatcher, Content Provider authorities , Required methods on Content Provider (query, insert, delete, update) , MIME types , Contracts , Making content provider data accessible to other apps by modifying manifest, and protecting data with permissions.	10

4	**Background task :** Introducing services, using background threads, using alarms Enhancing user experience, Introduction and addition of action bar, menus and dialogs, drawables and gradients, custom animations Broadcast Receivers: What is a Broadcast Receiver and a Broadcast Intent? , Broadcast Receiver Security and Lifecycle, Services: What is a service? Long running task without a UI, Difference between Activity and Service , Start and 10 stop services, Lifecycle methods, Foreground services, IntentService class, App priority (critical, high, low), How to create a new Service, Notifications: What is a Notification? , Notification Design Guidelines. Maps and location based services (Using location based services, selecting a location provider, finding your current location, creating map based activities)	10
5	**Audio, video and using the camera** Playing audio and video, manipulating raw audio, using camera to take pictures, recording video, adding media to media store Telephony and SMS Hardware support for telephony, using telephony, introducing SMS and MMS Monetizing, promoting and distributing the applications Signing and publishing applications, distributing applications, introduction to monetizing applications	9

Learning Outcomes:-

By completion of this course a learner should be able to:

- Build and deploy their Android application.
- Learners understand the operation of the application, application lifecycle, configuration files, intents, and activities.
- The candidates get a better understanding of the components, layouts, event handling, and screen orientation.

- Learners also develop a working knowledge of the custom UI elements and positioning.
- The candidates may also have an in depth understanding of broadcast receivers and services.

Teaching & Learning Methodology:-

- The course content should be taught and implemented with the aim to develop required skills in the students so that they are able to acquire following competency:
- Develop GUI based mobile applications with Eclipse Android SDK on open source Android and propriety platforms with database connectivity.
    1) ANDROID Studio [Latest Version]
    2) ANDROID Version [Jelly Bean and later]

Books Recommended:-

1. Professional Android Application Development, Reto Meier, Wiley India Pvt Ltd
2. Beginning Android, Mark L Murphy, Wiley India Pvt Ltd.
3. Professional Android, Sayed Y Hashimi and Satya Komatineni, Wiley India Pvt Ltd.

E-Resources:-

Additional Resources of Android that can be used for conducting Practical as well as case studies :

- Developing Andriod Apps- Udacity https://www.udacity.com/course/ud853
- Build your firs App http://developer.android.com/training/basics/firstapp/index.html
- Android App Development Tutorial http://www.codelearn.org/androidtutorial
- ADT Plugin http://developer.android.com/tools/sdk/eclipse-adt.html
- Installing the Eclipse Plugin http://developer.android.com/sdk/installing/installing-adt.html
- Eclipse Download https://www.eclipse.org/downloads/

Practical List:-

Sr. No.	Practical's
1	Introduction to android operating system and study of basic widgets.
2	Study of android lifecycle and demonstration of it.
3	Program for First Android Application.
4	Program for developing an Android Application using a linear layout.
5	Study of intents and types of intents
6	Study of list views and adapters
7	Study of dialog interfaces in android
8	Study of Services in android
9	Study of android database (SQlite)
10	Mini Project

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINERING

DEPARTMENT OF COMPUTER ENGINEERING

PROGRAMMING WITH XML AND JSON

CODE: 2304080202

DEGREE: 8TH SEMESTER

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	P	Total		Th	Pr	Th	Pr	
4	-	4	8	6	30	-	70	50	150

Objectives:

This subject provides a detailed knowledge of XML technology like what is xml, features of xml, xml example, xml related technologies, creating xml structure by DTD, creating xml structure by schema (XSD), difference between DTD and schema.

In addition student will get knowledge on JSON, Which will help to learn JSON fundamentals, example, syntax, array, object, encode, decode, file, date and date format.

Prerequisites:

Before learning this course students must know the basics of HTML and JavaScript before learning this subject.

Course outline:-

Sr.No.	Course Contents	Number of Hours
1	**Introduction:** XML Features, HTML vs XML, XML Example, XML Technologies, XML Attributes, XML Comments, XML Tree.	9
2	**XML Validation:** Validation, XML DTD, XML CSS, XML Schema, DTD vs XSD, CDATA vs PCDATA.	7
3	**XML Advance:** XML Parsers, XML DOM, XML Database, XML Namespaces.	7
4	**XML Tools:** XML Viewers, XML Editors, XML Parsers, XML Processors.	6
5	**JSON :** Introduction of JSON, JSON Syntax, JSON DataTypes, Deep dive with examples, JSON Comparison with XML	7
6	**JSON:** JSON Objects, JSON Array, JSON Comments, JSON Schema.	5
7	**JSON:** JSON with PHP, JSON with Perl, JSON with Python, JSON with Ruby, JSON with Java, JSON with Ajax, JSON with Swift	8

Learning Outcomes:-

Upon successful completion of the course, the student should be able to:

- Describe the phases of planning and design of XML and JSON.
- This subject will help students to develop mobile application in terms of retrieving data from Database. XML and JSON used in web services request response in iOS and Android.

Teaching & Learning Methodology:

For understand this syllabus students need do several experiment on different software tools.

Books Recommended:

1. Learning XML, Book by Erik T. Ray
2. Beginning XML, Book by Wiley
3. Json for Beginners
4. JSON Quick Syntax Reference

E-Resources:-

https://www.tutorialspoint.com/xml/xml_tutorial.pdf
https://www.w3schools.com/xml/
https://www.javatpoint.com/json-vs-xml

Practical List:-

Sr. No.	Practical's
1	Study practical of XML Namespace.
2	Retrieve data from Database using XML.
3	Create document using XML.
4	Fetch different tags from created document and parse it.
5	Make advanced level XML file with nested tags and fetch tags using the parser.
6	Create a document using JSON.
7	Retrieve data from Database using JSON.
8	Fetch tags from the created document and parse it.
9	Make advanced level JSON files with nested tags and fetch tags using the parser.
10	XML Tree level Structure files parsing.
11	JSON Tree level structures file parsing.

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING

DEPARTMENT OF COMPUTER ENGINEERING

GRAPHICS PROGRAMMING & ANIMATION

CODE : 2304080 3

B.E. 8th SEMESTER

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	-	4	8	6	30	-	70	50	150

Objectives:

Explain the history of animation and also provides an insight to various medium of communicative media.

- Formulate a working definition of interactive multimedia.
- Demonstrate the use of animation, digitized sound, video control, and scanned images.
- Teach some compression techniques.
- Use basic instructional design principles in the development of stacks.
- Will develop conceptual maps of content and process for interactive multimedia instructional programs.

Prerequisites:-

Animation is the process of designing, drawing, making layouts and preparation of photographic sequences which are integrated in the multimedia and gaming products. Animation involves the exploitation and management of still images to generate the illusion of movement. A person who creates animations is called animator. He / she can use various computer technologies to capture the still images and then to animate these in desired sequence.

Course outline:-

Sr.No.	Course Contents	Number of Hours
1	**Multimedia Communications:** Introduction, Multimedia information representation, Multimedia networks, Multimedia applications, Application and networking terminology, Multimedia information representation, Digitization, Principles, Text and Images, Audio and video, Digital Video, Audio/Image coding standards	8
2	**Image Compression Systems:** Fundamentals of Image, Redundancy In Image, Lossless And Lossy Image Compression Techniques, Measurements Quality of Reconstructed Image (MSE, SNR, PSNR) , Huffman Coding, GIF, TIFF, JPEG	7
3	**Text Compression:** Compression Principles, Entropy And Source Encoding, Static Huffman Coding, Dynamic Huffman Coding, Arithmetic Coding, LZW Coding	8
4	**Audio-Video Compression:** Audio Compression, PCM, DPCM, ADPCM, Adaptive Predictive Coding, Linear Predictive Coding, Code Excited Coding, Perceptual Coding, Mpeg Audio Coder, Digital Video Coding Fundamentals, Video Compression Principles, Video Compression Standards	7
5	**2D Animation:** Basic Sketching, Working with Photoshop, Image Compositing, Digital Painting, Working with Flash/Animate, Advanced 2D Animation Techniques, Audio-Video Editing.	7
6	**3DAnimation:** Introduction, Modeling : Polygon and Splines, Animation techniques : Key Frame Animation, Forward Kinematics, Inverse Kinematics, Shape Deformation, Rendered Animation, Morphing, Character Animation, Facial Animation	8
7	**Introduction to 3D Modeling and Animation tool:** Blender	4

Learning Outcomes:

After successful completion of this course, student will be able to

- Understand the basic Animation tools.
- To understand some basic compression techniques.
- To study 3D animation techniques.

Teaching & Learning Methodology:

For teaching this subject we need some software requirements like newest version of Google Chrome of Mozilla Firefox, Autodesk Maya or Equivalent Animation software, Adobe Photoshop, Flash. Some hardware requirements like Microsoft Windows 7, Windows 8, windows 8.1 or windows 10, 4GB of RAM, 64 bit Intel or AMD multi-core processor, Webcam, 4GB Free disk space.

Books Recommended:

1. Multimedia Communications- Applications, Networks, Protocols & Standards, Fred Halsall, Pearson Publications.
2. Principles of Three dimensional computer animation, Michael O'Rourke, WW Norton & Company.
3. Introduction to Multimedia Communications, K.R. Rao, Zoran S.B. & Dragorad A.M, Publications Wiley.
4. Facial modeling and animation: stop staring, Jason Osipa, Wiley India Pvt. Ltd.

E-Resources:

1. https://www.autodesk.in/products/maya/free-trial
2. www. blender.org
3. https://www.keycdn.com/support/what-is-image-compression

Practical List:

Sr. No.	Practical's
1	Write a program on Text compression.
2	Do program on Image compression.
3	Audio compression
4	Video compression
5	Key frame based animation
6	Morphing
7	Rendered animation
8	Character animation
9	Facial animation
10	Modeling and animation using Blender

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ELECTRICAL ENGINEERING

SWITCH GEAR AND PROTECTION

CODE: 23050702

B.E. VIITH SEMESTER

Teaching and Examination Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	-	2	5	5	30	50	70	-	150

Objectives:

This subject is a core subject and very important for any practicing electrical engineer. The electrical engineer has to deal with many switchgears and protection systems of various elements of power systems. The subject curriculum focuses on the study of fundamentals of power system protection, electromagnetic relays which are important one. It also covers the protection of feeders, transmission lines, transformers, generators and induction motors. The subject deals with the principles of circuit breaking and circuit breaker fundamentals. It also covers the working principle of protective switch gears like CT and PT. The topics covered in the curriculum are chosen in such a way that the students get a very good idea of the underlying principles of switchgear and protection.

Prerequisites: - Control System Engineering

Contents:

Sr. No.	Topics	Teaching Hrs. (58 Hrs)
1	**Introduction to Protective Relaying and electromagnetic relays** Faults, Causes and Effects, Protective Zones, Primary and Backup Protection, Desirable Qualities and Terms of Protective Relaying, Basic Connection of Trip Circuit, Types of Relay Units, Relay Pick up, Reset or Drop out, Pick up/ Drop off Ratio, Construction and Working of Different Electromagnetic Relays	3

Prof Ramji Kanani 9/6/20 Prof. V.B. Babaria

2	**Over Current Protection of Transmission line** Introduction, Fuse, Thermal Relays, Over Current Relays, Application of Definite Time & IDMT O.C. Relays for Protection of Feeder, Directional Over Current Relay, Limitations of O.C. Relays	3
3	**Differential Protection** Simple Differential Protection, Zone of Protection and Actual Behavior of Simple Differential Protection, Percentage Differential Protection, Earth Leakage Protection	4
4	**Transformer Protection** Types of Faults, Over Current Protection, Percentage Differential Protection, Inrush Phenomenon, High Resistance Ground Faults in Transformers, Inter-turn Faults, Incipient Faults, Over-fluxing Phenomenon[	4
5	**Distance Protection of Transmission line** Drawbacks of O.C. Protection, Introduction to Distance Protection, Types of Distance Relay, Impedance, Reactance, MHO Relay, Performance of Distance Relay During Normal Load and Power Swing, Effect of Arc Resistance on Reach of Distance Relays, Comparison of Distance Relays, Distance Protection of Transmission line, Reasons for Inaccuracy of Distance Relay Reach, Three Step Protection, Trip contact configuration, 3-step protection of double and fed lines	5
6	**Carrier aided protection of transmission lines** Need for carrier aided protection of transmission lines, various options for carrier, Coupling and trapping the carrier into the desired line section, single line to ground coupling, line to line coupling, unit type carrier aided directional comparison relaying, carrier aided distance scheme for acceleration of zone II, transfer trip or inter trip, permissive inter trip, acceleration of zone II, pre-acceleration of zone II, phase comparison relaying (unit scheme)	5
7	**Generator protection** Various faults & abnormal operation conditions, stator & rotor faults, transverse differential protection, unbalanced loading, over speeding, loss of excitation, loss of prime mover	5
8	**Induction motor protection** Various faults & abnormal operation conditions, starting of induction motor, protection of small & large induction motor.	5
9	**Numerical protection** Introduction, block diagram of numerical relay, numerical over current protection, numerical transformer protection, numerical distance protection of transmission line	5
10	**Theory of circuit Interruption** Introduction, Physics of arc phenomena, Maintenance of the arc, Losses from plasma, Essential properties of arc, Arc interruption theories.	3
11	**Circuit Constant in Relation to Circuit Breaking** Introduction, Circuit breaker rating, Circuit constants & circuit conditions Re-striking voltage transient Characteristics of re-striking voltage, Interaction between the breaker & circuit, Current chopping, duties of switchgear	4

29/6/20

Prof. Ramji Kanani

Prof. V.B. Babaria

12	**Theory & Practice of Conventional Circuit Breaker and modern circuit breakers** Automatic switch, Air-break circuit breakers, Oil circuit breakers, Single and multi break Construction, Air-blast circuit breaker, Performance of circuit breakers and system requirements, Modification of circuit breaker duty by shunt resistors, Power factor correction by series resistance, Comparative merits of different types of conventional circuit	**8**
13	**Protective current transformer and potential transformer** Magnetization curve of CT, Difference between measurement & protective CT, CT errors, calculation of CT accuracy, selection of CT, CT requirements for differential protection, specifications of CT, specifications of PT, CVT.	**4**
TOTAL		**58**

Course Outcome:

After learning the course the students should be able to:

1. Explain the purposes of protection, in relation to major types of apparatus, protection principle, dangers and criteria.
2. Choose and justify a suitable protection system for a specified application.
3. Analyze and compare specified protection systems
4. Compare merits of various principles, relay hardware and interrupting devices.
5. Compare the different type of circuit breakers performance based on which selection of circuit breaker can be made for a given application

Teaching & Learning Methodology: -

Chalk and Talk method mostly preferable and Power point presentation is also preferable for some needful topics.

Reference Books:

1. Fundamentals Of Power System Protection – Y. G. Parithankar & S. R. Bhide, 2nd edition, PHI
2. Power system protection and switchgear by Oza, Nair, Mehta, Makwana
3. Switchgear And Protection – S. S. Rao, Khanna publication
4. Power System Protection And Switchgear – B. Ravindranath and M. Chander:
5. Art And Science Of Protective Relaying – Masson
6. A Web Course on Digital protection of power system by Prof. Dr. S.A.Soman, IIT Bombay.
7. Computer relaying for power systems by A.G.Phadke, J.S.Thorp-research studies press ltd. England John Wiley & sons Inc. New York.
8. Protection of power systems by Blackburn.
9. Protection and switchgear ,By Bhavesh Bhalja, R.P.Maheshwari, Nilesh hotani,1st edition,2011, Oxford Publication
10. Power System Protection – B. Ram , TMH Publication
11. Modern Power System Protection – DivyeshOza, TMH Publication

List of Experiments:

1. To study Micro controller based 3-Phase Differential Relay.
2. To study Micro controller based over current Relay.
3. To study the Numerical Protection of induction motor.
4. To obtain the operating characteristics of an IDMT relay.

KPK 29/6/2020
Prof. Ramji Kanani

Bala.-
Prof V.B. Babaria

5. To study the operating characteristics of directional over current relay.
6. To study the operating characteristics of the transformer percentage differential relay.
7. To study the magnetic inrush current in a transformer and its protection.
8. To study radial feeder protection using two overcurrent and one Earth fault relay.
9. TO obtain and study the magnetization characteristic of CT.
10. To study transformer differential protection.
11. To study the protection schemes for different abnormal conditions in an alternator.
12. To study Buchholz relay for transformer protection.
13. To study Generalized block diagram of Numerical Relay

SUGGESTED LIST OF STUDENT ACTIVITIES:

Protection using Fuses, MCB, MCCB & ELCB

Major Equipments:

Computers and programming software like C C++ or MATLAB SCILAB

Active learning Assignments (AL) : Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to SSIU.

KPK 29/6/2020
Prof. Ramji Kanani

Bala.
Prof. V. B. Babaria

Dalvjada
HOD (EE)

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

BRANCH NAME: ELECTRICAL ENGINEERING

SUBJECT NAME: INTER CONNECTED POWER SYSTEM

SUBJECT CODE: 23050701

B.E. VII - SEMESTER

Type of course: Engineering

Prerequisite: Electrical Power system I and Electrical Power Systems II

Rationale: This subject focuses on the study of behavior of power system components during normal operating conditions and/or when subjected to disturbances along with the basics of power system transmission and distribution. It also briefs the students about the modeling of power system components and networks for steady state analysis. They will be able to use the knowledge in economic operation and planning of power system network and also for the selection of components Like CB (Circuit Breaker for Power system protection.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
L	T	P	C	Theory Marks			Practical Marks			
				ESE (E)	PA (M)		ESE (V)		PA (I)	
					PA	ALA	ESE	OEP		
3	00	02	05	70	20	10	20	10	20	150

Content:

Sr. No.	Content	Total Hrs	% Weight
1	**Introduction:** Concept of Interconnection, Hierarchical Grid arrangements, Cascade Tripping, Islanding, Load dispatch centre, Power Generation Scenario in Gujarat and India	03	5
2	**Power system matrices** Brief explanation of Graph theory, Primitive Network, Y bus formation methods, Singular transformation method, Direct method, Removal of elements, Algorithm for formation of Z bus matrix addition of branch and link, Numericals	08	15
3	**Load flow studies** Introduction, Static Load Flow Equations, Bus Classifications, Approximate method, Gauss-Seidel Method, Newton Raphson Method, Fast Decoupled Load Flow Method, Comparison of different methods, Numerical	9	25

29/6/2020

Prof. Ramji Kanani

Prof V.B. Babaria

4	**Economic operation of power systems** Generator operating cost, Economic operation of generators within thermal plant, Optimal operation by co-ordination equation, Penalty factor, Derivation of transmission loss formula (Kron's method), Unit commitment problem solution by dynamic programming,Numericals	05	15
5	**Frequency and voltage control methods** Speed governing mechanism, Mathematical modeling, Adjustment of Governor characteristics, Single area control, Flat frequency control, Selective frequency control, Tie line load bias control, Methods of voltage control, Numericals	05	10
6	**Power system stability** Introduction, Mechanics of angular motion, The swing Education, transfer reactance, power relations, Steady state stability, Synchronizing power coefficient, Analysis of steady state stability, steady state stability with automatic voltage regulators, concept of shunt fault, transfer reactance during fault, reduction of power system to one machine connected to infinite bus, Transient stability, simplified transient generator model, The equal area stability criterion, solution of swing equation, Numericals	09	30
TOTAL		39	100%

Reference Books:

1. **Modern Power System Analysis,** D. P. Kothari,I. J. Nagrath, Tata McGraw-Hill Education,
2. **Power System Analysis and Stability, S.S. Vadhera, KhannaPublication**
3. **Power System Analysis, Hadi Saadat,** Tata McGraw-HillEducation
4. **Computer Aided Power System Analysis, G.L. Kusic, ©1986**
5. **Elements of Power System Analysis by William D. StevensonMcGraw-Hill**

Course Outcome:

After learning the course the students should be able to:

1. Model modern power system network.
2. Solve the problem of power flow through any power system network
3. Find economical generation of power and rescheduling of power Solve swing equation
4. Find the stability of a power system
5. Find the variation in the frequency because of change in generation

List of Experiments/Tutorials (Suggested):

Formation of Primitive, incidence Y bus and Z bus matrix for given network.

Derivation of static load flow equation for a sample 4 bus system.

Solution of static load flow equation using approximate method of Load Flow.

Solution of static load flow equation using Gauss-Seidel Method of Load Flow.

Solution of static load flow equation using Newton Raphson Method of Load Flow

23/6/2020

Prof Ramji Kanani

Prof V. B. Bakaria

Solution of static load flow equation using Fast Decoupled Load Flow Method of Load Flow

Find most economical generation on generator of a given power system

Find the penalty factor for the given system

Find (Beta) coefficient for the given system

Find the steady state/transient stability of the system for various disturbances in power system

Find critical clearing time using equal area criterion

Solution of swing equation using step by step method

Working of SLDC/ALDC/RLDC

Design based Problems (DP)/Open Ended Problem:

The students can be asked to collect the data of a small power system network. Then the model of the same network should be prepared using the knowledge gain by studying this course. Various analyses like power flow analysis. Stability analysis, load frequency analysis and economic analysis can be performed on the same system.

Major Equipment:

Computers and programming software like C C++ or MATLAB SCILAB List of

Open Source Software/learning website:

NPTEL

ACTIVE LEARNING ASSIGNMENTS:

Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to SSIU.

KRK 29/6/2020

Prof. Ramji Kanani

Bala.

Prof. V. B. Babaria

Dahiya
HOD (EE)

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARRNIM INSTITUTE OF TECHNOLOGY
SUBJECT NAME: Design of AC Machines
SUBJECT CODE: 23050703
B.E. VII SEMESTER

Type of course: Engineering Science (Electrical)

Prerequisite: Elements of Electrical Engineering, Elements of Electrical Design

Rationale: The design of most of the electrical equipments (machines) is an iterative process. The final objective is to design the most efficient equipment, with minimum size, weight and cost. There are number of constraints in the actual design process. Research in the field of materials science directly affects the design of machines. This subject focuses on conventional design procedure for AC machines as well as the application of computers for machine design.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
L	T	P	C	Theory Marks			Practical Marks			
				ESE (E)	PA (M)		ESE (V)		PA (I)	
					PA	ALA	ESE	OEP		
3	00	02	05	70	20	10	20	10	20	150

Content:

Sr. No.	Content	Total Hrs	% Weightage
1.	**DESIGN OF THREE PHASE INDUCTION MOTOR:** **MAIN DIMENSIONS:** Output equation, choice of specific loadings, separation of D and L. **STATOR DESIGN:** Stator winding design, Calculation of no. of turns per phase, Conductor's area, Shape of the stator slots, Area of stator slots, Stator teeth design, Depth of the stator core, Length of air gap, Numerical problems related to above topics. **ROTOR DESIGN:** A. Squirrel cage rotor – Selection of no. of rotor slots, Effect of harmonics and choice of rotor slots to minimize harmonics, vibration, noise and voltage ripples, Rules for selecting no. of rotor slots, Methods for reducing harmonic torque, Design of rotor bars and rotor slots. Design of end rings and rotorcore. B. Wound rotor - Calculation of number of rotor slots, Number of turns,Cross sectional area of rotor conductors, Types of rotor windings, Check for rotor tooth density, Design of rotor slot and rotor core.	15	35

KPK 29/6/2020
Prof. Ramji Kanani

Bala.
Prof V.B. Babaria

Dalsaniya
HOD (EE)

	PERFORMANCE PARAMETERS EVALUATION: No load current calculation, Stator and rotor resistance and reactance calculation, Circle diagram, Dispersion coefficient – effect on maximum output power factor Design aspects for large size machine, High voltage machine, High speed machine. Design of submersible motors. Numerical problems based on above topics. Computer programs and flow charts based on above topics.		
2.	**DESIGN OF SINGLE PHASE INDUCTION MOTOR:** Design of main dimensions, Design of stator, Design of rotor, Design of auxiliary winding. **PERFORMANCE PARAMETERS EVALUATION:** Rotor resistance, Stator resistance, Iron loss, Friction and Windage loss, Starting Torque, Circle diagram, Calculation of capacitance for maximum torque.	**5**	**15**
3.	**DESIGN OF SYNCHRONOUS MACHINE:** Output equation and design of main dimensions, Short Circuit Ratio (SCR) and its significance, Length of air gap and shape of pole face. **ARMATURE DESIGN:** Armature winding (Single layer and double layer), Number of armature slots, Slot dimensions, Length of mean turn, Calculation of armature resistance and reactance. **DESIGN OF FIELD SYSTEM:** Design of magnetic circuit, Open circuit characteristic, Determination of full load field MMF, Design of field winding, Determination of direct and quadrature axis synchronous reactance, Short circuit characteristics. **DESIGN OF TURBO ALTERNATORS:** Main dimensions, Length of air gap, Stator & Rotor design. Design considerations for low speed alternators and vertically operated alternator. Computer programs and flow charts based on above topics.	**15**	**35**
4.	**APPLICATION OF FINITE ELEMENT METHOD IN DESIGN:** Introduction to FEM, Application of FEM technique for design problems. Use of open source FEM software for 2D design. Computation of Performance parameters of machine using FEM software.	**4**	**15**
TOTAL		**39**	**100%**

Learning Objectives:

1. To understand the design of Induction machines and synchronousmachines.
2. To improve analytical skills with the help of numericalproblems.
3. To learn about preparation of detailed drawings for equipments based ondesign.
4. To learn the basics of computer aideddesign.

Reference Books:

1. A Course in electrical machine design – A. K. Sawhney, Dhanpat Rai andSons
2. Electrical machine design – R. K. Agrawal, S.K. Kataria &Sons
3. Design of Electrical machines – V. N. Mittle, Standard PublishersDistributors
4. Design and Testing of Electrical Machines – M V Deshpande,PHI
5. ElectricalMachineAnalysisusingFiniteElements–NicolaBianchi,TaylorandFrancis

Course Outcome:

After learning the course the students should be able to:

- Design the Induction and Synchronous machines of givenspecifications.

Dolaysan (HOD) Prof. Ramji Kanani 29/6/2020 Bala.- Prof. V. B. Babaria

- Prepare the detailed sketches of the designedmachine.
- Use computer for electrical machinedesign.

List of Experiments and Open Ended Problems: (This is a suggestive list only)

During the laboratory hours, the design problems based on the syllabus should be assigned to the students. After carrying out the detailed design, drawing sketches should be prepared by the students.

(1) Design of three phase squirrel cage inductionmotor
(2) Design of three phase slip ring inductionmotor
(3) Design of single phase inductionmotor
(4) Design of submersiblemotor
(5) Design of turboalternator
(6) Design of salient pole low speedalternator
(7) Practice problems on open source software(FEMM)
(8) Performance parameters evaluation using FEMsoftware

Major Equipment:

Lab set ups of following machines

(1) Cut section models of (a) Induction machine (b) Synchronousmachine
(2) Charts to explain various parts ofmachines

List of Open Source Software/learning website:

- http://www.electrical-engineering-portal.com/
- http://nptel.iitm.ac.in/courses.php
- http://www.femm.info
- www.vlab.co.in

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, alongwiththenamesofthe studentsofthegroup,thenameofthe faculty,DepartmentandCollege on the first slide. The best three works should submit toSSIU.

KRK 29/6/2020
Prof. Ramji Kanani

Bala.
Prof. V.B. Babaria

Dalwadi
HOD (EE)

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ELECTRICAL ENGINEERING

ADVANCE POWER ELECTRONICS

CODE: 23050704

B.E. VIITH SEMESTER

Teaching and Examination Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	-	2	5	4	30	50	70	-	150

Objectives: - The course is aimed to provide exposure of some power electronic converters that are utilized by the industries and utilities and are not taught in the basic courses on Power Electronics.

Prerequisites: - Power Electronics

Contents:

Sr. No.	Topics	Teaching Hrs. (39 Hrs.)
1.	**Switching Voltage Regulators:-** Introduction, Linear power supply (voltage regulators); Switching voltage regulators; Review of basic dc-dc voltage regulator configurations –Buck, Boost, Buck-Boost converters and their analysis for continuous and discontinuous mode; Other converter configurations like Flyback converter, Forward converter, Half bridge, Full bridge configurations, Push-pull converter, C'uk converter, Sepic Converter; Design criteria for SMPS; Multi-output switch mode regulator.	9
2.	**Resonant Converters:-** Introduction, Need of resonant converters, Classification of resonant converters, Load resonant converters, Resonant switch converters, zero voltage switching dc-dc converters, zero current switching dc-dc converters, clamped voltage topologies.	7

KPK 29/6/2020

Prof. Ramji Kamani

Prof. V. B. Babaria

3.	**Multi-level converters:-** Need for multi-level inverters, Concept of multi-level, Topologies for multi-level: Diode Clamped, Flying capacitor and Cascaded H-bridge multilevel Converters configurations; Features and relative comparison of these configurations applications, Introduction to carrier based PWM technique for multi-level converters.	**05**
4.	**Multipulse Converters:-** Concept of multi-pulse, Configurations for m-pulse (m=12,18, 24 ....) converters, Different phase shifting transformer (Y-Δ1, Y-Δ2, Y-Z1 and Y-Z2) configurations for multi-pulse converters, Applications.	**04**
5.	**HVDC Transmission:-** Introduction, Operation of 12-pulse converter as receiving and sending terminals of HVDC system, Equipment required for HVDC System and their significance, Comparison of AC and DC transmission, Control of HVDC transmission.	**04**
6.	**FACTS devices:-** Importance of reactive power compensation, Flow of power in AC system and conventional control mechanisms, Definition of Flexible ac Transmission Systems (FACTS) and brief description, possible benefits from FACTS, Thyristor- Controlled Reactor (TCR), Fixed CapacitorThyristor-Controlled Reactor (FC-TCR), Thyristor-Switched capacitor and Reactor, Thyristor-Switched capacitor-Thyristor-Controlled Reactor (TSCTCR), STATCOM configuration and operating principle, Static characteristics of SVC and STATCOM Comparison of SVC and STATCOM, Principle of series compensation, Introduction to Static Synchronous Series Compensator, Advantages and limitation of SSSC, Introduction to UPFC and operating principle.	**10**
TOTAL		**39**

Course Outcome:

After learning the course the students should be able to:

1. Evaluate different dc-dc voltage regulators.
2. Simulate and analyze resonant converters.
3. Select appropriate phase shifting converter for a multi-pulse converter.
4. Evaluate various multi-level inverter configurations.

Teaching & Learning Methodology: -

Chalk and Talk method mostly preferable and Power point presentation is also preferable for some needful topics.

Reference Books:

1. Ned Mohan, Tore M. Undeland and William P. Robbins, "Power Electronics – Converters,
2. Muhammad H. Rashid, "Power Electronics - Circuits, Devices and Applications", Prentice Hall of India, 3rd ed., 2009.

29/6/20

Prof Ramji Kanani

Bala.

Prof. V. B. Bakaria

3. Bin Wu, "High Power Converters and AC Drives", John Willey & sons, Inc., 2006.
4. Derek A. Paice "Power Electronic Converter Harmonics – Multipulse Methods for Clean Power", IEEE Press, 1996.
5. Muhammad H. Rashid , "Power Electronics Handbook", Elsevier, 3rd ed., 2011.
6. P.C.Sen, "Modern Power Electronics ", S. Chand and Co. Ltd., New Delhi, 2000.
7. Vijay K. Sood, "HVDC and FACTS Controllers Applications of Static Converters in Power Systems", Kluwer Academic Publishers, Boston, 2004.
8. L. Umanand, "Power Electronics Essentials and Applications", Wiley India Ltd., 2009

List of Experiments:

Lab experiments shall be based on the course content and few experiments shall involve the analyzing and designing skills besides the basic understanding of the subject. A list provided here is to indicate the type of experiments that can be included. About 10 experiments (from different topics) shall be included to cover the entire course.

1. Evaluate the performance and operating modes of SLR/PLR dc-dc converter with the change in switching frequency.
2. Simulate/Design a circuit for a Buck Converter with ZVS/ZCS to regulate the output voltage Vo with a given input voltage Vin.
3. Carrier based Sine PWM control of a CHB multilevel inverter and study of harmonic spectrum.
4. Study the operation and performance of second order converters like Buck-Boost, Flyback, Forward converters etc.
5. Study the operation and performance of fourth order converters like C'uk or Sepic converters.
6. Evaluate the performance of STATCOM/SVC as a shunt compensator.
7. Study of harmonic spectrum for 12 and 18 pulse converters.

Design based Problems (DP)/Open Ended Problem:

Course coordinator can assign the design based problem/open ended problem.

Major Equipment:

Simulation software like MATLAB, PSIM, Scilab, Power Electronic Converters, CRO/DSO, meters, Current/Voltage Probes, Isolation transformer etc. as demanded by the course.

List of Open Source Software/learning website:

1. MIT OPEN COURSEWARE by Massachusetts Institute of Technology - website: ocw.mit.edu
2. Courses available through NPTEL. - website : nptel.ac.in

Active learning Assignments (AL) : Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students. so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to SSIU.

KPN 29.6.20 Prof. Ramji Kanani

Bala. Prof. V.B. Babaria

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ELECTRICAL ENGINEERING

INDUSTRIAL INSTRUMENTATION

CODE: 23050705

B.E. VIITH SEMESTER

Teaching and Examination Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	-	2	5	4	30	50	70	-	150

Type of Course: - Electrical Engineering

Prerequisites: - NA

Rationale: Sound knowledge about various techniques used for the measurement of industrial parameters is essential for the student of engineering. This subject provides the knowledge of measurement of velocity, displacement, viscosity, temperature using various types of sensors and related circuits.

Contents:

Sr. No.	Topics	Teaching Hrs. (39 Hrs.)
1.	**Transducers:** Introduction to instrumentation system, static and dynamic characteristics of an instrumentation system, Principles and classification of transducers, Electrical transducers, basic requirements of transducers	04
2.	**Strain Gauge and Strain Measurement:** Factors affecting strain measurements, Types of strain gauges, theory of operation of resistive strain gauge, gauge factor, types of electrical strain gauges, strain gauge materials, gauging techniques and other factors, strain gauge circuits and temperature compensation, applications of strain gauges	04

29/6/20

Prof. Ramji Kamani

Prof. V.B. Babaria

3.	**Displacement Measurement:** Resistive potentiometer (Linear, circular and helical), L.V.D.T., R.V.D.T. and their characteristics, variable Inductance and capacitance transducers, Piezo electrical transducers-output equations and equivalent circuit, Hall effect devices and Proximity sensors, Large displacement measurement using synchros and resolvers, Shaft encoders.	05
4.	**Forces and Torque Measurement:** Load cells and their applications, various methods for torque measurement. Use of torque wrenches	04
5.	**Pressure Measurement:** Mechanical devices like Diaphragm, Bellows, and Bourdon tube for pressure measurement, Variable inductance and capacitance transducers, Piezo electric transducers, L.V.D.T. for measurement of pressure, Low pressure and vacuum pressure measurement using Pirani gauge, McLeod gauge, Ionization gauge, Pressure gauge calibration.	05
6.	**Flow and level Measurement:** Differential pressure meter like Orifice plate, Venturi tube, flow nozzle, Pitot tube, Rotameter, Turbine flow meter, Electro magnetic flow meter, hot wire anemometer, Ultrasonic flow meter. Resistive, inductive and capacitive techniques for level measurement, Ultrasonic and radiation methods, Air purge system (Bubbler method).	8
7.	**Temperature Measurement:** Resistance type temperature sensors – RTD & Thermister, Thermocouples & Thermopiles, Laws of thermocouple – Fabrication of industrial thermocouples – Signal conditioning of thermocouples output – Radiation methods of temperature measurement – Radiation fundamentals – Total radiation & selective radiation pyrometers – Optical pyrometer – Two colour radiation pyrometers	05
8.	**Digital Data Acquisition systems & control:** Use of signal conditioners, scanners, signal converters, recorders, display devices, A/D & D/A circuits in digital data acquisition. Instrumentation systems. Types of Instrumentation systems. Components of an analog Instrumentation Data – Acquisition system. Multiplexing systems. Uses of Data Acquisition systems. Use of Recorders in Digital systems. Digital Recording systems. Modern Digital Data Acquisition system. Analog Multiplexed operation, operation of sample Hold circuits	04
Total		**39**

Course Outcome:

The theory should be taught and practical should be carried out in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following course outcomes.

After learning the course the students should be able to:

1. Select a transducer based on its operating characteristics for the required application.

KPK 29/01/20
Prof. Ramji Kanani

Bala.
Prof. V. B. Babaria

2. Check various available techniques available and select appropriate to obtain satisfactory task for the parameter to be measured.
3. Know advantages and limitations of selected techniques.
4. Interpret the measurement results and cause of any possible error.

Teaching & Learning Methodology: -

Chalk and Talk method mostly preferable and Power point presentation is also preferable for some needful topics.

Reference Books:

1. Industrial Instrumentation & Control by S. K. Singh. TMH Publication
2. Electrical and Electronics Measurement and Instrumentation, By A. K. Shawney, Dhanpatrai & sons publications.
3. Measurement Systems – Application and Design By E.O. Doebelin, TMH Publication
4. Principles of Industrial Instrumentation, D Patranabis, 3rd edition, Mc Graw hill
5. Mechanical & Industrial Measurements by R. K. Jain, Khanna Publication

Laboratory Work:

Directions for Laboratory work:

- The list of experiments is given as a sample.
- Minimum 10 experiments should be carried out.
- Similar laboratory work fulfilling the objectives can also be considered.
- As far as possible, printed manual should be preferred so that students can concentrate
- in laboratory experiments and related study.

List of Experiments:

1. To study the measurement of weight using Strain gauge.
2. To study the measurement of linear displacement using Linear Variable Differential Transformer
3. To Study the measurement and control of temperature using Resistance Temperature Detector (RTD).
4. To Study the measurement and control of temperature using Thermocouple.
5. To Study the measurement and control of temperature using Thermistor.
6. To study the measurement of flow using Ultrasonic Flow meter.
7. To study the measurement of speed using Decoder.
8. To study the measurement of torque.
9. To study the measurement of force using Piezoelectric transducer.
10. To study Measurement of flow using Electromagnetic flow-meter.

KRK 29/6/20
Prof. Ramji Kanani

Bala.-
Prof. V. B. Babaria

Design based Problems (DP)/Open Ended Problem:

1. Select appropriate transducer for the measurement of specified parameter.
2. Design appropriate circuit that can be used for transducer.
3. Select calibration and compensation circuit to get accurate result.
4. Obtain operating characteristics and find the error.
5. Integrate above to design a project that can be used for complete measurement of specific parameter in industry.

Major Equipment:

1. 4 ½ digit Digital Multimeter
2. Various transducers and their trainer kit.
3. Digital Oscilloscope
4. Any one simulation software (Open source software preferred) : Scilab/Matlab and Simulink toolbox.

List of Open Source Software/learning website:

1. http://www.electrical4u.com/

2. http://nptel.ac.in

Active learning Assignments (AL) : Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students.so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to SSIU.

KPN 29/6/20

Bala.

Prof. Ramji Kanani

Prof. V. B. Babaniya

Dahyaben
HOD (EE)

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ELECTRICAL ENGINEERING

TESTING AND COMMISSIONING OF ELECTRICAL EQUIPMENTS

CODE: 23050802

B.E. VIIITH SEMESTER

Teaching and Examination Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	-	2	5	5	30	50	70	-	150

Type of Course: - Electrical Engineering

Prerequisites: - Fundamentals of Electrical Machines, Electrical Measurements.

Rationale: Power Systems and Industrial Plants consist of number of electrical drives, transformers, circuit breakers and other equipments which require installation, commissioning and regular maintenance to prevent permanent break down. It is required to carryout/supervises installation, commissioning and maintenance of various electrical equipments in power stations, substations and industry. This course will enable the students to understand the concepts, principles and acquire basic skills of installation, commissioning and maintenance of electrical equipments in power stations, substations and industry.

Contents:

Sr. No.	Topics	Teaching Hrs. (39 Hrs.)
1.	**Safety Management:** Objectives, Safety Management during Operation and Maintenance, Clearance and Creepages, Electric Shock, need of Earthing, different methods of Earthing, factors affecting the Earth Resistance, methods of measuring the Earth Resistance, Equipment Earthing and System Grounding, Earthing Procedure - Building installation, Domestic appliances, Industrial premises, Earthing of substation, generating station and overhead line.	04

KPY 29/8/2020
Prof. Ramji Kanani

Prof. V. B. Babaria

Dodiyara
H.O.D (EE)

2.	**Installation of Electrical Equipment:** Inspection of Electrical Equipment at site, Storage Electrical Equipment at site, Foundation of Electrical Equipment at site, Alignment of Electrical Machines, Tools/Instruments necessary for installation, Technical report, Inspection, storage and handling of transformer, switchgear and motors.	04
3.	**Testing of Transformer, Plant and Equipment:** General Requirements for Type, Routine and Special Tests, Measurement of winding resistance; Measurement of voltage ratio and check of voltage vector relationship; Measurement of impedance voltage/short-circuit impedance and load loss; Measurement of no-load loss and current; Measurement of insulation resistance; Dielectric tests; Temperature-rise, insulation and HV test, dielectric absorption, switching impulse test. testing of Current Transformer and Voltage Transformer, power transformer, distribution transformer, CVT and special transformer with reference to Indian Standard (IS). Drying out procedure for transformer. PI index, Commissioning steps for transformer, Troubleshooting & Maintenance of transformer. [Ref: IS 2026:Part_1-10-Power Transformers: Methods of Test; IS 13956:1994- Testing Transformers]	13
4.	**Installation and Commissioning of Rotating Electrical Machines:** Degree of protection, cooling system, degree of cooling with IP- IC code (brief discussion), enclosures, rating of industrial rotating electric machine, installation, commissioning and protection of induction motor and rotating electric machine, drying out of electric rotating machine, insulation resistance measurement, site testing and checking, care, services and maintenance of motors, commissioning of synchronous generator, protection and automation of synchronous generator, synchronous motor, D.C. generator and motor with reference to Indian Standard (IS). [Ref: IS 4029:2010-Guide for Testing Three Phase Induction Motors; IS 7132:1973-Guide for Testing Synchronous Machines; IS 9320:1979-Guide for Testing of Direct Current (dc) Machines]	10
5.	**Transmission line:** Commissioning of A.C transmission line and HVDC transmission, galvanize steel structure, towers and insulator for transmission and distribution line, tower footing resistance, substation equipment, bus bar system, power cable, low power control cable, Contactor, GIS (gas insulated substation).	04
6.	**Switch Gear & Protective Devices:** Standards, Classification, specification, rating and duties of CB, installation, commissioning tests, maintenance schedule, type & routine tests. Operation of s/s (steps) for line Circuit breaker maintenance. Location of lightening arrester with reasons.	04
TOTAL		39

29/6/20
Prof. Ramji Kanani

Prof. V. B. Babaria

Dobyas
HOD (EE)

Course Outcome:

After learning the course, the students will be able to Undertake installation, commissioning and maintenance of various electrical equipments, including:

1. Preparation of maintenance schedule of different equipment and machines.
2. Trouble shooting chart for various electrical equipment, machines and domestic appliances.
3. Procedure of different types of earthing for different types of electrical installations.
4. Familiar about electrical safety regulations and rules during maintenance.

Teaching & Learning Methodology: -

Chalk and Talk method mostly preferable and Power point presentation is also preferable for some needful topics.

Reference Books:

1. Rao, S., "Testing, commissioning, operation and maintenance of electrical equipment", 6/E., Khanna Publishers, New Delhi
2. Paul Gill, "Electrical power equipment maintenance and testing", CRC Press, 2008.
3. Singh Tarlok, "Installation, commissioning and maintenance of Electrical equipment", S.K. Kataria and Sons, New Delhi,
4. Philip Kiameh, "Electrical Equipment Handbook: Troubleshooting and Maintenance", McGrawHill, 2003.
5. Relevant Indian Standards (IS Code) and IEEE Standards for-Installation, maintenance and commissioning of electrical equipments/machines.

Laboratory Work:

List of Experiments:

1. Measure insulation resistance of a winding/cables/wiring installation.
2. Types of earthing & Measurement of earth resistance of installation of building and appliances by
3. Study of Power Quality and Harmonics due to various type of load using Power Analyzer.
4. To study of drying out process of Transformer and The procedure of drying out of electrical equipment.
5. Perform various tests on insulating oil.
6. To study various Test of Induction Motor and their significance.
7. To study various Test of Synchronous Machine and their significance.
8. To carry out routine tests on a given contactor used in the 3-phase supply.
9. To find out Phase shift in a transformer.
10. To find out reflection of fault current on opposite side of the transformer.

6/2020

Prof. Rajni Kanani

Prof. V. B. Babaria

HOD (EE)

Open Ended Problems/ Suggested Student Activities:

- Arrange a visit to nearby industry/substation to observe installation/commissioning and troubleshooting of various electrical equipment and machines.
- Arrange expert lectures of the professional engineers involved in installation, commissioning and testing of heavy power equipments/machines.
- Use Flash/Animations to demonstrate installation of various electrical equipment and devices.

Major Equipment:

1. Experimental Test rig for Transformer, Induction Motor, Synchronous Motor.
2. Digital Multi-meter & Clamp on Meter.
3. Digital Tachometer.
4. Oil testing kit.
5. Megger.
6. 3-phase Power Analyzer.

List of Open Source Software/learning website:

1. http://www.bis.org.in/index.asp
2. http://164.100.105.199:8071/php/BIS/IndStndrdLocatr/StandrdsSelection.php
3. http://www.ieee.org/publications_standards/publications_standards_index.html
4. http://www.nema.org/Standards/About-Standards/pages/default.aspx
5. http://www.electricalsafetyfirst.org.uk/guides-and-advice/around-the-home/first-aid/

Active learning Assignments (AL) : Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students.so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to SSIU.

KRK
29/6/2020
Prof. Ramji Kanani

Bala-
Prof. V.B. Bakaria

HOD (E&E)

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ELECTRICAL ENGINEERING

POWER SYSTEM PLANNING AND DESIGN

CODE: 23050801

B.E. VIITH SEMESTER

Teaching and Examination Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	-	2	5	5	30	50	70	-	150

Objectives:

This subject focuses on the mechanical and electrical design aspects of important power system components. In this subject students will learn basic concepts of generation,planning, transmission and distribution planning. The course also includes power system earthing and insulation co-ordination.

Prerequisites: - Electrical power generation and Electrical power system-I

Contents:

Sr. No.	Topics	Teaching Hrs.
1	**Transmission lines design :** Requirements of transmission lines, selection of voltage for high-voltage transmission lines, choice of conductors, spacing of conductors, corona, insulators, specifications of transmission lines, surge impedance loading of transmission lines, electrical design of transmission lines, main considerations in the mechanical design of transmission lines, sag-tension relation, stringing of transmission lines, towers Design of EHV transmission lines : transmission of electric power at extra high voltage, design considerations of EHV lines, selection and spacing of conductors, corona, radio and television interference, insulation coordination, towers	8

KPK 29/5/20
Prof Ramji Kanani

Prof. V.B. Babaria

Head (EE)

2	**Design of distribution systems :** Development of a distribution plan, transmission and distribution systems, types of distribution systems arrangements, primary distribution design, secondary distribution design, distribution substations, calculation of distributor sizes: voltage drops, voltage regulation, Lamp flicker	6
3	**Design of power system :** Introduction, selection of sizes and location of generating stations, selection and specifications of transmission lines, sizes and location of substations, interconnection	4
4	**Power System Earthing :** Objectives, definitions, tolerable limits of body currents, soil resistivity, earth resistance, tolerable step and, actual step and touch voltage, design of earthing grid, concrete encased electrodes, tower footing resistance, measurement of earth resistance R, measurement of soil resistivity, impulse behavior of earthing system.	5
5	**Insulation Co-ordination:** Introduction, definitions, determination of line insulation, B.I.L and insulation levels of sub-station equipment, lightning arrester selection, power system over voltages, tentative selection of arrestor voltage ratings, selection of arrestor discharge currents, arrestor discharge voltage, establishment of impulse voltage level of equipment, protective margin, establishment of separation limits, location of lightening arrestor	4
6	**Power system improvement:** Introduction, methods of power system improvement, power system improvement scheme, determination of the voltage regulation and losses in a power system, shifting of distribution transformer centre, financial aspects of the power system improvement scheme	6
7	**Power system planning:** Introduction, methods of power system planning, forecasting load and energy requirements, generation planning, transmission system planning, distribution system planning, reliability of electrical power systems, methods of measuring power system reliability	6
	TOTAL	39

Course Outcome:

After learning the course the students should be able to:

1. Design transmission line (electrical and mechanical aspects)
2. Design primary and secondary distribution.
3. Selection of sizes and location of generating stations, substations.
4. Explain the basic concepts of power system earthing and measurement of earthing resistance.
5. Explain the basic concepts of insulation co-ordination.
6. Explain the basic concepts of generation planning, transmission planning and distribution planning.

KPR 29/6/2020
Prof. Ramji Kanani

Bala--
Prof. V. B. Babaria

Babaria (HOD(E&C))

Teaching & Learning Methodology: -

Chalk and Talk method mostly preferable and Power point presentation is also preferable for some needful topics.

Reference Books:

1. Electrical Power System Design – M. V. Deshpande, TMH publication
2. Electrical Power System Design – B. R. Gupta, S. CHAND
3. A course in Electrical Power- Soni, Gupta and Bhatnagar, DhanpatRai& Sons

List of Experiments:

During the laboratory hours, the design problems based on the syllabus should be assigned to the students.

1. Design of transmission line.
2. Visit of substation and draw its lay out plan.
3. Design of transmission line towers.
4. Survey of rural electrification and draw Single Line Diagram.
5. Survey of industrial distribution system and draw Single Line Diagram SLD.
6. Study pipe earthing and plate earthing.
7. Students should learn Indian standards related to design problems.
8. Survey of Cables/Conductors used in transmission and distribution system.

SUGGESTED LIST OF STUDENT ACTIVITIES:

1. Visit to a village. Supply is taken from pole mounted transformer and distributed in various part of village.
2. Load calculation, loading capacity of different equipments.
3. Verification of 3-phase balanced loading.
4. Finding transformer rating based on loading
5. Making drawing sheet representing Single line diagram of three phase distribution.

Active learning Assignments (AL) : Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to SSIU.

KPK 29/6/2020
Prof. Ramji Kanani

BaCa.
Prof. V. B. Babaria

Hod (EE)

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARRNIM INSTITUTE OF TECHNOLOGY
ELECTRICAL ENGINEERING
POWER SYSTEM OPERATION AND CONTROL
SUBJECT CODE: 23050803
B.E. VIII - SEMESTER

Type of course: Engineering Science (Electrical)

Prerequisite: Basic understanding of structure of the power system and power system analysis.

Rationale: Demand of electrical energy is increasing day by day due to improvement in the life style of the people in particular and development of the countries in general. On the other hand, conventional sources of power generation are limited. Under this scenario, the power system network operates in a stressed condition. Effective management of generation, transmission and distribution of electrical power is necessary for optimal system operation, for loss minimization and to avoid the unwanted power cuts. This subject deals with the fundamentals for effective operation and control of the power system.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
				Theory Marks			Practical Marks			
L	T	P	C	ESE (E)	PA (M)		ESE (V)		PA (I)	
					PA	ALA	ESE	OEP		
3	0	0	3	70	20	10	0	0	0	100

Content:

Sr. No.	Content	Total Hrs	% Weightage
1.	**Automatic Generation and Voltage Control:** Introduction; Load Frequency Control (Single Area Case); Load Frequency Control and Economic Despatch Control; Two-Area Load Frequency Control; Optimal (Two-Area) Load Frequency Control; Automatic Voltage Control; Load Frequency Control with Generation Rate Constraints (GRCs); Speed Governor Dead-Band and Its Effect on AGC; Digital LF Controllers; Decentralized Control.	5	15
2.	**Power System Security:** Introduction; System State Classification; Security Analysis; Contingency Analysis.	4	15
3.	**Reactive Power and Voltage Control:** Introduction; Reactive power requirement of an uncompensated line; Implication of surge impedance loading; Reactive loss characteristics of transmission line; Operation of a transmission line at no load condition; Operation of a transmission line under heavy loading condition; Voltage regulation of the transmission line and its relation with reactive power; Maximum power transfer in an uncompensated line; Line load ability. Reactive power-voltage (Q-V) coupling concept; Governing effects on reactive power flow; Relation between voltage and reactive power at a node in a power system; Reactive power requirement for control of voltage in long lines;	10	20 - 25

9/6/2020

Prof. Ramji Kanani

Prof. V. B. Bakaria

HOD (EE)

	Operational aspects in reactive power and voltage control; Basic principle of system voltage control; Reactive power flow constraints and their implications in loss of voltage; Effect of transformer tap changing in the post disturbance period; Effect of generator excitation adjustment in the post disturbance period; Practical aspects of reactive power flow problems leading to voltage collapse in EHV lines.		
4.	**State Estimation:** Introduction; Least Squares Estimation: The Basic Solution; Static State Estimation of Power Systems; Tracking State Estimation of Power Systems; Some Computational Considerations; External System Equivalency; Treatment of Bad Data; Network Observability and Pseudo-Measurements; Application of Power System State Estimation	**10**	**20 - 25**
5.	**Load Forecasting:** Introduction; Forecasting Methodology; Estimation of Average and Trend Terms; Estimation of Periodic Components ;Estimation of $y_s(k)$:Time Series Approach; Long-Term Load Predictions Using Econometric Models; Reactive Load Forecasting.	**5**	**15**
6.	**Introduction to Power System Deregulation and Restructuring:** Introduction; Motivation for Restructuring of power system; Electricity market entities and model; Benefits of Deregulation; Basic terminologies; Deregulation – International scenario; Milestones of deregulation in the world; **Indian power sector – Past and present status:** Growth of power sector in India – An overview, A time line of the Indian power sector, Players in the Indian power sector, Research and professional bodies.	**5**	**15**
TOTAL		**39**	**100%**

Reference Books:

1. Modern Power System Analysis – D. P. Kothari, I. J. Nagrath, TMHPublication
2. An introduction to Reactive Power Control and Voltage Stability in Power Transmission Systems – A Chakrabarti, D P Kothari, A K Mukhopadhyay, Abhinandan De,PHI
3. Electrical Power Systems – P. Venkatesh, B.V. Manikandan, S.C. Raja, A. Srinivasan,PHI
4. Power System Analysis – J. J. Grainger, W.D. Stevenson, Mc-GrawHill seriespublication
5. Power Generation Operation and Control – A. J. Wood, B. F. Woolenberg, John Wiley andSons
6. Power System Analysis – Hadi Saadat, Mc-GrawHill seriespublication
7. Advanced Power System Analysis and Dynamics – L. P. Singh, New AgeInternational
8. Operation of Restructured Power Systems – K. Bhattacharya, H. J. Bollen, J. E. Daalder, Kluwer academicpublishers
9. http://nptel.ac.in/courses/108101040/(PSOCwebcourse)

Course Outcome:

After learning the course the students should be able to:

- Understand the techniques to control power flows, frequency andvoltage.
- Explore the significance of power systemrestructuring.
- Perform system state estimation and explore itsimportance.
- Learn the power system security and its application as a systemoperator.
- Carry out load forecasting using availablemethods.

List of Open Source Software/learning website:

- http://nptel.ac.in/courses/108101040/
- http://www.electrical-engineering-portal.com/
- http://nptel.iitm.ac.in/courses.php
- www.vlab.co.in

Prof Ramji Kanani

Prof. V. B. Babaria

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should be submitted to SSIU.

KPK
29/6/20
Prof. Ramji Kanani

Bala.
Prof. V.B. Babaria

HOD (EE)

SWARNIM STARTUP & INNOVATION UNIVERSITY
SWARRNIM INSTITUTE OF TECHNOLOGY
ELECTRICAL ENGINEERING
ENERGY CONSERVATION AND AUDIT
SUBJECT CODE: 23050804
B.E. VIII - SEMESTER

Type of course: Engineering Science (Electrical)

Prerequisite: Fundamentals of Courses like Power Systems, Electrical Machines, Applied thermal and hydraulic engineering etc.

Rationale: The course provides basic understanding of energy audit and management. The consumption of energy is increasing day by day. One way to cope up with the increase in energy demand is to increase the production of energy which demands more investment and the other way is to conserve the energy as energy conserved/saved is twice the energy generated. Energy conservation means reduction in energy consumption but not compromising with the quality or quantity of energy production. Essential theoretical and practical knowledge about the concept of energy conservation, energy management, different approaches of energy conservation in industries, economic aspects of energy conservation project and energy audit and measuring instruments in commercial and industrial sector will be achieved through this course.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
L	T	P	C	Theory Marks			Practical Marks			
				ESE (E)	PA (M)		ESE (V)		PA (I)	
					PA	ALA	ESE	OEP		
3	0	2	5	70	20	10	20	10	20	150

Content:

Sr. No.	Content	Teaching Hrs. (39)	% Wtg.
1.	**Energy Audit Methodology and recent trends.** General Philosophy, need of Energy Audit and Management, EC Act, Definition and Objective of Energy Management, General Principles of Energy Management. Energy Management Skills, Energy Management Strategy. Economics of implementation of energy optimization projects, it's constraints, barriers and limitations, Financial Analysis: Simple Payback, IRR, NPV, Discounted Cashflow;Report-writing, preparations and presentations of energy audit reports, Post monitoring of energy conservation projects, MIS, Case-studies / Report studies of Energy Audits. Guidelines for writing energy audit report, data presentation in report, findings recommendations, impact of renewable energy on energy audit recommendations. Instruments for Audit and Monitoring Energy and Energy Savings, Types and Accuracy. Case studies of implemented energy cost optimization projects in electrical utilities as well as thermal utilities.	**10**	**25%**
2.	**Electrical Distribution and Utilization:** Electrical Systems, Transformers loss reductions, parallel operations, T & D losses, P.F. improvements, Demand Side management (DSM), Load Management, Harmonics & its improvements,	**10**	**25%**

29/6/2020
Prof. Ramji Kanani
Dahiyaa (HOD EE)

Prof. V.B. Babaria

	Energy efficient motors and Soft starters, Automatic power factor Controllers, Variable speed drivers, Electronic Lighting ballasts for Lighting, LED Lighting, Trends and Approaches. Study of 4 to 6 cases of Electrical Energy audit and management (Power factor improvement, Electric motors, Fans and blowers, Cooling Towers, Industrial/Commercial Lighting system, etc.)		
3.	**Thermal Systems:** Boilers- performance evaluation, Loss analysis, Water treatment and its impact on boiler losses, integration of different systems in boiler operation. Advances in boiler technologies, FBC and PFBC boilers, Heat recovery Boilers- it's limitations and constraints. Furnaces- Types and classifications, applications, economics and quality aspects, heat distributions, draft controls, waste heat recovering options, Furnaces refractory- types and sections. Thermic Fluid heaters, need and applications, Heat recovery and its limitations. Insulators- Hot and Cold applications, Economic thickness of insulation, Heat saving and application criteria. Steam Utilization Properties, Steam distribution and losses, steamtrapping, Condensate, Flashsteamrecovery.	**09**	**25%**
4.	**System Audit of Mechanical Utilities:** Pumps, types and application, unit's assessment, improvement option, parallel and series operating pump performance. Energy Saving in Pumps & Pumping Systems. Bloomers (Blowers) types & application, its performance assessment, series & parallel operation applications & advantages. Energy Saving in Blowers Compressors, types & applications, specific power consumption, compressed air system,& economic of system changes. Energy Saving in Compressors & Compressed Air Systems Cooling towers, its types and performance assessment & limitations, water loss in cooling tower. Energy Saving in Cooling Towers .Study of 4 to 6 cases of Energy Audit & Management in Industries (Boilers, Steam System, Furnaces, Insulation and Refractory, Refrigeration and Air conditioning, Cogeneration, Waste Heat recovery etc.)Study of Energy Audit reports for various Industries and Organizations.	**10**	**25%**
TOTAL		**39**	**100%**

Reference Books:

1. Energy Audit and Management, Volume-I, IECC Press
2. Energy Efficiency in Electrical Systems, Volume-II, IECC Press
3. Energy Management: W.R.Murphy, G.Mckay, Butterworths Scientific
4. Energy Management Principles, C.B.Smith, Pergamon Press
5. Industrial Energy Conservation, D.A. Reay, Pergammon Press
6. Energy Management Handbook, W.C. Turner, John Wiley and Sons, A Wiley Interscience
7. Industrial Energy Management and Utilization, L.C. Witte, P.S. Schmidt, D.R. Brown, Hemisphere Publication, Washington,1988
8. Hand Book of Energy Audits, Albert Thumann, P.E., C.E.M. William J. Younger, C.E.M., CRC Press

Course Outcome: After learning the course the students should be able to,

1. Identify and assess the energy conservation/saving opportunities in different electric system
2. Identify and assess energy conservation opportunities in thermal system
3. Demonstrate skills required for energy audit and management.
4. Prepare energy flow diagrams and energy audit report
5. Suggest cost-effective measures towards improving energy efficient and energy conservation.

KRK 29/6/2020
Prof. Ramji Kanani

Bala-
Prof. V. B. Babaria

HOD (EE)

Suggested list of experiments:

1. Computing efficiency of DC motor/Induction Motor/Transformer
2. Calculating the efficiency of boiler / blowers / compressors etc.
3. Draw the energy flow diagram for an industry/shop floor division.
4. Study of various energy efficient equipment like LED lighting devices, Energy Efficient motors, Electronics ballast etc.
5. Soft starting of an induction motor
6. Study of Variable frequency drive based IM speed control for energy conservation.
7. Industry visit with an aim of
   (i) Studying various energy management systems prevailing in a particular industry/Organization
   (ii) Identifying the various energy conservation methods useful in a particular industry
8. Studying the various energy conservation methods useful in power generation, transmission and distribution
9. Study of APFC panel or Estimating the requirement of capacitance for power factor improvement.
10. Evaluating the energy conservation opportunity through various methods like simple payback period IRR and NPV.
11. Determine depreciation cost of a given energy conservation project/equipment
12. Study of various measuring instruments used for energy audit : Lux meter, Power analyzer, flue gas analyzer
13. Identifying the energy conservation opportunities in a lab, department or institute.
14. Prepare a sample energy audit questionnaire
15. Prepare a sample energy audit report
16. Prepare a technical report on energy conservation act2003

SUGGESTED LIST OF STUDENT ACTIVITIES:

Following is the list of proposed student activities: Assignments on solving simple numerical, Prepare a report based on a survey of at least two nearby industries on energy conservation measures adopted by them using questionnaire, Carry out a survey on internet and prepare a report on energy conservation act an ECBC. Carry out detailed energy audit of your Institute or any other official building.

Major Equipments:

Anemometer, Lux Meter, Power Analyzer, Thermometer (Contact / Non-contact type), Tachometer (Contact / Non-contact type), Pressure Gauges, Multimeter, Ammeter (AC / DC), Voltmeter (AC / DC) Mandatory, Power Factor meter, Tong Tester, Earth Tester, Energy meter, Tri-vector meter, Stroboscope,

List of Open Source Software/learning website:

https://beeindia.gov.in/
http://nptel.ac.in/
https://lbre.stanford.edu/sem/energy_conservation

ACTIVE LEARNING ASSIGNMENTS:
Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus gets covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should be submitted to GSIU.

KPK 29/6/20 Prof. Ramji Kanani

Baba.. Prof. V. B. Babaria

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ELECTRICAL ENGINEERING

POWER QUALITY MANAGEMENT

CODE: 23050805

B.E. VIIITH SEMESTER

Teaching and Examination Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	-	2	5	5	30	50	70	-	150

Type of Course: - Electrical Engineering

Prerequisites: - Fundamentals of Power Systems and Power Electronics

Rationale: Quality of power can have direct impact on many industrial consumers. There has recently been a great emphasis on revitalizing industry with more automation and more modern equipment. This usually means electronically controlled, energy-efficient equipment that is often much more sensitive to deviations in the supply voltage. This worsens the quality of power. The electric utility is concerned about power quality issues as well. This course would make the students aware about the various issues affecting the power quality as well as techniques available to improve the quality of power

Contents:

Sr. No.	Topics	Teaching Hrs. (39 Hrs.)
1.	**Introduction to Power Quality:** Definition of power Quality, power quality terminology, power quality issues, Susceptibility Criteria, Responsibility of supplier and users of elect power, Standards.	03
2.	**Power Frequency Disturbance:** Common power frequency disturbances, voltage sags, cures of low frequency disturbances, voltage tolerance.	03
3.	**Electrical Transients:** Transient system model, Examples of models & response, Types and causes of transients, Examples of transient wave forms.	04

Prof. Ramji Kanani Prof. V. B. Babaria

HOD (E&E)

4.	**Harmonics:** Definition , number, odd and even harmonics, causes of harmonics, Individual & total distortion, Harmonics signatures, Effect of harmonics, Guide lines for harmonic voltage & current limitation, Harmonic current mitigation.	06
5.	**Grounding & Bonding:** Introduction, National electric code grounding requirements, Essentials of grounding system, Ground electrodes, Earth resistance tests, Earth ground grid system, Power Ground system, Signal reference ground, Signal reference ground methods, Single and multi-point grounding, Ground loops.	05
6.	**Power Factor:** Introduction, Active and Reactive power, Displacement and true power factor, power factor improvement, correction, penalty, voltage rise due to capacitance, application of synchronous condensers and static VAR compensators.	03
7.	**Electromagnetic Interference:** Electric and magnetic fields, Electromagnetic interference terminology, Power frequency fields, High frequency interference, EMI Mitigation, Cable shielding to minimize EMI, Health concerns of EMI.	05
8.	**Power Quality Measurement:** Power quality measurement devices, power quality measurements, Number of test locations, Test duration, Instrument setup, Instrument set up guidelines.	05
9.	**Distributed Generation and Power Quality:** Resurgence of DG, DG technologies, Interface to the utility system, Power quality issues, Operating conflicts,	05
TOTAL		39

Course Outcome:

After learning the course the students will be able to:

1. Understand the major power quality problems.
2. Use equipment that are required to measure the quality of power
3. Apply and analyze/compare techniques available to mitigate power quality problems.

Teaching & Learning Methodology: -

Chalk and Talk method mostly preferable and Power point presentation is also preferable for some needful topics.

Reference Books:

1. Power Quality by C.Sankaran, CRC publication
2. Electrical Power Systems Quality by Roger C.Dugan , TMH publication
3. Harmonics and Power Systems by Francisco C. De La Rosa, CRC Publication

KPK 29/6/20 Prof. Ramji Kanani

Balar Prof. V.B. Babaria

Dolyaar HOD (E&E)

Laboratory Work:

List of Experiments:

1. Study and calculation of THD and IHD of various types of non-linear loads
2. Power factor improvement using static VAR compensators
3. Measurement of current harmonics using current probe
4. Measurement of high frequency noise with oscilloscopes having high sampling rates
5. Measurement of true RMS value of voltage and current using true RMS meters
6. Measurement of magnetic and electric field using low frequency electromagnetic field meter
7. Study of harmonic distortion limits in agreement with IEEE 519
8. Study of power quality monitoring standards such as IEEE 1159 and IEC 61000-4-30

Design based Problems (DP)/Open Ended Problem:

Students can carry out analysis of harmonics generated due to non-linear loads. The analysis of harmonics may be also simulated using MATLAB or PSCAD.

Major Equipment:

1. Current probe for measuring current harmonics
2. True RMS meter
3. Spectrum analyzer
4. Oscilloscope with high sampling rate
5. Data loggers and chart recorders
6. Low frequency electromagnetic field meter
7. MATLAB for simulation of harmonics generated by non-linear loads

List of Open Source Software/learning website:

Learning resource by nptel, http://nptel.ac.in/courses/108106025 / Power quality in power distribution systems, Dr. Mahesh Kumar, IIT Madras.

Active learning Assignments (AL) : Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students.so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to SSIU.

KPK 29/6/20
Prof. Ramji Kanani

Bala.
Prof V.B. Babaria

Dolyade
HOD (EE)

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

DESIGN OF STEEL STRUCTURE

CODE: 23030701

B.TECH SEM -7

Syllabus

Teaching & Evaluation Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	1	-	5	5	30	-	70	50	150

Objectives: -

- To provide a coherent development to the students for the courses in sector of Structural Engineering.
- To present the foundations of many basic Structural Engineering tools and concepts related to Designing.
- To give an experience in the implementation of engineering concepts which are applied in field of Structural Engineering.
- To involve the application of scientific and technological principles of planning, analysis, design.

Prerequisites: - Mechanics of Solids, Structural Analysis-I & II, Elementary Structural Design.

Course outline: -

Sr. No.	Course Contents	Number of Hours
Unit-1	Connections	06
Unit-2	Axial force design	08
Unit-3	Design of Industrial Building	08
Unit-4	Design of Gantry girders	08
Unit-5	Design of foot-over bridges	09
Unit-6	Plastic Design	10
Unit-7	Design for Beams	05

I/c Prof. Mann Brajapati

Dr. M.N. PATEL

Course outcome: -

On completion of this module, the learner will be able to:

- Prepare structural layout of Industrial steel structures, plate girder, foot-over bridge.
- Determine the loads acting on it and identify the typical failure modes.
- Apply the principles, procedures and current Indian codal provisions to the analysis and design of Industrial structures, plate girder & foot-over bridges.
- Apply the principles of plastic design in steel beams & portal frames.

Content:

Sr.No.	Topics	Teaching Hrs.
Unit-1 Connections	Bolted connections – bearing type, behavior of bolted joints, Design strength of ordinary & HSFG bolts. Welded connectionsFillet and Butt weld, design of simple connections such as lap and butt joints, truss joint connections.	06
Unit-2 Axial force design	Tension member: types of tension member, behavior, modes of failure, Design of tension member, splices, lug angle. Compression member: Behaviour, classification of sections, possible modes of failure, elastic buckling of slender member, design of compression member having single & built-up section, lacing & battening,	08
Unit-3 Design of Industrial Building	Structural layout of industrial building, Various types of trusses and their selection, effect of wind loads on purlin and trusses, bracing systems, columns, foundations	08
Unit-4 Design of Gantry girders	Gantry girder – static and moving loads, selection & design of section.	08
Unit-5 Design of foot-over bridges	Structural system of through & deck type bridges, design of foot-over bridge & its Supporting system.	09
Unit-6 Plastic Design	Introduction to plastic method of analysis, Design of continuous beams and portal frame using plastic design approach.	10
Unit-7 Design for Beams	Type of sections, classification, Lateral stability, Design strength of laterally restrained and unrestrained beams, shear strength, deflection, web buckling & crippling, Design of simply supported beam.	05

Teaching & Learning Methodology: - Chalk and Talk method mostly preferable and Power point presentation is also preferable for some needful topics.

Books Recommended:

1. N. Subramaniam, Design of Steel Structures, Oxford University Press.

2. S. S. Bhavikatti, Design of Steel Structures: By Limit State Method as Per IS: 800-2007, I K International Publishing House Pvt. Ltd

3. P. Dayaratnam, "Design of Steel Structures", S. Chand Group

4. IS 800:2007, General Construction In Steel - Code of Practice, Bureau of Indian Standards, New Delhi.

5. IS 875 (Part 1): latest version, Indian Standard Code of Practice for Design Loads (Other than Earthquake) for Buildings and Structures Part-1 Dead Loads - Unit Weights of Building Materials and Stored Materials, Bureau of Indian Standards, New Delhi.

6. IS 875 (Part 2): latest version, Indian Standard Code of Practice for Design Loads (Other than Earthquake) for Buildings and Structures Part-2 Imposed Loads, Bureau of Indian Standards, New Delhi.

7. IS 875 (Part 3): latest version, Indian Standard Code of Practice for Design Loads (Other than Earthquake) for Buildings and Structures Part-3 Wind Loads, Bureau of Indian Standards, New Delhi.

8. IS 875 (Part 4): latest version, Indian Standard Code of Practice for Design Loads (Other than Earthquake) for Buildings and Structures Part-4 Snow Loads, Bureau of Indian Standards, New Delhi.

9. IS 875 (Part 5): latest version, Indian Standard Code of Practice for Design Loads (Other than Earthquake) for Buildings and Structures Part-5 Special Loads and Combinations, Bureau of Indian Standards, New Delhi.

Web Resources:

1. http://nptel.ac.in/
2. elearning.vtu.ac.in

Prof. Mani Prajapati

Dr. M.N. PATEL

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

IRRIGATION ENGINEERING

CODE: 23030702

B.TECH. SEM-7

Teaching & Evaluation Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	0	1	4	4	30	-	70	50	150

Objectives: -To take up the basic concepts of irrigation and construction of various hydraulic structures.

- To introduce students to basic concepts of water, plants, their interactions, as well as irrigation and drainage systems design, planning and management.
- The structures involved the elementary hydraulic design of different structures and the concepts of maintenance shall also form part.
- To develop analytical skills relevant to the areas mentioned above, particularly the design of irrigation and drainage projects.

Prerequisites: -

Knowledge of Fluid Mechanics, Hydrology and Water Resources Engineering

Course outline: -

Sr.No.	Course Contents	Number of Hours
Unit-1	Introduction	09
Unit-2	Methods of Irrigation	03
Unit-3	Diversion Works & Storage and Outlet works	11
Unit-4	Design of Irrigation Channel	11
Unit-5	Cross drainage works	07
Unit-6	Canal regulation works	04

I/c Mam

Prof. Mami Bajapati

Dr. M.N.PATEL

Course outcome: -

On the completion of the course one should be able to understand:

- Calculate the pressure at key points of sheet piles and floor thickness for a weir/barrage using Khosla's theory
- Concepts of irrigation and different hydraulic structures.
- How to estimate the quantity of water required by crops.
- Be able to plan and design irrigation projects.
- Design channels and other irrigation structures required for irrigation, drainage, soil conservation, flood control and other water-management projects.

Content:

Sr.No.	Topics	Teaching Hrs.
Unit-1 Introduction	Necessity of irrigation- scope of irrigation engineering- benefits and ill effects of irrigation, irrigation development in India- types of irrigation systems, Soil-water plant relationship: Classification of soil water- soil moisture contents- depth of soil water available to plantspermanent and ultimate wilting point, Irrigation requirements – Net irrigation requirement, Field irrigation requirement, Gross Irrigation requirement, Soil moisture extraction pattern, Frequency of irrigation, Principal Indian crops, Gross command area, Culturable command area, Duty and delta relation, Irrigation efficiency, assessment of irrigation water	09
Unit-2 Methods of Irrigation	Classification- choice of method of irrigation- surface and subsurface irrigation methods, Sprinkler and Drip Irrigation	03
Unit-3 Diversion Works & Storage and Outlet works	Different stages of a river and their flow characteristics, Weir and barrages, Various parts of a weir and their functions, Exit gradient, Principles of weir design on permeable formations -Bligh's creep theory and Khosla's theory. Types of earthen dams, Seepage in earth dams, Gravity dams, Forces acting on a gravity dam, Rock-fill dams, Spillways, Types of spillways, Spillways gates and energy dissipation works.	11
Unit-4 Design of Irrigation Channel	Alignment- canal capacity- losses- FSL of canal- design of canal in alluvial soil and non alluvial soils- Kennedy's silt theory- Lacey's regime theory- balancing depth- use of Garrets diagrams and Lacey's Regime diagrams- lining of irrigation channels- design of lined canal drainage behind lining. Water logging: Causes, Measures: surface and sub-surface drains, land reclamation.	11
Unit-5 Cross drainage works	Types- selection of suitable type of CD works- aqueduct and Syphon aqueductdetermination of maximum flood discharge and waterway for drain, fluming of canal- uplift pressure on underside of barrel roof and at the floor of the culvert- design of bank connections.	07
Unit-6 Canal regulation works	Canal fall- necessity and location- types of falls- Cross regulator and distributory head regulator- their functions, Silt control devices, Canal escapes- types of escapes.	04

Teaching & Learning Methodology: - Chalk and Talk method mostly preferable and Power point presentation is also preferable for some needful topics.

Books Recommended:

1. Irrigation & Water Power Engineering - Dr. B.C.Punmia & B.B.Pande, Laxmi Publications, (P) Ltd, New Delhi

2. Irrigation, Water Resources & Water Power Engineering - Dr. P.N.Modi, Standard Book House, Delhi

3. Irrigation, Water Power & Water Resources Engineering - Dr. K.R.Arora Standard Publishers Distributors, Delhi

4. Irrigation Engineering and Hydraulic Structures - S.K.Garg, Khanna Publishers, Delhi

5. Irrigation Engineering, S.K. Mazumder, Galgotia Publications Pvt Ltd., New Delhi

6. A.M. Micheal, "Irrigation, Theory and Practice", Vikas Publishing House Pvt. Ltd. New Delhi

Web Resources:

1. http://nptel.iitm.ac.in/courses/webcourses contents/IIT%20Kharagpur/Water%20Resource%20Engg/New_index1.html
2. http://nptel.iitm.ac.in/courses/webcourses contents/IIT%20Kharagpur/Water%20Resource%20Engg/pdf/m3l02.pdf
3. http://nptel.iitm.ac.in/courses/webcourses contents/IIT%20Kharagpur/Water%20Resource%20Engg/pdf/m3l03.pdf

S/c
Prof. Mann Prajapati

Dr. M.N. PATEL

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

URBAN TRANSPORTATION ENGINEERING

CODE: 23030703

B.TECH SEM-7

Teaching & Evaluation Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	1	0	4	4	30	-	70	50	150

Objectives: -

- To introduce the concept of Urban Transporation system and its planning, Urbanization, modes of transportation in urban area, Transit system
- To give idea of modeling in planning, to develop the methodology of travel demand modeling for Urban Transportation Systems
- To impart knowledge about the landuse planning and transportation Interaction.

Prerequisites: - Basic knowledge and terminologies related to Urban Transportation and modes.

Course outline: -

Sr.No.	Course Contents	Number of Hours
Unit-1	Introduction to Urban Transporatation system and Definition of Urban area and trends in Urbanization	05
Unit-2	Travel demand	09
Unit-3	Transporation survey and Travel Forcasting	06
Unit-4	Urban Transporation Planning System	06
Unit-5	Corridor Identification	04
Unit-6	Mass Transit system	03
Unit-7	Urban Transportation structure, Development and Plan preparation	06

Prof. Mansi Prajapati

Dr. M.N. PATEL

Course outcome: -

On completion of this module, the learner will be able to:

- Students will know about the transportation system planning in new or existing town or city.
- Students will be able to analyse the issues related to congestion and inconvinence due to Urban transportation.
- The students would be able to understand and evaluate current scenarios of traffic management and improve it.

Content:

Sr.No.	Topics	Teaching Hrs.
Unit-1 Introduction to Urban Transporatation system	Introduction, Objectives and goals; Roles of transportation at various levels; levels of transportation planning; Introduction to Urbanization; Trends in urbanization; Problems in urban transportation; Identification	05
Unit-2 Travel Demand	Concepts of travel demand; factors affecting demand and the demand functions; calibration methods; sequential, direct demand models; introduction to aggregate and disaggregate approaches	09
Unit-3 Transporatation Survey and Travel forcasting	The transportation study area definition; division into traffic zones; network identification and coding; types of travel and characteristics of various surveys; home interview; roadside survey; goods, mass transit and intermediate public transport surveys; sampling and expansion factors; accuracy checks, screen; Growth factor methods and urban transportation planning system; growth factors; average growth factor method and Furness method line checks, consistency checks.	06
Unit-4 Urban Transporation Planning System	Trip generation; zonal regression methods and category analysis; trip distribution method; gravity models and opportunity models; modal split methods; factors affecting modal split; trip end models and trip distribution models; route assignment; factors affecting route choice; diversion curve; shortest paths; all or nothing assignment.	06
Unit-5 Corridor Identification	Prediction issues and forecasting of the travel demand and future desires; corridor identification and corridor screen line analysis.	04
Unit-6 Mass Transit system	Bus and rail transit; characteristics, capacities, Introduction to routing and scheduling, route planning transit system's performance parameters .	03
Unit-7 Urban Transportation structure, Development and Plan preparation	Urban forms and structures; point, linear, radial, poly-nuclear developments and preparation of plan, comprehensive and traffic system management plans.	06

Teaching & Learning Methodology: - Chalk and Talk method mostly preferable and Power point presentation is also preferable for some needful topics.

List of Tutorials:

Field Visit to Urban Mass Transportation System Service - Depot, Terminals, Offices

1. Students can conduct home interview survey in group for the different zone/ward areas of city. From the collected data, they can develop zonal regression models, carry out category analysis, prepare base year O-D matrix and desire line diagram, mode wise and purpose wise trip distribution, trip length frequency distribution and prepare power point presentation of all this analysis.
2. Students can evaluate the existing mass transportation system. They can conduct the survey of boarding and alighting of passengers, find the actual demand on the routes and ascertain the optimum routing and scheduling.

Books Recommended:

1. B.G.Hutchinson, Principles of urban transportation system planning- McGraw-Hill, New York, 1974
2. Edward K.Morlok, Transportation Engg. and Planning
3. W.Dickey, Metropolitan Transportation Planning Tata McGraw-Hill, New Delhi, 1975
4. Blunder and Black, Land useTtransportation System
5. J.Ortuzer and L.G. Willumsen, Modelling Transport, Johan Wiley and Sons Chincester,1994
6. Vukan R. Vuchic, Urban Transit : Operations, Planning and Economics, Wiley Sons Publishers.
7. Peter White, Public Transport, UCL Press
8. Kadiyali L.R., Traffic Engineering and Transport Planning, Khanna Publishers
9. Khisty, C J., Transportation Engineering – An Introduction, Prentice-Hall, NJ
10. S.C. Saxena, Traffic Planning and Design, Dhanpat Rai Pub., New Delhi.

Web Resources:

1. https://nptel.ac.in/courses/105/107/105107067/

Prof. Mami Prajapati

DR. M.N. PATEL

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

GROUND IMPROVEMENT TECHNIQUES

CODE: 23030704

B.TECH.SEM-7

Teaching & Evaluation Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	1	0	4	4	30	-	70	50	150

Objectives: -

- To impart fundamental knowledge of Ground Improvement Techniques.
- At the end of the course student is expected to identify the problematic soil.
- To make capable of designing the appropriate method of Ground Improvement according to site conditions and requirement.

Prerequisites: - Basic knowledge and terminologies related to Geotechnical Engineering

Course outline: -

Sr.No.	Course Contents	Number of Hours
Unit-1	Introduction To Ground Improvement	05
Unit-2	Methods of Ground Improvement	09
Unit-3	Dewater And Drainage	06
Unit-4	Physical And Chemical Stabilization	06
Unit-5	Soil Reinforcement	06

Course outcome: -

On completion of this module, the learner will be able to:

- An understanding about types of ground improvement techniques and soil distribution in India
- To understand the selection of appropriate soil improvement technique based on the soil type and application
- Knowledge about Compaction of soil.
- Knowledge about types of chemical stabilization and their methods

Prof. Mansi Prajapati

Dr. M.N. PATEL

- To know regarding Ground Anchors, Rock Bolts and Soil Nailing
- Understanding about various methods of dewatering of soil

Content:

Sr.No.	Topics	Teaching Hrs.
Unit-1 Introduction To Ground Improvement	Soil distribution in India, Compaction of soil, Engineering properties of soft, weak and compressible deposits and problems associated with these deposits, Need for soil improvement (cohesive soils and cohesionless soils) Reclaimed soils Ground Improvement Potential.	05
Unit-2 Methods of Ground Improvement	Compaction, Preloading, admixtures, heat treatment, ground freezing, anchorage, micropiles, stone columns, accelerated consolidation with prefabricated drains, granular columns, lime columns, electro-osmosis, compaction piles heavy tamping, deep mixing, vibro-replacement,vibro-compaction, blast densification, soil nailing, ground	09
Unit-3 Dewater And Drainage	Introduction, Ditches and sumps, Well point system, Shallow well system, Deep well drainage, Vaccum method, Elctro-osmosis method, seepage analysis, Protective filters	06
Unit-4 Physical And Chemical Stabilization	Mechanical stabilization, Lime stabilization, Cement stabilization,, Bitumen stabilization	06
Unit-5 Soil Reinforcement	Types of soil reinforcements, Geotextiles – definition and types, functions of geotextiles, use og geotextiles in different works, placement of geotextiles	06

Teaching & Learning Methodology: - Chalk and Talk method mostly preferable and Power point presentation is also preferable for some needful topics.

Practical Exercises:

1. Determination of various index properties of soil (specific gravity, liquid limit, plastic limit, shrinkage limit, relative density, soil classification)
2. Determination of various engineering properties of soil (permeability, shear strength, compaction, swell pressure)
3. Chemical analysis of soil

Books Recommended:

4. B. C. Punamia, "Soil Mechanics and Foundation", Laxmi Publications
5. Koerner R M, "Construction and Geotechnical Methods in Foundation Engineering", McGraw Hill Publishing Co. Ltd., 1984
6. Hausmann M.R. „Engineering Principles of Ground Modification" McGraw Hill Publishing Company, New York – 1990
7. Van Impe W.F, "Soil Improvement technique and their evaluation" 12. Rao V.V S, "Ground Improvement techniques

Web Resources:

1. http://www.cdeep.iitb.ac.in/nptel
2. http://www.nptel.iitm.ac.in

Prof. Manni Prajapati

DR. M.N. PATEL

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

REMOTE SENSING & GIS

CODE: 23030705

B.TECH.SEM-7

Teaching & Evaluation Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	1	-	4	4	30	-	70	50	150

Objectives: -

- To develop understanding about Photogrammetry, remote sensing system, Global Navigation Satellite System (GNSS) and GIS.
- To enable students to make measurements using photogrammetric technique, to carryout analysis of remotely sensed data and extract information from it.
- To enable students conversant with data collection using GNSS systems and Differential GPS.
- To enable students prepare thematic maps and carryout analysis using GIS technique.
- To enable students learn different applications of Photogrammetry, remote sensing system, Global Navigation Satellite System (GNSS) and GIS.

Prerequisite: Basic knowledge of surveying, computer and its peripherals, Fundamentals of Photogrammetry, Remote Sensing, GPS and GIS.

Prof. Mani Prajapati

Dr. M.N.PATEL

Course outline: -

Sr. No.	Course Contents	Number of Hours
Unit-1	Introduction	03
Unit-2	Aerial Phhotogrammrtry	07
Unit-3	Remote Sensing	09
Unit-4	GNSS and Scanners	07
Unit-5	GIS	09
Unit-6	Application of Geoinformatics	05

Course Outcome:

After learning the course the students should be able to:

1. Ability to develop Orthographic and Contour maps using aerial photographs and Remote sensing Images
2. Ability to develop maps using Total Station, GIS, GPS and Scanners
3. Ability to create GIS application referencing Spatial features with Attribute data

Content:

Sr. No.	Topics	Teaching Hrs.
Unit-1 Introduction	Introduction to geo-informatics. Conventional methods of mapping. Advanced methods of mapping. Comparison of Methods.	03
Unit-2 Aerial Phhotogrammrtry	Development and classification of Photogrammetry, Aerial Photogrammetric processes: acquisition of data, classification of Photographs, Photographic scale, relief displacement, Flight planning, stereo Photogrammetry, Stereo model compilation principal and use of stereoscopic 3D view and parallax bar, Ortho-rectification, Orientation and triangulation, DEM Generation.	07
Unit-3 Remote Sensing	Introduction to Electromagnetic Spectrum (EMR), interaction of EMR with atmosphere and target, Resolutions: Spatial, temporal, spectral and radiometric, sensor characteristics, satellite data products, digital imaging, digital image processing, visual image interpretation, digital image interpretation. microwave remote sensing.	09

Unit-4 GNSS and Scanners	**Global Navigation Satellite System (GNSS)**: GNSS basic concepts, GPS (NAVSTAR), Galileo, GLONASS and Indian Regional Navigation Satellite System (IRNSS). Functional segments of GPS and components. Working principle, factors affecting, GPS setup and accessories, satellites & receivers, Differential GPS (DGPS), Applications of GNSS. **Scanners:** Introduction, Classification, Principle and Application.	07
Unit-5 GIS	**Structure of GIS**: Cartography, Geographic mapping process, GIS data models, database management systems, Raster data representation, Vector data representation, transformations, map projections, Geographic Data Representation, Storage, Quality and Standards, Assessment of data, quality, managing data errors Geographic data standards. GIS Data Processing, Analysis and Modeling: Raster based GIS data processing – Vector based GIS data processing – Queries – Spatial analysis – Descriptive statistics – Spatial autocorrelation– Quadrant counts, and nearest neighbor analysis – Network analysis – Surface modeling – DEM.	09
Unit-6 Application of Geoinformatics	Case studies of applications of geo-informatics to following areas: a. Environment b. Water Resource c. Transportation d. Town Planning e. Geology f. Disaster Management g. Mapping.	05

Teaching & Learning Methodology: - Chalk and Talk method mostly preferable and Power point presentation is also preferable for some needful topics.

List of Experiments/Tutorials:

1. Photo interpretation and Photogrammetry
2. Image Registration and Georeferencing
3. Image Interpretation
4. Image classification
5. Application of GIS and GPS
6. Creation of thematic maps
7. Overlay analysis
8. Digital Elevation Modeling
9. Geospatial analysis and Map based Queries

H/c Mami

Prof. Mami Brajapati

DR. M.N. PATEL

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

EARTHQUAKE ENGINEERING

CODE: 23030706

B.Tech Sem-7

Teaching & Evaluation Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	1	-	4	4	30	-	70	50	150

Prerequisites: - Mechanics of Solids, Structural Analysis I & II, Design of Reinforced Concrete Structure.

Objectives: -

- To provide a coherent development to the students for the courses in sector of Earthquake Engineering.
- To present the foundations of many basic Earthquake Engineering tools and concepts related to Earthquake proof Designing.
- To give an experience in the implementation of engineering concepts which are applied in field of Earthquake Engineering.
- To involve the application of scientific and technological principles of planning, analysis, design

Course outline: -

Sr.No.	Course Contents	Number of Hours
Unit-1	Earthquake Basics	03
Unit-2	Fundamentals of Earthquake Vibrations of buildings	11
Unit-3	Design Philosophy	11
Unit-4	Lateral Loads on Buildings	06
Unit-5	Ductile Detailing	05
Unit-6	Special topics	06

T/c Mami

Prof. Mami Prajapati

Dr. M.N.PATEL

Course outcome: -

On completion of this module, the learner will be able to:

- Determine the response of SDOF & MDOF structural system subjected to vibration including earthquake.Determine the loads acting on it and identify the typical failure modes.
- Apply the concept of Earthquake Resistant Design & concept of lateral load distribution on buildings.
- Determine the lateral forces generated in the structure due to earthquake.
- Apply the concept of ductile detailing in RC structures.

Content:

Sr.No.	Topics	Teaching Hrs.
Unit-1 Earthquake Basics	Interior of Earth, plate tectonics, faults, consequences of earthquake, Basic parameters of earthquake, magnitude & intensity, scales, Seismic zones of India, damages caused during past earthquakes (worldwide).	03
Unit-2 Fundamentals of Earthquake Vibrations of buildings	Static load v/s Dynamic load (force control and displacement control), simplified single degree of freedom system, mathematical modelling of buildings, natural frequency, resonance v/s increased response, responses of buildings to different types of vibrations like free and forced, damped and un-damped vibration, response of building to earthquake ground motion, Response to multi degree (maximum three) of freedom systems up to mode shapes.	11
Unit-3 Design Philosophy	Philosophy of earthquake resistant design, earthquake proof v/s earthquake resistant design, four virtues of earthquake resistant structures (strength, stiffness, ductility and configuration), seismic structural configuration, Introduction to IS: 1893 (Part I), IS: 875 (Part V). Seismic load: Seismic Coefficient Method – base shear and its distribution along height. Introduction to Response spectrum, IS code provisions.	11
Unit-4 Lateral Loads on Buildings	**Lateral Load Distribution (SDOF):** Rigid diaphragm effect, centers of mass and stiffness, torsionally coupled and uncoupled system. **Lateral Load Analysis:** Analysis of frames using approximate methods like portal & cantilever methods	06
Unit-5 Ductile Detailing	Concepts of Detailing of various structural components as per IS: 13920 provisions.	05

Unit-6 Special topics	Introduction to Earthquake Resistant Features of un-reinforced & reinforced masonry Structure, Confined Masonry, Soil liquefaction, Structural controls, Seismic strengthening.	06

Teaching & Learning Methodology: - Chalk and Talk method mostly preferable and Power point presentation is also preferable for some needful topics.

Books Recommended:

1. Manish Shrikhande & Pankaj Agrawal; Earthquake resistant design of structures, PHI Publication, New Delhi
2. S.K.Duggal; Earthquake resistance design of structures; Oxford University Press, New Delhi.
3. A.K.Chopra; Dynamics of structures , Pearson, New Delhi
4. Clough & Penzin; Dynamics of structures
5. Park & Pauly; Behaviour of RC structure
6. John M.Biggs; Introduction to Structural Dynamics
7. C V R Murthy - Earthquake Tips, NICEE
8. IITK-GSDMA EQ26 – V -3.0 Design Example of a Six Storey Building
9. S S Rao; Mechanical Vibration; Pearson, New Delhi.

IS Codes:

1. Criteria for earthquake resistant design General provision & Building - IS: 1893 (PartI) - 2002
2. Code of Practice for Ductile Detailing of RC Structures - IS: 13920 (1993).
3. Code of Practice for earthquake resistant design & Construction of buildings – IS 4326 (1993).
4. Improving Earthquake Resistance of Earthen Buildings - IS 13827(1993)
5. Guide lines for Improving Earthquake Resistance low strength masonry buildings - IS 13828 (1993)

I/c Prof. Mauli Rajapati

Ds. M.N. PATEL

List of Open Source Software/learning website:

1. www.nicee.org
2. www.eeri.org
3. www.gsdma.org
4. www.ndma.gov.in
5. www.nptel.iitm.ac.in/courses/
6. www.nisee.berkeley.edu/elibrary/getpkg?id=NONLIN

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

CONSTRUCTION PROJECT MANAGEMENT

CODE: 23030801

B.TECH SEM-8

Teaching & Evaluation Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	1	0	4	4	30	-	70	50	150

Objectives: -

- To provide the knowledge of management in construction organization.
- To impart the knowledge of various softwares used in management of construction project
- To provide the knowledge of account management in construction work.

Prerequisites: - Study of construction and various method of construction with different equipment.

Course outline: -

Sr.No.	Course Contents	Number of Hours
Unit-1	Introduction of Project management and project organization	05
Unit-2	Construction Economics and Planning	10
Unit-3	Project scheduling and Resource leveling	04
Unit-4	Construction Equipment and Account Management	08
Unit-5	Construction material management	02
Unit-6	Construction Project cost management	05
Unit-7	Construction quality management	04
Unit-8	Construction safety management and factors for success of a Project	06

I/c

Prof. Mansi Bajapati

Dr. M.N. PATEL

Course outcome: -

After learning the course the students should be able to:

(1) Execute all type of managerial tasks in construction projects.

(2) Use software for construction projects management.

Content:

Sr.No.	Topics	Teaching Hrs.
Unit-1 Introduction of Project management and project organization	Construction company structure of construction organization, Management levels, Factors for success of a construction organization. A construction project, Phases of construction project, Importance of construction and construction industry.	05
Unit-2 Construction Economics and Planning	Economic decision making, Evaluating alternatives by; Effect of taxation on comparison of alternatives; Effect of inflation on cash flow; Evaluation of public projects; Benefit cost ratio method; Types of project plans, Work break down structure, Planning techniques, Bar charts, CPM and PERT network analysis, Precedence network ladder network, Line of balance method.	10
Unit-3 Project scheduling and Resource	Resource allocation, Importance of project scheduling, Deriving other schedules, Network crushing and cost time trade off. advanced concepts in economical analysis.	04
Unit-4 Construction Equipment Management	Advanced concepts in economical analysis.	08
Unit-5 Construction material management	Material management functions, Inventory management. Job layout	02
Unit-6 Construction Project cost management	Project cost management, Collection of cost related information, Cost codes, Cost statement, Value management in construction, Steps, Value engineering application in a typical case project.	05
Unit-7 Construction quality management	Construction quality, Inspection, Quality control and Quality assurance in projects, Total quality management, Quality gurus and their teaching cost of quality ISO standards, Principles of quality management systems, (CONQUAS) construction quality assessment system.	04

Unit-8 Construction safety management and factors for success of a Project	Evolution of safety, Unsafe conditions, Unsafe acts health and safety act and regulation cost of accidents, Role of safety personnel, Accident causes and principles of safety, Safety and health management system. Project performance measurement and project evaluation criteria, Project performance attributes, Effect of other elements on project performance	06

Teaching & Learning Methodology: - Chalk and Talk method mostly preferable and Power point presentation is also preferable for some needful topics.

Design based Problems (DP)/Open Ended Problem:

1. Students have to visit a construction project site and study various management practices and find out the progress is as per planning or not. If not what are the factors responsible for discrepancy.

2. Students shall adopt any construction project and study how the management tasks are performed and how the progress is monitored. Students shall submit a report of their case study.
3. Teacher can give data of a construction project and students can be asked to carry our all function required during the planning phase.

Books Recommended:

1. Construction project management: Theory and Practices, 2nd edition, 2016, Kumar Niraj Jha, Pearson Education Publishers.
2. Project management for engineering and Construction, By Garold D Oberlender, 2nd Edition, McGraw Hill Education (India), Pvt. Ltd.
3. CPM and PERT: Punamia & Khandelwal.
4. Construction planning and management, P S Gehlot and B M Dhir, Wiley Eastern Ltd.
5. A management guide to PERT/ CPM by Weist and Levy, Prentice Hall

Web Resources:

1. http://www.nptel.ac.in

I/c

Prof. Mami Bajapati

Dr. M.N. PATEL

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

PRESTRESSED CONCRETE

CODE: 23030802

B.TECH SEM -8

Teaching & Evaluation Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	1	-	5	5	30	-	70	50	150

Objectives: -

- To provide a coherent development to the students for the courses in sector of Concrete Design and it's various application.
- To present the foundations of many basics of Prestressed Concrete and uses in field.
- To give an experience in the implementation of prestressed Concrete which are highly demanded in present structural design.
- To involve the application of scientific and technological principles of Prestressed Design and analysis.

Prerequisites: - Structural Analysis-I & II, Concrete technology, Design of Reinforced Concrete structure.

Course outline: -

Sr.No.	Course Contents	Number of Hours
Unit-1	Introduction and Anchorage Zone	12
Unit-2	Cable profiles	09
Unit-3	Design of Pre-stressed Concrete Sections	10
Unit-4	Pre-Stressed Slab and Partial Prestressing	11
Unit-5	Design of Water Retaining Structure	09

Prof. Mann Bajapati

Dr. M.N. PATEL

Course outcome: -

On completion of this module, the learner will be able to:

- Apply concepts & methods for pre stressing systems for different materials..
- compute stresses in beams due to transverse loads & prestressing.
- Determine the losses in beams due to prestress, short and long term deflection, flexural and shear strength of beam.
- Analyse and design substructure, foundation and adjoining elements.

Content:

Sr.No.	Topics	Teaching Hrs.
Unit-1 Introduction and Anchorage Zone	Systems of pre-stressing in detail, pre-stressing techniques, transfer of Pre-stress, types of commercially available jacks, computation of losses of pre-stress, end block stresses, design.	12
Unit-2 Cable profiles	Concordant and non-concordant cable profile and associated factors in continuous members. Modern cable laying: materials & practices, precautions etc. Computation of deflection in pre-stressed concrete members.	09
Unit-3 Design of Pre-stressed Concrete Sections	Flexural, shear and torsion resistance of members, preliminary and final design of sections, design of pre and post tensioned flexural members; simply supported and continuous members.	10
Unit-4 Pre-stressed Slab and Partial Prestressing	Design of slabs, tendon layout, precast slab, production and their applications principles and advantages, methods, practices and design.	11
Unit-5 Design of Water Retaining Structure	Case study of one bridge girder with design and constructional features.	09

Teaching & Learning Methodology: - Chalk and Talk method mostly preferable and Power point presentation is also preferable for some needful topics.

Books Recommended:

1- Design of Pre stressed Concrete by T.Y. Lin, Wiley Eastern International.

2- Design of Pre stressed Concrete Structures by N.Sinha Ray, S.Chand Co.

3. Prestressed concrete structures by Praveen Nagrajan, Pearsons

4. Krishna Raju N. Pre stressed Concrete, Tata McGraw Hill Co.

5. Rajagopal N., Prestressed Concrete, Narosa Publishing House.

6. Dayarathnam P., Prestressed Concrete Structures, S.Chand Publishers.

Web Resources:

1. http://nptel.ac.in/
2. elearning.vtu.ac.in
3. http://www.icri.org
4. http://www.nbmcw.com

Prof Mamta Prajapati

DR. M.N. PATEL

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

FOUNDATION ENGINEERING

CODE: 23030803

B.TECH.SEM-8

Teaching & Evaluation Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	0	1	4	4	30	-	70	50	150

Objectives: -

- To impart knowledge on common method of sub soil investigation and design of foundation.

Prerequisites: - Basic knowledge and terminologies related to geotechnical engineering.

Course outline: -

Sr.No.	Course Contents	Number of Hours
Unit-1	Site Investigation And Selection Of Foundation	05
Unit-2	Types Of Footing	03
Unit-3	Shallow Foundation	07
Unit-4	Deep Foundation	07
Unit-5	Retaining Walls	05
Unit-6	Geotextiles	04

Course outcome: -

On completion of this module, the learner will be able to:

- On choosing suitable foundation system (shallow/Deep) for different structures, that satisfy the allowable bearing capacity and settlement requirements based on soil properties
- Design deep foundation satisfying bearing capacity and settlement requirements,
- Design and analysis of retaining walls and sheet piles under static loads,
- Students will have the ability to select type of foundation required for the soil at a place and able to design shallow, foundation, deep foundation and retaining structures.

Prof. Mann Prajapati

Dr. M.N. PATEL

Content:

Sr.No.	Topics	Teaching Hrs.
Unit-1 Site Investigation And Selection Of Foundation	Scope of exploration, Methods of exploration, Types of boring, Depth and spacing of bore hole, Types of soil samples, Sampling methods, Types of sampler, Penetration tests (SPT and SCPT), Strength parameters, Bore log report and Selection of foundation.	05
Unit-2 Types Of Footings	Types of Isolated footing, Combined footing, Strap footing, Mat foundation, Types of deep foundations, Difference, Applications, Codal provision	03
Unit-3 Shallow Foundation	Defination, Purposes of shallow foundation, Minimum depth of foundation, Types of bearing capacity failures, Types of analysis, Terzaghis's analysis, Skempton's analysis, Factors affecting bearing capacity , Effect of water table on bearing capacity of foundations, IS code method, Codal provision, Methods of minimizing total and differential settlements, Bearing capacity of raft/mat foundation as per codal provisions, Contact pressure under rigid and flexible footings. Floating foundation. Types of pavements & its design, Examples	07
Unit-4 Deep Foundation	Introduction, types of piles with their function, factors affecting selection of pile, the method of installation of piles and their load carrying capacity for different soils, piles subjected to vertical loads- pile load carrying capacity from static formula, dynamic formulae, penetration test & Pile load test (IS 2911). Pile group: carrying capacity, efficiency and settlement. Negative skin friction, Under-reamed piles, Examples	07
Unit-5 Retaining Walls	Types of retaining walls (counter fort, gravity, diaphragm walls, sheet pile walls, soldier piles and lagging), Earth pressure (Active, Passive and at rest), Stability analysis.	05
Unit-6 Geotextiles	Geotextiles – definition and types, functions of geotextiles, use of geotextiles in different works, placement of geotextiles	04

Teaching & Learning Methodology: - Chalk and Talk method mostly preferable and Power point presentation is also preferable for some needful topics.

Practical Exercises:

1. Plate load test (PLT)
2. Standard Penetration test (SPT)
3. Static and Dynamic Cone Penetration test (SCPT-DCPT)
4. Triaxial Shear Test (CD condition)
5. Consolidation test (on soft marine clays)
6. Swell Pressure test
7. CBR test

Books Recommended:

1. Khanna, S.K. & Justo, C.E.G., Highway Engineering, NemChand & Bros, Roorkee (U.A).
2. P. Purushothama Raj; Soil Mechanics and Foundation Engineering; Pearson Education.
3. B.C. Punamia; Soil Mechanics & Foundation Engineering; Laxmi Pub. Pvt. Ltd., Delhi
4. V. N. S. Murthy; Soil Mechanics & Foundation Engineering; Sai Kripa Technical Consultants, Banglore
5. Gopal Ranjan, Rao A.S.R.; Basic and applied soil mechanics; New age int. (p) ltd.
6. Arora K.R.; Soil Mechanics & Foundation Engineering; Standard Pub., Delhi
7. Das Braja M; Principles of Geotechnical Engineering; Thomson Asia Pvt. Ltd.

IS Codes:

8. Code of practice for determination of bearing capacity of shallow foundation IS:6403
9. Code of practice for design and construction of pile foundation- IS:2911 (Part I to IV)
10. Method for standard penetration test for soil- IS:2131 12)
11. Code of practice for subsurface investigation for foundation- IS:1892 13)
12. Code of practice for structural safety of buildings: Shallow Foundations- IS:1904
13. Code of practice for calculation of settlement of foundations- IS:8009

Web Resources:

1. http://www.cdeep.iitb.ac.in/nptel
2. http://www.nptel.iitm.ac.in

Dr. M.N. PATEL

I/c Mami

Prof. Mami Prajapati

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

AIR POLLUTION AND CONTROL

CODE: 23030804

B.TECH SEM-8

Teaching & Evaluation Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	1	-	4	4	30	-	70	50	150

Objectives: - It provides fundamentals for selection and design of the most appropriate and sustainable air pollution control equipments. It also provides the basics on treatment options and technology selection for specific industrial applications.

Prerequisite: Knowledge of Fundamentals of Air Pollution

Course outline: -

Sr. No.	Course Contents	Number of Hours
Unit-1	Emission Quality Requirements	01
Unit-2	Control of Particulates	10
Unit-3	Control of gaseous pollutants	08
Unit-4	Air Pollution Episodes and Atmospheric Photochemical Reactions	06
Unit-5	Mobile Sources	07
Unit-6	Sources and Air Pollution control systems for Specific Industries	08

I/c

Prof. Mann Prajapati

Dr. M.N. PATEL

Course outcome: -

After learning the course the students should be able to:

1. Select the most appropriate technology to purify and/or control emission of particulate emission.
2. Suggest the applicable technology to prevent , control or scrub the oxide of sulfur from the gas and design the control equipment. .
3. Apply the best technologies for control of NOx.
4. Propose the measures to control the emission from mobile sources.
5. Devise the techniques to control gases and vapors from industries using concepts of absorption, adsorption and condensation.

Content:

Sr. No.	Topics	Teaching Hrs.
Unit-1 Emission Quality Requirements	Air Quality Emission and Standards.	01
Unit-2 Control of Particulates	Particulate control mechanisms, gravity settler, venturi scrubber, cyclone separator, bagfilters electrostatic precipitator.	10
Unit-3 Control of gaseous pollutants	**(i) Control of Sulphur Oxides:** Introduction: thermo dynamics and kinetics of sulphur dioxide Formation Control methods: Pre combustion :Low sulphur fuel firing, Desulphurization of fuel ; Post combustion: Tall stack dispersion Flue gas desulphurization :Non regenerative process; Regenerative process ;dry process : carbon adsorption & spray dryer scrubbing **(ii) Control of Nitrogen Oxides:** Introduction : mechanism of formation of nitrogen oxides Control Methods: Pre combustion and combustion Methods Post combustion : Catalytic Decomposition, Catalytic Reduction : Selective Non- Catalytic reduction and Selective Catalytic reduction; Adsorption , Absorption **(iii) Control of VOCs:** Introduction, sources and Mechanisms.	08
Unit-4 Air Pollution Episodes and Atmospheric Photochemical Reactions	Introduction, thermodynamics of photo chemical reactions, monoatomic oxygen and ozone formation. Role of oxides of nitrogen in photo oxidation, hydro carbon in atmospheric photo chemistry, oxidants in photo chemical smog, hydro carbon reactivity.	06

Unit-5 Mobile Sources	IC engine and cycle, A/F ratio, sources of air pollutants, control by process change, engine design change, Stratified charge engines, Rotary combustion engines, control by fuel change, catalytic converters, air pollution by diesel engines and turbojet engines.	07
Unit-6 Sources and Air Pollution control systems for Following Industries	1. Mineral Processing industry 2. Cement Industry 3. Fertilizer Industry 4. Chemical Industry 5. Thermal power plant 6. Foundry and induction furnace metal industries	08

Teaching & Learning Methodology: - Chalk and Talk method mostly preferable and Power point presentation is also preferable for some needful topics.

List of Tutorials

1. Assignment based on Air quality and emission standards, Air pollution indices
2. Tutorial based on A/F ratio and Vehicle Pollution
3. Air Pollution Control Equipments for particulate control: Working principle, Construction, applications.
4. Assignments on different techniques for control of sulphur oxides
5. Assignments on different techniques for control of Nitrogen oxides.
6. Assignments on Control of gases and vapours.
7. Assignments on Atmospheric Photochemical reactions.

Design based Problems (DP)/Open Ended Problem: Term paper on Air Pollution control systems for industries including identification and characterization of sources of air pollution, treatment and control of air pollutants including waste minimization with flow diagram.

Major Equipment:

1. Respirable Dust sampler.
2. PM 10 and PM 2.5 monitor.
3. Stack monitoring kit.
4. Auto exhausts analyzer.

Reference Books:

1) Air Pollution Control – by Wark & Warner
2) Air Pollution – by M N Rao
3) Air Pollution – by Henry Perkins
4) Air Pollution and control – by Noel De nevers.

Prof. Mami Prajapati

Dr. M.N. PATEL

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

DOCK HARBOUR AND AIRPORT ENGINEERING

CODE: 23030805

B.TECH SEM-8

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	1	0	4	4	30	-	70	50	150

Objectives: -

- To Study basics of docks, harbour and airports.
- To Learn various marine structures and navigation aids at port.
- To Understand various ground and airside structures including terminal building.
- To understand the function of different components of airports, docks and harbours.
-

Prerequisites: - Basic knowledge and terminologies related to Transportation engineering.

Course outline: -

Sr.No.	Course Contents	Number of Hours
Unit-1	Harbour Engineering General:	05
Unit-2	Natural Phenomena	03
Unit-3	Marine Structures	06
Unit-4	Port Amenities	06
Unit-5	Airport Engineering	08
Unit-6	Terminal Area Design	05
Unit-7	Grading And Drainage	06

Dr. M.N. PATEL

Prof. Mamta Bajapati

Course outcome: -

On completion of this module, the learner will be able to:

- To understand the various elements of Harbour and Airport.
- To understand the fundamentals of planning and design of various marine structures.
- To make the students aware about the operations in Harbour
- To give knowledge of maintenance techniques at Harbour.
- To understand the fundamentals of planning and design of Airport structures.
- To make students aware of design of runway and taxiways at Airport.
- To make students aware of the operations at Airport.

Content:

Sr.No.	Topics	Teaching Hrs.
Unit-1 Harbour Engineering General:	**Harbour Engineering General:** History, development, classification of harbours, major ports in India, administrative set up, harbor economics **Harbour Planning:** Harbour components, ship characteristics, characteristics of good harbour, and principles of harbour planning, size of harbour, site selection criteria and layout of harbours.	05
Unit-2 Natural Phenomena	**Natural Phenomena:** Wind, waves, tides formation and currents phenomena, their generation characteristics and effects on marine structures, silting, erosion and littoral drift.	03
Unit-3 Marine Structures	**Marine Structures:** General, breakwaters - function, types general design principles, wharves, quays, jetties, piers, pier heads, dolphin, fenders, mooring accessories function, types, suitability, design and construction features. **Docks and Locks:** Tidal basin, wet docks-purpose, design consideration, operation of lock gates and passage, repair docks - graving docks, floating docks, marine railway.	06
Unit-4 Port Amenities	**Port Amenities:** Ferry, transfer bridges, floating stages, and transit sheds, warehouses, cold storage, aprons, cargo handling equipment, purpose and general description. **Navigation Aids:** Channel and entrance demarcation, buoys, beacons, lighthouse, electronic communication devices. **Harbour Maintenance:** Coastal protection-purpose and devices, dredging-Land maintenance dredging, purpose, methods, dredgers-types, suitability, disposal of dredged material.	06

Unit-5 Airport Engineering	**General:** History, development, policy of air transport, aircrafts, aerodromes, air transport authorities, air transport activities, aircrafts and its characteristics, airport classifications **Airport Planning:** Regional planning-concepts and advantages, location and planning of airport elements-airfield, terminal area, obstructions, approach zone, zoning laws, airport capacity, airport size and site selection, estimation of future air traffic, development of new airport, requirements of an ideal airport layout. **Runway Design:** Wind rose and orientation of runway, factors affecting runway length, basic runway length, corrections to runway length, runway geometrics and runway patterns (configurations). **Taxiway Design:** Controlling factors, taxiway geometric elements, layout, exit taxiway, location and geometrics, holding apron, turnaround facility. Aprons-locations, size, gate positions, aircraft parking configurations and parking systems.	08
Unit-6 Terminal Area Design	**Terminal Area Design:** Terminal area elements and requirements, terminal building functions, space requirements, location planning concepts, vehicular parking area and circulation network.	05
Unit-7 Grading And Drainage	**Grading and Drainage:** Airport grading-importance -operations, airport drainage- aims, functions, special characteristics, basic requirements, surface and subsurface drainage systems. **Air Traffic Control and Visual Aids:** Air traffic control-objectives, control system, control network-visual aids-landing information system, airport markings and lighting.	06

Teaching & Learning Methodology: - Power Point presentation mostly preferred and in some topics chalk & duster is preferable.

Books Recommended:

1. Airport Planning & Design by Dr. S. K. Khanna, M.G.Arora and S.S. Jain, Nem Chand & Bros publisher.
2. Airport Engineering by G.V. Rao, Tata McGraw Hill Pub. Co. publisher.
3. Dock and Tunnel Engineering by R. Srinivasan and S. C. Rangwala, Charotar Publication House publisher.
4. Docks and Harbour Engineering by S. P. Bindra, DhanpatRai& Sons publisher.
5. Alonzo Def. Quinn, Design and Construction of Ports and Marine Structure, McGraw - Hill Book Company, New York
6. Ashford N. and Wright P.H., Airport Engineering, John Wiley and Sons, Inc., New York
7. Horonjeff R and Mackelvey F.X., Planning and Design of Airports fourth Intl.edition,McGraw Hill Book Co., New Delhi

Web Resources:

1. http://www.cdeep.iitb.ac.in/nptel
2. http://www.nptel.iitm.ac.in

Dr. M. N. PATEL

Prof. Mansi Bhojak

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING

DEPARTMENT OF AUTOMOBILE

VEHICLE TESTING & HOMOLOGATION

CODE: 23010701

B.E. 7TH Semester

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	-	2	0	5	30	0	70	50	150

Prerequisites: - Basics of Fundamentals of Automobile Engineering.

Course outline: -

The number of rules and norms applying to automobiles has increased globally due to increased emphasis on safety and environmental protection. Newly designed automobiles or automobile models are to be tested thoroughly for its performance and safety before it reaches to the users. Automotive homologation is the activity of certifying vehicles and every component fitted in a vehicle has to satisfy the requirements set by various statutory / regulatory bodies. It is mandatory to get approval for export of automobile products or its components. This subject will give preliminary idea regarding some of the practices and standards followed in automobile industry for their testing and homologation.

Sr. No.	Course Contents	No. of Hours
1	**Need of vehicle testing and homologation**: Vehicle testing organizations, Hierarchy of testing: Individual component approval, System level approval and Whole vehicle approval. Type Approval & Conformity of Production tests.	03
2	**NOISE VIBRATION AND HARSHNESS TESTING** Review of vibration fundamentals, vibration control, fundamentals of acoustics, human response to sound, automotive noise criteria, Standard noise measurement methods, Noise inside and outside the vehicle, sources of vehicle noise- intake and exhaust noise, combustion noise, mechanical noise, noise from auxiliaries, wind noises, transmission noises, brake squeal, structure,noise, noise control methods. Pass by Noise testing method.	06
3	**Engine ,Fuel systems and Emissions Testing:** Laboratory testing of basic engine parameters: Measurement of BHP, IHP, Engine testing on dynamometers, different types of dynamometers- hydraulic, eddy current etc., engine analyzers- for petrol and diesel engines, FIP calibrating and testing, Emission test for CO, HC, NOx,	07

	CO_2, PM, etc. using exhaust gas analyzers, their types. Orsat apparatus,smoke meter.	
4	**Vehicle Performance Testing:** Methods for evaluating vehicle performance- energy consumption in conventional automobiles, performance, emission and fuel economy, Operation of full load and part load conditions, effect of vehicle condition, tyre and road condition and traffic condition and driving habits on fuel economy, Gradability test, Turning circle diameter test, Steering Impact test, Steering effort test.	06
5	**Road and track testing:** Initial inspection, PDI, engine running in and durability, intensive driving, maximum speed and acceleration, brake testing on the road, hill climbing, handling and ride characteristics, safety, mechanism of corrosion, three chamber corrosion testing, wind tunnel testing, road testing, test tracks.	06
6	**Vehicle testing on chassis dynamometers:** Two wheel & four wheel dynamometers, vehicle testing lanes - side slip testers, wheel alignment testing, wheel balancing, brake test, head light alignment and light intensity testing.	06
7	**Active and Passive Safety testing:** Wheel rim testing for cornering and radial fatigue, Fire resistance test, bumper test, crash test, side impact test, rollover test, safety belt test, Airbag test, Safety belt anchorages, Seat anchorages & head restraints, Occupant protection Impact test, Side door intrusion test.	06
8	**Automobile testing standards:** Introduction, overview and study of testing standards like; AIS testing standards, Euro Standards, SAE standards. ISO26262 standards for functional safety of electrical and/or electronic systems in automobiles. ***Understanding of some AIS Standards:*** AIS-008 (Installation requirements of lighting and light-signaling devices for motor vehicles having more than three wheels, trailer and semi-Trailer excluding agricultural tractor and special purpose vehicles), AIS-018:2001 (Automotive Vehicles - Speed limitation Devices – Specifications), AIS-037 (Procedure for Type Approval and establishing conformity of production for safety of critical components), AIS-093 (Code of practice for construction and approval of truck cabs & truck bodies), AIS-003 (Automotive Vehicles - Starting Gradeability - Method of Measurement and Requirements), AIS-038 (Battery Operated Vehicles – Requirements for Construction and Functional Safety).	06

List of Practical –

After learning the course the students should be able to:

1	To study the performance characteristics of automobile petrol engine
2	To study the performance characteristics of automobile diesel engine
3	To study the performance characteristics of automobile engine operated on alternate fuel (CNG, LPG, Bio Diesel).
4	To study the performance characteristics of Electric.
5	To study the performance characteristics of Hybrid Electric vehicles.
6	Calibration of fuel injection pump and testing.
7	Calibration of Diesel Injectors.
8	Vehicle testing on chassis dynamometers.
9	Analyze the emissions of petrol, diesel and CNG vehicles using exhaust gas analyzer.
10	Measurement of steering effort.

Books Recommended:

1.Raymond M. Brach and R. Matthew Brach, "Vehicle Accident Analysis and Reconstruction Methods", SAE International, 2011
2. J. G. Giles – Vehicle operation and performance, Wildlife Publications, London, 1969.
3. W. H. Crouse and L. Anglin – Motor vehicle inspection, McGraw Hill Book Co. 1978.
4. Dr. N.K.Giri- Automotive technology – Khanna publishers, 2009
5.. Ulrich Seiffert and Lothar Wech, "Automotive Safety Handbook", SAE International, 2007
6. ISO Standards, ICS: 43.020, 43.040, 43.100

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF AUTOMOBILE ENGINEERING

Vehicle Dynamics

CODE: 23090708

BE_AUTO_7

Teaching & Evaluation Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	-	2	5	4	30	00	70	50	150

Objectives:

Prerequisites:

Kinematics of Machines, Dynamics of Machinery (Mechanical Engineering), Automobile System, Physics (Automobile Engineering)

Course outline:

Sr. No.	Course Contents	Number of Hours
1	**Performance Characteristics of Vehicle:** SAE Vehicle axis system, Forces & moments affecting vehicle, Earth Fixed coordinate system, Dynamic axle loads, Equations of motion, transmission characteristics, vehicle performance, power limited and traction limited acceleration, braking performance, Brake proportioning, braking efficiency.	6
2	**Aerodynamics:** Mechanics of Air Flow Around a Vehicle, Pressure Distribution on a Vehicle, Aerodynamic Forces, Drag Components, Aerodynamics Aids.	4
3	**Tire Mechanics:** Tire Construction, Size and Load Rating, Terminology and Axis System, Tractive Properties, Cornering Properties, Camber Thrust, Aligning Moment, Combined Braking and Cornering, Conicity and Ply Steer, Slip, Skid, Rolling Resistance, Elastic Band Model for longitudinal slip, Simple model for lateral slip, Combined longitudinal/lateral slip (friction ellipse), Taut string model for lateral slip, Magic Tire Formula	7

4	**Suspensions:** Suspension Kinematics, Suspension types, Solid Axles, Independent Suspensions, Anti-Squat and Anti-Pitch Suspension Geometry, Anti-Dive Suspension Geometry, Roll Center Analysis, Suspension Dynamics, Multi-body vibration, Body and Wheel hop modes, Invariant points, Controllable Suspension Elements: Active, Semi-Active. Choice of suspension spring rate, Calculation of effective spring rate, Vehicle suspension in fore and apt directions.	8
5	**The Steering System:** The Steering Linkages, Steering System Forces and Moments, Steering System Models, Steering Geometry, Steady Handling (2 DOF steadystate model), Understeer and Oversteer, Effect of Tire Camber and Vehicle Roll (3 DOF steady-state model), Transient Handling and Directional Stability (2 DOF unsteady model), Effect of Vehicle Roll on Transient Handling (3 DOF unsteady model), Steady-State and Transient Handling of Articulated Vehicles.	8
6	**Rollover:** Quasi-Static Rollover of a Rigid Vehicle, Quasi-Static Rollover of a Suspended Vehicle, Transient Rollover	4
7	**Motorcycle Dynamics:** Kinematic structure of motorcycle, geometry of motorcycles, importance of trail, Resistance forces acting on motorcycle (tyre rolling resistance, aerodynamic resistance forces, resistant force caused by slope), Location & height of motor cycle's centre of gravity (C.G), Moments of inertia on Motorcycle. Introduction to Front & Rear suspensions of Motorcycle	5

Learning Outcomes:

After learning the course the students should be able to:

- Understand the dynamics of vehicle ride
- Calculate and refer the loads and forces associated to the vehicles
- Analyse the behavior of the vehicles under acceleration, ride and braking

Teaching & Learning Methodology:

Books Recommended:

1. Hans Pacejka, Tire and Vehicle Dynamics, Elsevier, 2012.
2. Thomas D Gillespie, "Fundamentals of Vehicle dynamics", SAE USA 1992.
3. Rajesh Rajamani, Vehicle Dynamics & control, Springer.
4. R.V. Dukkipati, Vehicle dynamics, Narsova Publications.
5. Wong J Y, "Theory of Ground Vehicles", John Wiley & Sons, New York, 1978.
6. Milliken W F and Milliken D L, Race car Vehicle Dynamics, SAE.

7. Garrett T K, Newton K and Steeds W, "Motor Vehicle", Butter Worths & Co., Publishers Ltd., New Delhi, 2001.

8. Heinz Heister, "Vehicle and Engine Technology", SAE Second Edition, 1999.

9. Vittore Cossalter, Motorcycle Dynamics, 2nd Edition, Publisher: LULU.com

10. R N Jazar, Vehicle Dynamics: Theory and Application, Springer.

E-Resources:

1. http://nptel.ac.in/courses/107106080/

Practical List:

1. Experimental study of mechanism for air flow over different geometry of vehicles.

2. Experimental studies of measurements of drag and lift coefficient for different geometry vehicle using wind tunnel apparatus.

3. To study the effect of tyre pressure and temperature on the performance of the tyre.

4. To simulate and study a quarter car models using MBD software.

5. To simulate and understand behaviour of sprung / un-sprung mass & lumped mass system MBD software.

6. Finding the stiffness of tyre with variation of air pressure.

7. To simulate and study the effect of different conditions on vehicle loading.

8. Study of latest technologies available nowadays in vehicles helping to maintain stability of the vehicle on the road.

9. Study geometry of motorcycles as well as various types of forces faced by the motorcycle & its rider

10. Study the location & height of Centre of gravity (C.G) of a motorcycle

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF AUTOMOBILE ENGINEERING

Automobile Component Design

CODE : 23010703

B.E. 7TH SEMESTER

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	-	2	6	5	30	-	70	50	150

Prerequisites:- Zeal to learn the subject

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**standardization in automobile system design:** Preferred numbers – preferred series – derived series- and their applications in design.	4
2	**Design Considerations:** Manufacturing and assembly considerations, Design of components for casting, welding, forging, hot and cold working, machining etc. assembly considerations in design. Design for Fatigue and Creep – thermal considerations – wear considerations in design – Human considerations in design.	9
3	**Rolling Contact Bearing:** Types of rolling contact bearings, static and dynamic load capacities, Stribeck's Equation, Equivalent bearing load, load life relationship, Bearing life, Load factor, Selection of bearings from manufacturers catalogue. Lubrication and mountings, dismounting and preloading of bearings, Oil seals and packing.	4
4	**Sliding Contact Bearings:** Bearing material and their properties, Bearing types and their constructional details, Hydrodynamic Lubrication- Basic theory, Design consideration in hydrodynamic bearings, Raimondi and Boyd method relating bearing variables	3

5	Design of Gears: Types of gears, Design consideration of gears, material selection, **Spur Gears:** Force analysis, Number of teeth, Face width & Beam strength of gear tooth. Dynamic tooth load. Effective load on gear tooth. Estimation of module based on beam strength. Wear strength of gear tooth. Estimation of module based on wears strength. Spur gear design for maximum power transmission. **Helical Gears:** Virtual number of teeth, Tooth proportions, Force analysis, Beam strength of helical gears, Effective load on gear tooth, Wear strength of helical gears, Design of helical gears **Bevel Gears:** Terminology of bevel gears, Force analysis, Beam strength of bevel gears, Wear strength of bevel gear, Effective load on gear tooth, Design of bevel gear. **Worm Gears**: Force analysis, Friction in worm gear, Vector method, Strength rating of worm gears, Wear rating of worm gear	14
6	**Design of Gearbox** Design considerations of gearbox, selection of proper gear ratios for an automobile gearbox, design of shafts, splines, and gears for gear box used in automobiles.	8
7	**Design of I.C. Engine Components:** - Engine power requirements, Selection of engine type, Stroke & Bore, compression ratio, clearance volume and swept volume, mean piston speeds. Design of Piston & Piston pin: Materials used, design of piston crown, pin dimensions. - Design of Crank shaft & Connecting Rod -Forces, material, types, design criteria, dimensions etc Design of main journal bearing pin and connecting rod bearing pin of Crank shaft. - Main journal bearing and connecting rod bearing (small end & big end), Cam shaft bearings: Bearing materials, design criteria, types and dimensions. - Cylinder block dimensions, Types of liner– Dry & Wet type, Design of cylinder head: Stresses, materials, Combustion chamber design	12

Learning Outcomes:-

1. Student will be able to select and design the different automobile components.

2. Student will be able to standardize the different parts.

3. Student will be able to give reasons of assumptions made while designing the component with reference to manufacturing assembly, thermal and wear considerations point of view.

Teaching & Learning Methodology:-

The students will be involved with the following learning activities:

- Assignments
- Progress tests
- Quizzes
- Examinations

Books Recommended:

1. Elements of Motor Vehicles Design by D T Bdonkins, TMH
2. Automobile Chassis Design and calculations by P. Lukin, Mir Publishers
3. Auto design Problems by K. M. Agrawal, Satya prakashan.
4. Automotive Mechanics by N. K. Giri, Khanna Publishers
5. Machine Design by Sadhu singh, Khanna Publishers
6. Automobile Chassis Design by Dean Averns,Lllife Books Ltd (1992)
7. Automobile Engg. Vol-I & II by Kirpal Singh, Standard Pub.
8. Automobile Engg. Vol-I & II by K.M.Gupta, Umesh Pub.
9. Auto Design by R. B. Gupta, Satya Prakashan
10. "Mechanical Engineering Design", Fourth Edition, by Joseph E. Shigley & Larry D.Mitchell,McGraw-HillInternationalBookCompany
11. Design of Machine Elements by Bhandari, Tata McGraw-Hill Publishing Company Ltd
12. Machine Design by, Sharma and Agrawal, S. K. Kataria & Sons
13. Transmission System Design by R. B. Patil, Tech Max Pub, Pune.
14. Machine Design Vol-II & III by F.Haideri, Nirali Prakashan, Pune.
15. PSG Design Data Book.

LIST OF PRACTICALS: The term work shall be based on the topics mentioned above and one component assembly must be design and sheet must be drawn for assembly and parts.

1. To standardize the given automobile part for size, torque and power point of view.
2. To design the spur, helical, bevel and worm gear for given situation of automobile vehicle.
3. To design the gear box for given situation of automobile vehicle
4. To design the engine cylinder for given situation of automobile vehicle.
5. To design the piston for given situation of automobile vehicle.
6. To design the flywheel for given situation of automobile vehicle.
7. To design the valve and valve mechanism for given situation of automobile vehicle.
8. To design the connecting rod for given situation of automobile vehicle.
9. To select the bearing for given situation to support the rotating/sliding part of an engine.
10. To give reason of design considerations during the above part and assembly design for which you made assumptions.

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF AUTOMOBILE ENGINEERING

Two and Three Wheelers

CODE: 23010704

B.E. 7TH Semester

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	-	2	5	4	30	-	70	50	150

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	**Introduction to Automotive Systems** Vehicle body classification and specification: Body construction type, Location of engine and Drive system types and arrangement, specification of vehicles; Functional requirements of vehicle body, Body trim and fittings, Overview of various systems including safety features, steering system types, Tire construction and types.	7	15%
2	**Body Load Analysis:** Vehicle Loads: Static load, Load due to Acceleration and Braking, Moments and Torque due to driving conditions, resistance to motion and aerodynamic load, Types of materials used in body construction, Analysis and Selection of body member sections, Body sub frame and underfloor structure, car front and rear end structure, Vehicle Structure Analysis by Simple Structural Surface (SSS) Method: Saloon and simple van.	9	20%
3	**Transmission and Driveline systems** Constructional features and working of clutches*, Gear Train: sliding mesh, constant mesh and synchromesh gear boxes with related components, Propeller and drive shaft, universal joints, Rear wheel drive arrangements, Rear axle final drive, the differential, rear axle, Simple problems in all mentioned topics, Automatic Transmission and CVT.	7	20%
4	**Suspension, Steering and Braking systems** Types of suspension systems, Functional requirements of suspension systems, Front suspension system and Steering: Types, Definitions for wheel orientation and its effect, Types and Constructional features of Front Suspension, , Steering layout, types of steering gears, steering linkages, steering mechanism, definitions and significance of camber, caster and king pin inclination, toe in and toe out on turn, measurement and adjustment of various steering system	14	25%

	layouts, steering ratio, under steering and over steering, steering geometry; Rear suspension system: Types, Factors affecting design and selection; Performance Analysis of Suspension system: Mobility, kinematic / graphical analysis, Roll centre analysis, and force analysis Brake system components and configurations, Fundamentals of braking: braking distance, braking efficiency, weight transfer, wheel skidding, Brake proportioning and adhesion utilization, ABS and Electronic Braking system: Working principles, Features and advantages.		
5	**Electrical and Electronics:** Electrical and electronic components of vehicle, fundamentals of engine electricals, Lighting and Indicators: Features, Requirements and typical settings, Body electrical and electronic systems, Monitoring and Instrumentation.	5	20%
6	**Modern Vehicles:** Introduction to electric vehicles & hybrid vehicles.	2	5 %

* To be covered during laboratory sessions.

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
10	**15**	**15**	**10**	**10**	**10**

Legends: R: Remembrance; U = Understanding; A = Application and above Levels (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table

Reference Books:

1. Motor Vehicle Structures: Concepts and Fundamentals, Jason C. Brown, A. John Robertson, Stan T. Serpento, Butterworth Heinemann, 2002.
2. Handbook of Vehicle Design Analysis, John Fenton (Editor), Mechanical Engineering Publications Limited, London and Bury St Edmunds, UK, 1996.
3. Automobile Technology, N.K. Giri, Khanna Publishers, 2011.
4. An Introduction to Modern Vehicle Design, Julian Happian-Smith, Butterworth- Heinemann, 2002.
5. Theory of Ground Vehicles, J.Y. Wong, John Wiley and Sons, 2001.
6. Automobile Mechanical and Electrical Systems Automotive Technology: Vehicle Maintenance and Repair, Tom Denton, Butterworth Heinemann, 2011.
7. Clutches and Brakes, W C Orthwein, Marcel Dekker.
8. Automotive Mechanics by William H Crouse.
9. Advanced Vehicle Technology by Heinz and Heisler

Course Outcome:

After learning the course the students should be able to:

1. Understand the construction details of types of vehicle and functions of various systems.
2. Analyse and select components of various systems of vehicle.

List of Experiments:

1. Study constructional features of vehicle body, various layouts, vehicle classifications and specifications.
2. Load analysis of two to three different classes of four wheelers.
3. Study vehicle Aerodynamics: Vehicle features and Loading.
4. Study components of transmission system.
5. Study constructional features and working of clutches and automatic transmission system.
6. Develop mathematical model of a suspension system and analyse the same.
7. Study different types of steering systems, constructional features and related configurations.
8. Study different types of braking systems, their constructional features and typical layout for hydraulic pneumatic and electronic brakes.
9. Study features, requirement and components of electrical and lighting system.
10. Study electronic systems of a vehicle along with different types of sensors, safety features and their integration.

Design based Problems (DP)/Open Ended Problem:

1. Develop mathematical model of a suspension system write a code to study its performance with variation of parameters.
2. For a vehicle, carryout braking force analysis and compare your design against the parameters of existing system in the vehicle.
3. Understand the concept of friction to transmit the power between two shaft (Clutch)
4. Advanced suspension with variable stiffness. (air suspension)
5. Design Gear box in Final drive to vary the gear ratio and compare expected performances.

Major Equipment:

1. Frames of different types of vehicles.
2. Section model of different types of transmission systems.
3. Working models of vehicle systems.
4. Educational cut section models of all the modules are required.

List of Open Source Software/learning website:

www.nptel.ac.in

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to GTU.

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING

DEPARTMENT OF AUTOMOBILE ENGINEERING

PROJECT 1

CODE: 23000023

B.E. 7TH Semester

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
0	0	4	4	2	0	50	0	100	150

Guideline for Final Year BE Project Report Submission:-

All the final year students who are working on their 7th semester project need to submit thefollowing:

Project Report (A Hard bound hard copy) - It is required to be a report of the work, done bythe team of students during the 7th semester. The Report is to be submitted whether the projecthas been completed or is yet to be completed.

Case 1: Wherein the project is to be completed during two semesters (the 7semester).

In this case students need to submit their project report of the work done during theseventh semester in spiral bound as follows:

1. Student Copy
2. Dept. Copy/Guide Copy in spiral bound.
3. No External Guide copy required.

For students, whose project is a full-year project and who are to complete the project during the8thsemester, should add the following details in their project submissions:

1. PDF generated under Phase I & II of Online project tracking system.
2. Problem Summary or Introduction
3. Aims and Objectives of the work
4. Brief literature review
5. Plan of their work
6. Materials and methods used
7. Progress, they had made during the 7thsemester
8. Expected outcome

9. References

10. Any other details

Case 2: wherein during the 7th semester the project has been completed

The students have to submit the project report in a hard bound. Every team has to submit two/three copies of the project report as follows:

1. Student Copy

2. College/Dept. or Guide copy

3. In case of students doing IDP: if industry mentor/external guide requires a third copy, students may prepare either a hard or a spiral bound copy as per suggestion given by industry mentor/external guide.

For students whose project is completed should add the following details in their project submissions:

1. PDF generated under Phase I & II of Online project tracking system.

2. Problem Summary or Introduction

3. Aims and Objectives of the work

4. Brief literature review

5. Plan of their work

6. Materials and methods used

7. Result, Discussion and Conclusion

8. References

9. Any other details

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING

DEPARTMENT OF AUTOMOBILE ENGINEERING

COMPUTER INTEGRATED MANUFACTURING IN AUTOMOBILE INDUSTRY

CODE: 23010706

B.E. 7TH Semester

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	-	-	3	3	30	-	70	-	100

Objective: - Computer integrated producing is extremely demanded space currently each day. laptop Integrated producing deals with style of parts to producing and additionally includes designing and dominant the processes. Automobile Industries wide use CNC, FMS and AI technology currently each day. Students are acquainted with its hardware and package and additionally able to write programs for machining and application of Central Intelligence Machinery in automobile assembly and ancillaries industries..

Prerequisites: - Manufacturing Processes-I

Course outline: -

Sr. No.	Course Contents	No. of Hours
1	**INTRODUCTION TO COMPUTER INTEGRATED MANUFACTURING:** Concepts of Computer Integrated Manufacturing, Objectives & scope, Nature & Type of manufacturing system, Evolution, Benefits of CIM, Role of manufacturing engineers, Application of CIM in Automobile Industry.	3
2	**NC/CNC MACHINE TOOLS:** NC and CNC Technology: Types, Classification, Specification and components, Construction Details, Controllers, Sensors and Actuators, CNC hardware: Re circulating ball screw, anti-friction slides, step/servo motors. Axis designation, NC/CNC tooling. Fundamentals of Part programming, Types of format, Part Programming for lathe and milling machine operations, subroutines, do loops, canned Cycles	12
3	**PROGRAMMABLE LOGIC CONTROLLERS:** Relay Device components, Programmable controller architecture, programming a programmable controller, tools for PLC logic design, Application of PLC in automobile industry.	3
4	**GROUP TECHNOLOGY AND CAPP:** Introduction, part families, part classification and coding systems: OPITZ, PFA,	6

	FFA, Cell design, rank order clustering, Benefits of group technology. Approaches to Process Planning, Different CAPP system application and benefits.	
5	**ROBOT TECHNOLOGY:** Introduction: Robot Anatomy, Laws of Robot, Human System and Robotics, Coordinate system, Specifications of Robot. Power sources actuators and Transducers, Robotic Sensors, Grippers, Robot Safety, Robot Applications, Economic Considerations of Robotics system, Concepts of Computer Vision and Machine Intelligence.	6
6	**FLEXIBLE MANUFACTURING SYSTEM:** Introduction & Component of FMS, Needs of FMS, general FMS consideration, Objectives, Types of flexibility and FMS, FMS lay out and advantages. Automated material handling system: Types and Application, Automated Storage and Retrieval System, Automated Guided Vehicles, Cellular manufacturing, Tool Management, Tool supply system, Tool Monitoring System, Flexible Assembly Systems	6
7	**ASSEMBLY LINES:** Fundamental of Assembly line and Automated Assembly line, Line balancing algorithm, Concept of transfer line, Design and concept of automated assembly line, Quantitative analysis of assembly line.	6
8	**INTEGRATED PRODUCTION MANAGEMENT SYSTEM:** Introduction, PPC fundamentals, Problems with PPC, MRP-I, MRP-II. Just in Time philosophy: JIT & GT applied to FMS.	3

Learning Outcomes: -After learning the course the students should be able to

1. Students will describe basic concepts of CIM application and benefits.
2. Students will prepare CNC programs for manufacturing of different geometries on milling and lathe machines.
3. Students will prepare logic diagram for different application of automation.
4. Students will classify different components using different techniques of group technology
5. Students will prepare Process planning for different components in automobile Industry
6. Students will select layouts of FMS for industrial applications
7. Students will describe Robot for preliminary industrial applications like pick and place.
8. Student will identify application of PPC, JIT, MRP-I, MRP-II, and Expert system to CAM
9. Student will design and implement concept of automated assembly line in automobile industry

Teaching & Learning Methodology:-

It is theoretical subject with methods used in industries. So following teaching methodology should be appropriate.

1. Explaining the Concept of different Methods & trying to implement in the real situation specially visiting the industry and get data and finding out the Solution for the same.
2. Classroom Communication.
3. Interactive Learning Methods.

Books Recommended:

1. Automation, Production Systems and Computer Integrated Manufacturing by Mikell P Groover, Pearson Education.
2. Robotics Technology and Flexible Automation, by S R Deb, S Deb, McGraw Hill Education Private Limited.
3. Flexible Manufacturing Cells and System -William. W. Luggen Hall, England Cliffs, Newjersy
4. Computer Numerical Control, P. Radhakrishnan, New Central Book Agency, 1992.
5. Computer integrated manufacturing -S. Kant Vajpayee – Prentice Hall of India.
6. System Approach to Computer Integrated Manufacturing. Nanua Singh, Wiley and sons Inc, 1996.

List of Open Source Software/learning website:

1. https://nptel.ac.in/courses/112/104/112104289/

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING

DEPARTMENT OF AUTOMOBILE ENGINEERING

Noise, Vibration & Harshness and Safety

CODE: 23010707

B.E. 7TH Semester

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	-	0	3	3	30	00	70	00	100

Prerequisites: -Dynamics of Machines, Vehicle Dynamics.

Course outline: -

1. Students will become familiar with the basic terminologies of Noise, Vibration & Harshness – NVH, which is a major focus for high end luxury vehicles manufacturers, in the current times.
2. Students will acquire Comprehensive, theory based understanding of natural and physical sciences along with engineering fundamentals related to Sources of Vibration and Noise applicable to the automobile engineering discipline and possibility of modifications and improvements.
3. Student will understand Application of engineering techniques, tools, for measurement methods in order to learn to control and solve complex Vehicle vibrations behavior /as well as performance problems.
4. Student will learn Application of systematic engineering synthesis and design processes for eliminating or reducing the Vibration, Noise to reduce irritation to occupants and achieve improvement in perception of ride comfort

Sr. No.	Course Contents	No. of Hours
1	**INTRODUCTION TO NHV:** Definition of Noise, Vibrations & Harshness in reference to Vehicular application. Study principles of Rolling, Pitch & Yaw velocity and moments.	02
2	**FUNDAMENTALS OF NOISE AND VIBRATIONS:** Basic Concepts of Vibrations: Simple Harmonic Motion, Frequency of Vibrations, Period, Natural Frequency, Resonant Frequency, Amplitude of vibrations. Un-Damped & Damped Vibrations. Types of Vibrations: Free & Forced Vibrations induced for Single degree of freedom & Multi degrees of freedom. 2 Basic Concepts of Noise: Fundamentals of Acoustics. General Types of 05 15 sound wave propagations- wave equation, specific acoustic impedance, Plane wave & Spherical waves. Structure borne sound and air borne sound. Interior noise sources and levels of noise. Anatomy of human ear and mechanism of hearing. Sound intensity, summation of pure tones (decibel addition), subtraction &	05

	averaging. Octave and Octave bands.	
3	**CHARACTERISTICS & SOURCES OF VIBRATIONS** **Power Train**: Engine, Clutch, Transmission, Propeller shaft, Differential, Drive shaft, Trans axle. Power train mounts. **Suspension**: Different types of suspensions, Dampers, Rubber & Rubber embedded Metallic bushes. Passive and Active suspensions. **Road roughness & irregularities, Tyres &Wheels Low frequency vibrations**: due to body structure, Seat mounting, seat materials and Steering assembly components.	05
4	**VIBRATIONS MEASUREMENT TECHNICS AND CONTROL:** Vibration measuring Instruments: Vibration pick-up, Types of Transducers, Vibrometer etc. for measurement of Frequency of vibrations, Period, Amplitude, Velocity and acceleration parameters. Methods of Control and vibrations isolation: Different Types of Dampers, Vibrations absorber / isolator (including viscous damping, sandwich construction).	10
5	**SOURCES OF NOISE, NOISE MEASUREMENT TECHNICS AND CONTROL:** Noise specifications and mandatory standards regulations. Brake Squeal noise, Pass-by Noise, wind noise, squeak noise and rattle, interior noise (including noise emitted by running of accessories, indicators and all buzzers). Power train, Engine Air Intake & Exhaust noise, Engine accessories, cooling system and vehicle body protrusion noise, under body protrusion noise. Noise due to Tyre-Road friction and slip characteristics. **Noise Measuring Instruments**: Microphone, Sound intensity probes. **Noise Control:** Damping treatment methods, Control through isolations and noise absorbing materials and structure. Active and semi-active control of noise. Study of anechoic chamber.	10
6	**Harshness:** Definition. Its effect and acceptable degree of Harshness. Perception of Ride comfort i.e. psychological effects of Noise & Vibrations. **Study of NVH - Legislations applicable for vehicles in India**	05
7	**Safety:** Passive safety Active safety. Study of Safety Regulations for vehicular application	05
8	**Introduction to software applications (Capabilities & Limitations of different software's) for analysis of NVH.**	03

Books Recommended:

1. Vehicle Noise, Vibration, and Sound Quality by Gang Sheng Chen, SAE International Publications.
2. Fundamentals of Noise and Vibration, by Norton M.P, Cambrige University Press
3. Mechanical Vibrations & Noise Control, by Dr. Sadhu Singh, Khanna Publishers.
4. Mechanical Vibrations by G.K.Grover, Published by Nem Chand & Bros, Roorkee, India.
5. Mechanical Vibrations, by S.S.Rao, Pearson.
6. Theory of Vibration with Applications, by W.T.Thomson & M.D.Dahleh, Pearson Education.
7. Dynamic Vibration Absorbers, by Borris and Kornev, John Wiley Publication

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF AUTOMOBILE ENGINEERING

Total Quality Management

CODE: 23010708

BE_AUTO_7_Department Elective - II

Teaching & Evaluation Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	-	-	3	3	30	00	70	00	100

Objectives: The course aims to impart basic knowledge about various aspects of Quality Management.

Prerequisites: Nil

Course outline:

Sr. No.	Course Contents	Number of Hours
1	**Introduction Quality Management:** Indian Companies Monopolize the Deming Awards in 2003, Quality Management- A conceptual frame work, Strategic Quality Management, Benchmarking.	4
2	**Quality Standards and business excellence models:** Quality system Standards, Bureau of Indian Standards, Agmark Grading and standardization, Quality council of India, International Organization for Standardization, Conformance to Specifications, Quality Assurance, Quality Circles, Quality audits, ISO 14000, Customer Operations Performance Centre (COPC) 2000	4
3	**Total Quality Management (TQM):** W. Edwards Deming's Contribution to TQM, Juran's Contribution to TQM, Crosby's contribution to TQM, Ishikawa's contribution to TQM, Comparing the Quality Gurus, Total Productive Maintenance (TPM).	6
4	**Service quality management and Cost of Quality:** Products and services, Classification of services, Service Quality, Measuring Service Quality, Prevention costs, Appraisal Costs, Internal and External failure costs, Cost of quality models, India's Quality Journey so far, Quality	6

	management in India, Quality related priorities of Indian companies, Case studies	
5	**Six sigma and Experimental design:** Meaning of Six sigma, The seven magnificent Quality tools, Introduction of experimental design, Taguchi Method in Experimental Design, Concept, Application of QFD, Case Study.	8
6	**Statistical Quality Control:** Quality control-its introduction and benefits, Variation in processes: factors, process capability & Its analysis, control charts for variables and attributes, Establishing & interpreting control charts, Concept of Acceptance Sampling, sampling by attributes, single and double sampling plans, inspections by samples, AQL, LTPD, consumers and producer's risk, construction and use of operating characteristic curves, use of standard sampling tables and related IS, sampling by variables, Continuous sampling plan, vendor ratings.	10

Learning Outcomes:

After learning the course the students should be able to:

1. Understand QM.
2. Evaluate Q.S. & B.E.models.
3. Understand TQM & Its various Tools.
4. Implement SQC.
5. Understand basics of IPR.

Books Recommended:

1. Quality Management by Kanishka Bedi
2. Intellectual Property Rights, Prbuddha Ganguli, TMH
3. Probability and Reliability with Statistics, Trivedi, PHI
4. Statistical Quality Control By M. Mahajan
5. TQM in Service Sector, R.P.Mohanty and R.R.Lakhe
6. Total Quality Management, Arora ,Kataria
7. Total Quality Management, Subburaj, TMH

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING

DEPARTMENT OF AUTOMOBILE ENGINEERING

PROJECT 2

CODE: 23000025

B.E. 8TH Semester

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
0	0	16	16	8	0	200	0	300	500

Guideline for Final Year BE Project Report Submission:-

All the final year students who are working on their 8th semester project need to submit thefollowing:

Project Report (A Hard bound hard copy) - It is required to be a report of the work, done bythe team of students during the 8th semester/4TH Year.

Case 1: Wherein the project is completed during two semesters (7semester& Semester 8).

Jn this case students need to submit their project report of the work done during the7th& 8th semester in Hard bound as follows:

1. Student Copy

2. College/Dept. or Guide copy

3. In case of students doing IDP: if industry mentor/external guide requires a third copy, students may prepare either a hard or a spiral bound copy as per suggestion given by industry mentor/external guide.

Case 2: wherein during the 7th semester the project has been completed and new project has been selected in 8th Semester.

The students have to submit the project report in a hard bound. Every team has to submit two/three copies of the project report as follows:

1. Student Copy

2. College/Dept. or Guide copy

3. In case of students doing IDP: if industry mentor/external guide requires a third copy, students may prepare either a hard or a spiral bound copy as per suggestion given by industry mentor/external guide.

Note: All of the Students should add the following details in their project submissions:

1. Problem Summary or Introduction
2. Aims and Objectives of the work
3. Brief literature review
4. Monthly Plan of their work done
5. Materials and methods used
6. Result, Discussion and Conclusion
7. References
8. Any other details

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF AUTOMOBILE ENGINEERING

SUBJECT NAME: Automobile System Design

SUBJECT CODE: 23010801

B.E. 8TH Semester

Type of Course: - Advanced / Application

Pre-requisite:- Automobile System and Machine Design and Industrial Drafting

Rationale- To make student get acquainted with to standardize the automobile part after designing the system component like clutch , propeller shaft , axle , steering linkages , braking parts , suspension system etc. within the space limitations and optimize it.

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	-	2	6	5	30	-	70	50	150

CONTENT:-

Sr.N.	Course Content	Total Hours	% Weightage
1	**Design of clutch system** Design of various clutch system components (Single plate, multiple plates, centrifugal clutch, lining material) and Pressure Plate Assembly components. Hydraulic Clutch system components (Master Cylinder, Slave cylinder, reservoir) clutch fluid – its properties, hydraulic pipes. Clutch Pedal & Clutch hand lever design. Clutch cable Design / selection considerations.	10	17
2	**Design of propeller shaft:** Design of propeller shaft for bending, torsion, rigidity and critical speed criteria. Design of universal joint and slip joint.	05	8
3	**Design of Axle:** Front Axle beam, Steering Knuckle, King pin. Rear Axle (drive Axle) tube, Design of fully floating, half floating axle and dead axle. Design of Final drive and differential: Design of spiral bevel and hypoid type of final drive/differential.	08	13
4	**Design of steering system:** Condition for true rolling, Turning circle radius, Principle of Ackermann steering, Ackermann-linkage geometry, Steering gear ratio, Steering box torque, Design of various steering gear box.	05	9
5	**Design of braking system:** Brake balance, Stopping distance, Brake fade, Work done in braking, Braking efficiency, Braking of vehicle, Braking of vehicle moving in a curved path, Design of drum brake, Design of disc brake, Design of hydraulic brake system, Design of hand brake or parking brake.	12	20

6	**Design of suspension system:** Function of suspension, Forces act on suspension, Suspension springs (laminated or leaf, coil, torsion bar, rubber spring, pneumatic spring), Design of laminated or leaf spring, Design of helical or coil spring, Design	**12**	**20**

	of torsion bar spring.		
7	**Optimum design:** Optimum design for automotive elements like shaft-springs etc, Johnson's method of optimum design.	**08**	**13**
	Total	**60**	**100**

Reference Books:

1. Elements of Motor Vehicles Design by DTB donkins, TMH
2. Automobile Chassis Design and calculations by P.Lukin, Mir Publishers
3. Auto design Problems by K.M.Agrawal, Satyaprakashan.
4. Automotive Mechanics by N.K.GIri, Khanna Publishers
5. Machine Design by Sadhusingh, Khanna Publishers
6. Automobile Chassis Design by Dean Averns, Lllife Books Ltd (1992)
7. Automobile Engg. Vol - I & II by Kirpal Singh, Standard Pub.
8. Automobile Engg. Vol - I & II by K.M.Gupta, Umesh Pub.
9. Auto Design by R.B. Gupta, Satya Prakashan
10. "Mechanical Engineering Design", Fourth Edition, by Joseph E. Shigley & Larry D. Mitchell, McGraw-Hill International Book Company
11. Design of Machine Elements by Bhandari , Tata McGraw-Hill Publishing Company Ltd
12. Machine Design by, Sharma and Agrawal, S.K.Kataria & Sons
13. Transmission System Design by R.B.Patil, TechMax Pub., Pune.
14. Machine Design Vol - II & III by F.Haideri, Nirali Prakashan, Pune.
15. PSG Design Data Book.
16. Automotive Chassis by P.M.Heldt , Chilton Co., NY (1992)
17. Machine Design by Pandya and Shah, Charotar Publishing House.
18. Machine Design by R S Khurmi J.K.Gupta, S chand & Co.

COURSE OUTCOME:

1. Student will be able to select and design the different automobile system for given situation.
2. Student will be able to standardize the different parts.
3. Student will be able to optimize the parts for given situation.

LIST OF PRACTICALS:

The term work shall be based on the topics mentioned above and one system must be design and sheet must be drawn for assembly and parts.

1. To Standardize the any automobile system part for size , torque and power point of view.
2. To design the **clutch** for given situation of automobile vehicle.
3. To design the **propeller shaft** for given situation of automobile vehicle.
4. To design the **Axle** for given situation of automobile vehicle.
5. To design the **steering system** for given situation of automobile vehicle.
6. To design the **braking system** for given situation of automobile vehicle.
7. To design the **suspension system** for given situation of automobile vehicle.

8. To optimize the part from above design given situation of automobile vehicle.

List of Open Source Software/learning website:

1. http://nptel.ac.in/
2. www.learnerstv.com
3. http://auto.howstuffworks.com/
4. **nptel**.iitk.ac.in/

ACTIVE LEARNING ASSIGNMENTS:

Preparation of power-point slides, which can include mathematical calculations, videos, animations, pictures, graphics for better understanding of theory and practical work . The faculty will allocate chapters/ parts of chapters to various groups of students so that the entire syllabus can be covered. The power-point slides should be made available on the College/ Institute's web-site along with the name of the students, faculty, Department and College on the first slide. Best three presentations should be submitted to GTU.

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF AUTOMOBILE ENGINEERING

VEHICLE BODY ENGINEERING

CODE: 23010802

B.E. VIII Semester

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	-	2	5	4	30	-	70	50	150

Objective: -

- At the end of the course, the students will be able to have a sound knowledge for the design of the vehicles body to give maximum comfort for the passengers and exposed to the methods of stream lining the vehicles body to minimize drag.

Prerequisites: -Knowledge of Automobile Engineering-I & II, Chassis & Transmission Control

Course outline: -

Sr. No.	Course Contents	No. of Hours
1	**CAR BODY DETAILS** Types: saloon, convertibles, limousine, estate car, racing and sports car. Visibility: regulations, driver's visibility, tests for visibility, methods of improving visibility and space in cars. Safety: safety design, safety equipments for cars. Car body construction; design criteria, prototype making, initial tests, crash tests on full scale model, Dummies and Instrumentation	08
2	**VEHICLE AERODYNAMICS** Objectives. Vehicle drag and types; various types of forces and moments, effects of forces and moments, side wind effects on forces and moments, Various body optimization techniques for minimum drag, wind tunnel testing: flow visualization techniques, scale model testing, component balance to measure forces and moments.	10
3	**BUS BODY DETAILS** Types: mini bus, single decker, double-decker, two level and articulated bus. Bus body layout; floor height, engine location, entrance and exit location,	08

	seating dimensions. Constructional details: frame construction, double skin construction, types of metal sections used, Regulations, Conventional and integral type construction.	
4	**COMMERCIAL VEHICLE DETAILS** Types of body; flat platform, drop side, fixed side, tipper body, tanker body, Light commercial vehicle body types. Dimensions of driver's seat relation to controls. Drivers cab design.	09
5	**BODY MATERIALS, TRIM AND MECHANISMS** Steel sheet, timber, plastic, GRP, properties of materials; Corrosion, anticorrosion methods. Selection of paint and painting process. Body trim items. Body mechanisms.	10

Learning Outcomes: -

- Illustrate the different types and components of car body.
- Explain the concept, importance and testing of aerodynamics in car body design
- Illustrate the different types and components of bus and commercial body
- Explain different vehicle body materials with their merits and demerits.
- Explain the concept of painting and painting process in car body.
- Describe the concept and importance of Air conditioning in Automobiles.

Books Recommended:

- J.Powloski - "Vehicle Body Engineering" - Business Books Ltd, London -1989
- Giles.J.C. - "Body construction and design" - Liiffe Books Butterworth & Co. - 1971.
- John Fenton - "Vehicle Body layout and analysis" - Mechanical Engg. Publication Ltd., London – 1982
- Braithwaite.J.B. - "Vehicle Body building and drawing" - Heinemann Educational Books Ltd., London – 1977.

Student Activities/assignment to be performed in continuous internal evaluation:

- Collect information on different vehicle bodies with photographs and specifications.
- Collect information on different tools and equipments used in body repair shops
- Collect information on different paint components used in car body painting shops.
- Collect information on different advanced body repair process.
- Collect information on different advanced paints and painting process.
- Collect information on servicing of car air conditioning system.

Note:

1. Student should prepare a hand written report on any one of the above/similar activity, which helps in achieving above course outcomes.
2. The report prepared should be approved by the concerned staff and HOD.
3. The activity group should consist of maximum of three students.

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF AUTOMOBILE ENGINEERING

ELECTRIC VEHICLES

CODE: 23010803

B.E. 8TH SEMESTER

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	-	2	5	4	30	00	70	50	150

Prerequisites:- Zeal to learn the subject

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Electric and Hybrid Electric Vehicles** Configuration of Electric Vehicles, Performance of Electric Vehicles, Traction motor characteristics, Tractive effort and Transmission requirement, Vehicle performance, Tractive effort in normal driving, Energy consumption Concept of Hybrid Electric Drive Trains, Architecture of Hybrid Electric Drive Trains, Series Hybrid Electric Drive Trains, Parallel hybrid electric drive trains	6
2	**Energy storage for EV and HEV** Energy storage requirements, Battery parameters, Types of Batteries, Modelling of Battery, Fuel Cell basic principle and operation, Types of Fuel Cells, PEMFC and its operation, Modelling of PEMFC, SuperCapacitors	6
3	**Electric Propulsion** EV consideration, DC motor drives and speed control, Induction motor drives, Permanent Magnet Motor Drives, Switch Reluctance Motor Drive for Electric Vehicles, Configuration and control of Drives.	8
4	**Design of Electric and Hybrid Electric Vehicles** Series Hybrid Electric Drive Train Design: Operating patterns, control strategies, Sizing of major components, power rating of traction motor, power rating of engine/generator, design of PPS Parallel Hybrid Electric Drive Train Design: Control strategies of	12

	parallel hybrid drive train, design of engine power capacity, design of electric motor drive capacity, transmission design, energy storage design	
5	**Power Electronic Converter for Battery Charging** Charging methods for battery, Termination methods, charging from grid, The Z-converter, Isolated bidirectional DC-DC converter, Design of Zconverter for battery charging,	8

Learning Outcomes:-

After learning the course the students should be able to:

1. Understand working of Electric Vehicles and recent trends
2. Analyze different power converter topology used for electric vehicle application
3. Develop the electric propulsion unit and its control for application of electric vehicles

Teaching & Learning Methodology:-

The students will be involved with the following learning activities:

- Assignments
- Progress tests
- Quizzes
- Examinations

Books Recommended:

1. M. Ehsani, Y. Gao, S. Gay and Ali Emadi, Modern Electric, Hybrid Electric, and Fuel Cell Vehicles: Fundamentals, Theory, and Design, CRC Press, 2005

2. Iqbal Husain, Electric and Hybrid Vehicles: Design Fundamentals, CRC Press, 2003

3. Sheldon S. Williamson, Energy Management Strategies for Electric and Plug-in Hybrid Electric Vehicles, Springer, 2013.

4. C.C. Chan and K.T. Chau, Modern Electric Vehicle Technology, OXFORD University Press, 2001.

5. Chris Mi, M. Abul Masrur, David Wenzhong Gao, Hybrid Electric Vehicles Principles And Applications With Practical Perspectives, Wiley Publication, 2011.

Major Equipment:

Necessary instruments, kits and apparatus are to be provided for conducting above said practical in a group of maximum four students.

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF AUTOMOBILE ENGINEERING

Automotive and Combustion Engine Technology

CODE: 23010805

B.E. VIII Semester

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	-	2	5	4	30	-	70	50	150

Objective: -

This course is in continuation to fundamentals of internal combustion engines. The course focuses at imparting knowledge and process of combustion regarding automobile engines. Students examine the combustion process and characteristics of different types of internal combustion engines: sparkignition, diesel, stratified-charge, GDI and HCCI engines.

Prerequisites: -Automobile engines

Course outline: -

Sr. No.	Course Contents	No. of Hours
1	**Overview of gasoline direct injection engines Introduction:** overview of direct injection gasoline engines, potential and technologies for high efficiency direct injection gasoline engine, high pressure fuel injection system, exhaust emissions and after treatment devices	06
2	**Stratified charge combustion in direct injection gasoline engines :** Introduction, thermodynamics and combustion process, production engines with stratified gasoline direct injection	10
3	**Turbocharged direct injection spark ignition engine:** Introduction, historical background: turbo charging for high specific output, problems and challenges associated with turbo charging spark ignition engines, advantages of combining direct injection and turbo charging in spark ignition engines, challenges of applying direct injection to a turbocharged spark ignition engine	10

4	**Direct injection gasoline engines with auto ignition combustion:** Introduction, principle of auto ignition combustion in the gasoline engines, approaches to auto ignition combustion operation in gasoline engines, operation and control of direct injection gasoline engines with auto ignition combustion	10
5	**Homogenous Charge Compression Ignition (HCCI) Engines:** Introduction, HCCI combustion fundamentals, Gasoline HCCI engine, Diesel HCCI combustion engines, operational limits and emissions	09

Learning Outcomes: -

After learning the course the students should be able to:

1. Students will describe basic concepts of combustion process in diesel engine.
2. Students will describe basic concepts of combustion process in spark ignition engine.
3. Students will describe basic concepts of combustion process in HCCI engine.
4. Students will describe basic concepts of combustion process in GDI engine.
5. Students will describe and analysis effect of super charging in petrol engine.
6. Students will describe and analysis effect of stratification in engine.

Tutorial:

1. Study of combustion process of diesel engine.
2. Study of combustion process of spark ignition engine.
3. Study of Stratified charge combustion in direct injection gasoline engines.
4. Study of direct injection gasoline engines with autoignition combustion.
5. Study of Turbocharged direct injection spark ignition engine.
6. Study of Homogenous Charge Compression Ignition (HCCI) Engines.

List of Open Source Software/learning website:

1. Videos on latest combustion engines and processes

Books Recommended:

- Advanced Direct Injection Combustion Engine Technologies and Development. Vol.1
- Gasoline and gas engines by Hua Zhao
- HCCI and CAI engines for the automotive industry by Hua Zhao
- Internal combustion engine by v ganesan
- Internal combustion engine by heywood .

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF INFORMATION TECHNOLOGY

ARTIFICIAL INTELLIGENCE

CODE: 2304070I

DEGREE: 7TH SEMESTER

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	P	Total		Th	Pr	Th	Pr	
4	-	4	8	6	30	-	70	50	150

Objectives:

The basic objective of AI is to enable computers to perform such intellectual tasks as decision making, problem solving, perception, understanding human communication (in any language, and translate among them), and like.

Prerequisites:

Before learning this course students must know the basics of Programming language and algorithms.

Sr. No.	Course Contents	Number of Hours
1	**INTRODUCTION OF AI:** The AI Problems, What is an AI technique, Application of AI, The Underlying Assumption.	6
2	**PROBLEM SPACE AND SEARCH:** State space search, Uninformed - DFS, BFS, Iterative Deepening and informed search techniques: heuristic Functions, Generate and Test Hill Climbing, Problem Reduction	8

	,Constraint Satisfaction ,Mean-Ends Analysis ,Simulated Annealing, A*, variations of A*	
3	**KNOWLEDGE REPRESENTATION AND REASONING:** Introduction To Logic, Propositional Logic, Reasoning in Propositional logic, First Order Logic: Syntax and Semantics, Inference in First Order Logic, Unification, Forward and backward chaining, Resolution	8
4	**ADVERSARIAL SEARCH AND GAME PAYING:** Games, Minimax algorithm, alpha-beta pruning, Constraint-satisfaction problems	5
5	**INTRODUCTION TO PROLOG:** Syntax of Prolog ,Facts and predicates, data types, goal finding, backtracking, simple object, compound objects, use of cut and fail predicates, recursion, lists, simple input/output, implementing AI problem in Prolog, dynamic database	7
6	**NATURAL LANGUAGE PROCESSING:** Introduction, Syntactic Processing, Semantic Analysis, Semantic Analysis, Discourse And Pragmatic Processing, Spell Checking	7
7	**EXPERT SYSTEM ARCHITECTURE & TOOL:** Introduction, Rule Based System Architecture, Nonproduction System Architecture, Dealing with Uncertainty, Knowledge Acquisition & Validation, System Building Tools	8

Learning Outcomes:-

Upon successful completion of the course, the student should be able to:

- Be familiar with Artificial Intelligence, its foundation and principles.
- Examine the useful search techniques; learn their advantages, disadvantages and comparison.
- Learn programming language to program intelligent systems.
- Understand important concepts like Expert Systems, AI applications.
- Be exposed to the role of AI in different areas like NLP, Pattern Recognition etc.
- Learn the practical applicability of intelligent systems, specifically its applications.
- Be able to develop intelligent systems

Teaching & Learning Methodology:-

At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.

- Lectures will be conducted with the aid of multi-media projector, black board, OHP etc.
- Attendance is compulsory in lecture and laboratory which carries 10 marks in overall evaluation.
- One internal exam will be conducted as a part of internal theory evaluation.
- Assignments based on the course content will be given to the students for each unit and will be evaluated at regular interval evaluation.
- Surprise tests/Quizzes/Seminar/tutorial will be conducted having a share of five marks in the

overall internal evaluation.

- The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.
- Experiments shall be performed in the laboratory related to course contents.

Books Recommended:-

1. Artificial Intelligence, Elaine Rich & Kevin Knight, TMH Publication
2. Stuart Russell and Peter Norvig, Artificial Intelligence: A Modern Approach, 2nd Edition, Pearson Publication.
3. George Lugar, "AI-Structures and Strategies for Complex Problem Solving", 4/e, 2002, Pearson Educations.
4. Introduction to Turbo PROLOG, Carl Townsend, BPB Publication.
5. Introduction to AI & Expert Systems, Dan W. Patterson, PHI Publication.
6. "PROLOG Programming For Artificial Intelligence" -By Ivan Bratko(Addison-Wesley)

E-Resources:-

https://nptel.ac.in/courses/106106126/

Practical List:-

Sr. No.	Practical's
1	Study of facts, objects, predicates and variables, Rules, Unification in PROLOG.
2	Write a program to implement "cut" and "fail" predicate in PROLOG
3	Write a program to implement arithmetic operators, simple input/output and compound goals in PROLOG.
4	Write a program to implement recursion in PROLOG.
5	Write a program to implement Lists in PROLOG.
6	Write a program to implement string operations in PROLOG. Implement string operations like substring, String position, palindrome etc.)
7	Write a program to solve travelling salesman problem using Prolog.
8	Study of dynamic database in PROLOG.
9.	Write a program to implement BFS (for 8 puzzle problem or Water Jug problem or any AI search problem)
10.	Write a program to implement DFS (for 8 puzzle problem or Water Jug problem or any AI search problem)

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF INFORMATION TECHNOLOGY

IOT AND APPLICATIONS

CODE: 23040703

B.E. 7TH SEMESTER

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	4	7	5	30	--	70	50	150

Objectives: -

To assess the vision and introduction of IOT. To Understand IOT Market perspective. To Implement Data and Knowledge Management and use of Devices in IoT Technology. To Understand State of the Art - IoT Architecture. To classify Real World IoT Design Constraints, Industrial Automation in IoT.

Prerequisite:-

Fundamentals of computer network, wireless sensor network, communication & internet technology, web technology, information security.

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Introduction to IoT:** The Internet of Things Today, Towards the IoT Universe, Defining IoT, Characteristics of IoT, Physical design of IoT, Logical design of IoT, Functional blocks of IoT, Communication models & APIs.	08
2	**IoT& M2M:** Machine to Machine, Difference between IoT and M2M, Software define Network.	06
3	**Network & Communication aspects:** Wireless medium access issues, MAC protocol survey, Survey	

	routing protocols, Sensor deployment & Node discovery, Data aggregation & dissemination.	07
4	**Challenges in IoT:** Design challenges, Development challenges, Security challenges, Other challenges.	06
5	**Domain specific applications of IoT:** Home automation, Industry applications, Surveillance applications, Other IoT applications	07
6	**Developing IoTs:** Introduction to Python, Introduction to different IoT tools, Developing applications through IoT tools, Developing sensor based application through embedded system platform, Implementing IoT concepts with python	06

Learning Outcomes:-

After learning the course, the student will be able:

1. Understand the vision of IoT from a global context.
2. Understand the application of IoT.
3. Determine the Market perspective of IoT.
4. Use of Devices, Gateways and Data Management in IoT.
5. Building state of the art architecture in IoT.
6. Application of IoT in Industrial and Commercial Building Automation and Real World Design Constraints.

Teaching & Learning Methodology:-

At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.

1. Lectures will be conducted with the aid of multi-media projector, black board, OHP etc.
2. Attendance is compulsory in lecture and laboratory which carries 10 marks in overall evaluation.
3. One internal exam will be conducted as a part of internal theory evaluation.
4. Assignments based on the course content will be given to the students for each unit and will be evaluated at regular interval evaluation.
5. Surprise tests/Quizzes/Seminar/tutorial will be conducted having a share of five marks in the overall internal evaluation.
6. The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.
7. Experiments shall be performed in the laboratory related to course contents.

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY
DEPARTMENT OF INFORMATION TECHNOLOGY
PYTHON PROGRAMMING
CODE: 2304070 2
DEGREE 7th SEMESTER

Teaching & Evaluation Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	4	7	5	30	--	70	50	150

Objectives:

Python is a modern language useful for writing compact codes specifically for programming in the area of Server-side Web development, Data Analytics, AI and scientific computing as well as production tools and game programming. This course covers the basics and advanced Python programming to harness its potential for modern computing requirements.

Prerequisites: Required Basic Knowledge of Object-Oriented Concepts.

Course Outline:-

Sr. No	Course Contents	Number of Hours
1	**Introduction to Python Programming Language:** • Strengths andWeaknesses, • IDLE, DynamicTypes, • NamingConventions, • StringValues, • StringOperations, • StringSlices, • StringOperators, • Numeric DataTypes, • Conversions, • Built inFunctions	4

2	**Data Collections and Functions, Scoping and Abstraction:** • Tuples • set • Lists and Dictionaries • Lists and Mutability • Functions as Objects • Functions and scoping • Global keyword • Modules • System Functions and Parameters • Strings and Input • Iteration • Control Structures	8
3	**Classes and Object-Oriented Programming:** • Classes inPython • Principles of ObjectOrientation • CreatingClasses • InstanceMethods • SpecialMethods • ClassVariables • Inheritance • Polymorphism • TypeIdentification • Custom ExceptionClasses	8
4	**Functions, Scoping and Abstraction:** • Functions and scoping • Specifications • Recursion • Global variables • Modules • Files • System Functions and Parameters	7
5	**I/O and Error Handling inPython:** • Introduction • DataStreams • Creating Your Own Data Streams • AccessModes • Writing Data to aFile • Reading Data from aFile • Additional FileMethods • Using Pipes as DataStreams • Handling IO Exceptions • Working withDirectories • Metadata • Errors • Run TimeErrors • The ExceptionModel • ExceptionHierarchy • Handling MultipleExceptions • Types of testing – Black-box and Glass-box	08

	• Debugging	
6	**Advance Topics:** • Application of AI, Future of AI, Introduction of Machine Learning, Introduction of Deep Learning, Machine Learning vs Deep Learning. • Deep Learning Libraries. • Neural Networks • Security – Encryption and Decryption, Classical Cyphers • Graphics and GUI Programming – Drawing using Turtle, Tkinter and Python, Other GUIs • Plotting using PyLab • Networking and Multithreaded Programming, Sockets, Threads and Processes, Chat Application	5

Learning Outcomes:

After learning the course, the student will be able:

- To develop proficiency in creating based applications using the Python Programming Language.
- To be able to understand the various data structures available in Python programming language and apply them in solving computational problems.
- To be able to do testing and debugging of code written in Python.
- To be able to draw various kinds of plots using PyLab.
- To be able to do text filtering with regular expressions in Python
- To be able to create socket applications in Python
- To be able to create GUI applications in Python
- To be able to build Artificial neural network model in Python

Teaching & Learning Methodology:-

- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
- Lectures will be conducted with the aid of multi-media projector, black board.
- Attendance is compulsory in lecture and laboratory which carries 10 marks in overall evaluation.
- One internal exam will be conducted as a part of internal theory evaluation.
- Assignments based on the course content will be given to the students for each unit and will be evaluated at regular interval evaluation.
- Surprise tests/Quizzes/Seminar/tutorial will be conducted having a share of five marks in the overall internal evaluation.
- The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.
- Experiments shall be performed in the laboratory related to course contents.

Books Recommended:-

1. John V Guttag. "Introduction to Computation and Programming Using Python", Prentice Hall of India
2. R. Nageswara Rao, "Core Python Programming", dreamtech
3. Wesley J. Chun. "Core Python Programming - Second Edition", Prentice Hall
4. Michael T. Goodrich, Roberto Tamassia, Michael H. Goldwasser, "Data Structures and Algorithms in Pyhon", Wiley
5. Kenneth A. Lambert, "Fundamentals of Python – First Programs", CENGAGE Publication
6. Luke Sneeringer, "Professional Python", Wrox
7. "Hacking Secret Ciphers with Python", Al Sweigart, URL- https://inventwithpython.com/hacking/chapters

E-Resources:-

https://www.tutorialspoint.com/python/index.htm
https://www.javatpoint.com/python-tutorial

Practical List:-

Sr. No	Practical's
1	Write python program to print Hello World
2	Write python program to Hello World using string variable
3	Write python program to store data in list and then try to print them.
4	Write python program to do basic trim and slice on string.
5	Write python program to print list of numbers using range and for loop
6	Write python program to store strings in list and then print them.
7	Write python program to let user enter some data in string and then verify data and print welcome to user.
8	Write python program in which a function is defined and calling that function prints Hello World
9	Write python program in which a function(with single string parameter) is defined and calling that function prints the string parameters given to function.
10	Write python program in which a class is define, then create object of that class and call simple print function define in class.
11	Write a python program to demonstrate the python libraries for machine learning and deep learning
12	Develop programs to learn regular expressions using python.
13	Develop chat room application using multithreading.
14	Learn to plot different types of graphs using PyPlot.
15	Implement classical ciphers using python.
16	Draw graphics using Turtle.
17	Develop programs to learn GUI programming using Tkinter.

Books Recommended:-

1. Vijay Madisetti, ArshdeepBahga, "Internet of Things: A Hands-On Approach"
2. WaltenegusDargie,ChristianPoellabauer, "Fundamentals of Wireless Sensor Networks: Theory and Practice"

E-Resources:-

1) https://www.udemy.com/internet-of-things-iot-for-beginners-getting-started/

2) http://playground.arduino.cc/Projects/Ideas

3) http://runtimeprojects.com

4) http://www.megunolink.com/articles/arduino-garage-door-opener

5) http://www.willward1.com/arduino-wifi-tutorial

Practical List:-

Sr. No.	Practical's
1	Define and Explain Eclipse IoT Project
2	List and summarize few Eclipse IoT Projects
3	Sketch the architecture of IoT Toolkit and explain each entity in brief
4	Demonstrate a smart object API gateway service reference implementation in IoT toolkit
5	Write and explain working of an HTTP- to-CoAP semantic mapping proxy in IoT toolkit.
6	Describe gateway-as-a-service deployment in IoT toolkit.
7	Explain application framework and embedded software agents for IoTtoolkiit
8	Explain working of Raspberry Pi.
9	Connect Raspberry Pi with your existing system components.
10	Give overview of Zetta

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING

DEPARTMENT OF INFORMATION TECHNOLOGY

NETWORK PROGRAMMING

CODE : 23040704

B.E. 7th SEMESTER

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	-	4	7	5	30	-	70	50	150

Objectives:

This course provides the student with fundamental knowledge of the various aspects of computer networking and enables students to appreciate recent developments in the area. The course will be driven from the engineering perspective.

- The learning objectives of this course are to:
- Understand uses of TCP/IP protocol suite.
- Understand, design and implement Advanced Applications
- Utilize the concepts of TCP/IP protocol to develop client-server applications.

Prerequisites:-

Brief knowledge about Data Communication & Networking concepts such as Network Topology, Network Models-OSI,TCP-IP, network categories and network connecting devices, Internetworking, Internetworking Infrastructure, Internetworking Routing, Socket Interface.

Course outline:-

Sr.No.	Course Contents	Number of Hours
1	**Layering Model and Physical Interface:** Introduction, Protocols and Standards, Standards Organization, Internet Standards, Internet Administration, A Brief History, The OSI Model, Layers in the OSI Model, TCP/IP Protocol suite, Addressing, TCP/IP versions. Underlying Technologies: Local Area Networks (LAN), Point-to-Point WAN, Switched WAN, Connecting Devices.	06
2	**Internetworking Infrastructure:** Subnetting and Supernetting, Subnetting, Masking, Example of subnetting, Variable-length Subnetting, Supernetting, Internet Protocol :-Datagram, Fragmentation, Options, Checksum, IP Design, IP Addressing :- Datagram, Fragmentation, Options, Checksum, IP Design, IP Addressing - Introduction, Classful Addressing, Other Issues, A sample internet with classful addresses, Bridging and Interfacing: ARP, RARP, BOOTP, DHCP .	09
3	**Internetworking Routing:** Delivery and Routing of IP Packets ,Routing Protocols -Interior and Exterior Routing, RIP, OSPF, BGP, Internet Control Message Protocol (ICMP) ,Internet Group Message Protocol (IGMP),Multicast Routing, Multicast Trees, Multicast Routing Protocols, DVMRP, MOSPF, CBT, PIM, MBONE.	10
4	**Transport and Application Services:** User Datagram Protocol (UDP)- Process-to- Process Communication, User Datagram, Checksum, UDP Operation, Use of UDP, UDP Design, Transmission Control Protocol (TCP) -Process-to-Process Communication, TCP Services, Segment, Options, Checksum, Flow Control, Error Control, TCP Timers, Connection, State Transition Diagram, Congestion Control, TCP Operation, TCP Design, Domain Name System ,File Transfer Protocol ,Application Layer and Client-Server Model	09
5	**Socket Interface:** Definitions, Sockets, Byte Ordering, Address Transformation, Byte Manipulation Functions, Information about remote host, Socket System Calls, Connectionless Iterative Server, UDP Client-Server Programs, Connection Oriented Concurrent Server, TCP Client-Server Programs.	06

Learning Outcomes:-

After completing this course, students will be able to:

- Know how internet exchanges data
- Know various addressing standards of internet
- Know various routing algorithm
- Know about Socket

Teaching & Learning Methodology:-

- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
- The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.
- Experiments shall be performed in the laboratory related to course contents.
- describe major technologies and protocols used in network communications
- demonstrate advanced knowledge of networking.
- demonstrate advanced knowledge of programming for network communications
- make use of various solutions to perform inter-process communications

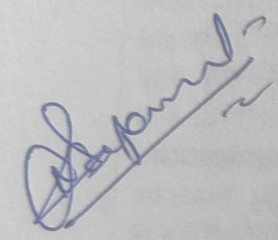
Books Recommended:-

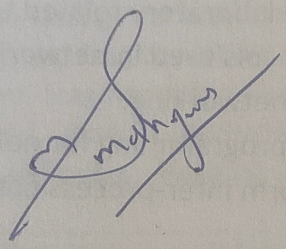
1. TCP/IP Protocol Suite by **Behrouz A. Forouzan**, Tata McGraw Hill.
2. UNIX Network Programming Volume-1 by **W. Richard Stevens, Bill Fenner and Andrew M. Rudoff**, Addision-Wesley.
3. High-Speed Networks and Internets, Performance and Quality of Service, Second Edition,**William Stallings**, Pearson
4. Internetworking with TCP/IP Volume-2, Client-Server Programming and Applications by **Douglas E. Comer and David L. Stevens**, Prentice Hall

Practical List:-

Sr. No.	Practical's
1	Understanding and using of commands like ifconfig, netstat, ping, arp, telnet, ftp, finger, traceroute, whois
2	Socket Programming: Implementation of Connection-Oriented Service using standard ports.
3	Implementation of Connection-Less Service using standard ports
4	Implementation of Connection-Oriented Iterative Echo-Server, date and time, character generation using user-defined ports
5	Implementation of Connectionless Iterative Echo-server, date and time, character generation using user-defined ports.
6	Implementation of Connection-Oriented Concurrent Echo-server, date and time, character generation using user-defined ports

7	Program for connection-oriented Iterative Service in which server reverses the string sent by the client and sends it back
8	Program for connection-oriented Iterative service in which server changes the case of the strings sent by the client and sends back (Case Server).
9	Program for Connection-Oriented Iterative service in which server calculates the Net-salary of an Employee based on the following details sent by the client i)basic-sal ii) hra iii) da
10	Program for file access using sockets.
11	Program for Remote Command Execution using sockets.
12	Implementation of DNS .
13	Program to implement Web Server using sockets





SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING

DEPARTMENT OF INFORMATIONTECHNOLOGY

MACHINE LEARNING

CODE: 2308 0801

B.E. 8TH SEMESTER

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
4	-	4	8	6	30	--	70	50	150

Objectives:

To know about Machine Learning concepts and implementation following are the objectives:

1. Introduction of Machine Learning & its application areas.
2. To know Supervised, Unsupervised and Semi supervised algorithms.
3. To know usage of AI and Data mining algorithms in Machine Learning.

Prerequisites:

Students should have an introductory level of knowledge about Artificial Intelligence and Data Mining. Knowledge of basic neural networks, activation function will be an advantage. Concepts of statistics should be known by all students in advance.

Course outline:-

Sr.No.	Course Contents	Number of Hours
1	**Introduction:** Introduction to machine learning, Machine Learning vs Deep Learning, Why machine learning?, Application of Machine Learning, Machine Learning Techniques, Testing techniques for machine learning models.	04
2	**Supervised learning algorithm:** Introduction, types of learning, application, Supervised learning: Linear Regression Model, Naive Baye's classifier Decision Tree, K nearest neighbor, Logistic Regression, Support Vector Machine, Random forest algorithm	09
3	**Unsupervised learning algorithm:** Grouping unlabelled items using k-means clustering, Hierarchical Clustering, Probabilistic clustering, Association Rule mining, Apriori Algorithm, FP- GrowthAlgorithm, Gaussian mixture model.	09
4	**Introduction to Statistical Learning Theory, Feature extraction** - Principalcomponent analysis, Singular value decomposition. Feature selection – feature ranking and subsetselection, filter, wrapper and embedded methods, Evaluating Machine Learning algorithms and ModelSelection.	09
5	**Semi supervised learning, Reinforcement learning:** Markov decision process (MDP), Bellman equations, policy evaluation using Monte Carlo, Policy iteration and Value iteration, Q-Learning, State- Action-Reward-State-Action (SARSA), Model-based Reinforcement Learning.	09
6	**Advance Topics:**Deep Learning, The Artificial Neuron, Biological Neuron, Perceptron, Perceptron Learning Rule, Perceptron Function, ReLu Functions, Hyperbolic Functions, Softmax Function, Sigmoid function, Data vs Information, Data Cleaning, Digital image processing, Fundamental steps in Digital Image Processing, Image Noise Reduction and Filtering Techniques, Open Source Deep Learning Libraries and Platforms.	09

Learning Outcomes:

After learning above course student should be able to:

1. Understand the Concepts of Supervised and Unsupervised Learning Algorithm.
2. Understand the Feature Extraction & Machine Learning Algorithms.
3. Understand the concept of Deep Learning and its application.
4. Understand the artificial neurons with a comparison to biological neurons.
5. Understand how the capacity of a model is affected by underfitting and overfitting.

Teaching & Learning Methodology:

At first basic concepts related to the AI and Data Mining will be discussed to give idea of problem domain to the students. After that introduction will be given on Supervised, Unsupervised learning. After that Semi supervised learning and reinforcement learning will be discussed. Laboratory experiments will be performed to get more clarification on the concepts.

Books Recommended:

1."Machine Learning" by SaikatDutt, Subramanian Chandramouli and Amit Kumar Das, by Pearson Education.

2."Introducing Machine Learning" by Dino Esposito, Francesco Esposito, by Pearson Education.

3."Machine Learning" by Tom M. Mitchell, by Tata McGrawHill Publications

4."Artificial Neural Networks" by B.Yegnanarayana, Eastern Economy Edition

E-Resources:-

- https://github.com/connectIOT/iottoolkit
- https://www.arduino.cc/
- http://www.zettajs.org/
- Contiki (Open source IoT operatingsystem)
- Arduino (open source IoTproject)
- IoT Toolkit (smart object API gateway service referenceimplementation)
- Zetta (Based on Node.js, Zetta can create IoT servers that link to various devices andsensors)

Practical List:-

Sr. No.	Practical's
1	Write a program to demonstrate read the training data from a .CSV file using Pandas.
2	Introduction of Web Scraping with Pandas and Beautifulsoup.

3	Write a program to demonstrate the working of the Artificial Neural Network.
4	Build an Artificial Neural Network by implementing the Backpropagation algorithm and test the same using appropriate data sets.
5	demonstrate different data visualization techniques.
6	Introduction of Deep Learning Libraries
7	Write a program to construct a Neural network considering medical data. Use this model to demonstrate the diagnosis of heart patients using standard Heart Disease Data Set. You can use Python ML library classes/API.
8	Write a program to construct a Regression considering price prediction data. Use any regression model to predict the future Price. You can use Python ML library classes/API.
9	Write a program to Recognize Objects with Your Webcam Using AlexNet.
10	Write a program for Object Detection Using Deep Learning.
11	Write a program for Yield calculation from past data Using Machine Learning.
12	Write a program for Image Segmentation using Python's scikit-image module.

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF INFORMATION TECHNOLOGY

PROGRAMMING WITH XML AND JSON

CODE: 2304080 2

DEGREE: 8TH SEMESTER

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tut	P	Total		Th	Pr	Th	Pr	
4	-	4	8	6	30	-	70	50	150

Objectives:

This subject provides a detailed knowledge of XML technology like what is xml, features of xml, xml example, xml related technologies, creating xml structure by DTD, creating xml structure by schema (XSD), difference between DTD and schema.

In addition student will get knowledge on JSON, Which will help to learn JSON fundamentals, example, syntax, array, object, encode, decode, file, date and date format.

Prerequisites:

Before learning this course students must know the basics of HTML and JavaScript before learning this subject.

Course outline:-

Sr.No.	Course Contents	Number of Hours
1	**Introduction:** XML Features, HTML vs XML, XML Example, XML Technologies, XML Attributes, XML Comments, XML Tree.	6
2	**XML Validation:** Validation, XML DTD, XML CSS, XML Schema, DTD vs XSD, CDATA vs PCDATA.	7
3	**XML Advance:** XML Parsers, XML DOM, XML Database, XML Namespaces.	7
4	**XML Tools:** XML Viewers, XML Editors, XML Parsers, XML Processors.	6
5	**JSON :** Introduction of JSON, JSON Syntax, JSON DataTypes, Deep dive with examples, JSON Comparison with XML	7
6	**JSON:** JSON Objects, JSON Array, JSON Comments, JSON Schema.	5
7	**JSON:** JSON with PHP, JSON with Perl, JSON with Python, JSON with Ruby, JSON with Java, JSON with Ajax, JSON with Swift	6

Learning Outcomes:-

Upon successful completion of the course, the student should be able to:

- Describe the phases of planning and design of XML and JSON.
- This subject will help students to develop mobile application in terms of retrieving data from Database. XML and JSON used in web services request response in iOS and Android.

Teaching & Learning Methodology:

For understand this syllabus students need do several experiment on different software tools.

Books Recommended:

1. Learning XML, Book by Erik T. Ray
2. Beginning XML, Book by Wiley
3. Json for Beginners
4. JSON Quick Syntax Reference

E-Resources:-

https://www.tutorialspoint.com/xml/xml_tutorial.pdf
https://www.w3schools.com/xml/
https://www.javatpoint.com/json-vs-xml

Practical List:-

Sr. No.	Practical's
1	Study practical of XML Namespace.
2	Retrieve data from Database using XML.
3	Create document using XML.
4	Fetch different tags from created document and parse it.
5	Make advanced level XML file with nested tags and fetch tags using the parser.
6	Create a document using JSON.
7	Retrieve data from Database using JSON.
8	Fetch tags from the created document and parse it.
9	Make advanced level JSON files with nested tags and fetch tags using the parser.
10	XML Tree level Structure files parsing.
11	JSON Tree level structures file parsing.

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF INFORMATION TECHNOLOGY

GRAPHICS PROGRAMMING & ANIMATION

CODE: 2304080 3

B.E. 8th SEMESTER

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	-	4	8	6	30	-	70	50	150

Objectives:

Explain the history of animation and also provides an insight to various medium of communicative media.

- Formulate a working definition of interactive multimedia.
- Demonstrate the use of animation, digitized sound, video control, and scanned images.
- Teach some compression techniques.
- Use basic instructional design principles in the development of stacks.
- Will develop conceptual maps of content and process for interactive multimedia instructional programs.

Prerequisites:-

Animation is the process of designing, drawing, making layouts and preparation of photographic sequences which are integrated in the multimedia and gaming products. Animation involves the exploitation and management of still images to generate the illusion of movement. A person who creates animations is called animator. He / she can use various computer technologies to capture the still images and then to animate these in desired sequence.

Course outline:-

Sr.No.	Course Contents	Number of Hours
1	**Multimedia Communications:** Introduction, Multimedia information representation, Multimedia networks, Multimedia applications, Application and networking terminology, Multimedia information representation: Digitization, Principles, Text and Images, Audio and video, Digital Video/Audio/Image coding standards	8
2	**Image Compression Systems:** Fundamentals of Image, Redundancy In Image, Lossless And Lossy Image Compression Techniques, Measurements Quality of Reconstructed Image (MSE, SNR, PSNR) , Huffman Coding, GIF,TIFF,JPEG	7
3	**Text Compression:** Compression Principles, Entropy And Source Encoding, Static Huffman Coding, Dynamic Huffman Coding, Arithmetic Coding, LZW Coding	8
4	**Audio-Video Compression:** Audio Compression, PCM, DPCM, ADPCM, Adaptive Predictive Coding, Linear Predictive Coding, Code Excited Coding, Perceptual Coding, Mpeg Audio Coder, Digital Video Coding Fundamentals, Video Compression Principles, Video Compression Standards	7
5	**2D Animation:** Basic Sketching, Working with Photoshop, Image Compositing, Digital Painting, Working with Flash/Animate, Advanced 2D Animation Techniques, Audio-Video Editing.	7
6	**3DAnimation:** Introduction, Modeling : Polygon and Splines, Animation techniques : Key Frame Animation, Forward Kinematics, Inverse Kinematics, Shape Deformation, Rendered Animation, Morphing, Character Animation, Facial Animation	8
7	**Introduction to 3D Modeling and Animation tool:** Blender	4

Learning Outcomes:

After successful completion of this course, student will be able to

- Understand the basic Animation tools.
- To understand some basic compression techniques.
- To study 3D animation techniques.

Teaching & Learning Methodology:

For teaching this subject we need some software requirements like newest version of Google Chrome of Mozilla Firefox, Autodesk Maya or Equivalent Animation software, Adobe Photoshop, Flash. Some hardware requirements like Microsoft Windows 7,Windows 8, windows 8.1 or windows 10, 4GB of RAM, 64 bit Intel or AMD multi-core processor, Webcam, 4GB Free disk space.

Books Recommended:

1. Multimedia Communications- Applications, Networks, Protocols & Standards, Fred Halsall, Pearson Publications.
2. Principles of Three dimensional computer animation, Michael O'Rourke, WW Norton & Company.
3. Introduction to Multimedia Communications, K.R. Rao, Zoran S.B. & Dragorad A.M, Publications Wiley.
4. Facial modeling and animation: stop staring, Jason Osipa, Wiley India Pvt. Ltd.

E-Resources:

1. https://www.autodesk.in/products/maya/free-trial
2. www. blender.org
3. https://www.keycdn.com/support/what-is-image-compression

Practical List:

Sr. No.	Practical's
1	Write a program on Text compression.
2	Do program on Image compression.
3	Audio compression
4	Video compression
5	Key frame based animation
6	Morphing
7	Rendered animation
8	Character animation
9	Facial animation
10	Modeling and animation using Blender

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CHEMICAL ENGINEERING

Process Equipment Design-II

SUBJECT CODE:

B.E.7th SEMESTER

Teaching and Examination Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	-
3	1	0	4	4	30	20	70	30	150

Sr. No	Course Content	Total Hrs.
1.	**Introduction :** Determination of internal design pressure, external design pressure & design temperature, Different types of equipments, Static & rotary equipments, Different types of static equipments, Properties of material, Fatigue, Creep, Brittle fracture, etc., Different methods of fabrication, Different types of welding joints, Joint efficiency, Radiography, etc.	3
2.	**Mechanical design of Pressure vessel:** Introduction of ASME Code sec-VIII, DIV-I & IS-2825,Classifacaton of pressure vessel as per IS-2825,Mechanical design of Shell: shell subjected to internal pressure, Graphical & analytical method for Shell subjected to external pressure, design of shell for external pressure with & without stiffening ring, Different types of head, their selection criteria, Mechanical design of heads: Heads subjected to internal pressure, Graphical & analytical method for heads subjected to external pressure, Different types of Nozzles, their selection criteria, Design of nozzle pipe, Design of reinforcement pad by area for area method, Different types of flanges, Different types of standard flanges, their important features & selection criteria, Different types of flange facings & their selection criteria, Rating of standard flanges, Different types of gaskets, their selection criteria, Design of ring flange, etc.	15
3.	**Mechanical design of Reaction Vessel:** Mechanical design of shell, head, Jacket, coil, agitator, nozzle, body flange, etc., Different types of agitators & their selection criteria, Different types of agitator shaft sealing system & their selection criteria, Different types of power transmission system, Determination of power required for agitation, shaft diameter, blade thickness, etc., Different types of jackets & their selection criteria, Selection between coil & jacket	7

HOD

Sandip..

(Sandip Shah, Env. Engg. in AMC)

4.	**Mechanical design of Storage Tank:** Classification of storage tank as per IS-803,Determination of capacity of storage tank, its diameter & height, Design of shell of storage tank, Design of bottem plate, Design of Self supported conical roof, Design of structured supported conical roof as per API 620, Selection of column,girders and rafters,Roof curb angel,Dyke wall, Floating roof, etc.	7
5.	**Mechanical design of Shell & Tube Heat Exchangers:** Mechanical design of Shell, tube, tube sheet, head, channel shell, , etc. of shell & tube heat exchanger	5
6.	**Mechanical design of Vertical tall tower (Distillation Column):** Mechanical design of shell, head, tray support, nozzle, , body flange, etc. of Vertical tall tower, Determination of shell thicknesses at various heights for tray tower & packed tower for internal & external pressure,Different types of tray supports & their selection criteria, design of horizontal structural member with perifery ring type packing support	8
7.	**Supports :** Different types of supports, Mechanical design of bracket support, skirt support & saddle support	6
8.	**Pressure Relieving Devices :** Different types of pressure safety valves, Rupture disks, sizing of valves	3

Term Work:

Based on above topics design problems (at least three) should be given to the students. Febrication drawings based on these designed equipments must be prepared.

Text Book:

1. Illustrated Process Equipment Design by S B Thakore, Second edition.

Reference Books:

1. Illustrated Process Equipment Design by S B Thakore, Second edition,.
2. Process Equipment Design - M.V.Joshi & V V Mahajani, Third edition.
3. Process Equipment Design (Mechanical Aspects) By B.C.Bhattacharya
4. Process Equipment Design - Vessel Design - L.E. Brownell & E.H.Young, First Edition.

HOD

(Sandip Shinde,
Env. Engg. IT AMC)

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CHEMICAL ENGINEERING

Project-I

SUBJECT CODE:

B.E.7th SEMESTER

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	-
0	0	8	4	4	0	20	0	80	100

Under the above subject each student will be assigned the chemical industry based or practical based project work under the supervision of teaching staff members and will submit in the form of a report .The same work will be continued in eighth semester as project-II.

For the identification of the project work any one of the options can be followed.

(1) Student can be sent for industrial training for 2 to 4 weeks at the end of fifth semester or at the end of sixth semester before starting of seventh semester. Under the guidance of industrial person or faculty student will identify the industrial problem to work on as project work.
(2) Industrial application oriented problem identified by faculty may be assigned as project work to student.
(3) Faculty may assign research based work as project to student.

HOD

(Sandip Sharma, Env. Engg. IIT Ams)

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CHEMICAL ENGINEERING

Nanotechnology

SUBJECT CODE:

B.E.7th SEMESTER

Type of course: Nanoscience and Nanotechnology

Prerequisite: Fundamental of Chemistry, thermodynamics and material Science

Rationale: To make students understand the use of concept of nanotechnology and nanoscience in the chemical industries and in consumer products. Nanotechnology will mean complete control of the structure of matter, building complex objects with molecular precision. In current scenario, engineers are finding a wide variety of ways to deliberately make materials at the nanoscale to take advantage of their enhanced properties such as higher strength, lighter weight, increased control of light spectrum, and greater chemical reactivity then their larger scale counterparts. So in order to move towards advanced materials and devices students should have the knowledge of nano science.

Teaching and Examination Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	-
2	0	2	4	3	30	20	70	30	150

Content:

Sr. No.	Content	Total Hrs.	Weight age
1.	**Generic methodologies for nanotechnology: classification and fabrication:** Introduction and classification, Summary of the electronic properties of atoms and solids, Effects of the nanometer length scale, Fabrication methods, Preparation, safety and storage issues.	8	15
2.	**Strategies for the scalable synthesis of quantum dots and related Nano dimensional materials –1:** Introduction, Defining Nano dimensional Materials, Potential Uses for Nanodimensional Materials, The General Methods Available for the Synthesis of Nanodimensional, Materials, Precipitative Methods, Reactive Methods in High Boiling Point Solvents.	9	16

HOD

(Sandip Shaikh, Env. Engg. in AMC)

3.	**Strategies for the scalable synthesis of quantum dots and related Nano dimensional materials –II:** Reactive methods in high boiling point solvents, gas-phase synthesis of semiconductor nano particles , synthesis in a structured medium , the suitability of such methods for scaling	9	16
4.	**Nanotechnology and ceramics :** Introduction, Synthesis, Vapor Condensation Methods, Sputtering, Laser Method, Spray Pyrolysis, Thermo Chemical /Flame Decomposition of metal organic Precursors methods	9	16
5.	**Tools to characterize nanomaterials:** X-Ray Diffraction (XRD), Scanning Electron Microscopy, Transmission Electron Microscopy, Atomic Force Microscopy, UV/Visible Spectroscopy	9	18
6.	**Applications of nanomaterials:** Cosmetics and Consumer Goods, Nano Sensor, Nano catalysts, Water Treatment and the Environment, Paints, Food and Agriculture Industry.	10	19

Reference Books:

1. Nanostructures and Nanomaterials: Synthesis, Properties and Applications by G. Cao, Imperial College Press, 2004.
2. Nanoscale Science and technology by Robert Kelsall (editor), Ian W. Hamley (co-editor), Mark Geoghegan (co-editor) , ISBN: 978-0-470-85086-2
3. The Chemistry of Nanomaterials: Synthesis, Properties and Applications by C. N. R. Rao, A. Muller, A. K. Cheetham, WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim, ISBN: 3-527-30686-2.
4. Nanoscale Materials in Chemistry Edited by Kenneth J. Klabunde, John Wiley & Sons, Inc., ISBNs: 0-471-38395-3 (Hardback); 0-471-22062-0.
5. Textbook of Nanoscience and Nanotechnology, B.S. Muty, P. Shankar, Baldev Raj, B.B Rath and James Murday, University Press, IIM (ISBN-978 81 7371 738 3).
6. Introduction to Nanotechnology by Charles P. Poole Jr and. Frank J. Owens, Wiley-Inter science, 2003.

Suggested Specification table with Marks (Theory):

Distribution Of Theory Marks					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
15	20	30	5	-	-

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcome: After learning the course the students should be able:

1) Understand bulk and Nanostructured materials.
2) Understand synthesis of nanomaterial with different.
3) Understand the basic principal of various characterization technique.
4) Understand the use of nanoscience and nanotechnology for various applications.

HOD

C Sandip Sharma, Env. Engg. IT AMC

5) Students can understand the difficulties in synthesizing Nano particles and can work in the field of commercialization of Nano materials.

List of Tutorials:

Students can study different synthesis techniques for producing nanoparticles depending upon the types and properties of Nano materials. Each group of students are expected to create a way to synthesize nanomaterials in cheap and easier way at laboratory level and prepare report of project assigned to his/her group even students can study the instruments related to the characterization of Nano materials. In addition, each group is expected to give a power point presentation during the semester. The presenter will be selected randomly just prior to the presentation.

List of Open Source Software/learning website:

- Students can refer to video lectures available on various websites including NPTEL.
- Students can refer to the CDs which are available with some reference books for the solutions of problems using software. Students can develop their own programs for the solutions using excel, Chemical and other simulation software.

ACTIVE LEARNING ASSIGNMENTS:

Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide.

HOD

C Sandip Sharma,
Env. Engg. M AMC

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CHEMICAL ENGINEERING

Plant Design & Project Engineering

SUBJECT CODE:

B.E.7th SEMESTER

Teaching and Examination Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	-
3	0	0	3	3	30	20	70	30	150

Sr. No	Course Content	Total Hrs.
1.	**Introduction:** Basic considerations in chemical engineering plant design, project identification, preliminary techno-economic feasibility.	3
2.	**Process design aspects:** Selection of process-factors affecting process selection. Importance of Laboratory development pilot plant, scale up methods, safety factors, types of flow diagrams.	4
3.	**Selection of process equipments:** Standard versus special equipment-material of construction for process equipments, selection criteria, and specification sheets.	4
4.	**Process auxiliaries:** Piping design, layout, and supports for piping insulations. Pipe fittings, types of valves, selection of valves, process control and instrumentation control system design.	4
5.	**Process utilities:** Process water, boiler feed water, water treatment, waste treatment and disposal, disposal, steam, oil heating system, chilling plant, compressed air and vacuum.	4
6.	**Plant location and layout:** Factors affecting plant location, factors in planning layouts, principles of plant layout, use of scale models.	8

HOD

(Sandip Shukla, Ex. Engg. in ANC)

7.	**Cost estimation:** Factors involved in project cost estimation - Total capital investment, Fixed capital and working capital, types and methods for estimation of total capital investment, Estimation of equipment cost	8
8.	**Estimation of total Project cost &product cost:** Factors involved in project cost, factors affecting investment and production costs, utilities cost, evaluation of product cost,	6
9.	**Depreciation:** Types and methods of determining depreciation, evaluation of depreciation methods.	3
10.	**Profitability, alternative investments and replacement:** Methods for profitability evaluation, Evaluation of Break Even Point, % rate of return, Practical factors in alternative investment and replacement studies.	4
11.	**Project management:** Planning of project schedule by BAR CHART, Inventory control scheduling a project using CPM/PERT methods.	6

Text Books:

1. M.S. Peters and Timmerhaus, "Plant design and Economics for Chemical Engineers", McGraw Hill 3rd Edition
2. F.C. Vibrandt and C.E. Dryden, "Chemical Engineering Plant Design", McGraw Hill Fifth Edition

Reference Books:

1. Industrial Engineering and Management by O. P. Khanna
2. Project Engineering : Suhas Mokashi ,Mcmillan Publisher

HOD

C Sandip Sharma,
Env. Engg. in AMC)

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CHEMICAL ENGINEERING

Energy Technology

SUBJECT CODE:

B.E.7th SEMESTER

Teaching and Examination Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	-
2	0	2	4	3	30	20	70	30	150

Sr. No	Course Content	Total Hrs.
1.	**An Introduction to Energy Sources** energy sources (conventional & non-conventional), renewable energy resources, primary & secondary energy sources, energy chain, energy demand, national energy strategy & plan, energy management, energy audit & conservation	2
2.	**Definitions, Units & Measures** proximate & ultimate analysis, calorific values, rank of coal, coking & caking, gasification, basis for reporting results of analysis, units & conversion factors	4
3.	**Solid Fuels** wood & charcoal, peat, lignite, sub-bituminous & bituminous coals, semi-anthracite and anthracite coals, cannel & boghead coal, origin of coal, composition of coal, analysis & properties of coal, problems	6
4.	**Processing of Solid Fuels** coal preparation, washability curve, dry & wet washing methods of coal, washer efficiency, gasification & liquefaction of solid fuels, problems	6
5.	**Solar Energy** solar constant, solar radiation & related terms, measurement of solar radiation, solar energy collectors – flat plate collector, air collector, collectors with porous absorbers, concentrating collectors, applications & advantages of various collectors, selective absorber coatings, solar energy storage systems (thermal, electrical, chemical & mechanical), solar pond, applications of solar energy	6

HOD

(Sandip Sharma, Env. Engg. in AMC)

6.	**Wind Energy** basic principles, power in wind, force on blades & turbines, wind energy conversion, site selection, basic components of wind energy conversion systems (WECS), classification of WECS, wind energy collectors, applications of wind energy	6
7.	**Energy from Biomass** introduction, energy plantation, biomass conversion technologies, photosynthesis, biogas generation, factors affecting biogas generation, classification of biogas plants & their comparisons, types of biogas plants (including those used in India), biogas from plant wastes, community plants & site selection, digester design considerations, design calculations, methods of maintaining & starting biogas plants, properties & utilisation of biogas, thermal gasification of biomass, pyrolysis, alternative liquid fuels	6
8.	**Geothermal Energy** geothermal resources, hydrothermal resources, liquid dominated systems, geopressured resources, petrothermal systems, magma resources, energy conservation & comparison with other resources, applications of geothermal energy	6
9.	**Energy from Oceans** OTEC, methods (open cycle & close cycle) energy from tides, components of tidal power plants, operation, methods of utilisation of tidal energy, storage, ocean waves, wave energy conversion devices	6
10.	**Fuel Cell** introduction, hydrogen – oxygen fuel cell, ion exchange membrane cell, fossil fuel cell, molten carbonate cell, advantages & disadvantages, conversion efficiency, polarisation, type of electrodes, applications of fuel cells	6
11.	**Hydrogen & Methanol** properties of Hydrogen, production of hydrogen, thermochemical methods, fossil fuel methods, solar methods, storage & transportation, safety & management	6
12.	**Magneto Hydro-Dynamic (MHD) Power Generation** principle, MHD system, open cycle system, closed cycle system, design problems & developments, advantages, materials for MHD generators, magnetic field & super conductivity	6
13.	**Nuclear Energy** fission, fusion, fuel for nuclear fission reactor (exploration, mining, milling, concentrating, refining, enrichment, fuel fabrication, fuel use, reprocessing, waste disposal), storage & transportation, fast & slow neutrons, multiplication factors & reactor control, uranium enrichment process, nuclear reactor power plant, fast breeder reactor, boiling water reactor, pressurised heavy & light water reactor	6

HOD

C Sandip Sharma,
Lect. Engg. in AMCS

Practical and Term Work:

Experiments based on above topics should be given to the students.

Text Book:

1. Energy Sources 2nd Ed. by G. D. Rai, Khanna Publications, New Delhi

Reference Books:

1. Fuels & combustion by Samir Sarkar, Orient Longmans(1974)
2. Solar Energy by Sukatame, Tata McGraw Hill, New Delhi
3. Energy Technology by Rao & Parulaker

HOD

(Sandip Sharma,
Env. Engg. in AMC)

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CHEMICAL ENGINEERING

Computer Aided Process Synthesis

SUBJECT CODE:

B.E.7th SEMESTER

Type of course: Chemical Engineering

Prerequisite: Basics of heat transfer, mass transfer and reaction engineering

Rationale:
Chemical process design requires the selection of a series of processing steps and their integration to form a complete manufacturing system. This course emphasizes selection of the steps as individual operations and their integration to form an efficient process. Also, the process will normally operate as part of an integrated manufacturing site consisting of a number of processes serviced by a common utility system.

Teaching and Examination Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	-
2	1	0	3	3	30	20	70	30	150

Sr.No.	Content	Total Hrs	% Weight age
1	**The Design Process:** Objectives, Design Opportunities, Steps in Product Process Design, Environmental, Protection, Safety Considerations, Engineering Ethics, Role of Computers	8	11
2	**Reactor Design and Reactor Network Synthesis:** Objectives, Reactor Models, Reactor Design for Complex Configurations, Reactor Network Design Using the Attainable Region	8	11

HOD

(Sindip Shoodhi,
Env. Engg. in AMC)

3	**Synthesis of Separation Trains:** Objectives, Introduction ,Phase Separation of Reactor Effluent, Criteria for Selection of Separation Methods, Selection of Equipment, Sequencing of Ordinary Distillation for the Separation of Nearly Ideal Fluid Mixtures, Heuristics for Determining Favourable Sequences, Marginal Vapour Rate Method,Complex and thermally coupled distillation,Sequencing of Ordinary Distillation for the Separation of Nearly Non-Ideal Fluid Mixtures	**14**	**19**
4	**Synthesis of Heat Exchanger Networks:** Objectives, Basic Heat Exchanger Network Synthesis (HENS), Minimum Utility Targets, Temperature Interval Method, Hohmann / Lochart Composite Curves (HCC), Grand Composite Curves (GCC), Pinch Design Approach to Inventing a Network, Networks for Maximum Energy Recovery, Minimum Number of Exchangers, Stream Splitting, Threshold and Optimum Approach Temperature, Derivation of Network Superstructures for Minimization of Annual Costs, Multiple Utility Design Problems	**24**	**34**
5	**Energy Integrated Distillation Processes:** Heat Integrated Distillation Trains, Impact of Pressure, Multi Effect Distillation, Heat Pumping, Vapour Recompression and Reboiler Flashing, Positioning of Heat Engines and Heat Pumps	**8**	**11**
6	**Design and Scheduling of Batch Processes:** Objectives, Introduction, Design of Batch Process Units, Design of Reactor-Separator Processes, Design of Single Product Processing Sequences, Design of Multi-Product Processing Sequencing	**10**	**14**

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
14	14	21	7	7	7

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Books:

1. Lorens T. Biegler, E. Ignacio grossmann, Arthur W. Westerberg, Systematic Methods of Chemical Process Design, Prentice Hall International.
2. Warren D. Seider, J. D. Seader, Daniel R. Lewin, Product and Process Design Principles: Synthesis, Analysis, and Evaluation, 2nd Edition, Wiley.
3. Robin Smith, Chemical Process: Design and Integration, Wiley.
4. James M. Douglas, Conceptual Design of Chemical Processes, McGraw Hill International, 1988.

Course Outcome:

After learning the course the students should be able to:

HOD

C Sandip Shedding
Env. Engg. in AMC

1. Learn the basic heat exchanger network synthesis (HENS).
2. Develop the pinch design approach to inventing a network.
3. Study the derivation of network structures for minimization of annual costs.
4. Configure the multiple utility design problems.
5. Learn about the Environment Protection, Safety Considerations & Engineering Ethics.

6. Learn about the Energy Integrating in reactor networks
7. Understand the Energy Integrated Distillation Processes.
8. Understand the concept of reactor network synthesis. And enable to do the reactor network design using the attainable region.
9. Understand the production of multiple products
10. Design the Batch scheduling.
11. Understand the Design and Scheduling of Batch Processes.

List of Experiments:
Tutorials/Presentation/Practical based on above topics.

Design based Problems (DP)/Open Ended Problem:
Students are free to select any area of design for the Synthesis of Optimal chemical process based on chemical engineering applications.
1. Synthesis of Optimal Chemical Reactor Networks.
2. Synthesis and Optimization of Distillation Column Sequences for Separation of Multicomponent Products.
3. Synthesis of heat exchanger networks.

Major Equipment:

Computers software (Excel Spread-sheet, GAMS, etc.)

List of Open Source Software/learning website:

- Students can refer to video lectures available on the websites including NPTEL lecture series.
- Students can refer to the CDs available with some reference books for the solution of problems using software/spreadsheets.
- Most of these examples do not require specialist software and can be performed on spreadsheet software. Students can develop their own programs/spreadsheets for the solution of problems. Students can use GAMS software for the solution of LP, NLP, MILP, etc. optimization problems

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty.

HOD

C. Sandip Sharma,
Env. Engg. in AMC

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CHEMICAL ENGINEERING

Chemical Reaction Engineering-II

SUBJECT CODE:

B.E.7th SEMESTER

Type of course: Chemical Engineering

Prerequisite: A course on Chemical Reaction Engineering-I

Rationale: In this subject emphasis is on heterogeneous reaction engineering and non-ideal reactors, catalysis, leading finally to design considerations. The first part of this subject deals with residence time distributions, and how they can be used to characterize and design non-ideal reactors. Kinetics and design of reactors for non-catalytic fluid-fluid and fluid-particle reactions follows. And the last part of the subject deals with catalysis and catalytic reaction kinetics.

Teaching and Examination Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	-
3	0	2	5	4	30	20	70	30	150

Contents:

Sr. No.	Content	Total Hrs.	% Weightage
1.	**Non-Ideal Flow:** Basics of non-ideal flow, Residence time distribution, stimulus response techniques, The E,F and C Curves, their interrelationship, conversion in non-ideal flow reactors, Dispersion model, Chemical Reaction and dispersion, Intensity of fluid mixing. Tanks in series model, Deviation from plug flow, Models for real stirred tanks.	10	18
	Heterogeneous Non-Catalytic Systems:		
2.	**Heterogeneous Reactions: Introduction:** Rate steps involved in heterogeneous systems, Overall rate expression for linear and non linear process, contacting patterns for two-phase systems.	4	9
3.	**Fluid-Fluid systems:** Rate equation, rate equation for straight mass transfer, kinetic regimes of mass transfer and chemical reaction, rate equation for mass transfer and chemical reactions, film conversion parameter, fluid-fluid reactor design.	8	14

HOD

Sandip Shirodkar, Env. Engg. (HAMC)

4.	**Fluid-Particle systems:** Fluid partial reaction kinetics, selection of a model, Shrinking Core Model for unchanging and changing size spherical partials, Diffusion through gas film and through ash layer controlling, Chemical reaction controlling, Shrinking core model, its limitations, Determination of rate controlling step.	**8**	**14**
	Solid Catalyzed systems:		
5.	**Catalysis:** Catalysts, Physical properties of catalyst, surface area, void volume, solid density, pore volume distribution, Classification and preparation of catalyst, catalyst promoters. Catalyst inhibitors, Catalyst poisons, Nature and Mechanism of Catalytic reactions.	**9**	**18**
6.	**Solid-Catalysed reactions: Kinetics:** Adsorption isotherms and rates of adsorption and desorption. Kinetic regimes, rate equations for surface kinetics, Pore diffusion, determining rate controlling step, experimental methods for finding rates, product distribution in multiple reactions.	**9**	**18**
7.	**Introduction to Catalytic Reactors:** Packed bed catalytic reactors, fluidized bed reactors, trickle beds, slurry reactors.	**6**	**9**

Suggested Specification table with Marks (Theory):

Distribution Of Theory Marks					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
15	20	20	10	5	0

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Books:

1. Octave Levenspiel, "Chemical Reaction Engineering", 3rd Edition, John Wiley & Sons (Asia) pvt. Ltd.
2. H. Scott Fogler, "Elements of Chemical Reaction Engineering" 3rd Edition November, Prentice Hall of India Pvt Ltd
3. J.M.Smith, "Chemical Engineering Kinetics", 2nd edition, McGraw-Hill
4. L. D. Schmidt, the Engineering of Chemical Reactions, Oxford Press.
5. J. J. Carberry, "Chemical and Catalytic Reaction Engineering", McGraw Hill, New York, 1976.

HOD

C Sandip Sharma,
Env. Engg. in AMC

Course Outcome:

At the end of this course student will be able to,

- Analyze the RTD studies for any flow reactor, to predict the deviation from ideal reactors by evaluating the dispersion number
- Analyze the various contacting pattern for two phase system and predict the rate equation for heterogeneous reactions.
- Analyze the best kinetic regimes for mass transfer and reaction for a given reaction and predict the rate equation.
- Predict the rate controlling step for the fluid - particle reactions.
- Classify catalysts and predict physical properties of catalyst, surface area, void volume, solid density pore volume distribution.
- Understand the nature and mechanism of catalytic reactions.

List of Experiments:

Experiments based on

- RTD studies in different reactors.
- Various models for non-ideal flow.
- Heterogeneous reaction kinetics etc.

Design based Problems (DP)/Open Ended Problem:

Open ended problems based on following topics can be selected,

- Study of various stimulus response techniques
- Study of resistance steps involved in heterogeneous reactions
- Finding rate expressions for given chemical reaction with mass transfer.
- And similar topics based on syllabus

Major Equipment:

- Tubular reactor for RTD analysis
- CSTR for RTD analysis
- Packed beds for RTD analysis etc

List of Open Source Software/learning website:

- NPTEL lecture series
- Literature available on Chemical Reaction Engineering
- MIT Open course lecture on Chemical Reaction Engineering

ACTIVE LEARNING ASSIGNMENTS:

Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide.

HOD

Sandip Shaorag,
Asst. Engg. in AMC

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CHEMICAL ENGINEERING

Solid Fluid Operation

SUBJECT CODE:

B.E. 8th SEMESTER

Type of course: Chemical Engineering.

Prerequisite: Fundamental Principles of Mechanical Operations, Fluid Flow Operations and Mass Transfer Operations.

Rationale: To provide detail idea about the operations that includes solid-fluid chemical operations. It is also required to elaborate a list of the main process variables. To obtain the operation algorithm, analyze and interpret the variables behavior and problems to choose equipment for the same. Dimension the equipment and adapt methodologies for the resolution of a new situation. The general idea is to give the students an elaborate knowledge of the solid- fluid operations that are directly applicable in industries.

Teaching and Examination Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	-
3	0	0	3	3	30	20	70	30	150

Content:

Sr. No.	Topic	Teaching Hours	Module Weightage (%)
1	**Introduction:** Solid- Fluid operations, characterization and classification.	4	7
2	**Mixing and agitation:** Mixing, Agitation, Different types of agitators and their selection criteria, Calculation of power required for agitation, Scale up of agitated vessel, static mixers, intensive mixers, heating and cooling mixers.	8	14
3	**Fluidization:** Fluid flow in porous solid beds, Conditions for Fluidization, Types of fluidization, Applications of fluidization	9	16
4	**Transportation:** Mechanic, Slurry, hydraulic and pneumatic transport, conveyors.	8	15

HOD

(Sandip Sharma, Asst. Prof. in ANC)

5	**Filtration and sedimentation:** Cake filters, Constant rate filtration, constant pressure filtration, Filter press, Shell and leaf filters, vacuum filters, Centrifugal filters, Filter media, Filter aids, Clarifying filters, Gravity classifiers, Sink and float method, Clarifiers and thickeners, Batch sedimentation, Rate of sedimentation, Thickeners, Cyclones, Hydrocyclones, Centrifuges.	**10**	**18**
6	**Solid- Fluid Mass Transfer:** Leaching, Crystallization, Nucleation, Growth of crystals, Drying.	**8**	**15**
7	**Solid- Fluid Reactors:** Fluidized bed reactor, moving bed reactor, slurry bed reactor, fixed bed reactor.	**7**	**15**

Reference Books:

1. Introduction to Chemical Engineering by W. L. Badger & J.T. Banchero.
2. "Mass transfer operation" by R. E. Treybal, Mc-Graw Hill international
3. G. G. Brown, Unit Operations, CBS Publisers & Distributors, 2005.
4. J. F. Richardson, J. H. Harker, J. R. Backhurst, Coulson and Richardson's Chemical Engineering, vol. 2, 5th ed., Butterworth, 2002.
5. C. J. Geankoplis, Transport Processes and Separation Process Principles, 4th ed., Prentice-Hall, 2003.
6. J. D. Seader, E. J. Henley, Separation Process Principles, 2nd ed., John Wiley & Sons, 2006.
7. Don W. Green, Robert H. Perry: Perry's Chemical Engineers' Handbook, eighth edition.
8. Unit Operations of Chemical Engg. By W.L. McCabe, J. C. Smith & Harriott, 6th Edition Mc-Graw Hill international.

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
20	15	20	5	10	0

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcome:

After learning the course the students should be able:

- To make students aware about all the solid fluid operations in chemical industries.
- To understand the principles behind different solid - fluid operations.
- To make student understand the global scenario and requirement of solid fluid operations and advancement in the same field.
- To understand the variety of application of solid fluid operations in chemical industries.
- To make student realize application and design related problems in solid-fluid operations in chemical industries.

List of Tutorials:

Students can select any solid- fluid mechanical operation and identify problems related to its design and application in current industries. Students can modify the design or can suggest the changes required for better operation in terms of economy and efficiency. Students can also optimize the equipment for better results and data collection. Students need to prepare a report on the same topic and also to prepare power point presentation on the same.

HOD

Sc. A'G.

(Sandip Shinde, Asst. Engg. in AMS

List of Open Source Software/learning website:

- Students can refer to video lectures available on various websites including NPTEL.
- Students can refer to the CDs which are available with some reference books for the solutions of problems using software. Students can develop their own programs for the solutions using excel, Chemical and other simulation software.

ACTIVE LEARNING ASSIGNMENTS:

Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide.

HOD

(Sandip Sharma,
Env. Engg. in AMC)

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CHEMICAL ENGINEERING

Fertilizer Technology

SUBJECT CODE:

B.E. 8th SEMESTER

Type of course: Chemical Engineering

Prerequisite: Basics of Chemical Process Industries and Chemical Technology

Rationale:

Indian economy is dominated by agriculture sector. Synthetic fertilizers are must for producing good crops. Hence it is needed to provide comprehensive and balanced understanding of essential link between chemistry and the synthetic fertilizer industry. It is therefore vital for chemical engineers to understand for each fertilizer product, its flow diagram for Industry production. For this purpose,students should have skills for arranging treatment, reaction and separation steps in a flow diagram for variety of fertilizers including Nitrogenous fertilizers, Phosphatic fertilizer, Potash Fertilizer, Complex fertilizer and Bio fertilizers is essential. Hence this course is designed to achieve this objective.

Teaching and Examination Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	-
3	0	0	3	3	30	20	70	30	150

Sr. No.	Content	Total Hrs	% Weightage
1	**Overview of Fertilizer:** Synthetic fertilizers, Classification of fertilizers, Role of essential Elements in plant Growth, Macro elements and Micro elements, Application of fertilizers considering Nutrient, Balance and types of crop. Development of fertilizer industry; Fertilizer production and consumption in India; Nutrient contents of fertilizers; Secondary nutrients; Feedstock and raw materials for nitrogenous, phosphatic and potassic fertilizers.	8	14

HOD

C Sanjip Sharma, Env. Engg. in AMC)

2	**Nitrogenous Fertilizers:** **Introduction to Ammonia:** Physical &chemical properties, applications, Synthesis gas by Catalytic partial oxidation Steam Hydrocarbon reforming, Ammonia converters: Design aspect of Single bed and multi-bed converter, Kellogg process and HaldorTopsoe process, Storage and Transportation of Ammonia. **Introduction to Nitric acid:** Chemical, physical properties and applications, Manufacturing of Nitric Acid by Pressure ammonia oxidation process and Intermediate pressure ammonia oxidation process, Concentration of Nitric acid by $Mg(NO_3)_2$. **Urea**: Physical, chemical properties, Manufacturing of Urea by Stamicarbon's CO2 stripping process, Toyo-Koatsu total recycle process, Manufacturing of Ammonium nitrate by Prilling process, Ammonium sulphate from Ammonium carbonate and gypsum, Ammonium chloride from Ammonium sulphate and sodium chloride	22	36
3	**Potassium Fertilizers:** Physical, chemical properties and uses of Potassium Chloride, Potassium nitrate, Potassium sulphate, Manufacturing of potassium chloride from sylvinite, Preparation of Potassium nitrate, Potassium sulphate.	12	25
4	**Miscellaneous Fertilizer and Bio Fertilizers:** Manufacturing of NPK, Ammonium Sulphate Phosphate (ASP), Calcium Ammonium Nitrate(CAN), Biofertilizers, Types of Biofertilizers, Nitrogen-fixing biofertilizers, Phosphate-solubilizing biofertilizers, Preparation of a biofertilizers	12	25

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
28	**14**	**28**	**-**	**-**	**-**

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Books:

1. Hand book of Fertilizer Association of India, New Delhi, 1998.
2. Slack A.V., Chemistry & Technology of Fertilizers, Interscience, New York, 1967.
3. M. Gopala Rao & Marshall Sittig,Dryden's Outlines of Chemical Technology, East-West Press, 3rd Edition, New Delhi.
4. Austin G. T, Shreve's Chemical Process Industries, 5th edition, Mc. Graw Hill Publications.
5. Pandey & Shukla, Chemical Technology, Volume I & II, 2nd Edition, Vani Books Company.
6. N S Subba Rao, Bio fertilizers in Agriculture, Oxford & IBH Publishing Company.

HOD

(Sandip Shroff,
Env. Engg. in AMC)

List of tutorials:

- Introduction to fertilizers industries.
- Different types of fertilizers.
- Manufacturing process for different nitrogenous fertilizers.
- Manufacturing process for different potassium fertilizers.
- Introduction to bio fertilizers.

Course Outcome:

After learning the course the students should be able to:

- Use reactions and unit operations steps in manufacturing of various fertilizers
- Characterize fertilizers on the basis of different properties.
- Identify engineering problems in fertilizer manufacturing.
- Handle the fertilizers.
- Select appropriate synthesis fertilizer.

List of Open Source Software/learning website:

- Students can refer to video lectures available on the websites including NPTEL lecture series.
- Students can refer to the CDs available with some reference books for the solution of problems using software/spreadsheets. Students can develop their own programs/spreadsheets for the solution of problems.
- MIT Open course lecture on Equipment design used in fertilizer Technology.

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide.

HOD

C Sandip Sharma,
Env. Engg. in ANC)

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CHEMICAL ENGINEERING

Chemical System Modeling

SUBJECT CODE:

B.E. 8th SEMESTER

Teaching and Examination Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
2	0	0	2	2	30	20	70	30	150

Sr. No.	Course Contents	Total Hrs
1.	**Introduction of Modeling:** Introduction to chemical Engg system models, Model development procedure: system analysis, modeling, simplification of model, solution and validation. Modeling Aspects: Deterministic Versus Stochastic Process, Deterministic Process, Stochastic Process, Physical Modeling, Mathematical Modeling	3
2.	**Classification of Mathematical Modeling:** Independent and Dependent Variables, and Parameters, Classification based on Variation of Independent Variables, Distributed parameter Models, Lumped Parameter Models, Classification based on the State of the Process, Static Model, Dynamic Model, The complete Mathematical Model, Classification Based on the Type of the Process, Rigid or Deterministic Models, Stochastic or Probabilistic Models, Comparison between Rigid and Stochastic Model.	6
3.	**Models in Mass-Transfer Operations:** Steady–state Single–stage Solvent Extraction, Steady-state Two–stage Solvent Extraction, Steady-state N–stage Counter-current Solvent Extraction	3
4.	**Models in Heat –transfer Operations:** Counter current Cooling of Tanks, Temperature Distribution in a Transverse Cooling fin of Triangular Cross-Section, Unsteady-state heat Transfer in a Tubular Gas Pre heater, Heat loss through pipe flanges.	30
5.	**Models in Fluid-flow Operations:** Laminar flow in a Narrow slit, The Continuity Equation, Concentration Profile and Temperature of fixed bed catalytic Reactor.	12

Text book:

HOD

Process Plant Simulation --- B.V.Babu,Oxford University Press(publisher)

Reference Books:

1. Applied Mathematics in Chemical engg---- Mickley, Sherwood & Reed.
2. Mathematical methods in Chemical engg ----Jenson & Jeffereys
3. Systematic Methods of Chemical Process Design, Lorens T. Biegler , E.Ignacio grossmann, Arthur W Westerberg, Prentice Hall International,Inc
4. Process Modeling and Simulation by Lyuben

Sandip Sharma, Env. Engg. in AMC

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CHEMICAL ENGINEERING

Petroleum Refining & Petrochemicals

SUBJECT CODE:

B.E. 8th SEMESTER

Teaching and Examination Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	-
3	0	0	3	3	30	20	70	30	150

Sr. No.	Course Contents	Total Hrs
1.	Types of crude, Evaluation of oil stocks and refinery products	6
2.	**Properties of Petroleum oil products** : Definition and significance of various properties like API gravity, Aniline point, Diesel index, Cloud point, Pour point, Flash point,Fire point, Smoke point, Octane number, Cetane number, Softening point, etc	3
3.	Processing of petroleum: Atmospheric & Vacuum distillation, Treating operations for crude and refinery products, Sweetening process, propane deasphalting, etc.	6
4.	Gasoline blending, Atmospheric residue desulfurization, and Residue Upgradation	6
5.	Thermal & Catalytic cracking processes employed in refineries, Oil fields & refineries in India	6
6.	**Manufacturing process of Chemicals from methane** : Manufacturing process of methanol, Acetic acid, Vinyl Acetate ,Poly Vinyl Acetate	9
7.	**Manufacturing process of chemicals from ethylene**: Manufacturing process of Ethylene, Low density polyethylene, High density polyethylene, Vinylchloide monomer, Polyvinylchloide, Ethylene oxide and Ethylene glycol	9
8.	Manufacturing process of Propylene and Polypropylene, Manufacturing process of styrene, Polystyrene, Styrene butadine rubber	9

Practical and Term work:

Practicals on determining properties of fractions of crude petroleum oil as per IS: 1448

Text books:

1. Modern Petroleum Refining Processes, by B.K. Bhaskara Rao
2. Dryden's Outlines of chemical technology, 3rd ed., M Gopal Rao, Marshall sitting

Reference Books:

1. Petroleum Refining - Technology and Economics, by James H. Gary & Glenn E. Handwerk
2. Shreve's Chemical Process Industries by George Austin
3. Encyclopedia of chemical engineering by Kirk & Othmer
4. Petroleum Refinery Engineering by Nelsion

HOD

C Sandip Sharma, Env. Engg. in AMC

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CHEMICAL ENGINEERING

Process Simulation & Optimization

SUBJECT CODE:

B.E. 8th SEMESTER

Teaching and Examination Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	-
3	0	0	3	3	30	20	70	30	150

Sr. No.	Course Contents	Total Hrs
	CHEMICAL PROCESS SIMULATION	
1.	**concepts of General simulation for process design-** introduction, process simulation modes, sequential modular approach, recycle partitioning and tearing, simultaneous equation oriented approach, global equation approach and simulation examples.	12
2.	**Process Plant Simulation:** description of problem, steady state and dynamic simulation, simulation of continuous distillation, batch distillation, flow systems, reactors, controllers, process plants, start up and shutdown simulations.	15
	CHEMICAL PROCESS OPTIMIZATION	
3.	**Problem Formulation:** The nature and organization of optimization problems, Formulation of Objective functions.	3
4.	**Optimization Theory and Methods:** Basic concepts of optimization, optimization of unconstrained functions; one-dimensional search, unconstrained multi variable optimization, linear programming and applications, non-linear programming with constraints, optimization of stacked and discrete processes, numerical methods for optimization, introduction to advanced optimization techniques.	12
5.	**Application of optimizations:** Heat transfer and energy conservation, separation processes, fluid flow systems, chemical reactor design and operation etc.	12

Text Books:

1. Edgar Thomas, Himmelblau David, "Optimization of Chemical Processes" , 2nd Edition, McGraw Hill (2001)
2. Lorenz T. Biegler, Ignacio E. Grossmann, Arthur W. Westerberg, "Systematic Methods of Chemical Process Design", Prentice Hall of India.

Reference book :

1. Gordon S.G. Beveridge, Robert S. Schechter, "Optimization: Theory and Practice" McGraw Hill

HOD

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CHEMICAL ENGINEERING

PROJECT II

SUBJECT CODE:

B.E. 8th SEMESTER

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	-
0	0	16	16	8	0	20	0	80	100

Under the above subject each student will continue the chemical industry based or practical based project work which was assigned to him/her in 7th semester under the supervision of teaching staff member and will submit in the form of a report as Project-II.

HOD

(Sandip Sharma,
Env. Engg. in AMC)

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ENVIRONMENTAL ENGINEERING

ADVANCED WASTEWATER TREATMENT TECHNOLOGIES

SUBJECT CODE:

B.E. 7th SEMESTER

Type of course: Professional Elective Course

Prerequisite: Knowledge of Physico-chemical and biological treatment of wastewater

Rationale: Satisfying the stringent standards for disposal of treated effluents in various sinks and reusing/ recycling of treated effluents for different uses requires that the wastewater be given more exhaustive and advanced treatment. Hence this subject aims to give knowledge to the students regarding advanced wastewater treatment technologies.

Teaching and Examination Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	-
3	0	2	5	4	30	-	70	50	150

Content:

Sr No	Course Contents	Total Hrs
1	**Overview** Overview of Advanced Waste Water Treatment Introduction, Need of Advanced Waste Water Treatment, Purpose of Advanced Waste Water Treatment.	02
2	**Nutrient Removal – Nitrogen & Phosphorus** Nitrogen Removal: .Nitrification, Denitrification Simultaneous nitrification and denitrification, Phosphorus Removal: Introduction, Phosphorus removal by Chemical Precipitation: Principles of process, Chemicals applied, Chemistry of phosphorus	06

P. B. Patel

	precipitation, Process configuration, Phosphorus removal by Biological Precipitation: Principles of the process, Microorganisms involved in the process, Process configurations.	
3	**Membrane Filtration** Membrane Process Terminology, Membrane Process Classification and operation: Microfiltration, Ultrafiltration, Nano filtration, Reverse Osmosis, Electrodialysis, Membrane Configurations: Plate-andframe module, Spiral-wound module, Tubular module, Hollow-fiber module Membrane Fouling: Modes of membrane fouling, Control of membrane fouling, Application of membrane processes: Microfiltration, Ultrafiltration, Nanofiltration, Reverse Osmosis.	**06**
4	**Membrane Bioreactor** Introduction, Working principle of MBR, comparison with Activated Sludge Process Types of MBR Processes, Membrane modules and materials, operating parameters of MBR, mechanisms of membrane fouling, Factors affecting membrane fouling, Membrane Fouling Prevention Techniques, Applications of MBR.	**05**
5	**Electrochemical Wastewater Treatment Processes Introduction** Electro-coagulation : Working principle of electro coagulation, Electrode materials and reaction chemistry, Factors affecting Electro coagulation, Reactor configurations, Applications Electro-floatation : Working principle of electro floatation, Factors affecting electro floatation, Applications Electro-oxidation : working principle of Electro oxidation processes, Electrode materials and reaction chemistry, Factors affecting Electro oxidation processes, Applications	**06**
6	**Advanced Oxidation Processes** Working principle of advanced oxidation processes, Types of oxidizing agents and its reaction chemistry, ozone based and non ozone based processes, Fenton and photo-Fenton Oxidation, Solar Photo Catalytic Treatment Systems.	**06**
7	**Adsorption** Introduction, Fundamentals of adsorption, Type of adsorbents Development of adsorption isotherms: Freundlich, Langmuir, BET Activated carbon adsorption, Granular carbon adsorption Regeneration/reactivation of adsorbents.	**06**

B.B.Patel

8	**Ion Exchange** Introduction of Ion Exchange, Types of Ion Exchange Resins and its reaction chemistry, reactivation of Ion Exchange resins, Applications : Removal and recovery of heavy metals , Removal of nitrogen , Removal of phosphorus , Organic chemical removal.	**05**

Reference Books:

1. Waste water Engineering: Treatment and Disposal by Metcalf & Eddy
2. Membrane Systems for Wastewater Treatment –Water Environment Federation
3. Membrane Separation Processes by Kaushik Nath
4. Water Treatment Principles and Design by R. Rhodes Trussell Ph.D., P.E., BCEE, NAE, John C. Crittenden Ph.D., P.E., BCEE, NAE, David W. Hand Ph.D., BCEEM, Kerry J. Howe Ph.D., P.E., BCEE
5. Fundamentals of Water Treatment Unit Processes by David Hendricks.
6. Principles of Water Treatmentby Kerry J. Howe, Ph.D., P.E., BCEE David W. Hand, Ph.D., BCEEM, John C. Crittenden, Ph.D., P.E., BCEE, NAE, R. Rhodes Trussell, Ph.D., P.E., BCEE, NAE, George Tchobanoglous, Ph.D., P.E., NAE

Course Outcomes:

After learning the course the students should be able to do:

1. Discuss methods of advanced treatment technologies for pollutant removal particularly nitrogen & phosphorous from wastewater.
2. Compare the most appropriates types of membrane processes for advanced treatment of wastewater.
3. Recommend advanced oxidation processes and electrochemical processes to treat concentrated wastewater.
4. Explain the concept of advance treatment processes like adsorption, ion exchange for removal of pollutants.

B.B. Patel

List of Practicals:

1. Performance evaluation of Membrane Filter.
2. Nitrate removal using Ion-Exchange.
3. Fluoride removal using Adsorption Process.
4. Colour removal using Electro coagulation.
5. COD removal using Electro coagulation.
6. COD and color removal from industrial wastewater using AOPs.

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to Swarnim Startup & Innovation University.

B.B.Patel

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ENVIRONMENTAL ENGINEERING

DESIGN OF AIR POLLUTION CONTROL EQUIPMENTS

SUBJECT CODE:

B.E. 7th SEMESTER

Type of course: Professional core Course

Prerequisite: Knowledge of subjects Fundamentals of Air Pollution and Air Pollution Control & Management

Rationale: This course provides fundamentals for selection and design of the most appropriate air pollution control systems. It also provides the basics regarding the auxiliary equipments necessary for efficient working of air pollution control system of any industry.

Teaching and Examination Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	-
3	2	0	5	5	30	-	70	50	150

Content:

Sr No	Course Contents	Total Hr
1	**Design Fundamentals and Elements of Air Pollution Control System:** • Introduction: Sources of Pollutant Generation and Elements of Air Pollution Control System • Design Fundamentals: Bernoulli's Equation, Pressure, Types of Pressure, and Pressure Drops/Losses, Pressure Profile for a System, Temperature, Temperature and Pressure Corrections. • Hoods: Principle, Application, Types of Hoods • Ducts: Principle, Application, Types of Ducting System, Components of Ducting System	05

R.B. Patel

	• Stack: Principle, Application, Types of Stacks • Fans and Blowers: Principle, Application, Types of Fans and Blowers • Others: Flow Control Strategies and Handling Equipments.	
2	**Selection of air control equipments:** Introduction, process parameters, Operating conditions, Gas Characteristics, Dust Characteristics, Performance Required, Process Of Selection And Plant /Site Layout, Auxiliary Equipments.	03
3	**Cyclone separators:** Introduction, Principle And Theory, Terminology, Performance Equations, Design Numerical, Design Of Cyclone Separator, Operation And Maintenance and improving Performance.	04
4	**Fabric Filters:** Introduction, Principle And Theory, Terminology And Performance Equations, Design Numerical, Design Of Fabric Filter, Operation and Maintenance and Improving Performance.	05
5	**Electrostatic Precipitator:** Introduction, principle and theory, Terminology and performance equations, Design Numerical, Operation and maintenance and improving performance.	06
6	**Wet scrubbers:** Spray towers: Introduction, principle and theory, terminology, Cyclone spray chamber: Introduction, principle and theory, terminology. **Venturi Scrubber:** Introduction, principle and theory, Terminology and performance equations, Design Numerical, Design of venturi scrubbers, Operation and maintenance and improving performance.	03

Reference Books:

1. Air Pollution Control in Industries Vol. 1 & 2 by T K Ray Publishers: Tech Books International.
2. Air Pollution Control equipment calculations by Louis Theodore.
3. Air Pollution by M N Rao & H V N Rao
4. Air Pollution Control in industries by C S Rao

B.B.Patel

5. Air Pollution Control Engineering by Lawrence K. Wang, Norman C. Pereira, Yung-Tse Hung
6. Handbook-of-Air-Pollution-Control by Margeret-Pence

Course Outcomes:

1. Discuss requirements of Auxiliary and Air Pollution Control Equipments.
2. Select the most suitable and cost-effective air pollution control equipment to remove air pollutants.
3. Carry out a preliminary design of air pollution control equipments to reduce Particulate matter.
4. Discuss concept and design theory of Absorption and Adsorption tower.

List of Tutorials:

1. Detailed design and drawing of Cyclone Separator
2. Detailed design and drawing of Venturi Scrubber
3. Detailed design and drawing of Bag Filter
4. Detailed design and drawing of Electrostatic Precipitator
5. Detailed design and drawing of Hood
6. Detailed design and drawing of Duct
7. Detailed design and drawing of ID/FD Fan

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to Swarnim Startup & Innovation University.

B.B.Patel

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ENVIRONMENTAL ENGINEERING

ENVIRONMENTAL RISK ASSESSMENT AND MANAGEMENT

SUBJECT CODE:

B.E. 7TH SEMESTER

Type of course: Professional Course

Prerequisite: Knowledge of health impact and hazards

Rationale: Planning, executing and managing major risk with the understanding of organized risk assessment and management, multidisciplinary approach to evaluating scientific data, the techniques involved in analyzing risks.

Teaching and Examination Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	-
3	2	0	5	5	30	-	70	50	150

Course:

Sr No	Contents	Total Hrs
1	**Introduction:** Sources of Environmental hazards, Environmental and ecological risks, Environmental risk assessment framework, Regulatory perspectives and requirements, Risk Analysis and Management and historical perspective; Social benefit V/s technological Risks; Path to risk analysis; Perception of risk, risk assessment in different disciplines.	5
2	**Elements of Environmental Risk Assessment :** Hazard identification and accounting, Fate and behaviour of toxics and persistent substances in the environment, Properties, processes and parameters that control fate and transport of contaminants, Receptor exposure to Environmental Contaminants, Dose Response Evaluation, Exposure Assessment, Exposure Factors, Slope Factors,	8

	Dose Response calculations and Dose Conversion Factors, Risk Characterization and consequence determination, Vulnerability assessment, Uncertainty analysis.	
3	**Different Analysis for Risk Assessment:** Cause failure analysis, Event tree and fault tree modeling and analysis, Multimedia and multipathway exposure modeling of contaminant migration for estimation of contaminant concentrations in air, water, soils, and vegetation and animal products, Estimation of carcinogenic and non-carcinogenic risks to human health.	6
4	**Methods for Risk Assessment:** HAZOP and FEMA methods, Methods in Ecological risk assessment, Probabilistic risk assessments, radiation risk assessment, Data sources andevaluation.	6
5	**Risk Management:** Risk communication and Risk Perception, comparative risks, Risk based decision making. Risk based environmental standard setting, Risk Cost Benefit optimization and tradeoffs, Emergency Preparedness Plans, Emergency planning for chemical agent release, Design of risk management programs, risk based remediation; Risk communication, adaptive management, precaution and stake holder involvement.	10
6	**Application:** Case studies on risk assessment and management for hazardous chemical storage, Chemical industries, Tanneries, Textile industries, Mineral processing and Petrochemical plants, Hazardous waste disposal facilities, nuclear power plants, contaminated site remediation, Case histories on Bhopal, Chernobyl, Seveso, Three Mile Island.	10

Reference books:

1. Cutter, S.L., Environmental Risk and Hazards, Prentice-Hall of India Pvt. Ltd., NewDelhi, 1999.
2. Kolluru Rao, Bartell Steven, Pitblado R and Stricoff, Risk Assessment and ManagementHandbook, McGraw Hill Inc., New York, 1996.
3. Kofi Asante Duah, Risk Assessment in Environmental management, John Wiley andsons, Singapore, 1998.
4. Kasperson, J.X. and Kasperson, R.E. and Kasperson,R.E., Global Environmental Risks,V.N.University Press, New York; 2003.
5. Risks and Decisions for Conservation and environmental management, Mark Burman,Cambridge University Press.,

B.B.Patel

6. Susan L Cutter, Environmental Risks and Hazards, Prentice Hall of India, New Delhi,1999.
7. Joseph F Louvar and B Diane Louver, Health and Environmental Risk Analysis fundamentals with applications, Prentice Hall, New Jersey, 1997.
8. Hand book of Environmental Impact Assessment vol –1: By Judith petts,
9. The Risk Assessment of Environmental and Human Health Hazards (Text book of case studies): By Paustenbach, D.ceds
10. Hand book of Env Risk Assessment and Management Edited: By Peter Callow

Course Outcomes:

1. Describe the importance of Risk management.
2. Discuss the need of risk communication, economics of risk & risk evaluation.
3. Illustrate methods of the risk identification, evaluation & mitigation.
4. Examine the extent of damage performing Consequence analysis.
5. Describe the importance of Risk assessment.
6. Illustrate methods of the risk assessment.
7. Case studies on risk assessment and management.

List of Tutorials:

1. Hazard Identification of given Industry.
2. Prediction of potential chemical release using ALOHA model.
3. Case study on Risk Assessment of thermal power plant with remedial measures.
4. Case study on Risk Assessment of Chemical Industry with remedial measures.
5. Case study on Risk Assessment of landfill site with remedial measures.
6. Case study on Risk Assessment of CETP/BMW with remedial measures.

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to Swarnim Startup & Innovation University.

B.B. Patel

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ENVIRONMENTAL ENGINEERING

RESOURCE AND ENERGY RECOVERY FROM WASTE

SUBJECT CODE:

B.E. 7TH SEMESTER

Type of course: Institute Elective

Prerequisite: Knowledge of Energy Resources

Rationale: To understand the principles of recovery of materials and energy from wastes through biochemical, mechanical and thermo-chemical conversions.

Teaching and Examination Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
Th	Tu	P	Total		Internal		External		Total
					Th	Pr	Th	Pr	-
3	2	0	5	5	30	-	70	50	150

Course:

Sr. No.	Content	Total Hrs
1	**Mechanical Processing For Material Recycling:** Resource recovery for a sustainable development- Material and energy flow management and analysis - Systems and processes for reduction, reuse and recycling -Objectives of Waste Processing-Source Segregation and Hand SortingWaste Storage and Conveyance – Shredding – Pulping - Size Separation by Screens- Density Separation by Air Classification –magnetic and electromechanical separation processes- Design Criteria and Equipment selection	04

B.B. Patel

2	**Biological Processing For Resource Recovery:** Mechanisms of Biological Processing – Aerobic Processing of Organic fraction - Composting methods and processes- factors affecting- Design of Windrow Composting Systems- In Vessel Composting- Compost Quality Control- Vermiculture: definition, scope and importance - common species for culture - Environmental requirements - culture methods- Applications of vermiculture- Potentials and constraints for composting in India-Largescale and decentralized plants.	06
3	**Bio-Chemical Conversion Of Waste To Energy:** Principles and Design of Anaerobic Digesters – Process characterization and control- The biochemistry and microbiology of anaerobic treatment - Toxic substances in anaerobic treatment - Methane generation by Anaerobic Digestion- Anaerobic reactor technologies - Commercial anaerobic Technologies- Single stage and multistage digesters- Digester design and performance-Gas collection systems-Methane Generation and Recovery in Landfills – Biofuels from Biomass.	04
4	**Thermo-Chemical Conversion Of Waste To Energy:** Principles and Design of Energy Recovery Facilities -Types and principles of energy conversion processes - Incinerator design - Mass Burn and RDF Systems- Composition and calorific value of fuels and waste, Determination of the stoichiometric air consumption. Calculation of the flue gas composition - grate firing designs, boiler design, removal of bottom ash, heat recovery- Emission Controls – flue gas cleaning, de-dusting, flue gas scrubbers, DeNOx processes, dioxins and furans - Alternative thermal processes: co-incineration, pyrolysis, gasification, plasma arc - Process characterization and control- waste heat recovery- Bottom ash: Quantity, quality, treatment, utilization, disposal- Facility design- decentralized mobile plants- Planning and construction of incineration plants.	08
5	**Case Studies On Waste Recycling:** Recycling technologies for paper, glass, metal, plastic – Used Lead Acid Battery Recycling – End of Life Vehicle Recycling – Electronic Waste Recycling – Waste Oil Recycling – Solvent Recovery - Drivers and barriers for material recycling: social, legal and economic factors - Environmental impacts of waste recycling - Design for the environment: the life cycle approach.	06

B.B. Patel

Reference Books:

1. Aarne Veslind and Alan E Rimer (1981), "Unit operations in Resource Recovery Engineering ", Prentice Hall Inc., London
2. Manser A G R, Keeling A A (1996). Practical handbook of processing and recycling on municipal waste. Pub CRC Lewis London, ISBN 1-56670-164
3. Chiumenti, Chiumenti, Diaz, Savage, Eggerth, and Goldstein , Modern Composting Technologies
4. JG Press October 2005
5. Charles R Rhyner (1995),Waste Management and Resource Recovery, Lewis Publishers
6. Gary C. Young (2010)Municipal Solid Waste to Energy Conversion Processes: Economic, Technical, and Renewable Comparisons , John Wiley & Sons

Course Outcomes:

1. Understand the fundamental principles of existing and emerging technologies for the treatment of waste to recover of materials and generation of energy from waste.
2. Understand the process of generation of energy from waste through biochemical conversion.
3. Understand the process of thermo-chemical conversion of waste to energy.
4. Analyze and describe the potential of solid waste as a secondary raw material, and the associated problems and possibilities in a sustainable society.

List of Tutorials:

1. Determination of Composition of Municipal solid waste.
2. Determination of biogas generation from the different types of organic waste.
3. Determination of Bio-methane Potential of different agricultural waste.
4. Determination of ultimate and proximate analysis of given waste.
5. Determination of NPK of given compost.

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to Swarnim Startup & Innovation University.

B.B. Patel

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ENVIRONMENTAL ENGINEERING

RESOURCE AND ENERGY RECOVERY FROM WASTE

SUBJECT CODE:

B.E. 7TH SEMESTER

Type of course: Institute Elective

Prerequisite: Knowledge of Energy Resources

Rationale: To understand the principles of recovery of materials and energy from wastes through biochemical, mechanical and thermo-chemical conversions.

Teaching and Examination Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	-
3	2	0	5	5	30	-	70	50	150

Course:

Sr. No.	Content	Total Hrs
1	**Mechanical Processing For Material Recycling:** Resource recovery for a sustainable development- Material and energy flow management and analysis - Systems and processes for reduction, reuse and recycling -Objectives of Waste Processing-Source Segregation and Hand SortingWaste Storage and Conveyance – Shredding – Pulping - Size Separation by Screens- Density Separation by Air Classification –magnetic and electromechanical separation processes- Design Criteria and Equipment selection	04

B.B. Patel

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ENVIRONMENTAL ENGINEERING

CLEANER PRODUCTION AND WASTE UTILIZATION

SUBJECT CODE:

B.E. 7TH SEMESTER

Type of course: Institute Elective

Prerequisite: - Knowledge of Manufacturing processes and waste generation

Rationale: Environmental pollution caused by industry can be reduced either by treatment or by prevention at the source. Cleaner production is the technique of reduction of elimination of source of pollution from industry. This knowledge or concept is the need of the hour for all the countries of the world.

Teaching and Examination Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	-
3	2	0	5	5	30	-	70	50	150

Content:

Sr No	Course Contents	Total Hrs
CLEANER PRODUCTION:		
1	**Cleaner production concept:** Theory of cleaner production, Effect of CP on Industrial economy	02
2	**Cleaner Methodology:** Six steps methodology for CP, Designation of cleaner production team, Analyze process steps, generating cleaner production opportunities, selecting cleaner production solutions, Implementation, maintaining cleaner production, Financial Analysis Cleaner Production	05
3	**Applications of cleaner production in industries and case studies**	04
4	**Energy Audit Methodology:** Introduction , preliminary or walk-through energy Audit, Detailed energy audit,	04

WASTE UTILIZATION:		
1	Recycling & Reuse: Concept and application	03
2	Recycling and reuse of liquid industrial waste in different industries.	03
3	Recycling and reuse of solid industrial waste.	03
4	Waste Heat recovery from flue gases, Waste heat Recovery boilers	02
5	Types of heat exchangers, LMTD	02

Reference Books:

1. GCPC manual
2. Industrial Water Pollution Origins, Characteristics and Treatment by Nelson Nemaro

Course Outcomes:

1. Discuss the pathways of Cleaner Production with financial analysis.
2. Apply methodology of Energy Audits with case studies.
3. Suggest the recycling and reuse of liquid and solid industrial waste.
4. Identify the pathways for Waste Heat Recovery.

List of Tutorials:

1. Performance evaluation of different Heat Recovery Alternatives of given practical problems.
2. Case Study of Cleaner Production application in Pulp and Paper Industry.
3. Case Study of Cleaner Production application in Electroplating.
4. Case Study of Cleaner Production application in Dairy Manufacturing.

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to Swarnim Startup & Innovation University.

B.B.Patel

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ENVIRONMENTAL ENGINEERING

ENVIRONMENTAL IMPACT ASSESSMENT

SUBJECT CODE:

B.E. 8TH SEMESTER

Type of course: Professional Elective Course

Prerequisite: Knowledge of EIA procedure

Rationale: Define and Classify Environmental Impacts and the terminology to understand the environmental Impact assessment procedure

Teaching and Examination Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	-
3	2	0	5	5	30	-	70	50	150

Course:

Sr. No.	Contents	Total Hrs
1	**Concepts of Environmental Impact Assessment :** Environment; Environmental Impacts; Environmental Impact Analysis; Environmental Impact Assessment And Environmental Impact Statement; EIA- As An Integral Part of The Planning Process	6
2	**Detailed Contents of EIA:** Introduction; Project Description; Description of The Environment; Anticipated Environmental Impacts And Mitigation Measures: Analysis of Alternatives; Environmental Monitoring Programme; Additional studies; Project Benefits; Environmental Cost Benefit Analysis	10

B.B. Patel

3	**Environment attributes and Baseline Environment:** Air; water; noise; land and soil. Description of the Baseline Environment : Purposes for defining the Environmental Setting; Selection of parameters, Monitoring of physical environmental parameters, Collection and interpretation of baseline data for various environmental attributes	8
4	**Prediction and Methods of Assessment:** Prediction and Methods of Assessment of Impacts on Various aspects of Environment; Application of various models for the Prediction of impact on Air Environment, Water Environment, Noise Environment and Land.	8
5	**EIA notification September 2006 and amendments:** Categorization of projects, Procedure for getting environmental clearance, Public participation in environmental decision making process, Case studies on EIA for Industries and Infrastructure projects.	10

Reference Books:

1. Environmental Impact Analysis Handbook – by Rau Whooten; McGraw Hill publications.
2. Environmental Impact Assessment – by Larry Canter; McGraw Hill publications.
3. Environmental Impact Analysis – A Decision Making Tool by R K Jain.
4. Handbook of Environment Impact Assessment by Judith Petts; McGraw Hill publications.

Course Outcomes:

1. Explain the importance of EIA as an integral part of planning process.
2. Examine different environmental attributes and selecting the environmental parameters affecting project.
3. Apply various methods to predict the Environmental impacts of project after deciding various environmental attributes.
4. Create the EIA report for getting Environmental clearance.

B.B. Patel

List of Tutorials:

1. Questions based on Sustainable Development.
2. Questions based on Detailed Contents of EIA.
3. Questions based on Detailed Contents of EIA with specific project.
4. Questions based on Environmental Attributes.
5. Questions based on Description of Environmental Setting.
6. Questions based on Prediction and Methods of Assessment of impacts.
7. Questions based on EIA Notification.
8. Case studies related to Water; Air; Noise; Land; Socio Economic Impact.
9. Case studies on Environmental Audit.
10. Environmental Clearance.

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to Swarnim Startup & Innovation University.

B.B.Patel

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ENVIRONMENTAL ENGINEERING

ANAEROBIC BIOLOGICAL TREATMENT TECHNOLOGIES

SUBJECT CODE:

B.E. 8TH SEMESTER

Type of course: Professional Elective Course

Prerequisite: Knowledge of Biological Treatment Processes

Rationale: Different anaerobic biological treatments are required for treatment of organic waste.

Teaching and Examination Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	-
3	0	2	5	4	30	-	70	50	150

Course:

Sr No	Contents	Total Hr
1	**Anaerobic Treatment :** Fundamental concept, Application, Applications, Advantages & disadvantages of Anaerobic Treatment, Principles of Anaerobic Treatment, Methanogenic series Metabolism, COD equivalence of Methane, Factors affecting Anaerobic Treatment, Evaluating the applicability of Anaerobic Treatment.	02
2	**Microbiology and Biochemistry of Anaerobic Treatment processes:** Sources of Methane in Anaerobic Treatment, Role of Acid fermentation and Methane fermentation, Effects of sulphate reducing bacteria.	03
3	**Anaerobic Reactors:** Anaerobic Suspended growth processes, Anaerobic Attached growth processes, Anaerobic Sludge Blanket processes	08
4	Process operation parameter, Mixing and facilities, Heating facilities	06

5	**Design of Anaerobic reactors :** Stabilization pond, Oxidation pond, anaerobic lagoons, standard rate and high rate sludge digesters, Upflow Anaerobic Sludge Blanket, Upflow Anaerobic Filters.	16

Reference Books:

1. Anaerobic Biotechnology for Industrial Wastewater by Dr. R.E. Speece ARCHAE PRESS.
2. Wastewater Engineering Treatment and Reuse by Metcalf & Eddy.
3. Design of Anaerobic Process for the Treatment of Industrial and Municipal Wastes by J. F. Malina.
4. Biological Process Design for Wastewater Treatment by Larry D Benefield, Clifford W Randall.

Course Outcomes:

1. Understand the pathways of anaerobic treatment.
2. Classify and compare the various types of Anaerobic Reactors.
3. Describe the different operating parameters for anaerobic treatment.
4. Design the different types of anaerobic bioreactors depending upon the suitability of each for different types of waste.

List of Practicals:

1. To measure the methane content of anaerobic reactor.
2. To measure the COD reduction in Biphasic reactor.
3. To measure the VFA to alkalinity ratio.
4. To measure the BMP of given waste.

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to Swarnim Startup & Innovation University.

B.B. Patel

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ENVIRONMENTAL ENGINEERING

INDUSTRIAL WASTEWATER POLLUTION AND CONTROL

SUBJECT CODE:

B.E. 8TH SEMESTER

Type of course: Professional Elective Course

Prerequisite: Knowledge of wastewater treatment technologies

Rationale: Satisfying the standards for disposal of treated effluents in various sinks requires that the industrial wastewater to be given more exhaustive treatment. Hence this subject aims to give knowledge to the students regarding industrial wastewater treatment and disposal standards.

Teaching and Examination Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	-
3	0	2	5	4	30	-	70	50	150

Course:

Sr No	Course Contents	Total Hrs
1	**Water Quality Standards for industrial use:** Relevant Indian Standards for use of water in Textiles, Paper industry, chemical, Pharmaceutical, soft drink, boiler feed water, cooling tower, problems of silica, scaling & corrosion, caustic embitterment, benefits of pollution control.	04
2	**Standards for disposal into different Sinks:** Difference between criteria & standards, Stream standards, effluent standards, relevant Indian standards for disposal in to different sinks	04
3	**Concepts of disposal of wastewater into different sinks:** Disposal into river, lake, oceans.	08
4	**Oil Pollution and its removal technologies:** Introduction, nature and effects of oil and grease, sources of oily waste, Removal techniques of oily waste: oil skimmers, oil and grease traps, oil separators, floatation	06

5	**Volume & Strength reduction in industrial wastewater:** Measures for volume reduction & Strength Reduction	04
6	**Pre and Primary treatment for industrial wastewater:** Equalization & proportioning, Neutralization, Heavy metals removal.	04
7	**Common Effluent Treatment plants:** Need, concept and treatment technologies	04
8	**Treatment for strong industrial waste:** Incineration, Evaporation: Natural & forced evaporation.	02
9	**Pollution Control in Industries:** Manufacturing process, Identification & characterization of sources of wastewater, treatment of wastewater including recycling & reuse concepts in, pharmaceutical industry, Diary industry, sugar industry, starch industry, fertilize industry, tannery, pulp & paper industry, dye & dye intermediate.	06

Reference Books:

1. Industrial Water pollution by Nelson L. Nemerow.
2. Industrial water pollution by W. Wesley Eckenfelder –Mcgraw-Hill International edition.
3. Wastewater Engineering, Treatment & Reuse by Metcalf & edition Tata – Mcraw –Hill edition.
4. Handbook of Industrial Pollution & Control Vol. I & II by S.C. Bhatiya CBS , Published & distributions.
5. Wastewater Treatment by M.N. Rao & A.K. Datta.
6. Relevant Indian Standards.

Course Outcomes:

1. Relate the benefits of water pollution control to the industries.
2. Discuss the disposal standards for various environmental sinks and fate & transport of pollutant discharged into it.
3. Recommend the various waste reduction techniques as well treatment of specific industrial pollutant.
4. Explain the concept of Common effluent treatment plant and treatment of string industrial waste.
5. Propose the water pollution control strategies in major water polluting industries.

B.B. Patel

List of Practicals:

1. Characterization of wastewater from different industries.
2. Color removal using different adsorption materials.
3. Treatment of high COD waste using advanced oxidation processes.
4. Treatability study of given wastewater samples.
5. Presentation on manufacturing process, waste generation sources, characteristics of wastewater, treatment of wastewater for given industries.

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to Swarnim Startup & Innovation University.

B. B. Patel

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ENVIRONMENTAL ENGINEERING

PREVENTIVE ENVIRONMENTAL MANAGEMENT

SUBJECT CODE:

B.E. 8TH SEMESTER

Type of course: Institute Elective

Prerequisite: Knowledge of subject Environmental laws and policies

Rationale: Knowledge of preventive practices is essential to avoid the treatment and curative strategies.

Teaching and Examination Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	-
3	2	0	5	5	30	-	70	50	150

Course:

Sr No	Contents	Total Hrs
1	**Introduction:** The environment in the context of 21st century, Present status of India's Environment.	2
2	**Indian Environmental Policy :** Frame work and Implementation, Current environmental laws in India.	3
3	**Preventive Environmental Management Tools:** Environmental Audit, Environmental Impact Assessment, Life Cycle Analysis, Inventorization and Environmental Management system.	4
4	**Preventive Environmental Management Initiatives:** Cleaner Production, Green chemistry and cleaner technologies, Green choices in process Industries, Redesigning of unit operations and unit processes, Recycle and Reuse of waste water, Eco-industrial network, CDM as preventive Environmental management initiative	22
5	Relationship between industry and environment	2

B.B.Patel

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING

DEPARTMENT OF MECHANICAL ENGINEERING
COMPUTER AIDED DESIGN & MANUFACTURING
CODE: 23090701
B.E. 7TH Semester

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	-	2	5	4	30	-	70	50	150

Objective: -

- To provide an overview of how computers are being used in mechanical component design
- To understand the application of computers in various aspects of Manufacturing viz., Design, Proper planning, Manufacturing cost, Layout & Material Handling system.

Course outline: -

Sr. No.	Course Contents	No. of Hours
1	**INTRODUCTION:** A typical product cycle, CAD tools for the design process of product cycle, CAD / CAM system evaluation criteria, Input / Output devices; Graphics Displays: Refresh display, DVST, Raster display, pixel value and lookup table, estimation of graphical memory, LCD, LED fundamentals. Concept of Coordinate Systems: Working Coordinate System, Model Coordinate System, Screen Coordinate System. Line and Curve generation algorithm: DDA, Bresenham's algorithms. Graphics exchange standards and Database management systems.	06
2	**FINITE ELEMENT ANALYSIS:** Review of stress-strain relation and generalized Hooke's Law, Plane stress and Plane strain conditions; Concept of Total Potential Energy; Basic procedure for solving a problem using Finite Element Analysis. 1-D Analysis: Concept of Shape function and natural coordinates, strain - displacement matrix, derivation of stiffness matrix for structural problems, properties of stiffness matrix. 1-D structural problems with elimination and penalty approaches, 1-D thermal and fluid problems. Trusses and Beams: Formulation of stiffness matrix, simple truss problems to find displacement, reaction and stresses in truss members. Structural analysis using Euler-Bernoulli beam element. Higher Order Element: CST element stiffness matrix formulation, shape functions and applications of Quad and axis symmetric elements.	15
3	**COMPUTER AIDED MANUFACTURING:** CAM Concepts, Objectives & scope, Nature & Type of manufacturing system, Evolution, Benefits of CAM, Role of management in CAM, Concepts of	06

V.B. Mahajan D.H. Pandya

	Computer Integrated Manufacturing, Impact of CIM on personnel, Role of manufacturing engineers, CIM Wheel to understand basic functions.	
4	**NC/CNC MACHINE TOOLS:** NC and CNC Technology: Types, Classification, Specification and components, Construction Details, Controllers, Sensors and Actuators, CNC hardware: Re circulating ball screw, anti friction slides, step/servo motors. Axis designation, NC/CNC tooling. Fundamentals of Part programming, Types of format, Part Programming for drilling, lathe and milling machine operations, subroutines, do loops, canned Cycles, parametric sub routines.	06
5	**GROUP TECHNOLOGY AND CAPP:** Introduction, part families, part classification and coding systems: OPITZ, PFA, FFA, Cell design, rank order clustering, composite part concepts, Benefits of group technology. Approaches to Process Planning, Different CAPP system, application and benefits.	06
6	**FLEXIBLE MANUFACTURING SYSTEM:** Introduction & Component of FMS, Needs of FMS, general FMS consideration, Objectives, Types of flexibility and FMS, FMS lay out and advantages. Automated material handling system: Types and Application, Automated Storage and Retrieval System, Automated Guided Vehicles, Cellular manufacturing, Tool Management, Tool supply system, Tool Monitoring System, Flexible Fixturing, Flexible Assembly Systems.	08

Learning Outcomes: -After learning the course the students should be able to

1. Understand and appreciate use of computer in product development.
2. Apply algorithms of graphical entity generation.
3. Understand and use finite element methods for analysis of simple components.
4. Students will describe basic concepts of CAM application and understand CAM wheel
5. Students will classify different components using different techniques of group technology
6. Students will select layouts of FMS for industrial applications

Books Recommended:

1. Ibrahim Zied, CAD / CAM: Theory and Practice, McGraw-Hill
2. Hearn E J and Baker M P, Computer Graphics, Pearson.
3. Chandrupatla T A and Belegundu A D, Introduction to Finite Elements in Engineering, PHI.
4. Logan D, A First Course in the Finite Element Method, Cengage.
5. Computer Aided Manufacturing by Tien Chien Chang, Pearson Education
6. Automation, Production Systems and Computer Integrated Manufacturing by Mikell P Groover, Pearson Education
7. Robotics Technology and Flexible Automation, by S R Deb, S Deb, McGraw Hill Education Private Limited.
8. Flexible Manufacturing Cells and System -William. W. Luggen Hall, England Cliffs, Newjersy

Divyang Pandya Vikrant Mahajan

List of laboratory experiments:

1. Prepare a program for plotting lines and curves using algorithms learned.

2. Introductory exercise for 3-D modeling.
3. Exercise for FEA of 1-D structural problems.
4. Exercise for FEA of trusses.
5. Study of Computer Integrated System: Basics, Types of Manufacturing, role of management and CIM wheel
6. NC/CNC technology: Definition, Classification, Specification, Construction details, Sensors and Actuators, and different controllers.
7. Problems on GT and Industrial case problems on coding

List of Open Source Software/learning website: http://nptel.ac.in/

Active learning assignments:
Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide

Major Equipment:
1. Computers / Workstations
2. CAD Software
3. FEA Software
4. CNC Machine

D.H. Pandya

Vikas ant Mahajan

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

Power Plant Engineering

CODE: 23090702

BE_ME_7

Teaching & Evaluation Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	-	2	5	4	30	00	70	50	150

Objectives:

Prerequisites:

Course outline:

Sr. No.	Course Contents	Number of Hours
1	**Thermal Power Plant:** General layout of modern thermal power plant, Site selection, Presents status of power generation in India	2
2	**High Pressure Boilers:** (Unique features and advantages of high pressure boilers, La-Mont; Benson; Velox, Loeffler and Schmidt-Hartmann boilers)*, supercritical boilers, Supercharged and fluidized bed combustion, Methods of superheat control, Corrosion in boilers and its prevention	3
3	**Coal and Ash Handling Systems:** Coal storage, Burning systems, Types of stokers and their working, Pulverized fuel handling systems, Unit and central systems, Pulverized mills- ball mill, Bowl mill, Ball & race mill, Impact or hammer mill, Pulverized coal burners, Oil burners, Necessity of ash disposal, mechanical; hydraulic; pneumatic and steam jet ash handling system, Dust collection and its disposal, Mechanical dust collector, Electrostatic precipitator	5
4	**Draught System:** Natural draught – estimation of height of chimney, Maximum discharge	3

	condition, Forced; induced and balanced draught, Power requirement by fans	
5	**Steam Nozzles:** Types of nozzles, velocity of steam, discharge through nozzle, critical pressure ratio and condition for maximum discharge, physical significance of critical pressure ratio, nozzle efficiency	4
6	**Steam turbine:** (Principle of operation, types of steam turbines, compounding of steam turbines, impulse turbine – velocity diagram)*, calculation of work, power and efficiency, condition for maximum efficiency, Reaction turbines – velocity diagram, degree of reaction, reheat factor, (governing of steam turbine – throttle, nozzle and bypass governing)*, Methods of attachment of blades to turbine rotor, Labyrinth packing, Losses in steam turbine	5
7	**Condensers and Cooling Towers:** Types of condensers, sources of air in condenser, Effects of air leakage, Methods of obtaining maximum vacuum in condenser, vacuum & condenser efficiency, Mass of cooling water required, Edward air pump, Necessity of cooling ponds and cooling towers, Condenser water cooling systems, Types of cooling towers and cooling ponds	5
8	**Feed Water Treatment:** Necessity of feed water treatment, Different impurities found in feed water, Effect of impurities, pH & its role in corrosion and scale formation, Internal & external water treatment systems – Hot lime soda process, Zeolite ion exchange process, Demineralization plants, Reverse osmosis process, Sea water treatment using reverse osmosis, De-aeration	4
9	**Gas turbine:** Classification, open and closed cycle, gas turbine fuels, actual Brayton cycle, optimum pressure ratio for maximum thermal efficiency, work ratio, air rate, effect of operating variables on the thermal efficiency and work ratio and air rate, combined steam and gas turbine plant, gas turbine blade cooling	6
10	**Nuclear Power Plant:** Nuclear fusion and fission, Chain reaction, Nuclear fuels, Components of nuclear reactor, Classification of reactors, Pressurized water reactor, Boiling water reactor, Gas cooled reactor, CANDU reactor, Fast breeder reactor, Nuclear waste and its disposal, Nuclear power plants in India	4
11	**Economics of Power Generation:** Load curves, Load duration curves, Connected load, Maximum load, Peak load, Base load and peak load power plants, Load factor, Plant capacity factor, Plant use factor, Demand factor, Diversity factor, Cost of power plant, Performance and operating characteristics of power plant, Tariff for electric energy	4

Vikrant Marojan

* This topic should be covered during laboratory sessions

Divyang Pandya

Learning Outcomes:

After learning the course the students should be able to:

- Understand the different power generation methods, its economics and global energy situation
- Apply the basic thermodynamics and fluid flow principles to different power generation methods
- Analyze thermodynamic cycles of steam power plant and understand construction, working and significance of its various systems
- Analyze thermodynamic cycles of gas turbine power plant, nuclear power plant

Teaching & Learning Methodology:

Books Recommended:

1. Power Plant Engineering, P.K. Nag, McGraw-Hill Education
2. Power Plant Technology, M.M. El-Wakil, McGraw-Hill Education
3. Thermal Engineering, R.K.Rajput, Laxmi Publication
4. Gas Turbines by V Ganeshan, McGraw Hill Education
5. Steam Turbine Theory and Practice, William J. Kearton, CBS Publication

E-Resources:

1. http://nptel.ac.in/
2. http://npti.in/default.aspx

Practical List:

1. Study of Modern Steam Power Plant.
2. Study of Steam Turbines. (Impulse, Reaction and Governing).
3. Study of Gas and Steam Turbine Combined Cycles.
4. Study of Nuclear Power Plant.
5. Study of various draught system.
6. Study of different feed water treatment plants.
7. Study of different types of steam nozzle and design a nozzle.
8. Comparative study of different types of high pressure boilers.
9. Study of Coal and Ash handling system.
10. Study of condenser and cooling tower.

Divyang Pandya Vikrant Mahiya

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING

DEPARTMENT OF MECHANICAL ENGINEERING

OPERATION RESEARCH

CODE: 23090703

B.E. 7TH Semester

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	2	-	6	6	30	-	70	50	150

Objective: - Operations Research is widely used in the field of resolution-making for real-life difficulties. Directors, Managers and decision-makers get an idea for optimizing and approximating technical problems. They not only endeavor to devise suitable measures for problem-solving however also apply scientific methods to control the organization's continuous projects such as product mix, transportation, queuing, assignment, dynamic, Integer, goal and game problem.

Prerequisites: - Nil

Course outline: -

Sr. No.	Course Contents	No. of Hours
1	**OperationResearch:** History of Operation Research, Historical Standpoint, Methodology, Different Phases, Characteristicsof OR, Scope of OR and Application of Operations Research.	2
2	**Linear ProgrammingProblem:** Introduction of LP, Requirement of LP, Basic Assumptions, Formulation of LP, General Statement of LP, Solution techniques of LP: Graphical Methods, Analytical Methods:Simplex, Big MandTwoPhase, Sensitivity Analysis,PrimalandDualProblems,Economic Interpretation.	8
3	**Transportation and Assignment:** Transportation Problemsdefinition,Linear form, Solution methods: North west corner method, least cost method, Vogel's approximation method. Degeneracy in transportation, Modified Distribution method, Unbalanced problems&profit maximizationproblems.Transshipment Problems. Assignment Problems and Travelling sales man Problem.	6
4	**Game Theory:** Introduction, Characteristics of Game Theory, Two Person, Zero sum games, Pure strategy. Dominance theory, Mixed strategies (2x2, mx2),Algebraic and graphical methods.	4

Vikrant Mahajan Divyang Pandya

5	**Replacement theory:** Introduction, Replacement of capital equipment which depreciated with time, replacement by alternative equipment, Group and individual replacement policy.	3
6	**Inventory Control:** Inventory classification, Different cost associated to Inventory, Economic order quantity, Inventory models with deterministic demands, ABC analysis.	4
7	**Project Management:** Introduction to PERT and CPM, critical Path calculation, float calculation and its importance. Cost reduction by Crashing of activity.	6
8	**Queuing Theory:** Basis of Queuing theory, elements of queuing theory, Kendall's Notation, Operating characteristics of a queuing system, Classification of Queuing models, Preliminary examples of M/M/1: ∞/FCFA	5
9	**Decision Theory:** Introduction, Decision under certainty, Decision under risk, Decision under uncertainty: Laplace criterion, MaxiMin criterion, MiniMax criterion, savage MiniMax regret criterion, hurwicz criterion, Decision tree.	4

Learning Outcomes: -After learning the course the students should be able to

1. Students will be able to describe characteristics and scope of OR.
2. Students will be ableto define and formulate mathematical problems.
3. Students will be able to select optimal problems solving techniques for a given problem using LP.
4. Students will be able to formulate and solve transportation, travelling sales man and transshipment problems.
5. Students will be able to formulate and solve optimization problems related to job/ work assignments.
6. Students will be able to demonstrate and solve simple models of Game theory.
7. Students will be able to evaluate optimum solution using dynamic programming for different applications.
8. Students will be able to choose / devise appropriate queuing model for practical application.
9. Students will be able to solve different problems related to Network.

Teaching & Learning Methodology:-

It is theoretical subject with application of Scientific Methods. So following teaching methodology should be appropriate.

1. Explaining the Concept of different Methods & trying to implement in the real situation specially visiting the industry and get data and finding out the optimum Solution for the same.
2. Classroom Communication and Solving the examples quickly.
3. Interactive Learning Methods.

Books Recommended:

1. Operations Research: An Introduction by Hamdy Taha, Pearson
2. Operations Research by A M Natarajan, P Balasubramani, A Tamilarasi, Pearson Education Inc
3. Operations Research by P Mariappan, Pearson
4. Operations Research by H N wagner, Prentice hall.

Divyang Patel Nikunt Mahajan

5. Optimization in Operations Research by Ronald Rardin, Pearson Education Inc.
6. Operations Research by R. Paneerselvam, Prentice Hall of India Pvt. Ltd.
7. Quantitative Techniques in Management by N D Vohra, Tata McGraw-

List of Open Source Software/learning website:

1. https://nptel.ac.in/courses/112/106/112106134/
2. https://nptel.ac.in/courses/110/106/110106062/
3. https://nptel.ac.in/courses/110/106/110106059/

List of Practical: -

1. Exercise on definition, formulation of linear programing problems.
2. Exercise on Graphical solution of linear programing problems.
3. Exercise and case problems on Simplex, Big M and Two phase LP Problems.
4. Exercise and case problems on Dual and Primal LP Problems.
5. Exercise and case problems on Sensitivity Analysis.
6. Exercise and case problems on Transportation and Transshipment Problems.
7. Exercise and case problems on Assignment and Travelling sales man Problems.
8. Exercise and case problems on Queuing theory.
9. Exercise and case problems on Game theory.
10. Exercise on Inventory model.
11. Exercise on Replacement theory.
12. Exercise and case problems on PERT/CPM

Divyang Pandya Viknant Mahajan

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

MACHINE DESIGN

CODE : 23090704

B.E. 7TH SEMESTER

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	-	2	5	5	30	-	70	50	150

Prerequisites:- Zeal to learn the subject

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Gear Design**: Recitation: Classification of gears, Selection of type of gears, Law of Gearing, Gear terminology, Standard system of gear tooth, force analysis, Interference and undercutting, number of teeth, gear tooth failures, selection of material. Spur and Helical Gears: Stress in gear tooth: Lewis formula, AGMA bending stress equation and AGMA pitting resistance formula, Gear quality and selection aspects. Bevel and Worm gears: Specifications and design of bevel and worm gears.	11
2	**Design of Gear Box for Machine Tools:** Comparison and Choice of progression (Arithmetic, Geometric, Harmonic and Logarithmic), general design procedure, determination and fixation of spindle speeds, selection of the best structure diagram, selection of gear layout and ray diagram, determination of number of teeth on gears	5
3	**Journal Bearings:** Classification of bearings. Journal bearing Types, Lubrication: types of lubrication, Lubricants, Effect of pressure and temperature on viscosity, Stable lubrication, Thin and thick film lubrication. Hydraostatic Bearing: Viscous flow through rectangular slot, step bearing, energy losses.	7

Vikrant Mahajan Divyang Pandya

	Hydrodynamic Bearing: Lubrication theory (Petroff's Equation, Reynolds' Equation), Design of bearings with Raimondi and Boyd method, power and heat generation, bearing materials.	
4	**Rolling Contact Bearings:** Classification, Static load carrying capacity, Stribeck's equation, Dynamic load carrying capacity, Equivalent bearing load, Load-Life relation, Selection of bearing life, Load factor, Selection of bearing from catalogue, Design for cyclic loads and speeds, Bearing with probability of survival other than 90%, Selection of taper roller bearing, Bearing failure, Lubrication of rolling contact bearing.	4
5	**IC Engine Components:** Design of cylinder and Cylinder head, Design of piston, Design of connecting rod, Design of crankshaft and Design of valve-gear mechanism.	9
6	**Design of Cranes**: Basic objectives of material handling system, Types of load, Classification and application of various Material handling equipment, Basic principles in selection of material handling system, Classification of cranes, Stress analysis and selection of Hooke (IS 15560, 2005), Pulley System (hoisting tackle analysis), Steel Wire ropes: Classification and coding, stress analysis and selection, Design of Sheave and drums.	8

Learning Outcomes:-

After learning the course the students should be able to:
1. Design gears of various types.
2. Design gearboxes for machine tools.
3. Design journal bearing and select antifriction bearing for state application.
4. Design IC engine components and crane parts

Teaching & Learning Methodology:-

The students will be involved with the following learning activities:
- Assignments
- Progress tests
- Quizzes
- Examinations
- Laboratory reports

Books Recommended:

Vikrant Maheji Divyang Pandya

1. R L Norton, Machine Design An Introduction, Pearson.
2. R G Budynas, and K J Nisbett, Shigley's Mechanical Engineering Design, McGraw-Hill
3. V B Bhandari, Design of Machine Elements, 3/e, McGraw Hill.
4. V B Bhandari, Machine Design Databook, McGraw Hill.
5. R C Juvinall, Fundamentals of Machine Component Design, 4/e, Wiley.
6. P C Gope, Machine Design: Fundamentals and Applications, 1/e PHI.
7. K Hoga, B Dondlinger, Vehicular Engine Design, Springer

List of Tutorials:

1. Design of Spur Gears.
2. Design of Helical Gears.
3. Design of Bevel Gear.
4. Design of Worm gear.
5. Design of Gearbox.
6. Design of Journal Bearing.
7. Selection of Rolling Contact bearing.
8. Design of IC engine components.
9. Design of Crane components

List of Open Source Software/learning website:

1. www.nptel.ac.in/
2. http://help.autodesk.com/view/fusion360/ENU/
3. https://academy.autodesk.com/course/108871/introduction-cad-engineers
4. http://help.autodesk.com/view/fusion360/ENU/?learn=assemble
5. http://help.autodesk.com/view/fusion360/ENU/?learn=simulate
6. https://academy.autodesk.com/curriculum/introduction-cad-and-cae

Divyang Pandya Vikrant Mahajan

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING

DEPARTMENT OF MECHANICAL ENGINEERING

PROJECT 1

CODE: 23000023

B.E. 7TH Semester

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
0	1	2	3	2	0	50	0	100	150

Guideline for Final Year BE Project Report Submission:-

All the final year students who are working on their 7th semester project need to submit thefollowing:

Project Report (A Hard bound hard copy) - It is required to be a report of the work, done bythe team of students during the 7th semester. The Report is to be submitted whether the projecthas been completed or is yet to be completed.

Case 1: Wherein the project is to be completed during two semesters (the 7semester).

In this case students need to submit their project report of the work done during theseventh semester in spiral bound as follows:

1. Student Copy
2. Dept. Copy/Guide Copy in spiral bound.
3. No External Guide copy required.

For students, whose project is a full-year project and who are to complete the project during the8th semester, should add the following details in their project submissions:

1. PDF generated under Phase I & II of Online project tracking system.
2. Problem Summary or Introduction
3. Aims and Objectives of the work
4. Brief literature review
5. Plan of their work
6. Materials and methods used
7. Progress, they had made during the 7th semester
8. Expected outcome

Divyang Pandya

Vikrant Mahajan

9. References

10. Any other details

Case 2: wherein during the 7th semester the project has been completed

The students have to submit the project report in a hard bound. Every team has to submit two/three copies of the project report as follows:

1. Student Copy

2. College/Dept. or Guide copy

3. In case of students doing IDP: if industry mentor/external guide requires a third copy, students may prepare either a hard or a spiral bound copy as per suggestion given by industry mentor/external guide.

For students whose project is completed should add the following details in their project submissions:

1. PDF generated under Phase I & II of Online project tracking system.

2. Problem Summary or Introduction

3. Aims and Objectives of the work

4. Brief literature review

5. Plan of their work

6. Materials and methods used

7. Result, Discussion and Conclusion

8. References

9. Any other details

Divyang Pandya Vikrant Mahajan

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

Organizational Behavior

CODE: 23090705

B.E. VII Semester

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
-	-	-		2	-	-	-	50	50

Objective: -

- Organizational Behavior deals with the application of management skills applied to individual as well as group of persons.
- It also helps in team work and understanding group dynamics and leads to leadership and motivation.

Prerequisites: -NIL

Course outline: -

Sr. No.	Course Contents	No. of Hours
1	**Focus and Purpose:** Definition, need and importance of organizational behavior, Nature and scope, Frame work, OB model	03
2	**Individual Behaviour:** Attitudes: Characteristics, Components, Formation, Measurement, barriers to change attitude. Perception: Meaning and concept of perception, factors influencing perception, Motivation: Importance, Types, Theories of Motivation, and Effects on work behavior. Personality and value: Types, Factors influencing personality, Theories, Learning, Types of learners, The learning process, Learning theories, Organizational behavior modification. Misbehavior: Types, Management Intervention. Emotions: Emotional Labor, Emotional Intelligence, Theories. Impression management, Individual decision making techniques	14
3	**Group Behaviour:** Organization structure, Formation, Groups in organizations, Influence, Group dynamics, Group decision making techniques, Team building,	08

Vikrant Mahajan

Divyang Pandya

	Communication, Control, Johari Window	
4	**Leadership and Power:** Meaning, Importance, Leadership styles, Behavioral Theories, Fiedler model, LMX theory and Path Goal theory, Leaders vs. Managers, Sources of power, Power centers, Power and Politics.	07
5	**Dynamics of Organizational Behaviour:** Organizational culture and climate, Factors affecting organizational climate, Importance, Job satisfaction, Determinants, Measurements, Influence on behavior, Stress, Work Stressors, Prevention and Management of stress, Balancing work and Life, Kurt Lewin's–three step model, methods for implementing organizational change.	10

Learning Outcomes: -

- Students will be able to understand various methods and terms used different organizational behavior model
- Students will be able to understand Individual Behaviour like attitude, perception, motivation, personality, misbehavior and emotions.
- Students will be able to understand group behavior, leadership and power
- Students will be able to understand dynamics of organizational behavior and managing change.

Books Recommended:

- Stephen P. Robins, Organizational Behavior, / Pearson Education
- Udai Pareek, Understanding Organizational Behaviour, Oxford Higher Education
- Margi Parikh and Rajan Gupta, Organizational Behaviour, McGraw Hill Education
- Fred Luthans, Organizational Behavior, McGraw Hill
- Schermerhorn, Hunt and Osborn, Organizational behavior, John Wiley
- Mc Shane & Von Glinov, Organizational Behaviour, McGraw Hill
- Hellrigal, Slocum and Woodman, Organizational Behavior, Cengage Learning
- Ivancevich, Konopaske & Maheson, Organizational Behaviour & Management, McGraw Hill

List of Open Source Software/learning website:

1. Industry visit, Management games to understand Individual behavior and group behavior, also games for leadership development.

Divyang Pandya

Vikrant Mahajan

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

Vehicle Dynamics

CODE: 23090708

BE_ME_7_Department Elective - II

Teaching & Evaluation Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	-	-	3	3	30	00	70	00	100

Objectives:

Prerequisites:

Kinematics of Machines, Dynamics of Machinery (Mechanical Engineering), Automobile System, Physics (Automobile Engineering)

Course outline:

Sr. No.	Course Contents	Number of Hours
1	**Performance Characteristics of Vehicle:** SAE Vehicle axis system, Forces & moments affecting vehicle, Earth Fixed coordinate system, Dynamic axle loads, Equations of motion, transmission characteristics, vehicle performance, power limited and traction limited acceleration, braking performance, Brake proportioning, braking efficiency.	6
2	**Aerodynamics:** Mechanics of Air Flow Around a Vehicle, Pressure Distribution on a Vehicle, Aerodynamic Forces, Drag Components, Aerodynamics Aids.	4
3	**Tire Mechanics:** Tire Construction, Size and Load Rating, Terminology and Axis System, Tractive Properties, Cornering Properties, Camber Thrust, Aligning Moment, Combined Braking and Cornering, Conicity and Ply Steer, Slip, Skid, Rolling Resistance, Elastic Band Model for longitudinal slip, Simple model for lateral slip, Combined longitudinal/lateral slip (friction ellipse), Taut string model for lateral slip, Magic Tire Formula	7

4	**Suspensions:** Suspension Kinematics, Suspension types, Solid Axles, Independent Suspensions, Anti-Squat and Anti-Pitch Suspension Geometry, Anti-Dive Suspension Geometry, Roll Center Analysis, Suspension Dynamics, Multi-body vibration, Body and Wheel hop modes, Invariant points, Controllable Suspension Elements: Active, Semi-Active. Choice of suspension spring rate, Calculation of effective spring rate, Vehicle suspension in fore and apt directions.	8
5	**The Steering System:** The Steering Linkages, Steering System Forces and Moments, Steering System Models, Steering Geometry, Steady Handling (2 DOF steadystate model), Understeer and Oversteer, Effect of Tire Camber and Vehicle Roll (3 DOF steady-state model), Transient Handling and Directional Stability (2 DOF unsteady model), Effect of Vehicle Roll on Transient Handling (3 DOF unsteady model), Steady-State and Transient Handling of Articulated Vehicles.	8
6	**Rollover:** Quasi-Static Rollover of a Rigid Vehicle, Quasi-Static Rollover of a Suspended Vehicle, Transient Rollover	4
7	**Motorcycle Dynamics:** Kinematic structure of motorcycle, geometry of motorcycles, importance of trail, Resistance forces acting on motorcycle (tyre rolling resistance, aerodynamic resistance forces, resistant force caused by slope), Location & height of motor cycle's centre of gravity (C.G), Moments of inertia on Motorcycle. Introduction to Front & Rear suspensions of Motorcycle	5

Learning Outcomes:

After learning the course the students should be able to:

- Understand the dynamics of vehicle ride
- Calculate and refer the loads and forces associated to the vehicles
- Analyse the behavior of the vehicles under acceleration, ride and braking

Teaching & Learning Methodology:

Books Recommended:

1. Hans Pacejka, Tire and Vehicle Dynamics, Elsevier, 2012.
2. Thomas D Gillespie, "Fundamentals of Vehicle dynamics", SAE USA 1992.
3. Rajesh Rajamani, Vehicle Dynamics & control, Springer.
4. R.V. Dukkipati, Vehicle dynamics, Narsova Publications.
5. Wong J Y, "Theory of Ground Vehicles", John Wiley & Sons, New York, 1978.
6. Milliken W F and Milliken D L, Race car Vehicle Dynamics, SAE.

Divyang Pandey Vikrant Mahajan

7. Garrett T K, Newton K and Steeds W, "Motor Vehicle", Butter Worths & Co., Publishers Ltd., New Delhi, 2001.

8. Heinz Heister, "Vehicle and Engine Technology", SAE Second Edition, 1999.

9. Vittore Cossalter, Motorcycle Dynamics, 2nd Edition, Publisher: LULU.com

10. R N Jazar, Vehicle Dynamics: Theory and Application, Springer.

E-Resources:

1. http://nptel.ac.in/courses/107106080/

Divyang Pandya Vikrant Mahajan

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING

DEPARTMENT OF MECHANICAL ENGINEERING

GAS DYNAMICS

CODE: 23090710

B.E. 7TH Semester

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	-	-	3	3	30	-	70	-	100

Objective: - To make student understand various definitions and theoretical concepts related to Fundamental Aspects of Gas Dynamics, Normal Shock Waves, Variable Area Flow, Flow with Heat addition and Two-Dimensional Compressible Flow to meet UG level requirement. To explain student working of various systems related to gas dynamics: Shock waves, Adiabatic Flow in a Duct, voracity, velocity potential from undergraduate perspective. To teach student how to understand and apply mathematical treatment to various problems related to Generalized Quasi-One-Dimensional Flow ,Two-Dimensional Compressible Flow, shock wave relations, isotropic relations to reasonable correctness.

Prerequisites: - Fluid Mechanics

Course outline: -

Sr. No.	Course Contents	No. of Hours
1	**Fundamental Aspects of Gas Dynamics:** Introduction, Isentropic flow in a stream tube, speed of sound, Mach waves; One dimensional Isentropic Flow: Governing equations, stagnation conditions, critical conditions, maximum discharge velocity, isentropic relations.	8
2	**Normal Shock Waves:** Shock waves, stationary normal shock waves, normal shock wave relations in terms of Mach number; Oblique Shock Waves: Oblique shock wave relations, reflection of oblique shock waves, interaction of oblique shock waves, conical shock waves; Expansion Waves: Prandtl-Meyer flow, reflection and interaction of expansion waves, flow over bodies involving shock and expansion waves	10
3	**Variable Area Flow:** Equations for variable area flow, operating characteristics of nozzles, convergent-divergent supersonic diffusers ,Adaiabatic Flow in a Duct with Friction: Flow in a constant area duct, friction factor variations, the Fanno line	9

Divyang Pandya Vikrant Mahajan

4	**Flow with Heat addition or removal:** One-dimensional flow in a constant area duct neglecting viscosity, variable area flow with heat addition, one-dimensional constant area flow with both heat exchanger and friction, Generalized Quasi-One-Dimensional Flow: Governing equations and influence coefficients, solution procedure for generalized flow with and without sonic point.	8
5	**Two-Dimensional Compressible Flow:** Governing equations, vortices considerations, the velocity potential, linearized solutions, linearized subsonic flow, linearized supersonic flow, method of characteristics.	7

Learning Outcomes: -After learning the course the students should be able to

1. The student will be able to understand various definitions and theoretical concepts related to Fundamental Aspects of Gas Dynamics, Normal Shock Waves, Variable Area Flow, Flow with Heat addition and Two-Dimensional Compressible Flow to meet PG level requirement.
2. The student will be able to understand working of various systems related to gas dynamics : Shock waves, Adiabatic Flow in a Duct, vortices ,velocity potential etc. from undergraduate perspective.
3. To teach student how to understand and apply mathematical treatment to various problems related to Generalized Quasi-One-Dimensional Flow ,Two-Dimensional Compressible Flow, shock wave relations, isentropic relations to reasonable correctness..

Teaching & Learning Methodology:-

It is theoretical subject with application of Scientific Methods. So following teaching methodology should be appropriate.

1. Explaining the Concept of different Methods & trying to implement in the real situation specially visiting the industry and get data and finding out the Solution for the same.
2. Classroom Communication and solving the examples.
3. Interactive Learning Methods.

Books Recommended:

1. L.D.Landau and E..M.Lifshitz, Fluid Mechanics. 2nd ed.,Butterworth-Heinemann, 1995 3.
2. P. H. Oosthuizen and W. E. Carscallen. Compressible Fluid Flow. NY, McGraw-Hill, 1997 4.
3. M.A.Saad,Compressible Fluid Flow. 2nd ed. Upper Saddle River, NJ: Prentice-Hall, 1993
4. H. W. Liepmann, and A. Roshko, Elements of Gas Dynamics, Dover Pub, 2001.

List of Open Source Software/learning website:

1. https://nptel.ac.in/courses/112/106/112106166/

Divyang Pandya Vikrant Mahajan

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING

DEPARTMENT OF MECHANICAL ENGINEERING

METAL FORMING ANALYSIS

CODE: 23090712

B.E. 7TH Semester

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	0	0	3	3	30	0	70	0	100

Objective: - Illustrate capabilities and applications of metal forming processes.

Prerequisites: - Manufacturing Processes II

Course outline: -

Sr. No.	Course Contents	No. of Hours
1	Introduction to hot forming, cold forming, warm forming itsadvantages and disadvantagesTypical stress strain diagram for ductile materialsForming properties of metals and alloys (yield strength/flow stress,ductility, strain hardening, strain rate sensitivity, effect oftemperature and hydrostatic pressure on yield strength)Classification of forming processes and advantages of metal forming	3
2	Yield conditions, Von Mises' hypothesis of yielding, Tresca'shypothesis of yielding, graphical representation of yield criteria,Elastic stress strain relations for isotropic elastic materials,Idealized stress strain relations in plastic deformations, Isotropicand kinematic work hardening	6
3	Introduction to; (i). Theory of slip lines, (ii). upper bound theoremand (iii). lower bound theorem	3
4	FORGING processes: Introduction, classification of forging,forging machines, metal flow in forging, Analysis of plane straincompression, analysis of compression of circular disc with slabmethod	6
5	EXTRUSION Processes: Introduction, calculation of extrusionload using slab method, slip line method & upper bound method.Defects in extrusion. Direct & indirect extrusion.	5
6	WIRE DRAWING Processes: Introduction, defects, maximum possible reduction. Wire drawing load calculation using slab method.	3
7	ROLLING Processes: Classification, types of mill, Analysis oflongitudinal strip or sheet rolling process (calculation of rollseparating force, torque & power, angle of bite, maximumreduction in rolling), rolling defects, roll flattening, roll	6

Vikrant Mahajan

	camber	
8	SHEET METAL FORMING Processes: various sheet metaloperations, Blanking and punching operations, compound andprogressive dies, nesting, clearance, forces in blanking, Bending ofplates, bendability, spring back, bending force, bending momentfor real material, stress and strain in bending, stress in deepdrawing, drawability. drawing load, Anisotropy in sheetmetal	10
	Total	42

Learning Outcomes: -

After learning the course the students should be able to:

- Identify various forming process
- Identify and determine various methods rolling processes
- Identify and determine various methods to forging processes
- Identify and determine various methods to extraction processes
- Identify and determine various methods to Drawing processes
- Identify and determine various methods to Sheet metal forming processes

Teaching & Learning Methodology:-

1. Explaining the basic fundamentals of Metal Forming Analysis.
2. Classroom Communication.
3. Interactive Learning Methods

Books Recommended:

1. Ghosh A. and Mallik A. K., "Manufacturing Science", East -West Press, New Delhi,1998.
2. Juneja B. L., "Fundamentals of Metal Forming Processes", New Age InternationalPublishers, 2010.
3. Hosford William F. and Caddell R. M., "Metal Forming Mechanics and Metallurgy",Prentice Hall, 1993.
4. Mielnik Edward M., "Metal Working Science and Engineering", McGraw Hill, 1991.
5. Dieter G. E., "Mechanical Metallurgy", McGraw Hill, 1988.
6. Rao P.N., "Manufacturing Technology", Tata McGraw Hill, 1990.
7. Wangoner Robert H. and Jean-Loup Chenot, "Fundamentals of Metal Forming", JohnWiley & Sons, 1997.
8. Beddoes J. and Bibby M. J., "Principles of Metal Manufacturing Processes", Viva Books,2000.
9. Sharma P. C., "Production Engineering", S. Chand &Co ., New Delhi, 2003.

List of Open Source Software/learning website:

1. Code_Aster
2. AutoForm
3. CalculiX
4. www.nptel.ac.in

Divyang Pandya

Vikrant Mahajan

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING

DEPARTMENT OF MECHANICAL ENGG.

PROJECT 2

CODE: 23000025

B.E. 8TH Semester

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
0	0	16	16	8	0	200	0	300	500

Guideline for Final Year BE Project Report Submission:-

All the final year students who are working on their 8th semester project need to submit thefollowing:

Project Report (A Hard bound hard copy) - It is required to be a report of the work, done bythe team of students during the 8th semester/4TH Year.

Case 1: Wherein the project is completed during two semesters (7semester& Semester 8).

In this case students need to submit their project report of the work done during the7th& 8th semester in Hard bound as follows:

1. Student Copy

2. College/Dept. or Guide copy

3. In case of students doing IDP: if industry mentor/external guide requires a third copy, students may prepare either a hard or a spiral bound copy as per suggestion given by industry mentor/external guide.

Case 2: wherein during the 7th semester the project has been completed and new project has been selected in 8th Semester.

The students have to submit the project report in a hard bound. Every team has to submit two/three copies of the project report as follows:

1. Student Copy

2. College/Dept. or Guide copy

3. In case of students doing IDP: if industry mentor/external guide requires a third copy, students may prepare either a hard or a spiral bound copy as per suggestion given by industry mentor/external guide.

Divyang Pandya Vikrant Mahajan

Note: All of the Students should add the following details in their project submissions:

1. Problem Summary or Introduction
2. Aims and Objectives of the work
3. Brief literature review
4. Monthly Plan of their work done
5. Materials and methods used
6. Result, Discussion and Conclusion
7. References
8. Any other details

Divyang Pandya

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING

DEPARTMENT OF MECHANICAL ENGINEERING

INDUSTRIAL TRAINING

CODE: 23000028

B.E. 8TH Semester

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
-	-	4	4	2	-	50	-	200	250

Objective: - Students should work in the industry/laboratories as trainees so that they are able to acquire different learning out comes to demonstrate following course outcomes.(Students should be able to demonstrate these skills on the type of metallurgical process or parameters affecting, the following list is suggestive only, some more skills may be acquired by student depending upon the opportunities they get and in some cases some of the following skills may not be applicable on which they have undergone training).

Prerequisites: - Nil

Course outline: -

The students need to undergo partial industrial training on Government, Quasi Government or Public limited industries.Students of Degree in Mechanical Engineering can opt the above mentioned industries. On successful completion of the training students need to submit certificate of completion mentioning days of their attendance to the Head of the Department. It is required to submit report of the training at the end of the course and shall be evaluated internally.

Evaluation criteria:

1. Attendance (based on feedback from the industry) : 30%
2. Involvement (based on feedback from the industry) : 30%
3. Viva (as part of internal evaluation at the institute) : 20%
4. Bonafide record : 20%

Divyang Pandya

Vikrant Mahajan

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

RAPID PROTOTYPING

CODE: 23090803

B.E. 8TH SEMESTER

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	2	-	5	4	30	-	70	50	150

Prerequisites:- Zeal to learn the subject

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Introduction:** Introduction to Prototyping, Traditional Prototyping Vs. Rapid Prototyping (RP), Classification of Rapid Manufacturing Processes: Additive, Subtractive, Formative, Generic RP process.	4
2	**CAD Modelling and Data Processing for RP:** CAD model preparation, Data interfacing: formats (STL, SLC, CLI, RPI, LEAF, IGES, HP/GL, CT, STEP), conversation, validity checks, repair procedures; Part orientation and support generation, Support structure design, Model Slicing algorithms and contour data organization, direct and adaptive slicing, Tool path generation	9
3	**RP Processes:** Process Physics, Tooling, Process Analysis, Material and technological aspects, Applications, limitations and comparison of various rapid manufacturing processes. Photopolymerization (Stereolithography (SL), Microstereolithography), Powder Bed Fusion (Selective laser Sintering (SLS), Electron Beam melting (EBM)), Extrusion-Based RP Systems (Fused Deposition Modelling (FDM)), 3D Printing, Sheet Lamination (Laminated Object Manufacturing (LOM), Ultrasonic Consolidation (UC)), Beam Deposition (Laser Engineered Net Shaping (LENS), Direct Metal Deposition (DMD))..	4

Divyang Pandya Vikrant Mahajan

4	**Errors in RP Processes:** Pre-processing, processing, post-processing errors, Part building errors in SLA, SLS	3

Learning Outcomes:-

1. Understand and use techniques for processing of CAD models for rapid prototyping.

2. Understand and apply fundamentals of rapid prototyping techniques.

3. Use appropriate tooling for rapid prototyping process.

4. Use rapid prototyping techniques for reverse engineering

Teaching & Learning Methodology:-

The students will be involved with the following learning activities:
- Assignments
- Progress tests
- Quizzes
- Examinations

Books Recommended:

1. Chua C K, Leong K F, Chu S L, Rapid Prototyping: Principles and Applications in Manufacturing, World Scientific.

2. Gibson D W Rosen, Brent Stucker., Additive Manufacturing Technologies: Rapid Prototyping to Direct Digital Manufacturing, Springer.

3. Noorani R, Rapid Prototyping: Principles and Applications in Manufacturing, John Wiley & Sons.

4. Liou W L, Liou F W, Rapid Prototyping and Engineering applications: A tool box for prototype development, CRC Press.

5. Kamrani A K, Nasr E A, Rapid Prototyping: Theory and practice, Springer, 15. PSG Design Data Book.

List of Tutorials:

1. Review of CAD Modelling Techniques and Introduction to RP

2. Generating STL files from the CAD Models & Working on STL files

3. Processing the CAD data in Catalyst software (Selection of Orientation, Supports generation, Slicing, Tool path generation)

4. Learning techniques for fabricating an assembly 5. Prepare a CAD model with complex geometry and study effect of slicing parameters on final product manufactured through RP.

Divyang Pandya Vikrant Mahajan

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING

DEPARTMENT OF MECHANICAL AUTOMOBILE ENGINEERING

CODE: 23090804

B.E. 8TH Semester

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	0	2	5	4	30	0	70	50	150

Prerequisites: -Automobile Engines, Automobile Transmission

Course outline: -

1. Evaluate performance of an automobile due to various resistance, demonstrate selection of chassis frame of automobile body.
2. Classify and compare different braking and suspension system of automobile.
3. Illustrate working and functions of various automotive transmission system.
4. Performance assessment and selection of braking, suspension system of automobile.
5. Examine steering system and selection of automobile wheel and tyre

Sr. No.	Course Contents	No. of Hours
1	**Automobile Basics** Generation of automobiles, Classification, Layouts of automobiles, Front engine & front wheel drive, front engine & rear wheel drive, rear engine & rear wheel drive, Four wheel drive. Performance of Vehicle: Vehicle motion, Resistances during motion, Power required for acceleration and constant velocity motions, Tractive efforts and draw bar pull, Power required and engine characteristics, Motion on gradient. Chassis Frames and Body: Layout of chassis and its main components, Types of Chassis frames & body, Material, Unitized construction, design considerations	12
2	**Transmission** Purpose and necessity of gear box, classification, construction and working of different types of gear box, Gear selector mechanism, Heavy vehicle gear boxes, lubrication, Torque convertors, overdrive, operational problems and fault finding. Semi –Automatic and Automatic transmission : Hydraulic control systems, Electro hydraulic control systems, Automatic lay shaft gear boxes, Dual mode transmission with sequential gear change, Direct shift gear boxes, Over drive gears,Continuously variabletransmissions Electric drives : General arrangement and description of electric transmissions, Working	12

Divyang Pandya Vikrant Mahajan

	principle and control, advantages and limitations of electric drives	
3	**Drive lines** Drive Lines, Universal joints, Constant velocity joints, Propeller shaft construction, Drive line arrangement, Rear-wheel drive and front-wheel drive layouts, Front-wheel drive shafts, Tandem axle drive for heavy vehicles, Drive lines for public service vehicles	05
4	**Final drive and rear axles** Final drive and its types, Differential gears, Differential-All types, Rear axle construction, Heavy vehicle rear axle.	05
5	**Braking System** Braking System: Requirements and classification, brake efficiency and stopping distance, Hydraulic brakes, Master cylinder, dual braking, power brake, Parking brakes, Antilock brake, bleeding of brake, maintenance of braking system. Suspension System: Basic ride considerations, Types of suspension systems, Types of suspension spring, Tandem axle suspension, torsion bar, Shock dampers, Adaptive suspension systems, air suspension, Active roll control systems	14
6	**Steering systems** Principles and layout, types of steering gears, Front end geometry and wheel alignment, steering ratio, power steering, Steering axles for heavy vehicles, Hydraulic power-assisted steering, Electro-hydraulic power-assisted steering, Electrical power-assisted steering, Types of four-wheel steering. Tyres, wheels: Introduction to wheels, wheel balancing, tyres, classification, construction, Tread patterns, Cross ply, Radial & tubeless tyres, specifications of tyres, Tyre inflation, effects of tyre pressure on tyre performance. Tyre wear patterns and their causes.	12

LIST OF PRACTICALS:

1. Study of different layout of transmission system for a front wheel drive, rear wheel drive and a four wheel drive arrangement
2. Study of manual type gearbox and its Trouble shooting.
3. Study of typical car body construction
4. Demonstration of steering system and steering geometry angles and their impact on vehicle performance.
5. Study of the chassis frames of a Heavy / light duty vehicle frame (Leyland, Tata, Maruti, etc.)
6. Study of braking system of an automobile
7. Study of suspension system of two wheeler and four wheeler vehicle

Books Recommended:

1. Automobile Engineering Vol-1, 2 by Kirpal Singh ,Standard Publishers
2. A text book of Automobile Engineering by R.K. Rajput, Laxmi Publication
3. Automotive suspension and steering systems by Thomas W. Birch, Delmar Cengage Learning
4. Automotive Braking by Thomas W. Birch , Cengage Learning
5. Automotive Technology by Jack ErjavecCengage Learning

Divyang Pandya Vikrant Mahajan

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING
ENERGY CONSERVATION AND MANAGEMENT
SUBJECT CODE: 23090805
B.E. 8TH Semester

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
3	-	2	5	4	30	-	70	50	150

Sr. No.	Content	Total Hrs	% Weight age
1	**Global Energy Scenario:** Classification of Energy, Indian energy scenario, Sectorial energy consumption (domestic, industrial and other sectors), energy needs of growing economy, energy intensity, long term energy scenario, energy pricing, energy security, energy conservation and its importance, energy strategy for the future. **Energy Conservation Act 2001 and related policies**: Energy conservation Act 2001 and its features, notifications under the Act, Schemes of Bureau of Energy Efficiency (BEE) including Designated consumers, State Designated Agencies, Electricity Act 2003, Integrated energy policy, National action plan on climate	05	15
2	**Financial Management and Energy Monitoring and Targeting:** **Energy Policy** Investment-need, appraisal and criteria, financial analysis techniques simple payback period, return on investment, net present value, internal rate of return, cash flows, risk and sensitivity analysis; financing options, energy performance contracts and role of Energy Service Companies (ESCOs) **Energy Monitoring and Targeting:** Defining monitoring & targeting, elements of monitoring & targeting, data and information-analysis, techniques – energy consumption, production, cumulative sum of differences (CUSUM). Energy Management Information Systems (EMIS)	08	20
3	**Energy Management & Audit:** Definition, energy audit, need, types of energy audit. Energy management (audit) approach-understanding energy costs, Bench marking, energy performance, matching energy use to requirement, maximizing system efficiencies, optimizing the input energy requirements, fuel and energy substitution, energy audit instruments and metering	06	12
4	**Energy Efficiency in Thermal Utilities and systems:** **Boilers:** Types, combustion in boilers, performances evaluation, analysis of losses, feed water treatment, blow down, energy conservation opportunities. Boiler efficiency calculation, evaporation ratio and efficiency for coal, oil and gas. Soot blowing and soot deposit reduction, reasons for boiler tube failures, start up, shut down and preservation, Thermic fluid heaters, super critical boilers.	24	40

Divyang Pandya Vikram Mahajan

	Steam System: Properties of steam, assessment of steam distribution losses, steam leakages, steam trapping, condensate and flash steam recovery system, identifying opportunities for energy savings. Steam utilization, Performance assessment more details, installation, thermo-compressor, steam pipe insulation, condensate pumping, steam dryers **Furnaces:** Classification, general fuel economy measures in furnaces, excess air, heat distribution, temperature control, draft control, waste heat recovery. Forging furnace heat balance, Cupola, non-ferrous melting, Induction furnace, performance evaluation of a furnace, hot air generators. **Insulation and Refractories:** Insulation-types and application, economic thickness of insulation, heat savings and application criteria, Refractory-types, selection and application of refractories, heat loss. Cold insulation. **Heat Exchangers:** Types, networking, pinch analysis, multiple effect evaporators, condensers, distillation column, etc. **Waste Heat Recovery:** Classification, advantages and applications, commercially viable waste heat recovery devices, saving potential. **Cogeneration:** Definition, need, application, advantages, classification, saving potentials. Heat balance, steam turbine efficiency, tri-generation, micro turbine. **Heating, ventilation, air conditioning (HVAC) and Refrigeration System:** Factors affecting Refrigeration and Air conditioning system performance and savings Opportunities. Vapor absorption refrigeration system: Working principle, types and comparison with vapor compression system and saving potential, heat pumps and their applications, section on ventilation system, ice bank system, and performance assessment of window and split room air conditioners, Star labeled pumps, cold storage refrigeration, and humidification system.		
5	**Energy and environment, air pollution, climate change:** United Nations Framework Convention on Climate Change (UNFCC), sustainable development, Kyoto Protocol, Conference of Parties (COP), Clean Development Mechanism (CDM), CDM Procedures case of CDM – Bachat Lamp Yojna and industry; Prototype Carbon Fund (PCF).	05	13

At least 5 practical should be done during a semester.

- Determination of efficiency of boiler and analysis of flue gases.
- Study of heat exchangers.
- Study of variable speed drives
- COP of cooling towers.
- Efficiency of electrical motors.
- Study of diesel generator set.
- Measurement of load and power factor for the electrical utilities.
- Determination of efficiency of pumping system.
- Performance evaluation of blower
- Performance evaluation of air compressors
- Determining efficiency of lighting system/loads
- Measurement of Intensity of solar radiation
- Energy Content in Wind. (Prototype Wind Mill of 500W)
- Bio-gas Production from Kitchen waste.
- Performance of Gasifire.

Divyang Pandya Vikrant Mahaja

Reference Books:

1. Energy Conservation Guidebook, Dale R Patrick, Stephen W Fardo, 2nd Edition, CRC Press
2. Handbook of Energy Audits, Albert Thumann, 6th Edition, The Fairmont Press
3. Bureau of Energy Efficiency Reference book: No.1, 2, 3 4
4. Energy Management Handbook, W.C. Turner, John Wiley and Sons, A Wiley Interscience publication
5. Carbon Capture and Sequestration: Integrating Technology, Monitoring, and Regulation edited

6. Heating and Cooling of Buildings - Design for Efficiency, J. Krieder and A. Rabl, McGraw Hill Publication, 1994

Course Outcome:

After learning the course the students should be able:

1. To understand the basic knowledge of different terms & principles of energy conservation, audit and management.
2. To Evaluate the energy saving & conservation in different mechanical utilities.

Divyang Pandya Vikrant Mahajan

3. To understand efficient heat & electricity utilization, saving and recovery in different thermal and electrical system.
4. To prepare energy audit report for different energy conservation instances.

List of Open Source Software/learning website:

1. http://nptel.iitm.ac.in/
2. www.bee.com
3. www.powermin.nic.in
4. www.teriin.org
5. https://geda.gujarat.gov.in/

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to GTU.

Divyang Pandya

Vikrant Mahajan

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim Institute of Technology

Department of Computer Engineering

Bachelor of Technology (B. Tech) - Computer Engineering (Artificial Intelligence)

Subject: Robotic Process Automation Tools **Semester: 7**

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
2	-	2	4	3	30	50	70	-	150

Objectives:

- To understand the basics of RPA tools used in the industry.
- To understand what RPA process.
- To understand UI and tool windows.
- To understand the packages installed for automatic specific targets.
- To have practical knowledge on designing RPA solutions.

Sr. No.	Course Contents	Number of Hours
1	**Unit I:** **Robotic Process Automation concepts:** **Introduction to RPA**: Scopes and techniques of RPA, About UiPath, The future of automation. **Record and Play:** Record and Play, UiPath stack, Installing and Learning UiPath studio, Task recorder	8
2	**Unit II:** **Sequence and Data Manipulation** **Sequence:** Sequence, Flowchart and Control Flow, sequencing the workflow, control flow, various types of loops and decision making, step by step example using sequence, Flowchart and Control Flow. **Data Manipulation:** Variables and scope, Collections, Arguments, Collections, Clipboard management, File operation, CSV/Excel to data table and vice versa	8

3	**Unit III:** **Overview of UiPath** **User Interface Components:** Ribbon, Toolbars Access, Library panel, project panel, Outline panel, locals panel, Debugging, Recording, Workflow execution, context menu, properties panel, Designer panel, Universal search bar. **Workflow Design and UiPath Studio:** Layout diagrams, Type of Decisions, switch activity, Flow Decision, Flow switch, Naming conventions, managing variables in studio, types of variables, Managing arguments, Argument panel, Types of recording, Automatic recording, Basic, web and desktop automatic recording, Manual recording, Data scraping, Screen scrapping and its methods.	8
4	**Unit IV:** **Control Flow Activities and Selectors:** Assign activity, Delay activity, While activity, Do while activity, If activity, Switch activity, For each activity and Break activity. **Selectors and input/output methods:** Simple selectors, Generation of Dynamic selectors, passing the variables in selectors, Input methods, Output methods, Full text, Native, OCR	8
5	**Unit V:** **Automation** **Excel and PDF Automation:** Reading and working with rows of excel, Looping with excel, Working with PDF and excel files, retrieving data from web. **Email Automation:** Outlook Email activity, Get IMAP mail activity, Get POP3 mail message, get exchange mail activity, sending and receiving mail messages. **Orchestrator**: Dashboard, Robots, Processes, Jobs, Queues, Schedules, Transaction	8

Course Outcomes:

On successful completion of the module students will be able to:

- Analyze technical goals and tradeoffs.
- Know the importance of RPA tools.
- Envision a basic RPA implementation plan.
- Understand the challenges and risks when implementing RPA.
- Appreciate knowledge on automation and optimization of business process.

Text Books:

1. Intelligenct Control: A stochastic optimization approach by Kaushik Das Sharma, Amitava Chatterjee, AnjanRakshit. –Springer edition
2. Learning Robotic Process Automation with UiPath – Alok Mani Tripathi, Packt
3. Robotic Process Automation- Guide to building robots by Richard Murdoch.

Robotic Process Automation Tools Lab

List of Experiments:

Part A:

1. Read and write the data and append it to excel
2. Prepare a process of sending and receiving mail with/without attachment
3. Fill the data to collection or to extract form SQL database.

Part B:

4. Write the script to an agent in order to login for the setup created.
5. Write a script to extract the information form Email and to analyze the same.
6. Setup a workflow scheduler to manage work queues management

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim Institute of Technology

Department of Computer Engineering

Bachelor of Technology (B. Tech) - Computer Engineering (Artificial Intelligence)

Subject: ML Using Cloud Services **Semester: 7**

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
2	-	2	4	3	30	50	70	-	150

Objectives:

With the arrival of cloud computing and multi-core machines, we have enough compute capacity at our disposal to churn large volumes of data and dig out the hidden patterns contained in these mountains of data. This technology comes in handy, especially when handling Big Data. Today, companies collect and accumulate data at massive, unmanageable rates for website clicks, credit card transactions, GPS trails, social media interactions, and so on. And it is becoming a challenge to process all the valuable information and use it in a meaningful way.

Syllabus

Sr. No.	Content	Hours
1	**Module – 1:** **Getting started with Azure Machine Learning :** Core concepts of Azure Machine Learning, workflow of Azure Machine Learning, Azure Machine Learning algorithms, Supervised learning, Unsupervised learning, Deploying a prediction model	**09**
2	**Module – 2:** **Using Azure ML Studio :** Azure Machine Learning terminology,Azure Machine Learning pricing and availability, Create your first Azure Machine Learning workspace,Create your first Azure Machine Learning experiment, Download dataset from a public repository,Upload data into an Azure Machine Learning experiment, Create a new Azure Machine Learning experiment,Visualizing the dataset,Split up the dataset, Train the model, Selecting the column to predict, Score the model, Visualize the model results, Evaluate the model,Save the experiment,Preparing the trained model for publishing as a web service,Create scoring experiment .Expose the model as a web service,Azure Machine Learning web service BATCH execution,Testing the Azure Machine Learning web service	**09**

	Publish to Azure Data Marketplace,Overview of the publishing process, Guidelines for publishing to Azure Data Marketplace	
3	**Module – 3:** **Creating Azure Machine Learning client and server applications:** Why create Azure Machine Learning client applications?,Azure Machine Learning web services sample code, C# console app sample code ,R sample code,Moving beyond simple clients Cross-Origin Resource Sharing and Azure Machine Learning web services,Create an ASP.NET Azure Machine Learning web client Making it easier to test our Azure Machine Learning web service Validating the user input ,Create a web service using ASP.NET Web API ,Enabling CORS support,Processing logic for the Web API web service	**09**
4	**Module – 4:** **AWS Storage, Elasticity and AWS Networking** Amazon Storage, S3 Storage Basics, Managing Voluminous Information with EBS, Glacier Storage Service, AWS Networking: Networking Basics, VLAN Basics, Basics of AWS VLANs, AWS Network IP Addressing and Mapping	**09**
5	**Module – 5:** **Virtual Private Cloud (Vpc)** Load Balancers And .,Availability Zones, Elastic Network Interfaces (ENI), Setting Up VPC And Internet Gateway, Setting Up a Security Group, Launching And EC2 Instance And Assigning An ENI, Setting Up A VPN, Setting Up A Customer Gateway For VPN, Setting Up Dedicated Hardware For VPC, Scenario 1:VPC With A Public Subnet Only (Standalone Web), Scenario 2: VPC with Public And Private Subnets (3 Tier App), Scenario 3:VPC With Public And Private Subnets And Hardware VPN Access (Web On The Cloud, Database and App On Prem) Scenario 4: VPC With A Private Subnet Only And Hardware VPN Access. (Extension Of Your Corporate Network), Case Study	**09**

Outcomes:

- Learn about Azure Machine Learning.
- Learn about various machine learning algorithms supported by Azure Machine Learning.
- Learn how to build and run a machine learning experiment with real-world datasets.
- Learn how to use classification machine learning algorithms.
- Learn how to use regression machine learning algorithms.
- Learn how to expose the Azure ML machine learning experiment as a web service or API.
- Learn how to integrate the Azure ML machine learning experiment API with a web application

Text Books:

1. https://www.packtpub.com/in/application-development/machine-learning-cloud-azure-machine-learning-video#tab-label-table.of.contents
2. Kirk Hausman, Susan L. Cook, Telmo Sampaio, " CLOUD ESSENTIALS CompTIA® Authorized Courseware for Exam CLO-001", John Wiley & Sons Inc., 2013

3. Judith Hurwitz ,Robin Bloor , Marcia Kaufman , Fern Halper, “Cloud Computing for Dummies”, Wiley Publishing Inc., 2010-6

Reference Books:

1. Administering Erl,” Cloud Computing: Concepts, Technology & Architecture”, Pearson Education, 2014
2. Srinivasan, “Cloud Computing: A Practical Approach for Learning and Implementation “Pearson Education, 2014

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim Institute of Technology

Department of Computer Engineering

Bachelor of Technology (B. Tech) - Computer Engineering (Artificial Intelligence)

Subject: Chat Boat Development **Semester: 7**

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
2	-	2	4	3	30	50	70	-	150

Course Objectives:

- Gain knowledge about usage of advanced NLP techniques.
- Understand word embedding and filtering of texts.
- Understand seq-2-seq architecture and its training.
- Understand language modelling.
- Understand the working and implementation of chat bot

Sr. No.	Course Contents	Number of Hours
1	**Module – 1:** **Deep NLP Intuition:** Overview of NLP with Deep learning intuition, Types of NLP, Classical vs Deep learning models, Building End-to-End Deep learning models, Bag of words, Seq-2-Seq Architecture & training, beam search decoding, Attention Mechanisms	8
2	**Module – 2:** **Language Modeling:** Bigrams and language models, Neural bigram model, Improving the efficiency, word embedding, CBOW, Hierarchical softmax, word2Vec using tensorflow and Theano.	8
3	**Module – 3:** **Data Preprocessing:** POS tagging, RNN using Theano and Tensorflow, Hidden markov model(HMM), Named entity recognition(NER), word embedding, word analogies, TF-IDF and t-SNE concepts, comparing POS and NER, NER with Theano and Tensorflow.	8

4	**Module – 4:** **Building Chatbot 1:** Building the seq-2-seq model, training the model, understand the skip-gram method in word2vec, Understand and implement GloVe using gradient descent and alternating least squares, Using RNN for names entity recognition, implementing recursive neural networks for the sentiment analysis.	8
5	**Module – 5:** **Building Chatbot 2:** Encoding lexical semantics, sequence modeling& LSTM memory networks, Augmenting the LSTM tagger with character level features, Dynamic programming, BiLSTM-CRF for named entity recognition, loss function for discriminative tagging, Testing, Improving and testing the seq2seq model. Chat bot implementation using tensorflow and pytorch.	8

Outcomes:

1. Apply various techniques to develop model
2. Understand the difference between POS and NER, NER with Theano and Tensorflow
3. Understanding the concepts of classical Vs Deep learning models
4. Learn to build End to End deep learning models

Text Books:

1. Deep learning with application by Navin Kumar Manaswi
2. Deep Learning for NLP by PalashGoyal and Sumit Pandey.

Reference Books:

1. Building chatbots with python using advance NLP techniques by Sumit Raj
2. Speech and Language processing by Dan Jurafsky and James H. Martin

Chat-Bot Development Lab

List of Experiments:

1) Develop a retrieval based chat bot for Incident management system
2) Develop a chatbot for generative based
3) Develop a chatbot for customer complaints handling
4) Develop a chatbot for suggesting better books to buy on Amazon
5) Develop a bot for identifying named entity recognition
6) Develop a Rasa UI bot which acts as assistants for all the queries

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim Institute of Technology

Department of Computer Engineering

Bachelor of Technology (B. Tech) - Computer Engineering (Artificial Intelligence)

Subject: Intelligent Process Automation **Semester: 7**

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
2	-	2	4	3	30	50	70	-	150

Course Objectives:

- To understand the basics of PA and AI used in the industry.
- To understand what is process automation.
- To understand UI and tool windows.
- To understand the packages installed for automatic specific targets.
- To have practical knowledge on designing automated solutions.

Sr. No.	Course Contents	Number of Hours
1	**Cognitive Process Automation concepts:** **Introduction to CPA**: Scopes and techniques of CPA, CPA features, CPA platform overview, The future of intelligent automation. **Exploration of the tool:** UiPath architecture, Installing and Learning UiPath studio, UiPath operating model, Database installation.	9
2	**Automation in UiPath** **UiPath:** Working with different stages, Calculation, Decision, Choice, Collection, Loop, Anchor, Understanding Business objects, Understanding UiPath processes, Pages, Multi Page and page linking, Input, Output and Startup Parameters. **End to End Automation:** Creating and Managing Business objects in object studio, Creating and Managing UiPath processes in process studio, CSV/Excel to data table transfer and vice versa.	9

3	**UiPath Life Cycle and their artifacts** **User Interface Components:** Ribbon, Toolbars Access, Library panel, project panel, Outline panel, locals panel, Debugging, Recording, Workflow execution, context menu, properties panel, Designer panel, Universal search bar. **UI Automation and System Activities:** UI automation, System, Properties, Variables, Output and Arguments.	9
4	**Natural Language Processing:** Text Analysis, Text Cleaning, Stemming, TDM and DTM, Sentiment Analysis, NLP API consumption, Build your own social media monitoring tool and Analysis of Email. **Chatbot:** Handling user events and assistant Bots, Monitoring system event triggers, Hotkey triggers, Mouse triggers, System triggers, Launching an assistant bot on a keyboard event.	9
5	**Image and Text Automation:** **Image Automation**: Mouse and keyboard activitites, Guides/text activities, OCR- activities, Types of OCR, Image Activities, Computer Vision, Image classification, Unstructured data to structure conversion, Invoice data extraction. **Text Automation**: Exception Handling, Logging, Debugging, Tracing, Connecting with Database, Executing Query with Database, Project Organization, PDF-data extraction and automation, Email automation.	9

Course Outcomes:

On successful completion of the module students will be able to:

- Analyze technical goals and tradeoffs.
- Know the importance of automation tools.
- Envision a basic implementation plan.
- Understand the challenges and risks when implementing automation techniques.
- Appreciate knowledge on automation and optimization of business process through AI.

Text Books:

1. Robotic Process Automation Tools, Process Automation and their benefits: Understanding RPA and Intelligent Automation by Mr Srikanth Merianda.

2. Intelligenct Control: A stochastic optimization approach by Kaushik Das Sharma, Amitava Chatterjee, Anjan Rakshit. –Springer edition

3. Learning Robotic Process Automation by Alok Mani Tripathi

Reference Books:

1. Robotic Process Automation- Guide to building robots by Richard Murdoch.
2. Robotic Process Automation and Risk Mitigation: The Definitive Guide by Mary C. Lacity and Dr. Leslie P. Willcocks

3. Introduction to robotic process automation by Frank Casale

Website:

1. https://www.multisoftvirtualacademy.com/downloads/Robotics-Process-Automation-course-content.pdf
2. https://www.tutorialspoint.com/uipath/uipath_tutorial.pdf
3. https://www.credosystemz.com/wp-content/uploads/2018/12/UiPath-Training-Course-Content.pdf
4. http://www.traininginchennai.in/syllabus/Robotic-Process-Automation-Training-course-syllabus.pdf

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim Institute of Technology

Department of Computer Engineering

Bachelor of Technology (B. Tech) - Computer Engineering (Artificial Intelligence)

Subject: Real Time Data Processing **Semester: 7**

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	30	-	70	-	100

objectives:

- To understand advanced processing of Real time Data
- To understand different types of Real time Processing Tool
- To understand architecture of Apache Spark
- To understand about Deploying Apache Spark and its components
- To understand different available services for Apache Spark
- You will understand the processing and Storing Challenges for Real time Architecture
- You will get to know about data storage and processing techniques
- You will learn about GraphX and Mllib

Sr. No.	Course Contents	Number of Hours
1	**Streaming Data & Architectures** Sources of Streaming Data, Operational Monitoring, Web Analytics, Online Advertising, Social Media, Mobile Data and the Internet of Things, Why Streaming Data is Different, Loosely Structured, Highly-Cardinality Storage Real-Time Architecture Components, Collection, Data Flow, Processing, Storage, Delivery, Features of a Real-Time Architecture, High Availability, Low Latency, Horizontal Scalability, Languages for Real-Time Programming, Understanding MapReduce Failure for Streaming Data	10
2	**Introducing Real-Time Processing Tool** Apache Spark, Why Apache Spark, Evolution of Apache Spark, Architecture Apache Spark, Features of Apache Spark, Spark Deployment, Standalone, Hadoop YARN, Spark MapReduce, Components of Apache Spark, Spark core, Spark SQL, Spark Streaming, Spark Machine Learning, Spark GraphX, Spark Shell, Resilient Distributed Dataset (RDD) Basic, Spark Context, RDD Transformations, Creating RDDs, RDD Operations, Programming with RDD,	10

	Transformations, Actions, Lazy Evaluation, Converting between RDD Types	
3	**Data Processing using R & MLL** Spark Data Frame, Starting Session, Creating Data Frames, Spark Data Frame Operations, Rows, Columns, Grouping and Aggregations, Operating on Columns, User defined Functions, Data type mapping between R and Spark, Structured Streaming Architecture, Data types, Classification and Regression, Development Environment, Classification with Naïve Bayes, Theory, Clustering with K-Means, Theory, Artificial Neural Networks, Theory, Use Cases	10
4	**Processing Live Data Streams & SQL** Streaming overview, Basic Concepts, Linking, Streaming Context, Discretized Streams, Input DStreams and Receivers, Streaming Sources, TCP streams, File streams, Transformations on DStreams, Operations, DataFrame and SQL Operations, Check pointing, Memory Tuning Fault Tolerance SQL Context Datasets, DataFrame, Data Sources, , Importing, Processing Text Files, Processing JSON Files, Processing Parquet Files, Using SQL, User Defined Functions, Using Hive, Performance tuning, Distributed SQL Engine, Compatibility with Apache hive	10
5	**Data Processing using GraphX** Overview, Getting Started, Property Graph, Graph operations, Summary List, Property Operator, Structural Operator, Join, Neighbourhood Aggregations, Pregel API, Graph Builders, Vertex and Edge RDDs, Optimized Representation, Graph Algorithm	10

Course Outcome:

- Understand the advanced processing of Real time Data
- Understand different types of Real time Processing Tool
- Understand architecture of Apache Spark
- Understand about Deploying Apache Spark and its components
- Understand different available services for Apache Spark
- Understand the processing and Storing Challenges for Real time Architecture
- Know about data storage and processing techniques
- Concepts of GraphX and Mlib

Text Books

Sr. No	Name of the book	Author	Edition / volume
1	Real-Time Analytics,	Byron Ellis	Wiley publication

Reference Books:

Sr. No	Name of the book	Author	Edition / volume
1.	Mastering Apache Spark	Mike Frampton	Packt Publishing
2	Learning Spark	Holden Karau, Andy Kowinski & Matei Zaharia	O'Reilly Media

- https://spark.apache.org/docs/latest/streaming-programming-guide.html
- https://spark.apache.org/docs/latest/graphx-programming-guide.html
- https://spark.apache.org/docs/latest/sparkr.html

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim Institute of Technology

Department of Computer Engineering

Bachelor of Technology (B. Tech) - Computer Engineering (Artificial Intelligence)

Subject: Information Security Fundamentals **Semester: 7**

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	30	-	70	-	100

Objectives:

- To help students understand foundational concepts of information security
- To make it possible for students to appreciate the need for securing information from threats and risks
- To facilitate students to gain knowledge on how network infrastructure and connectivity can be secured

Sr. No.	Course Contents	Number of Hours
1	**Introduction to Information Security** Definition of Information Security, Evolution of Information Security; Basics Principles of Information Security; Critical Concepts of Information Security; Components of the Information System; Balancing Information Security and Access; Implementing IT Security, The system Development Life cycle, Security professional in the organization.	10
2	**The Need for IT Security** Business Needs-Protecting the functionality, Enabling the safe operations, Protecting the data, safe guarding the technology assets; Threats-compromises to Intellectual property, deliberate software attacks, Espionage and trespass, sabotage and vandalism; Attacks-Malicious Codes, Back Doors, Denial of Service and Distributed Denial of Service, Spoofing, sniffing, Spam, Social Engineering.	10

3	**Risk Management** Definition of risk management, risk identification, and risk control, Identifying and Accessing Risk, Assessing risk based on probability of occurrence and likely impact, the fundamental aspects of documenting risk via the process of risk assessment, the various risk mitigation strategy options, the categories that can be used to classify controls.	10
4	**Network Infrastructure Security and Connectivity** Understanding Infrastructure Security- Device Based Security, Media-Based Security, Monitoring and Diagnosing; Monitoring Network- Firewall, Intrusion Detection System, Intrusion Prevention system; OS and Network Hardening, Application Hardening; Physical and Network Security- Policies, Standards and Guidelines.	10
5	**Information Asset Classification** Classification of Information, Information Assets – Owner, Custodian, User, Information Classification in terms of Secret, Confidential, Private and Public, Declassification. Retention and Disposal of Information Assets. Provide Authorization for Access – Owner, Custodian and User	10

Outcomes:

- explain basic concepts and importance of information security
- identify threats to information security, analyse their impact and propose suitable countermeasures
- describe various aspects of securing network infrastructure and importance of classifying information

Text Books:

1. Mark Stamp's Information Security: Principles and Practice (WIND) Paperback – 2009 by Deven N. Shah, Wiley (2009)
2. Information Security Risk Analysis - Thomas R. Peltier, Third Edition, Pub: Auerbach, 2012
3. Information Systems Security: Security Management, Metrics, Frameworks and Best Practices by Nina Godbole, Wiley, 1st ed; 2008
4. Information Security: The Complete Reference by Mark Rhodes-Ousley, McGraw Hill Education; Second edition (1 May 2013)
5. Principles of Information Security by Michael E. Whitman, Cengage Learning India Private Limited; 5 edition (2015)
6. Cryptography and Network Security Principles and Practices, by William Stallings, Pearson Education; Seventh edition (30 June 2017)

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim Institute of Technology

Department of Computer Engineering

Bachelor of Technology (B. Tech) - Computer Engineering (Artificial Intelligence)

Subject: Infrastructure Containers **Semester: 7**

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	30	-	70	-	100

Objectives:

- Introducing Docker Architecture and its components.
- Working with Docker containers.
- Building Docker images by utilising the Docker file.
- Build applications and services using Docker.
- Implementing Docker Networking
- Using Docker APIs and Engine APIs
- Orchestrating Docker containers and discovering Docker services

Sr. No.	Course Contents	Number of Hours
1	**Unit I:** **Getting Started with Docker** Introduction to Dockers, Containers vs Virtual Machines, Docker Architecture, Docker Components, Installing Docker, Working with Docker Containers, Introduction to Swarm mode and Micro services.	8
2	**Unit II:** **Docker Images and Repositories** Docker Image Layers, Listing Docker Images, Pulling Images, Searching Images, Building Docker Images – Using Commands, Using Docker File, Working with Docker file, pushing image to the Docker Hub, Deleting an Image, Running	8

	Docker Registry.	
3	**Unit III:** **Containerized Applications** Docker to build and test a web application, Docker for Continuous Integration, Managing Multi-configuration job, Building services with Docker – Application, Application Server and Multi-container application stack, managing containers without SSH.	8
4	**Unit IV:** **Docker Networking and Docker APIs** Introduction to Docker Networking, None Network, Bridge Network, Host Network, Overlay Network, Container Networks with Docker Compose. The Docker APIs, Engine API, Managing images and containers with API, Authenticating the Docker Engine API**.**	8
5	**Unit V:** **Docker Orchestration and Service Discovery** Docker Compose, Consul, Service Discovery and Docker, Docker Swarm, Orchestration alternatives and components – Fleet and etcd, Kubernetes, Apache Mesos, Helios, Centurion.	8

Outcomes:

- Develop Containerized applications and implement continuous integration using Docker.
- Manage images and containers using Docker API.
- Create their own images and build the repository.
- Implement Docker Orchestration and Service discovery features.

Text Books:

1. James Turnbull, “The Docker Book: Containerization is the new virtualization", Docker Inc.,
2. Gene Kim, Patrick Debois, John Willis, Jez Humble, John Allspaw, "The DevOps Handbook: How to Create World-Class Agility, Reliability, and Security in Technology Organizations ", IT Revolution Press, First Edition, October 2016
3. Jeff Nickoloff, "Docker in Action" , Manning Publication Co., First Edition, 2016.

List of Experiments:

1. Docker Installation and Image setup.
2. Creating Images from Containers
3. Exposing Container Ports to the Host
4. Creating Custom Image from a Dockerfile
5. Managing Containers
6. Adding external containers to the containers
7. Base Image Maintenance and Cleanup
8. Building a Web farm for development and Testing
9. Creating Containerized Web Applications
10. Pushing Docker Images to Docker Hub

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim Institute of Technology

Department of Computer Engineering

Bachelor of Technology (B. Tech) - Computer Engineering (Artificial Intelligence)

Subject: Android Application Development **Semester: 7**

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	30	-	70	-	100

Objective:

1. Android is a comprehensive open source platform designed for mobile devices. It is championed by Google and owned by Open Handset Alliance.
2. The goal of the alliance is to "accelerate innovation in mobile and offer consumers a richer, less expensive, and better mobile experience." Android provides all the tools and frameworks for developing mobile apps quickly and easily. The Android SDK is all you need to start developing for Android. Android OS can be found in a series of mobile devices currently.
3. This course focuses to provide a conceptual understanding of android programming including design principles, practical implementation and development skills for programmer.

Course Content:

Sr. No.	Course Contents	Number of Hours
1	**Unit 1: Introduction to Android and Android Studio** Introduction, History, Features, Android Architecture, Versions/Evolution, Dalvik VM, Installing Android Studio (latest Version), Android Studio Environment, First Android Application, Application Folder Structure, Manifest file, R.java file, Activity, Activity life cycle, Application Components, Resource Files.	8

2	**Unit 2:UI Layouts and UI Elements** Layout, Linear Layouts, Relative Layout, Table Layout, Constraint Layout, View, TextView, EditText, Button, Events & Listeners, Image Button, floating Button, AutoCompleteTextView, RadioButton, RadioGroup, ToogleButton, CheckBox, Spinner, ProgressBar. Toast, Alert Dialogs, Custom Alert Dialog.	8
3	**Unit III:UI List, Picker Elements & Menus** ListView, ArrayAdapter, GridView, TableView, Custom ListView, Menus, Option Menu, Context Menu, Popup Menu TimePicker, DatePicker	8
4	**Unit IV:Data Persistency, Storage and Media** Preferences, Shared Preferences, Internal Storage, External Storage, SQLite Database, Content Providers, Media API, Audio, Video, Camera	8
5	**Unit V:Kotlin, Testing and Publishing App** Introduction, Setting Up Kotlin Environment, Data Types, Control Statements, Classes & Objects, Interfaces, Extensions, Generics, Enums, Simple Android App using Kotlin, Unit Testing, Instrumentation Testing, Activity Testing, Publishing App to Google Play Store	8

Outcomes:

- To provide students with an understanding of fundamental concepts in Android and hands on experience with Android programming including design, development and testing skills.
- On completion of this course the learner should be able to design and implement a variety of basic Android Apps.

Text/Reference Books:

1. Professional Android 4 Development by Reto Meier, John Wiley and Sons, 2012
2. Android in Action, Third Edition, by W. Frank Ableson, RobiSen, Chris King, C. Enrique Ortiz, 2012
3. Android Application Development Cookbook, by Wei-Meng Lee, John Wiley and Sons, 2013
4. Beginning Android 4, by Grant Allen, Apress, 2011.

Android Application Development Lab

List of Experiments:

1. Hello World Android Application
2. Hello Toast application
3. Product Review application
4. Using resources, templates, creating an app icon
5. TwoActivities application
6. Extended TwoActivities application
7. Implicit events
8. Calculator application
9. Using the Debugger
10. Testing your application

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim Institute of Technology

Department of Computer Engineering

Bachelor of Technology (B. Tech) - Computer Engineering (Artificial Intelligence)

Subject: Environmental Science **Semester: 7**

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	30	-	70	-	100

Objectives:

1. Understand how science and the scientific method work to address environmental problems.
2. Familiar with the Earth's major systems (ecosystems and biogeochemical cycles), how they function and how they are affected by human activity (population growth, air, water and soil pollution, ozone depletion, global warming, solid waste disposal).
3. Learn about the interaction of human society (urban sprawl, energy use/generation, resource consumption and economics) with the Earth's systems

Sr. No.	Course Contents	Number of Hours
1	**Unit – I: Introduction to Environmental studies and Ecosystems** Multidisciplinary nature of Environmental studies, Scope and importance; Concept of sustainability and sustainable development, What is an ecosystem? Structure and function of ecosystem; Energy flow in an ecosystem: food chains, food webs and ecological succession. Case studies of the following ecosystems: Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, oceans,estuaries)	8
2	**Unit – II: Renewable and Non-renewable Resources and Biodiversity and Conservation** Land resources and land use change; Land degradation, soil erosion and desertification, Deforestation: Causes and impacts due to mining, dam building on Environment, forests, biodiversity and tribal populations, Water :Use and over---exploitation of surface and ground water, floods, droughts, conflicts overwater (international &inter---state), Energy resources : Renewable and non renewable energy sources, use of alternate energy sources, growing energy needs, , Levels of biological diversity : genetic, species and ecosystem diversity; Biogeographic zones of India; Biodiversity patterns and global biodiversity	8

	hotspots, India as a mega-biodiversity nation; Endangered and endemic species of India, Threats to biodiversity: Habitat loss, poaching of wildlife, man---wildlife conflicts, biological invasions; Conservation of biodiversity: In---situ andEx---situ conservation of biodiversity, Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.	
3	**Unit – III: Environmental Pollution** Environmental pollution : types, causes, effects and controls; Air, water, soil and noise pollution, Nuclear hazards and human health risks, Solid waste management : Control measures of urban and industrial waste. Pollution case studies.	8
4	**Unit – IV: Environmental Policies & Practices** Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture, Environment Laws: Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act. International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity(CBD), Nature reserves, tribal populations and rights, and human wildlife conflicts in Indian context	8
5	**Unit – V: Human Communities and the Environment and Field work** Human population growth: Impacts on Environment, human health and welfare, Resettlement and rehabilitation of project affected persons; case studies, Disaster management : floods, earthquake, cyclones and landslides, Environmental movements :Chipko, Silent valley, Bishnois of Rajasthan, Environmental ethics: Role of Indian and other religions and cultures in Environmental conservation, Environmental communication and public awareness, case studies (e.g., CNG vehicles in Delhi), Visit to an area to document Environmental assets: river/ forest/ flora/fauna etc, Visit to a local polluted site-Urban/Rural/Industrial/Agricultural, Study of common plants, insects, birds and basic principles of identification, Study of simple ecosystems--pond, river, Delhi Ridge, etc.	8

Course Outcome:

On successful completion of the course, students will be able to,

1. Understand environmental studies, importance and its ecosystems
2. Explain renewable and non-renewable resources
3. Describe environment pollutions, policies and practices
4. Understand human communities and the field work

Suggested Readings:

1. Carson, R. 2002. Silent Spring. Houghton MifflinHarcourt.
2. Gadgil,M.,&Guha,R.1993.ThisFissuredLand:AnEcologicalHistoryofIndia.Univ.ofCaliforniaPress.
3. Gleeson,B.andLow,N.(eds.)1999.GlobalEthicsandEnvironment,London,Routledge.
4. Gleick,P.H.1993.WaterinCrisis.PacificInstituteforStudiesinDev.,Environment&Security. Stockholm Env. Institute, Oxford Univ.Press.
5. Groom,MarthaJ.,GaryK.Meffe,andCarlRonaldCarroll.PrinciplesofConservationBiology. Sunderland: Sinauer Associates,2006.
6. Grumbine,R.Edward,andPandit,M.K.2013.ThreatsfromIndia'sHimalayadams.Science,339:36---37.

SWARRNIM STARTUP & INNOVATION UNIVERSITY
Swarrnim Institute of Technology
Department of Computer Engineering
Bachelor of Technology (B. Tech) - Computer Engineering
(Cloud Technology & Information Security)
Code: _____

Subject: Advance Android Application Development **Semester: 7**

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	30	-	70	-	100

Objectives: -

- Gain knowledge on Native API and Location API
- Gain knowledge on Services, Notifications and Receivers
- Gain knowledge on IPC and Sockets
- Gain knowledge on Graphics
- Gain knowledge on third party API integration.

Prerequisites: - Basic Android Programming

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Native and Location API** Camera, Permissions, Sensors, Bluetooth, WiFi, SMS, Telephony, GPS, Location Manager, Google Maps.	9
2	**Services and Networks**	9

	Services, Broadcast Receiver, Alarm Services, Notifications, Notification manager, AIDL, Handler and Messenger, IPC, Sockets.	
3	**Threads and Graphics** Process, Threads, Thread Life Cycle, Task, Asynchronous Task, Graphics Introduction, Canvas/Drawing into a view, Surface View/Surface Holder, Animation, Frame Animations .	9
4	**Mobile Web, Integrating Facebook and Twitter** Web Applications, Json, Parsing Json, Web View, Viewport, Web Services, Consuming Web services, Develop clients for web services, Integrating Facebook, Integrating Twitter	9
5	**Universal App and Material Design** Introduction to Universal Applications, Fragments, Designing App for Different Devices, Introduction to Material Design, Material Themes, Lists, Cards, Maintaining Compatibility.	9

Learning Outcomes:-

At the end of the course, students will be able to:

- use camera and location api to build Android Apps
- use services and receivers to build Android Service Apps
- use threads and graphics to build Game kind of Android Apps
- use third party api to build rich Android Apps

Teaching & Learning Methodology:-

- The class will be taught using theory and case based method. In addition to assigning the case studies, the course instructor will spend considerable time in understanding the concept of innovation through the eyes of the consumer. The instructor will cover the ways to think innovatively liberally using thinking techniques

Books Recommended:-

Text/Reference Books:

1. Professional Android 4 Development by Reto Meier, John Wiley and Sons, 2012
2. Android in Action, Third Edition, by W. Frank Ableson, RobiSen, Chris King, C. Enrique Ortiz, 2012

3. Android Application Development Cookbook, by Wei-Meng Lee, John Wiley and Sons, 2013
4. Beginning Android 4, by Grant Allen, Apress, 2011
5. Beginning Tablet Programming, by Robbie Matthews, Apress, 2011.

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim Institute of Technology

Department of Computer Engineering

Bachelor of Technology (B. Tech) - Computer Engineering

(Cloud Technology & Information Security)

Code: _____

Subject: Block chain **Semester: 7**

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	30	-	70	-	100

Objectives: - This course is intended to study the basics of Blockchain technology. During this course learner will explore various aspects of Blockchain technology like application in various domains. By implementing learner will have idea about private and public Blockchain, and smart contract.

Prerequisites: - Basics of cryptography

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Introduction to Block chain and Cryptography** What is cryptography, Hashing Algorithms, Digital Signatures, What is Block chain?, Why Block chain is secure?, Features of Block chain, Private and Public key in block chain transaction	9
2	**Working of Block chain** How block chain works?, Genesis Block, Consensus Algorithms, Proof of Work vs. Proof of Stake, Why Bitcoin is on the hype?	9

3	**Ethereum And Hyperledger** What is Ethereum, Introduction to Ethereum, Consensus Mechanisms, How Smart Contracts Work, What is Hyperledger? , Distributed Ledger Technology & its Challenges, Hyperledger & Distributed Ledger Technology, Hyperledger Fabric, Hyperledger Composer	9
4	**Introduction to Decentralized Application** What is decentralization, Difference between centralized and decentralized applications, Disadvantages of centralized applications, dApps architecture, How to develop dApps, Future of Decentralized Applications, Application of dApps (Healthcare, supply chain, banking)	9
5	**Merkle Tree and Crypto currencies** Introduction to Merkle Tree Data Structures, Introduction to Crypto currencies, Advantages of Proof of Work and Proof of Stake, Disadvantages of Proof of Work and Proof of Stake, Bit coin Mining Future of Block chain	9

Learning Outcomes:-

* On successful completion of the course, the student will:

- Understand and explore the working of Blockchain technology (Understanding)
- Analyze the working of Smart Contracts (Analyze)
- Understand and analyze the working of Hyperledger (Analyze).
- Apply the learning of solidity and de-centralized apps on Ethereum (Apply)

Teaching & Learning Methodology:-

The class will be taught using theory and case based method. In addition to assigning the case studies, the course instructor will spend considerable time in understanding the concept of

innovation through the eyes of the consumer. The instructor will cover the ways to think innovatively liberally using thinking techniques

Books Recommended:-

1. Imran Bashir, “Mastering Block Chain: Distributed Ledger Technology, Decentralization and Smart Contracts Explained”, Packt Publishing
2. Ritesh Modi, “Solidity Programming Essentials: A Beginner’s Guide to Build Smart Contracts for Ethereum and Block Chain”, Packt Publishing
3. Anshul Kaushik, “Block Chain and Crypto Currencies”, Khanna Publishing House, Delhi.
4. Josh Thompsons, “Block Chain: The Block Chain for Beginners- Guide to Block chain, Technology and Leveraging Block Chain Programming”

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim Institute of Technology

Department of Computer Engineering

Bachelor of Technology (B. Tech) - Computer Engineering

(Cloud Technology & Information Security)

Code:_____

Subject: Embedded System Programming **Semester: 7**

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	30	-	70	-	100

Objectives: -

- Developing Embedded Systems from Scratch History & Evolution of Microprocessor and Microcontrollers
- Understand Embedded Microcontrollers platforms and its Programming Techniques
- Understanding Open Source Computing
- Understanding and developing basic modules of Embedded Systems
- Hands-On approach with Real time simulators and Actual Hardware platform

Prerequisites: - NA

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Introduction to Arduino** Introduction to Embedded Systems, Microprocessor vs Microcontroller, different microcontroller architecture, History of AVR Microcontrollers, The Arduino Platform, Block diagram, Architecture, Arduino Boards Pin functions, Overview of main	9

	features such as – I/O ports, timers, interrupts Serial port, PWM, ADC etc.	
2	**Getting Started with Programming:** Arduino Schematics, Concept of C-Language, C vs Embedded C, Introduction to Arduino IDE, Writing, Saving, Compiling and Uploading Sketches., Hello world program.	9
3	**Superv Digital & Analog I/O Programming** Digital Output Programming by discrete LED interface, Timer & delay time function, 7-segment LED programming, Buzzer interface, and programming. Digital Input Programming by interfacing Switches, Analog out (PWM) programming using RGB-LED interface. Analog Input Programming using POT.	9
4	**Conditions, loops, switch-case & functions** Loops and conditions based programming, while –loop, Function-prototype, declaration, and calling, declaring local and global variables, condition based switch-case.	9
5	**Serial communication & Peripheral Interfacing** Debugging & Debug Environment, Debug via Serial terminal, RS-232 & UART protocol communication, Reading & Writing using Serial, Peripherals Interface &Programming: 16x2 Alphanumeric LCD Interface, 4x4 keypad interface, H-bridge & DC motor Interface, LDR, IR sensor Interface.	9

Learning Outcomes:-

* On successful completion of the course, the student will:

- The Embedded Systems/IoT and their applications The role of Hardware in IoT
- The basics to intermediate understanding of Open source hardware
- Design and development of small scale applications using open source platform (Arduino-Hardware/Software)

Teaching & Learning Methodology:-

The class will be taught using theory and case based method. In addition to assigning the case studies, the course instructor will spend considerable time in understanding the concept of innovation through the eyes of the consumer. The instructor will cover the ways to think innovatively liberally using thinking techniques

Books Recommended:-

- Beginning with Arduino", by Michael McRoberts,
- "Arduino Cookbook", by Michael Margolis,
- "Getting Started with Arduino", by Massimo Banzi,

SWARRNIM STARTUP & INNOVATION UNIVERSITY
Swarrnim Institute of Technology
Department of Computer Engineering
Bachelor of Technology (B. Tech) - Computer Engineering
(Cloud Technology & Information Security)
Code: _____

Subject: IT Governance & Risk Management **Semester: 7**

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	30	0	70	0	100

Objectives: -This course will provide participants with an understanding of all the globally accepted GRC frameworks and how they can be applied to drive higher levels of business performance and improve short, medium and long-term business sustainability. Governance, Risk Management, and Compliance (GRC) are three main pillars that help assure an organization reliably achieves objectives, addresses uncertainty and acts with integrity. These frameworks ensure Confidentiality, integrity, and availability of information is maintained while operating more efficiently, enabling effective information sharing, predicting and managing risks

Prerequisites: -Knowledge of ISO 27001, PCI DSS, HIPAA, and various other cyber security compliance requirements.

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**IT Governance-Part 1:** Introduction & Concepts, Origin of Governance, Corporate Governance, Best Practices for IT	9

	Governance, Role of Governance in Information Security, Six outcomes of effective Security Governance, benefits of good governance, Cultural aspects in governance	
2	**IT Governance-Part 2:**IT Governance-Roles and Responsibilities, Role of IT Strategy Committee and Security Steering Committee, Standard IT Balanced Scorecard. Val-IT framework of ISACA, Governance in multi-department and multi-country enterprises, Importance of Governance in establishing a sustainable Security Culture in the organization	9
3	**Information Systems Strategy:** Role of Strategic Planning for IT, Strategic Direction and Alignment of Security Strategy with Business Objectives, Role of CISO, Security Metrics Program	9
4	**Risk Management Program**: Develop a Risk Management Program. Risk Management Process, Roles and Responsibilities, Risk-IT Framework of ISACA, Strategic Security decisioning using Risk Management	9
5	**Information Security Management:** Introduction, Performance Optimization, Management Information Security Forum, Segregation of Duties, Description of COBIT and other Frameworks, Security Program Effectiveness, Continuous Assessment and Improvement, In-sourcing versus Out-sourcing, Impact of ISM program across organization	9

Learning Outcomes:-

* On successful completion of the course, the student will:

- Explain how security is integrated with IT governance
- Justify the need for using standard frameworks in establishing a robust information security and risk management

Teaching & Learning Methodology:-

The class will be taught using theory and case based method. In addition to assigning the case studies, the course instructor will spend considerable time in understanding the concept of

innovation through the eyes of the consumer. The instructor will cover the ways to think innovatively liberally using thinking techniques

Books Recommended:-

Reference Books:

1. Managing Risk and Information Security by Malcolm Harkins, Apress; 1 edition, 2012
2. IT Governance: An International Guide to Data Security and ISO27001/ISO27002 by Alan Calder, Steve Watkins, Kogan Page; 6 edition (3 September 2015)
3. ISACA publications on COBIT, RiskIT and ValIT
4. Information Security Governance: Guidance for Information Security Managers by W. Krag Brotby and IT Governance Institute, Isaca (2 June 2008)
5. COBIT 5 Framework Perfect by Isaca, (10 April 2012)
6. Cobit 5 Foundation-reference and Study Guide by Ana Cecilia Delgado, CreateSpace Independent Publishing Platform; Stg edition (20 June 2016)
7. Governance of Enterprise IT Based on COBIT 5: A Management Guide by Geoff Harmer (Author), IT Governance Publishing, (6 February 2014)

E-Resources:-

1, https://en.wikipedia.org/wiki/Governance,_risk_management,_and_compliance

2, https://www.pwc.com/la/en/risk-assurance/it-grc.html

3, https://www.infosys.com/services/cyber-security/documents/governance-risk-compliance.pdf

SWARRNIM STARTUP & INNOVATION UNIVERSITY
Swarrnim Institute of Technology
Department of Computer Engineering
Bachelor of Technology (B. Tech) - Computer Engineering
(Cloud Technology & Information Security)
Code: _____

Subject: IT Service Frameworks – ITIL **Semester: 7**

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	-	3	3	30	0	70	0	100

Objectives: -

- ITIL-compatible tools offer better integration, interaction and compatibility with your global partners, and in addition, sticking to strict ITIL standards from a single vendor can help process integrations go seamlessly and ensure all parties are speaking the same technical language.
- It is always an advantage to understand what types of ITIL tools your global partners are working with and how they rate them. ITIL frameworks provide a homogenous IT environment and eases interactions with other global companies using similar preapproved tools. Managing staff, providing services to customers and creating efficiencies for less money can be daunting tasks for any IT organization.

Prerequisites: -Knowledge of ISO 27001, PCI DSS, HIPAA, and various other cyber security compliance requirements.

Course outline:-

Sr. No.	Course Contents	Number of Hours
I	**ITIL Overview and Service Strategy**	9

	ITIL History, Components of the ITIL Library, IT Service Management, Organizing for IT Service Management, Technology and Architecture, Overview of HPSM and OTRS as service management tool, Service Strategy: Service Strategy Lifecycle Stage, Service Portfolio Management, the Demand Management Process, the IT Financial Management Process, Introduction to ISO 20000 Standards.	
II	**Service Design** Service Design Lifecycle Stage, The Service Catalog Management Process, The Service Level Management Process, The Availability Management Process, The Capacity Management Process, The Information Security, Management Process, The IT Service Continuity, Management Process, The Supplier Management Process .	9
III	**Service Transition** Service Transition Lifecycle Stage, the Change Management Process, the Release and Deployment Management Process, the Service Asset and Configuration Management Process, Knowledge Management.	9
IV	**Service Operation** Service Operation Functions : Service Operation Lifecycle Stage, The Service Desk Function, The Technical Management Function, The Application Management Function, The IT Operations Management Function Service Operation Processes :The Event Management Process, The Incident Management Process, The Request Fulfilment Process, The Access Management Process, The Problem Management Process.	9
V	**Continual Service Improvement** Continual Service Improvement principles - CSI and organizational change, Ownership, Role definitions , External and internal drivers , Service Level Management , The Deming	9

	Cycle, Service measurement ,Knowledge Management, Benchmarks , Governance ,Frameworks, models, standards and quality systems Continual Service Improvement processes : 7step improvement process, Service reporting, Service management, return on in investment for CSI, business questions for CSI, Service level management	

Learning Outcomes:-

* On successful completion of the course, the student will:

- Understand the concepts of ITIL process and first stage
- Understand the process of service design stage of ITIL
- Explore the service transition phase
- Elaborate the working of service operation stage
- Illustrate the steps of continual service improvement stage

Teaching & Learning Methodology:-

The class will be taught using theory and case based method. In addition to assigning the case studies, the course instructor will spend considerable time in understanding the concept of innovation through the eyes of the consumer. The instructor will cover the ways to think innovatively liberally using thinking techniques

Books Recommended:-

Reference Books:

- Introduction to ITIL, Jan van Bon Stationery Office Books, The Stationery Office, 2010
- HP operation Manual from HP, 2010
- A Guide to Service Desk Concepts Donna Knapp From Cengage Learning, 2010
- The Shortcut Guide to Virtualization and Service Automation, Greg Shield Real-time Publishers, 2008
- Service automation and dynamic provisioning techniques in IP/MPLS environments - Christian Jacque net, Gilles Bourdon, Mohamed Boucadair John Wiley and Sons, 2008.

SWARRNIM STARTUP & INNOVATION UNIVERSITY
Swarrnim Institute of Technology
Department of Computer Engineering
Bachelor of Technology (B. Tech) - Computer Engineering
(Cloud Technology & Information Security)
Code: _____

Subject: Server Administration **Semester: 7**

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
2	-	2	5	3	30	50	70	-	150

Objectives:-

- To recognize and explore various services provided the windows server 2012
- To analyze and apply centralized services with client nodes of the network
- To recognize the importance of active directory and dynamic access control services while applying the same in the server network infrastructure
- To justify the minimal management and attain improved performance with Hyper v client.

Prerequisites:- Basics of cloud computing and storage.

Course outline:-

Sr. No.	Course Contents	Number of Hours
I	**Introduction to server 2012 and its services** Administering Windows Server 2012 -The Deploy Manage and Maintain Servers Section- Install and Configure Windows Deployment Services (WDS)-Deploy and Manage Server	6

	Images-Install and Configure Windows Server Update Services (WSUS) - Implement Patch Management Monitor Servers - The Configure File and Print Services Section.	
II	**File system and policies** Install and Configure Distributed File System (DFS) - Manage Distributed File System (DFS) - Configure File Server Resource Manager (FSRM) - Configure File and Disk Encryption - Configure Advanced Audit Policies.	**6**
III	**Network services** The Configure Network Services and Access Section - Configure DNS Zones - Configure DNS Records - Install and Configure Remote Access - Configure VPN - Configure Web Application Proxy - Configure Direct Access – server virtualization in windows - introduction to Hyper v – managing hyper v- steps to improve the client hyper – v.	**6**
IV	**Network policies** The Configure a Network Policy Server (NPS) Infrastructure Section- Configure Network Policy Server - Configure NPS Policies - Configure Network Access Protection-The Configure and Manage Active Directory Section.	**6**
V	**Active directory and group policies** Configure Service Authentication -Configure Domain Controllers -Maintain Active Directory - Configure Account Policies- The Configure and Manage Group Policy Section- Configure Group Policy Processing - Configure Group Policy Settings - Manage Group Policy Objects GPOs) - Configure Group Policy Preferences GPP) .	**6**

Learning Outcomes:-

After learning the course the students should be able to:

- Recognize the various services of Server 2012
- Configuration of Active directory and manage the domains
- Administrate and manage the AD domains in server 2012
- Maintain and manage the group policies.

Books Recommended:-

- MCSA Windows Server 2012 R2 3-in-1 Complete Study Guide - 2015 edition by William Panek
- Insalling And Configauration Windows Server 2012 R2 by Craig Zacker - 2014 edition – wiley pubications
- 70-411 Administering Windows Server 2012 R2 – wiley publications

Practical List:

1. Installing and Configuring Windows Server 2012 Core Version and Converting from Core version to GUI.
2. Configuring Local storage using Disk management and Diskpart commands.
3. Installing and Configuring FSRM for Quota management and File Screening.
4. Configuring EFS and creating recovery agent.
5. Securing Disk and Drive using Bit Locker Drive Encryption
6. Installing and Configuring Primary DNS Server.
7. Installing and Configuring Secondary and Stub Zone for DNS Server
8. Installing and Configuring Windows Server Update Services [WSUS].
9. Configuring Group Policies for Updates so that clients can target WSUS Server.
10. Creating and Configuring Data Collector Set.

SWARRNIM STARTUP & INNOVATION UNIVERSITY
Swarrnim Institute of Technology
Department of Computer Engineering
Bachelor of Technology (B. Tech) - Computer Engineering
(Cloud Technology & Information Security)
Code: _____

Subject: Server Side Scripting **Semester: 7**

Teaching & Evaluation Scheme:-

Teaching Scheme				**Credits**	**Evaluation Scheme**				
					Internal		**External**		**Total**
Th	**Tu**	**Pr**	**Total**		**Th**	**Pr**	**Th**	**Pr**	
2	**-**	**2**	**4**	**3**	30	50	70	-	150

- **Objectives:** - To learn the server side scripting languages and their applications. To understand complementarity of the class of languages to systems languages, their strengths and weaknesses.
- To learn Frameworks and CMS. To get knowledge about server side scripting language python and ruby. Regular expressions, text processing, client- and server-level scripting and CGI, GUI programming using Python.
- Basic concepts: scripts and scripting, scripting versus programming, scriptable objects and component ware, Ajax.

. **Course outline:-**

Sr. No.	**Course Contents**	**Number of Hours**
1	**Introduction to Server- Side Scripting Languages** Server-side Scripting, Different Scripting Languages, Web services, Web application frameworks – MVC, General purpose frameworks – e.g., Django, RoR; Discussion forums, Wikis, Weblogs, Content	6

	management system (CMS).	
2	**Introduction to Python** How to set up the environment, Lexical conventions and Syntax, Variables, Data Types, Operators, Statements and Expressions, Decision making, Loops, Strings, Tuples, Lists, Dictionary, Recursion, Date and Time, Functions, Modules – math, random; Files I/O, Exceptions	6
3	**CGI and GUI Programming in Python** Classes and Objects, Regular Expressions, CGI Programming, Database Access Networking, Sending Email, Multithreading, XML Processing, GUI Programming, Extending and Embedding Python.	6
4	**Introduction to Ruby on Rails** MVC Architecture, How to install, Framework, Directory structure, Features, Basic Rails Application	6
5	**Advanced Rails Applications** Setting up the database, Active records, Migrations, Controllers, Routes, Views, Layouts, Scaffolding, AJAX, Uploading files, sending Email	6

Learning Outcomes:-

- Students will gain the knowledge, they should be able to
- Explain basic Server web architecture
- Understand working of web protocols like Python, Ruby Rails as well as IP and web address
- Understand the CGI and GUI Programming.
- Understand and use advance rails application

Teaching & Learning Methodology:-

The challenge that teaching and learning computer programming presents, has encouraged the design and implementation of various new and innovative computer programming teaching methods. The presented methods aim to improve the students' success rates by increasing their motivation and encouraging the greater self-engagement.

Books Recommended:-

Text Books:

1. Professional Ruby on Rails by Noel Rappin, Wiley India Pvt Ltd
2. Learn Ruby on Rails: Book one, by Daniel Kehoe
3. Python: Essential Reference, by David M. Beazley
4. Core Python Programming, by Wesley J. Chun, Prentice Hall
5. Python Programming: An Introduction to Computer Science, by John M. Zelle, Franklin – Beedle and Associates

Practical List:-

Practical
1. Write Python script to print prime number form m to n. where m<n 2. Write Python script to create “Book” class with properties “id”, “author” and “price”. Create 4 Book objects and print details of books on console 3. Write Python script to list files and their sizes from a directory 4. Write Python script for performing simple mathematical calculations using GUI. 5. Write python script to generate Login Screen(GUI) and perform authentication using “client” and “server” as username and password respectively 6. Write Python script to create “Student” table with columns “sno”, “sname” and “result” in MySQL server and insert minimum 3 records into the table and print them all on console 7. Write Python script for simple chat application using networking 8. Design & Develop Ruby on Rails web application, which contains a welcome screen and displays the welcome message to the user with his name after entering name using Request & Response objects. 9. Design & Develop Ruby on Rails web application to manipulate Book details using MySQL database. Web pages as follows a. Add book details screen/page b. List book details screen/page c. Update book details screen/page 10. Design & Develop Ruby on Rails web application to retrieve and delete book details from MySQL database using AJAX

SWARRNIM STARTUP & INNOVATION UNIVERSITY
Swarrnim Institute of Technology
Department of Computer Engineering
Bachelor of Technology (B. Tech) - Computer Engineering
(Cloud Technology & Information Security)
Code: _____

Subject: Machine Learning Semester: 7

Teaching & Evaluation Scheme:-

Teaching Scheme				**Credits**	**Evaluation Scheme**				
Th	**Tu**	**Pr**	**Total**		**Internal**		**External**		**Total**
					Th	**Pr**	**Th**	**Pr**	
3	**-**	**-**	**3**	**3**	**30**	**-**	**70**	**-**	**100**

Objectives: -

• To understand the basic concepts of statistical learning methods and models. • To understand the importance of supervised learning in multivariate data sets. • To understand the estimation procedure for multiple regression coefficients • To understand the assumptions in estimating regression coefficients using OLS method. • To understand the importance of supervised learning in classifying class labels for prediction.

Prerequisites: - NA

Course outline:-

Sr. No.	**Course Contents**	**Number of Hours**

1	**Introduction to Machine Learning:** Introduction to Machine learning – Statistical Learning – types of Machine Learning – learning models: geometric, probabilistic and logistic models, introduction to supervised, unsupervised and reinforcement	9

	learning, Generalized Linear Model, difference between Generalized and General Linear Model, Link Functions and Linear Predictors, Parameter Estimation and Inference in the GLM, Prediction and Estimation with the GLM, Residual Analysis in the GLM : Raw and deviance residual, introduction to over dispersion, concepts on Poisson Regression.	
2	**Supervised Learning –Regression Analysis:** Introduction to parametric machine learning method, assumptions of parametric machine learning methods, linear model and its assumptions, simple linear regression, parameter estimation, properties of regression parameters, testing the significance of regression parameters, estimation of σ^2, Interval Estimation of the Mean Response, prediction of new observations, Confidence interval for β_0, β_1 and σ^2, Multiple linear Regression analysis, parameter estimation, and significance of coefficients, assumptions of multiple linear regression parameters.	9

3	**Classification Techniques – Logistic Regression:** Introduction to logistic regression, assumptions involved in logistic regression, concepts on odds and odds ratio, maximum likelihood estimation, binomial logistic regression, parameter estimation, properties of logistic regression coefficients, logistic regression for correlated data, model accuracy testing, confusion matrix, Receiver Operating Characteristic Curve, area under curve, likelihood ratio test, concepts and interpretation of Pseudo R square tests, Hosmer Lemeshow Test, Wald Test, prediction using better fit model and interpretation.	9
4	**Classification Techniques – Decision Tree**: Introduction to decision tree algorithms, classification tree, characteristics of classification tree – size and hierarchical nature of tree, training and testing data set, induction algorithms, probability estimation in decision tree – Laplace correction and no match method, stopping	9

	criteria for tree development, pruning techniques and pruned tree, evaluation of decision tree classifiers, generalization error, F measure, Confusion matrix, ROC curve, Hit Rate Curve, Lift curve, McNemar's Test, Resample paired t test, K-fold cross validated paired t test, prediction using better model, Decision tree ensembles methods.	

5	**Kernel Models and Unsupervised Learning**: Introduction to kernel methods, basics of Support Vector Machine (SVM) and Support Vector Regression (SVR), SVM : classification margin, Maximum margin hyper plane, primal form, dual form, soft margin, SVR : regression tube, primal form, dual form, kernel trick, kernel functions, linear, polynomial, radial and sigmoidal kernel functions, kernel prediction and kernel based algorithm for SVM and SVR, unsupervised Learning – Clustering, principle component analysis.	9

Learning Outcomes:-

* On successful completion of the course, the student will:

• Understand the difference between continuous class label and discrete class label classification methods.

• Predict the continuous class variable using linear regression analysis. • Predict the binary class variable using decision tree and random forest. • Understand the importance of Logistic regression and its application in business. • Apply the assessment method to find the better fit model for classification techniques.

Teaching & Learning Methodology:-

The class will be taught using theory and case based method. In addition to assigning the case studies, the course instructor will spend considerable time in understanding the concept of innovation through the eyes of the consumer. The instructor will cover the ways to think innovatively liberally using thinking techniques

Books Recommended:-

1. Introduction to Linear Regression Analysis, Fifth Edition - DOUGLAS C. MONTGOMERY, ELIZABETH A. PECK, G. GEOFFREY VINING, A JOHN WILEY & SONS, INC., PUBLICATION

2. Introduction to Machine Learning - EthemAlpaydm, The MIT Press

3. Using Multivariate Statistics - Barbara G. Tabachnick, Linda S. Fidell, Pearson 4. Applied Multivariate Statistical Concepts - Debbie L. Hahs-Vaughn, Routledge, 2016

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF BIOTECHNOLOGY

Biogeohydrotechnology and Biofuels

Subject Code: 256010104

M.Sc. Semester-1

Teaching & Evaluation Scheme

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	-	2	6	8	30	50	70	50	200

Objectives

- To provide applied knowledge of waste management with different biological methods, marine biotechnology, microbiology of minerals and fuel biology.
- Learn about the Methodology of waste treatment, marine bacterial diversity, bioleaching methods & bio-oxidation.
- Get awareness on the conservation of energy and migration towards bioenergy such as biogas, bio-hydrogen, bioethanol, etc.

Prerequisites

Student must have basic knowledge about waste treatment, bacterial diversity as well as energy resources.

Course outline

Unit. No.	Course Contents	Teaching hours
1	**Waste treatment:** • Classification and characterization of waste • Principles and mechanisms of waste treatment • Biological methods of liquid waste treatment • Biological methods for solid waste management	10
2	**Marine Biotechnology:** • Marine environment and bacterial diversity • Cultivation and enumeration of marine bacteria • Application of indicators of marine microbial enzymes, polysaccharide, antimicrobial peptides and carotenoids	10
3	**Microbiology of Minerals:** • Bioleaching and Bio-oxidation • Biogeohydrotechnology of sulphidic minerals • Biobeneficiation • Acid mine drainage formation and control • Bioleaching methods and factors affecting bioleaching	10
4	**Fuel Biotechnology:** • Types of energy resources and their uses • Biotechnology for biogas, bioethanol, biodiesel and bio-hydrogen production ➢ Desirable and undesirable features of biofuels ➢ Energy crops ➢ MEOR ➢ Mode of utilization of biomass	10
		40

Learning Outcomes

- The students will be able to apply the knowledge of the biological methods for solid and liquid waste treatment, also get knowledge about classification and characterization of waste.

- Student should be able to understand marine bacterial diversity and also learn techniques for cultivation and enumeration of marine bacteria and get knowledge about indicators of marine microbial enzymes and its applications.

- The course is designed to give students understanding different methods of bioleaching, bio-oxidation, bio-beneficiation as well as biogeohydrotechnology of sulphidic minerals. The study fuel biotechnology also helps students to understand importance of energy resources with knowledge of biogas, bioethanol, biodiesel, bio-hydrogen technology.

GE, SSIU, KALOL, GANDHINAGAR
SSIU
N RATHOD
andhinagar
SWARNIM

- Access information on a topic from a variety of sources, and be able to learn new things on one's own.

- Communicate verbally, graphically, and/or in writing the theoretical data and laboratory experiments clearly and concisely that incorporates the stylistic conventions used by microbiologists worldwide.

Teaching & Learning Methodology

- We should aim to provide a range of modes of learning, including, for example, individual work, group work and opportunities for off-campus learning through visit to various research institutions across India or collaborative arrangements.
- The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:
- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Books Recommended

- Bimal C Bhattacharyya., & Rintu Banerjee (2007). *Environmental biotechnology.*
- Ronald M. Atlas., & Richard Bartha (1998). *Microbial Ecology: Fundamentals and Applications*, 4th Edition
- Brierley, C. L., Ehrlich, H. Lutz. (1990). *Microbial mineral recovery.*
- T. Scheper (1983). *Advances in biochemical engineering/biotechnology.*
- Garg, Sudhi. (2011). *Environmental Security: Human and Animal Health.*

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MICROBIOLOGY

Bioinstrumentation

CODE:256010102

M.Sc. 1st semester

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	-	-	4	4	30	--	70	--	100

Objectives:-

- To provide students basic knowledge of Bio-analytical techniques. This course begins with a review of basic bio analytical technique and an introduction to general terminologies
- The purpose of the course is to introduce students to methods of Bioanalysis and to develop required microbiological skills which will be helpful in their future.
- This course contains bio analytical techniques along with their theory, working principal, common instrumentation and possible applications. This course will be equally beneficial to various scientific areas including, life science, chemical science, material science and environmental science.

Prerequisites:-

Student must have passed B.Sc in Microbiology as major subject and have knowledge about biology field.

Course outline:-

Sr. No.	Course Contents	Number of Hours
1.	Electrochemistry: pH and buffers, potentiometric and conductometric titration. Principle and application of light, phase contrast, fluorescence, scanning and transmission electron microscopy, scanning tunneling microscopy, atomic force microscopy, confocal microscopy, cytophotometry and flow cytometry. Preparation of microbial, animal and plant samples for microscopy.	**10**
2.	Principle methodology and applications of gel – filtration, ion –exchange and affinity chromatography; Thin layer and gas chromatography; High performance liquid chromatography, FPLC. Electrophoresis: Principle and applications of Native and SDS PAGE; Agarose and 2D gel electrophoresis.	**10**
3.	Spectroscopy: UV, Visible, IR, NMR and ESR spectroscopy. Atomic absorption and plasma emission spectroscopy; MS and MALDI-TOF.	**10**
4.	Centrifugation: Basic principle and application; Differential, density and Ultracentrifugation. Principle of biophysical method and used for analysis of biopolymer structure; X ray diffraction, flurorescence, Principle and applications of tracer technique in biology: Radioactive Isotopes and half life of isotopes; Effect of radiation on biological system; autoradiography; cerenkov radiation; radiation dosimetry; scintillation counting. Biosensors: Principle and application	**10**

Learning Outcomes:

- The students will be able to use selected analytical techniques. Familiarity with working principals, tools and techniques of analytical techniques. student should be able to understand basic concepts of the present day scope and applications of Bioanalytical techniques.
- The course is designed to understand the strengths, limitations and creative use of techniques for problem-solving.

- The students will be able to select analytical technique for case study. able to design experiments and understand the instrumentation. Students can use their knowedge in Academic and industrial research organization ,Industries based on biotechnology, pharmacy, agriculture, and chemical

Teaching & Learning Methodology

- We should aim to provide a range of modes of learning, including, for example, individual work, group work and opportunities for off-campus learning through visit to various research institutions across India or collaborative arrangements.
- The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:
- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Books Recommended

- K. Wilson, J. M. Walker, Eds., Principles and techniques of biochemistry and molecular biology (Cambridge University Press, Cambridge, UK : New York, 7th ed., 2009).
- R. F. Boyer, Biochemistry laboratory: modern theory and techniques (Prentice Hall, Boston, 2nd ed., 2012).
- R. Katoch, Analytical techniques in biochemistry and molecular biology (Springer, New York, 2011).
- D. L. Spector, R. D. Goldman, Eds., Basic methods in microscopy: protocols and concepts from cells: a laboratory manual (Cold Spring Harbor Laboratory Press, Cold Spring Harbor, N.Y, 2006).
- R. L. Switzer, Experimental biochemistry (W. H. Freeman and Co, New York, 3rd ed., 1999).

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

- R. F. Boyer, Modern experimental biochemistry (Benjamin Cummings, San Francisco, 3rd ed., 2000).
- J. R. Lakowicz, Principles of fluorescen

E-Resources

- https://www.slideshare.net/drmohsin3/colorimetry-spectrophotometry
- https://www.tandfonline.com/doi/abs/10.1081/SPM-100100006?journalCode
- https://www.fishersci.se/se/en/scientific-products/centrifuge-guide/centrifugation-theory.html
- https://en.wikipedia.org/wiki/Chromatography#:~:text=Chromatography
- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1122955/#:~:text=Bi

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF BIOTECHNOLOGY

GENE STRUCTURE AND FUNCTION
Subject Code: 256010101

M.Sc. Semester -1

Teaching & Evaluation Scheme

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	-	-	4	4	30	--	70	-	100

Objectives

- To provide students basic knowledge of Molecular biology of prokaryotes as well as eukaryotes.
- The purpose of the course is to give students to introduction of replication, transcription, translation and post-translation protein processing in prokaryotes and eukaryotes.
- To provide an understanding of Gene regulation and expression system and also get idea about transposons and topology of DNA.

Prerequisites

Student Must have studied B.Sc. with Biotechnology or Microbiology as a major subject and knowledge of basic biology.

Course outline

Sr. No.	Course Contents	Teaching hours
1	**DNA structure** Chemistry of DNA, Forces stabilizing DNA structure, Helix parameters, Forms of DNA, Watson –Crick and Hoogsteen base pairing, Physical properties of ds DNA (UV-Absorption spectra, Denaturation and Renaturation, Cot curves, DNA hybridization), Chemicals that react with DNA. DNA topology: DNA supercoiling, Supercoiled forms of DNA, Superhelical density, energetics of supercoiled DNA, Biology of supercoiled DNA (Topological domains of DNA, DNA topoisomerases, Mechanisms of supercoiling in cells, Mechanism of action of Topoisomerase I and II, effect of supercoiling on structure of DNA and role of supercoiling in gene expression and DNA replication) DNA-protein Interactions: General features, Interaction of Helix-turn Helix motif, B-sheet, Zn- DNA binding domains, etc with DNA.	08
2	**Organization of DNA into chromosomes** Packaging of DNA and organization of chromosome in bacterial cells; Packaging of DNA in eukaryotic nucleosome and chromatin condensation, assembly of nucleosomes upon replication, Chromatin modification and genome expression. DNA replication: Mechanism of DNA polymerase catalyzed synthesis of DNA, Types of DNA polymerases in bacteria and their role. Initiation of chromosomal DNA replication and its regulation in prokaryotes, assembly of replisome and progress of replication fork, termination of replication. Types and function of eukaryotic DNA polymerases, initiation of replication in eukaryotes, role of telomerases in replication of eukaryotic chromosomes. Inhibitors of DNA replication (blocking precursor synthesis, nucleotide polymerization, altering DNA structure).	08
3	**Transcription** RNA polymerases, features of prokaryotic and eukaryotic promoters, assembly of transcription initiation complex in prokaryotes and eukaryotes and its regulation; synthesis and processing of prokaryotic and eukaryotic transcripts. Transport of RNA within eukaryotic cell. **Translation** Structure and role of t-RNA in protein synthesis, ribosome structure, basic features of genetic code and its deciphering, translation (initiation, elongation and termination in detail in prokaryotes as well as eukaryotes).	08
4	**Processing of proteome** Posttranslational processing of proteins (protein folding, processing by proteolytic cleavage, processing by chemical modification),	08

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

	Protein degradation. Regulation of gene expression in prokaryotes: Operon concept, positive and negative regulation. Examples of lac-, Ara-, His- and Trp-operon regulation; antitermination, global regulatory responses; Regulation of gene expression in eukaryotes: Transcriptional, translational and processing level control mechanisms.	

Learning Outcomes

- The students will be able to apply the knowledge of the Molecular biology to understands concepts of various fields like research fields, Gene manipulation, Genetic engineering, Genetics, etc.
- Student should be able to understand basic concepts of Replication, transcription and translation in prokaryotes as well as eukaryotes, gene regulations, protein targeting, transposons, retrotransposons, application of transposons, protein degradation, gene expression, operon systems.
- Access information on a topic from a variety of sources, and be able to learn new things on one's own.
- Communicate verbally, graphically, and/or in writing the theoretical data clearly and concisely that incorporates the stylistic conventions used by biotechnologist worldwide.

Teaching & Learning Methodology

We should aim to provide a range of modes of learning, including, for example, individual work, group work and opportunities for off-campus learning through visit to various research institutions across India or collaborative arrangements.

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties
- Provide learning materials in different formats (written, online, audio, video podcast etc.) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

Books Recommended

1. Lewin's GENES X, Volume 10Benjamin Lewin, Jocelyn Krebs, Stephen Kilpatrick, Elliott Goldstein-Jones & Bartlett Learning, 2011
2. Molecular Biology of the gene – Watson, Hopkins, Roberts 4TH edition
3. Molecular biology of the cell (third edition): By B Alberts, D Bray, J Lewis, M Raff, K Roberts and J D Watson.
4. iGenetics: A Molecular Approach (3rd Edition). by Peter J. Russell

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF BIOTECHNOLOGY

Microbial Diversity

Subject Code: 256010103

M.SC. Semester -1

Teaching & Evaluation Scheme

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	-	-	4	4	30	--	70	-	100

Objectives

- To provide students the basic knowledge cell, cell structure & its function and role of various biomolecules.
- The purpose of the course is to give student to introduction of Evolution of the cell, Chemical and physical foundations of biomolecules, Nucleotides, Biological membranes.
- To provide an understanding of various cell organelles, amino acids, Lipids, vitamins, and membrane structure and transport mechanisms.

Prerequisites

Student must have studied M.Sc. with microbiology as a major subject and knowledge of basic Microbial diversity.

Course outline

Sr. No.	Course Contents	Teaching hours
1.	**Principles of microbial diversity** • Principles and concepts of microbial diversity • Culturable and non-culturable diversity • Methods of studying diversity • Principles and concepts of metagenomics • Conservation of microbial diversity • Metabolic diversity in bacteria	10
2.	**Bacterial systematics** • Conventional and molecular systematics and general discussion on the occurrence, diversity, characteristic features, significance and potential applications of various groups of bacteria, comparison of Bergey's Manual of Systematic Bacteriology (Edition 1 and 2) • Diversity of actinomycetes • Diversity of cyanobacteria	10
3.	**Diversity of yeast and moulds** • Systematics and classification of fungi • Properties, structure and reproduction of economically important fungi • Mycorrhizal fungi • Biology of yeast and its role in industry • Ecological importance and significance of fungi	10
4.	**Diversity of Archaea** • Systematics occurrence, diversity, characteristics features, of different groups of archaea bacteria • Survival, adaptation and potential applications: Halophiles, Thermophiles, Alkalophiles and Acidophile	10

Learning Outcomes

- The students will be able to understand the Knowledge of Diversity.
- Student should be able to understand basic concepts of Microbial diversity ,Diversity of Yeast and moulds ,Diversity of Archaea.
- Access information on a topic from a variety of sources, and be able to learn new things on one's own.

Teaching & Learning Methodology

We should aim to provide a range of modes of learning, including, for example, individual work, group work and opportunities for off-campus learning through visit to various research institutions across India or collaborative arrangements.

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Books Recommended

- Oladele Ogunseitan(2004), Microbial Diversity. Form and Function in Prokaryotes**.**
- Mikel A. Becerro, Maria J. Uriz, Manuel Maldonado and Xavier Turon (Eds.)(2012), Advances in Sponge Science: Physiology, Chemical and Microbial Diversity, Biotechnology.
- Christine E. Salomon; Nathan A. Magarvey; David H. Sherman(2004), Merging the Potential of Microbial Genetics with Biological and Chemical Diversity: An Even Brighter Future for Marine Natural Product Drug Discovery
- Burnet et.al(1980), A guide to identifying and classifying yeast.
- Colwd. D,Microbial diversity.

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF BIOTECHNOLOGY

Diversity of Prokaryotic and Eukaryotic Microorganisms-103
Subject Code: 56010103
M.SC. Semester -1

Teaching & Evaluation Scheme

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	-	2	6	6	30	50	70	-	150

Objectives

- To provide students the basic knowledge cell, cell structure & its function and role of various biomolecules.
- The purpose of the course is to give student to introduction of Evolution of the cell, Chemical and physical foundations of biomolecules, Nucleotides, Biological membranes.
- To provide an understanding of various cell organelles, amino acids, Lipids, vitamins, and membrane structure and transport mechanisms.

Prerequisites

Student must have studied M.Sc. with microbiology as a major subject and knowledge of basic Microbial diversity.

Course outline

Sr. No.	Course Contents	Teaching hours
1.	**Principles of microbial diversity** • Principles and concepts of microbial diversity • Culturable and non-culturable diversity • Methods of studying diversity • Principles and concepts of metagenomics • Conservation of microbial diversity • Metabolic diversity in bacteria	10
2.	**Bacterial systematics** • Conventional and molecular systematics and general discussion on the occurrence, diversity, characteristic features, significance and potential applications of various groups of bacteria, comparison of Bergey's Manual of Systematic Bacteriology (Edition 1 and 2) • Diversity of actinomycetes • Diversity of cyanobacteria	10
3.	**Diversity of yeast and moulds** • Systematics and classification of fungi • Properties, structure and reproduction of economically important fungi • Mycorrhizal fungi • Biology of yeast and its role in industry • Ecological importance and significance of fungi	10
4.	**Diversity of Archaea** • Systematics occurrence, diversity, characteristics features, of different groups of archaea bacteria • Survival, adaptation and potential applications: Halophiles, Thermophiles, Alkalophiles and Acidophile	10

Learning Outcomes

- The students will be able to understand the Knowledge of Diversity.
- Student should be able to understand basic concepts of Microbial diversity ,Diversity of Yeast and moulds ,Diversity of Archaea.
- Access information on a topic from a variety of sources, and be able to learn new things on one's own.

SWARNIM ★ GANDHINAGAR ★ SSIU ★ KALOL ★ COLLEGE, SSIU, KALOL, GANDHINAGAR

Teaching & Learning Methodology

We should aim to provide a range of modes of learning, including, for example, individual work, group work and opportunities for off-campus learning through visit to various research institutions across India or collaborative arrangements.

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Books Recommended

- Oladele Ogunseitan(2004), Microbial Diversity. Form and Function in Prokaryotes**.**
- Mikel A. Becerro, Maria J. Uriz, Manuel Maldonado and Xavier Turon (Eds.)(2012), Advances in Sponge Science: Physiology, Chemical and Microbial Diversity, Biotechnology.
- Christine E. Salomon; Nathan A. Magarvey; David H. Sherman(2004), Merging the Potential of Microbial Genetics with Biological and Chemical Diversity: An Even Brighter Future for Marine Natural Product Drug Discovery
- Burnet et.al(1980), A guide to identifying and classifying yeast.
- Colwd. D,Microbial diversity.

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF BIOTECHNOLOGY

Bioprocess Technology

CODE: 256010203

M.Sc. 2nd semester

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	-	-	4	4	30	-	70		100

Objectives:-

- To provide basic knowledge of bioprocess technology in the industry, how to isolate the micro-organisms, its preservation. How the strain can be improved for industrially important organisms. Types of substrate used for fermentation and about medium optimization.
- This study gives idea about the bioreactor design. Types of bioreactor used in the industry. how the sterilization of media and air can be done. Importance of mass transfer and determination of Kla, inoculum development.
- The student will get an idea about kinetic of substrate and utilization of batch, types of fermentation i.e fed batch and batch fermentation. What can be control system for monitoring the fermentation process.
- To provide the idea about down streaming process how to get end product in the fermentation. What different methods can be used for down streaming process.

Prerequisites: -

Student must have passed BSc Microbiology as major subject with basic knowledge of biology.

Course outline: -

Sr. No.	Course Contents	Number of Hours
1.	Introduction to bioprocess technology Isolation, preservation and improvement of industrially important organisms. Substrates for fermentation processes Medium optimization	**10**
2.	Bioreactor design: Laboratory, pilot and large scale reactors. Plug flow reactors, enzyme reactors. Sterilization of media and air. Scale up and Scale down Mass transfer of oxygen: Agitation and aeration, Determination of K_La, factors affecting K_La, fluid rheology. Inoculum development, aseptic inoculation and sampling.	**10**
3.	Bioprocess kinetics: Kinetics of growth and substrate utilization in batch, fed batch and continuous systems. Control of process parameters: Instrumentation for monitoring bioreactor and fermentation processes, Sensors, Controllers, fermentation control systems and architecture, Incubation and sequence control, advanced control. Dynamic modelling of fermentation processes.	**10**
4.	Downstream processing: Methods of Cell separation, Disruption and product purification. Fermentation Economics	**10**

Learning Outcomes:

- Student will learn about the bioprocess technology in the industry, how to isolate the micro-organisms, its preservation. How the strain can be improved for industrially important organisms. Types of substrate used for fermentation and about medium optimization.
- Provide an idea about the bioreactor design. Types of bioreactor used in the industry. how the sterilization of media and air can be done. Importance of mass transfer and determination of Kla, inoculum development.
- Get knowledge about kinetic of substrate and utilization of batch, types of fermentation i.e fed batch and batch fermentation. What can be control system for monitoring the fermentation process.

- To provide the idea about down streaming process how to get end product in the fermentation. What different methods can be used for down streaming process.

Teaching & learning Methodology:

- We should aim to provide a range of modes of learning, including, for example, individual work, group work and opportunities for off-campus learning through visit to various research institutions across India or collaborative arrangements.
- The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:
- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Basic Text & Reference Books:

- Principles of Fermentation Technology : Whitaker & Stanbury Comprehensive
- Biotechnology : Murray Moo Young
- Methods in Industrial Microbiology : Sikyta
- Fermentation Microbiology and Biotechnology, El Mansi and Bryc

E-Resources

- https://www.slideshare.net/zeal_eagle/fermentation-technology
- https://www.slideshare.net/asertseminar/bioreactor-ppt
- https://www.cheric.org/files/education/cyberlecture/e200402/e200402-901.pdf
- https://science.sciencemag.org/content/219/4585/728
- https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/downstream-processing
- https://www.slideshare.net/AyushJain378/downstream-processing-73275843

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF BIOTECHNOLOGY

Immunology
Subject Code: 256010202
M.SC. Semester -2

Teaching & Evaluation Scheme

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	-	-	4	4	30	-	70	-	100

Objectives

- To provide students the basic knowledge of immunity, system of immunology, interaction of Ag-Ab.
- The purpose of the course is to give student to introduction of Types of immunity, antigen- antibody reaction, Hypersensitivity reaction etc.
- To provide an understanding of immune system in the body, types of cells etc..

Prerequisites

Student Must have studied M.Sc. with microbiology as a major subject and knowledge of basic Immunology and medical microbiology.

Course outline

Sr. No.	Course Contents	Teaching hours
1.	Adaptive immunity and innate immunity: inflammation, role of cells, receptors and proteins in innate immunity, ubiquity of the innate system. Cells and organs of the immune system: Hematopoiesis, cells of the immune system, primary and secondary lymphoid organs. Antigens and antibodies: properties of immunogens, haptens, epitopes, structure and classes of immunoglobulins, biological activities and effector functions, monoclonal antibodies and anzymes. Antibody diversity: models, organization of Ig genes, mechanism of gene rearrangement, generation of diversity; expression, synthesis and class switching, antibody engineering.	10
2.	Antigen-antibody interactions: principles and applications. Complement: components of the system, activation, regulation, biological consequences and deficiency diseases. Major histocompatibility complex and antigen presentation: MHC-organization, inheritance, genes, molecules and peptide binding, expression, disease susceptibility, immune responsiveness, self MHC restriction, cytosolic and endocytic pathway for antigen processing.	10
3.	T-cell receptor, T-cell maturation, activation and differentiation: TCR- genetic organization and rearrangement of genes, TCR-complex, peptide binding, thymic selection, activation and differentiation of T cells. Generation, activation and differentiation of B cells: B cell maturation, activation and proliferation, germinal centres, regulation of the responses. Cytokines: properties, receptors, associated diseases, therapeutic applications. Leukocyte activation and migration: CAM, chemokines, recirculation and extravasation, inflammation and anti-inflammatory agents. Cell mediated cytotoxicity: effector T cells, cytotoxic T cells, NK cells, ADCC.	10
4.	Hypersensitivity reactions: classification and types of hypersensitivity reactions. Immune tolerance and autoimmunity: establishment and failure of tolerance, autoimmune diseases, mechanisms for the induction, animal models, treatment. Transplantation immunology: basis and manifestation of graft rejection, immunosuppressive therapy, immune tolerance. Cancer and immune system. Immunodeficiency.	10

SHARDABEN SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

Learning Outcomes

- The students will be able to understand the Knowledge of the types of immune system , Ag-Ab reaction techniques in the body ,hypersensitivity reaction etc.
- Student should be able to understand basic concepts of immunity and types of the cell, classification of the hypersensitivity :its types and function.
- Access information on a topic from a variety of sources, and be able to learn new things on one's own.
- At the end of the course the student would have basic knowledge of immunity, system of immunology, interaction of Ag-Ab.

Teaching & Learning Methodology

We should aim to provide a range of modes of learning, including, for example, individual work, group work and opportunities for off-campus learning through visit to various research institutions across India or collaborative arrangements.

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Books Recommended

- Kuby-Immunology: T. J. Kindt, R. A. Goldsby and B. A. Osborne; W. H. Freeman
- Janeway's Immunology: K. Murphy, P. Travers and M. Walport; Garland Sciences
- Immunology: Ivan Roitt, J. Brostoff and D. Male; Mosby
- Essential immunology: Ivan Roitt; Oxford: Blackwell
- Topic related review articles.

E-Resources

- https://www.slideshare.net/mobile/Jsjahnabi/types-of-immunity
- https://www.slideshare.net/mobile/mprasadnaidu/immunity-32908889
- https://www.slideshare.net/mobile/ArunimaSur/antigen-antibody-interaction-55880086
- https://www.slideshare.net/mobile/VELSPHARMD/hypersensitivity-24449005
- https://www.slideshare.net/mobile/VamsiIntellectual/types-of-cells-and-tissues

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF BIOTECHNOLOGY

Microbial Genetics
CODE: 256010201
M.Sc. 2nd semester

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	-	-	4	4	30	-	70		100

Objectives

- To provide students basic knowledge of Genetics of microbial organisms.
- The purpose of the course is to give students to introduction of replication, transcription and translation in eukaryotes.
- To provide an understanding of DNA damage and repair system and also get idea about transposons and its applications.

Prerequisites

Student Must have studied B.Sc. with biotechnology/Microbiology as a major subject and knowledge of basic biology.

Course outline

Sr. No.	Course Contents	Teaching hours
1	**Mutation and DNA Repair** Mutation, Spontaneous mutations (Random v/s adaptive nature of mutation, Luria and Delbruck experiment, Newcombe experiment, Lederberg's experiment, Mutation rate and its determination, Origin of spontaneous mutations), DNA damages (Deamination of bases, alkylation, damage due to reactive oxygen, UV induced damage) and it repair pathways (Methyl-directed mismatch repair, Nucleotide excision repair, Base excision repair, recombinational repair, SOS inducible repair, specific repair for oxidative DNA damage, pyrimidine dimers and alkylation induced damage and adaptive response). **Plasmid Biology** Types, compatibility, replication, control of copy number and plasmid segregation	10
2	**Recombination** Types of recombination, Models for Homologous recombination, Molecular mechanism of homologous recombination, Homologous recombination in eukaryotes, Mating- type switching. Molecular mechanism for site-specific recombination, Biological roles of site-specific recombination **Conjugation** Conjugation by E. coli F factor (Structure of F-factor, Regulation of F-factor fertility, establishment of cell contact, DNA mobilization and transfer and separation of mating pair, Hfr conjugation and chromosomal transfer, F-prime conjugation and merodiploid, Conjugation of fertility inhibited F-like plasmids, Nonconjugative, mobilizable plasmids, Broad Host Range self-transmissible plasmids, Chromosome mobilization by Non-F plasmids, Plasmid based conjugation in other bacteria (Salmonella, Pseudomonas, Streptomyces and Streptococcus. Interrupted mating and conjugational mapping. **Agrobacterium genetics** Ti-plasmid, Interkingdom gene transfer (Key early experiments, vir regulon, protein secretion apparatus, conjugation model of T-DNA transfer, Integration products).	10
3	**Transformation** Mechanism of Natural competence and transformation in Bacillus subtilis, Streptococcus pneumoniae and Haemophiles influenzae. Transformation by inducing artificial competence, Gene linkage and mapping by transformation. **Transduction Viral genetics** Generalized transduction in P22, P1, T4, γ and Mu bacteriophages, homologous recombination with recipient's chromosome, measuring transduction (cotransduction of markers, marker effects, abortive transduction, transduction of plasmids) Applications of generalized	10

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

	transduction. Specialized transduction in □ and its applications. **Viral genetics** Bacteriophages (T-series, γ-biology, Miniphages (M-13, γ X 174, Mu), Bacteriophage recombination (complementation, fine structure analysis).	
4	**Transposons Fungal genetics** Tetrad analysis and Mitotic recombination **Restriction-Modification systems** Role of Restriction-Modification systems, Types of RM systems, Modification, Restriction and Regulation. Transposable elements: Types of transposable elements, Structure, genetic organization and mechanism of transposition of Tn5, Tn3 and related transposons, Bacteriophage Mu, Tn7 and IS911, Integrons, Retrotransposons, Conjugative and Mobilizable transposons. Assays of transposition. **Molecular biology of tumor** Control of cell proliferation, oncogene activation, role of tumor suppressor genes, Apoptosis.	10

Learning Outcomes

- The students will be able to apply the knowledge of the Genetics of Microbes to understands concepts of various fields like R&D fields, Gene transfer among bacteria, etc.
- Student should be able to understand basic concepts of Mutation, DNA repair, Recombination, Conjugation, Transformation, Viral genetics, Transposons, Restriction-Modification systems, Molecular biology of tumor.
- Access information on a topic from a variety of sources, and be able to learn new things on one's own.
- Communicate verbally, graphically, and/or in writing the theoretical data clearly and concisely that incorporates the stylistic conventions used by biotechnologist/Microbiologist worldwide.

Teaching & Learning Methodology

We should aim to provide a range of modes of learning, including, for example, individual work, group work and opportunities for off-campus learning through visit to various research institutions across India or collaborative arrangements.

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties
- Provide learning materials in different formats (written, online, audio, video podcast etc.) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Books Recommended

1. Lewin's GENES X, Volume 10Benjamin Lewin, Jocelyn Krebs, Stephen Kilpatrick, Elliott Goldstein-Jones & Bartlett Learning, 2011
2. Watson JD, Baker TA, Bell SP et al. (2008) Molecular Biology of the Gene, 6th Ed., Benjamin Cummings
3. Molecular biology of the cell (third edition): By B Alberts, D Bray, J Lewis, M Raff, K Roberts and J D Watson.
4. Biotechnology and genomics by P. K. Gupta, Rastogi Publication
5. Molecular Genetics of Bacteria: 3rd (third) Edition-Larry Snyder

E-Resources

- https://www.nature.com/scitable/topicpage/dna-damage-repair-mechanisms-for-maintaining-dna-344/
- https://www.microscopemaster.com/plasmids.html
- https://aklectures.com/lecture/cell-cycle-and-cell-division/conjugation-transformation-and-transduction
- https://aklectures.com/lecture/cell-cycle-and-cell-division/conjugation-transformation-and-transduction
- http://grupo.us.es/gfnl/dna/genetic_ingeniering/transposons.htm

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF BIOTECHNOLOGY

Tools and techniques in synthetic microbiology

CODE: 256010204

M.Sc. 2ND SEMSTER

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	-	4	4	6	30	-	70		100

Objectives:-

- To provide basic knowledge of microscopy & its types, fixation & storage & cytology.
- The aim of the course is to provide students with the basic principles of cytochemistry and histochemistry.
- The preparation techniques for sample analysis used in cytochemistry, histochemistry, immunocytochemistry and in situ hybridization will be illustrated.
- Basic knowledge will also be provided for optical and electronic visualization of biological interest macromolecules.
- Theoretical lessons will be associated with seminars / workshops relating to examples of application of these methods to the study of cellular biology and instrument observation tools.
- The Microscope. Learning Objectives By the end of this topic, you will be able to: Name the parts of the microscope and their functions.

Prerequisites:-

- Student Must have studied B.Sc. with microbiology/biotechnology as a major subject and knowledge of basic biology

Course outline:-

Sr. No.	Course Contents	Number of Hours
1.	Light microscopy:- Optical corrections, Properties and types of objectives. Oculars, Illumination. Types of light microscopes: Bright field, dark field, fluorescence, phase contrast, polarizing, differential interference contrast. Micrometry.	**10**
2.	Electron microscopy: Basic components of electron microscopes. Thermionic and field emission electron guns. Types of electron microscopes: TEM, SEM, STEM, ESEM and HVEM	**10**
3.	Fixation and storage: Classification of fixatives , formulas. (Plant, animal and microbial samples). Factors affecting fixation. Procedures for fixation. Dehydration, infiltration and embedding. Media for embedding. Microtomes: Rotary, sliding cryostat, ultramicrotome and freezing ultra microtome. Preparation of biological samples for light and electron microscopy: Sectioning, maceration, squash and clearing technique. Freeze etching and freeze fracturing. Stains for light and electron microscopy. Staining procedures. Photomicrography.	**10**
4.	Histochemistry: Histo chemical localization of metabolites:- Starch, proteins, lipids, total carbohydrates, lignin, polyphenols, nucleic acid, histones, cutin, suberin and waxes. Localization of enzymes: Peroxidase, acid phosphatase and succinic dehydrogenase. Ultra structural cytochemistry:- Localization of tannin, protein, cell wall polysaccharide, lignin and membrane. Enzymes: Peroxidase, acid phasphatase. Immunocytochemistry	**10**

Learning Outcomes:

- At the end of the course the student would have basic knowledge of microscopy & its types, fixation & storage & cytology.

- At the end of the course, the student will have acquired basic theoretical knowledge related to:
    - -preparation techniques of histological samples and their cyto-histochemical staining;
      -main techniques of immunohistochemistry and in situ hybridization;
      - main methods of in situ observation of biological macromolecules in cells and tissues.
    - It is therefore timely to investigate how microscopy techniques can be taught most efficiently.
    - In this study, different teaching activities (TAs) that are currently used for microscopy training of students will be assessed regarding their value for the realization of intended learning outcomes

Teaching & Learning Methodology

We should aim to provide a range of modes of learning, including, for example, individual work, group work and opportunities for off-campus learning through visit to various research institutions across India or collaborative arrangements.

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Books Recommended

- Kuby-Immunology: T. J. Kindt, R. A. Goldsby and B. A. Osborne; W. H. Freeman
- Janeway's Immunology: K. Murphy, P. Travers and M. Walport; Garland Sciences
- Immunology: Ivan Roitt, J. Brostoff and D. Male; Mosby

- Essential immunology: Ivan Roitt; Oxford: Blackwell
- Topic related review articles.

E-Resources

- https://microbenotes.com/category/microscopy/
- https://www.khanacademy.org/science/high-school-biology/hs-cells/hs-introduction-to-cells/a/microscopy
- https://www.sciencedirect.com/topics/neuroscience/histochemistry
- https://www.sciencedirect.com/topics/medicine-and-dentistry/cytochemistry
- http://cytochemistry.net/

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF CHEMISTRY

Organic Chemistry - I

Subject Code: 256020101

M.Sc. Semester-1

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
Th	Tu	P	Total		Internal		External		Total
					Th	Pr	Th	Pr	
4	-	-	4	4	30	-	70	-	100

Objectives

- The students will understand the interdisciplinary nature of chemistry and to integrate knowledge.
- The students will develop the ability to effectively communicate scientific information and research results in written and oral formats.

Prerequisites

Chemistry majors must have a basic understanding of fundamental organic chemistry.

Course outline

Sr. No.	Course Contents	Teaching Hours
1	**(A) Elimination Reaction** The E1, E2, E1CB mechanism, stereochemistry. Orientation of the double bond syn and anti-eliminations. Reactivity- effects of substrate structures, attacking base, leaving group and medium. Mechanism and orientation in pyrolytic syn eliminations – Chugaev and Cope eliminations.	14

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

	(B) Nucleophilic Substitution Reaction Mixed SN1, SN2 and SET mechanism. Nucleophilicsubstitution at (a) Allylic carbon (Allylic rearrangements), (b) An Aliphatic trigonal carbon (the tetrahedral mechanism) and at (c) A Vinyl carbon. Participation of Neighboring groups in Nucleophilic substitution by (a) Carboxylate anion (b) Halogen atoms (c) Hydroxyl groups (d) Acetoxyl group (e) Phenyl group (f) RS group (g) Participation by π-bond.	
2	**(A) Aromaticit** Aromaticity, aromatic character, Frost circle diagram for cyclobutadiene, benzene and others. Resonance and chemical stabilization-aromatic character based on NMR criteria, Huckels rule, energy level of π moleculer orbitals, Huckelsmoleculer orbital(HMO) method, MO of simple organic systems such as ethene, allyl and butadiene Aromaticity in benzenoid and non-benzenoid compounds and charged rings, annulenes, fulvenes, azulenes, antiaromaticity and homoaromaticity. **(B) Acid base concept** Concept, pKa, Hammette equation, Concept of hindered base, The effect of structure on the strength of acids and bases.	14
3	**(A) Reactive intermediates** (1) Carbocations (classical and non-classical) stability , structure, generation and fate (2) Carbanions- stability, structure, generation and fate of carbanions (3) Carbenes-stability and structure, the generation and fate of carbenes. (4) Free radicals: stability, structure, generation and fate of free radicals, NBS (5) Nitrene : stability, structure, generation, reaction **(B) Rearrangements** General mechanistic considerations, nature of migration, migratory aptitude, and memory effects in respect of following. (1) Carbon to Carbon migration of R, H and Ar (i) Pinacol- Pinacolone rearrangement (ii) Favorskii rearrangement (2) Carbon to Nitrogen migrations: (i) Curtiusrearrangment (ii) Schmidt rearrangment (3) Carbon to oxygen migration of and Ar	14

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

	(i) Baeyer- villiger rearrangement (ii) Rearrangement of hydroperoxide	
4	**Stereo Chemistry** Optical and geometrical isomerism, origin of chirality and chiral centre, axis and plane, helicity, Enantiotopic and diastereotopic atoms, groups and faces, prochiralcentre, biphenyl, allenes, spirans, compounds containing chiral nitrogen and sulfur, .stereospecific and stereoslective synthesis, dynamic resolution.	14

Learning Outcomes

- At the end of the course the student would have sufficient knowledge of Organic Chemistry.
- Students will be able to design and carry out scientific experiments as well as accurately record and analyze the result of such experiments.

Teaching & Learning Methodology

We should aim to provide a range of modes of learning, including, for example, individual work, group work and opportunities for off-campus learning through visit to various research institutions across India or collaborative arrangements.

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the programmer/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs.
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups.
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties.
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a programmer/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.
- Include group work, with groups representing diverse cultures.

Books Recommended:

1. Advanced Organic Chemistry, Reactions Mechanisms and Structure , J. March, 6th Edition, John Wiley.
2. Carbenes, nitrenes and arynes, T.L. Gilchrist and C.W. Rees.

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

3. Guidebook to Mechanism in Organic Chemistry by Peter Sykes, 6th Edition, Prentice Hall.
4. Advanced Organic Chemistry Part A: Structure and Mechanism and Part B:Reaction and synthesis ,Francis A. Carey, Richard J. Sundberg, 5th Edition, Springer .
5. Organic Chemistry, JohnathanClayden, Nick Geeves, Stuart Warren, 1st Edition, Oxford University Press.
6. Principles of Organic Synthesis, R.O.C. Norman and J.M. Coxon, 3rd Edition, Blackie Academic and Proffessional.
7. Stereo Chemistry, P.S. Kalsi , New Age Publications.
8. Reagents in Organic Synthesis- Fieser and Fieser, John Wiley.
9. Physical Organic Chemistry by Jack Hynes,(plenum publication)
10. Organic Chemistry, T.W. Graham Solomons and Graig B. Frymes, John Wiley and Sons.
11. Organic Chemistry, F. A. Carey, McGraw Hill Edition.
12. General Organic Chemistry Sachin Kumar Ghose, New Central book agency.
13. Organic Chemistry Vol 1-2 I.L.Finar 5th edition,ELBS.

E-Resources

- https://chem.libretexts.org/Bookshelves/General_Chemistry/Map%3A_General_Chemistry_(Petrucci_et_al.)/27%3A_Reactions_of_Organic_Compounds/27.03%3A_Introduction_to_Elimination_Reactions
- http://www.chem.ucalgary.ca/courses/350/Carey5th/Ch08/ch8-0.html
- https://www.masterorganicchemistry.com/2017/02/23/rules-for-aromaticity/
- https://classnotes.org.in/class11/chemistry/ionic-equilibrium/concepts-acids-bases/
- http://burton.chem.ox.ac.uk/rearrangements-and-reactive.pdf
- https://www2.chemistry.msu.edu/faculty/reusch/virttxtjml/rearrang.htm
- https://www.masterorganicchemistry.com/2011/10/17/introduction-to-rearrangement-reactions/
- http://www.colby.edu/chemistry/CH241F/Chapter%204.pdf

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF CHEMISTRY

Inorganic Chemistry - I

Subject Code: 256020102

M.Sc. Semester-1

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	-	-	4	4	30	-	70	-	100

Objectives

- The students will understand the interdisciplinary nature of chemistry and to integrate knowledge.
- The students will develop the ability to effectively communicate scientific information and research results in written and oral formats.

Prerequisites

Chemistry majors must have a basic understanding of fundamental inorganic chemistry.

Course outline

Sr. No.	Course Contents	Teaching Hours
1	**Quantum theory and Atomic Structure** Postulates of quantum mechanics, setting up of different observables, Eigen value of angular momenta and commutation relations, step-up and step-down operators, and angular momenta	14

SWARRNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

	in many electron atoms. Schrodinger wave equation and applications: particle on a ring and the simple harmonic oscillator. H-atom wave functions, solutions of R(r) θ(θ) and ϕ(φ) equations, quantum numbers, angular and radial wave function, shapes of the orbitals, angular momentum of inner quantum number j, physical interpretation of hydrogenic orbitals; space quantization of electronic orbits; electron spin. Approximation methods: Variation method and application to H atom. Perturbation theory (first order and non-degenerate, application to the Helium atom.	
2	**Symmetry and Group Theory** Representation of groups-some properties of matrices & vectors, representation of groups, the Great orthogonality theorem and its consequences, character table, wave functions as basis for irreducible representations, direct product, identifying nonzero matrix elements.	14
3	**Magnetochemistry** Magnetic susceptibility and basic derivation of diamagnetic susceptibility, pascal constant and its utility, Curie law and Curie-Weiss law, antiferromagnetism and ferromagnetism. Types of antiferromagnetism, antiferro magnetic exchange pathway : Direct – metal- metal interaction and Indirect-atom exchange i.e. super exchange mechanism.	14
4	**Bio-inorganic Chemistry** Metalloporphyrins (enzymes) definition, hemoglobin and myoglobin, cytochrome, vitamin B12 (cyanocobalamin), zincmetallo enzymes, nitrogen fixation, essential and trace elements in biological system, biochemistry of non-metals K, Na pump (action of bath ions), toxic metals and their toxicity. Co-ordination compounds in medicine Chelation therapy, gold compounds and rheumatoid arthritis, anticancer drugs –platinum complexes, gold complexes, metallocenesetc, antimicrobial agents, metal complexes as radiodiagnostic agents, magnetic resonance imaging.	14

Learning Outcomes

- At the end of the course the student would have sufficient knowledge of inorganic Chemistry.
- Students will be able to design and carry out scientific experiments as well as accurately record and analyze the result of such experiments.

Teaching & Learning Methodology

GE, SSIU, KALOL, GANDHINAGAR
SSIU
N RATHOD
Kalol, Gandhinagar
SWARNIM SC

We should aim to provide a range of modes of learning, including, for example, individual work, group work and opportunities for off-campus learning through visit to various research institutions across India or collaborative arrangements.

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the programmer/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs.
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups.
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties.
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a programmer/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.
- Include group work, with groups representing diverse cultures.

Books Recommended

1. Introduction to Quantum Chemistry, A. K. Chandra, Tata MacGraw Hill
2. Quantum Chemistry, Ira N. Levine, Prentice Hall
3. Quantum Chemistry by R. K. Prasad, New Age International Publishers (1985)
4. Elementary Quantum Chemistry by D. L. Pilar, McGraw Hill Book Co, New York (1968)
5. D. A. McQuarrie Quantum Chemistry, OUP 1983
6. M. W. Hanna, Quantum Mechanics in Chemistry, The Benjamin Pub.
7. Molecular Quantum Mechanics, Third Edition, P. W. Atkins and R.S. Friedman
8. Group theory and symmetry in chemistry, L. H. Hall(McGraw Hill)
9. F. A. Cotton, Chemical Applications of Group theory, Wiley Eastern 2nd Edn.1992
10. V. Ramkrishnan& M. S. Gopinadhan, Group theory in Chemistry Vishal Pub.1996.
11. Inorganic Chemistry, Third Edition, Alan G. Sharpe
12. Theoretical Inorganic Chemistry, M. C. Day, J. Shellin
13. Chemistry, Fifth Edition, John E. McMurry, Robert C. Fay
14. Hermann Dugas, Bioorganic Chemistry, A Chemical Approach to Enzyme Action, Springer International Edition
15. An Introduction to Theoretical Chemistry, Jack Simons, Cambridge
16. Progress in inorganic Chemistry, Vols 18 and 38 ed. J. J. Lippard, Wiley
17. Inorganic Reaction Mechanisms, M. L. Tobe, Nelson Pub
18. Inorganic Chemistry, K. F. Purcell and J. C. Kotz.
19. Principles of Bioinorganic Chemistry, S. J. Lippard and J. M. Bers
20. Bioinorganic Chemistry, I. Bertini, H. B. Gray and S. J. Lippard
21. Principals of Biooganic Chemistry, S. J. Lippard and J. M. Berg, University Science Books.
22. Bioinorganic Chemistry, I. Bertini, H. B. Gray, S. J. Lippard and J. S. Valentine, University Science Books.
23. Inorganic Biochemistry vols I and II ed. G. L. Eichhorn, Elsevier
24. Introduction to Magnetochemistry, Alan Earnshaw, 1968

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

25. Elements of Magnetochemistry, Dutta and Syamal, 1993

E-Resources

- https://mysite.science.uottawa.ca/sgambarotta/sites/default/files/CHM%201311F/slide%20show/Ch-6%20atom/7_lecture.pdf
- https://chem.libretexts.org/Bookshelves/Physical_and_Theoretical_Chemistry_Textbook_Maps/Supplemental_Modules_(Physical_and_Theoretical_Chemistry)/Group_Theory/Group_Theory%3A_Theory
- http://www.ccl.net/cca/documents/dyoung/topics-orig/magnet.html
- https://www.mdpi.com/journal/magnetochemistry

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF CHEMISTRY

Physical Chemistry - I

Subject Code: 256020103

M.Sc. Semester-1

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	-	-	4	4	30	-	70	-	100

Objectives

- The students will understand the interdisciplinary nature of chemistry and to integrate knowledge.
- The students will develop the ability to effectively communicate scientific information and research results in written and oral formats.

Prerequisites

Chemistry majors must have a basic understanding of fundamental physical chemistry.

Course outline

Sr. No.	Course Contents	Teaching Hours
1	**Chemical thermodynamics** Nernst heat theorem and its applications to gaseous system, third law of thermodynamics and its applications to evaluate absolute entropies of solids, liquids and gases; partial molar quantities and their determination, Gibbs-Duhem equation, chemical potential,	14

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

	chemical potential of idea gases and solutions, Raoult's law, real solutions, free energy and solutions, activity and activity coefficients, methods of determination of activity and activity coefficients, fugacity of gases and liquids and methods of its determination. Non equilibrium thermodynamics-basic concepts.	
2	**Chemical Kinetics** Unimolecular reactions, chain reactions and branched chain reactions, explosion limits, chain reaction between hydrogen and bromine, theory of absolute reaction rates, kinetic isotope effect. Enzyme catalyzed reactions, mechanism, kinetics and some examples.	14
3	**Solid state chemistry** Bonding in solids and electronic structure in solids, bond theory-metals, semiconductors and insulators, defects in crystals, calculation of schottly and Frenkel defects using statistical method, non stoichiometry, solid electrolytes, and diffusion in solids, electrical conductivity in solids, super conductivity, perovskites.	14
4	**Surface chemistry** Physical and chemical adsorption, BET and HJ equations, heat of adsorption, determination of surface area of adsorbents, surface tension, Gibb's equation, surface active agents, micellisation, critical micellar concentration (cmc), detergency.	14

Learning Outcomes

- At the end of the course the student would have sufficient knowledge of Physical Chemistry.
- Students will be able to design and carry out scientific experiments as well as accurately record and analyze the result of such experiments.

Teaching & Learning Methodology:-

We should aim to provide a range of modes of learning, including, for example, individual work, group work and opportunities for off-campus learning through visit to various research institutions across India or collaborative arrangements.

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the programmer/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs.

- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups.
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties.
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a programmer/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.
- Include group work, with groups representing diverse cultures.

Books Recommended:

1. Textbook of physical chemistry – W.J.Moore.
2. Textbook of physical chemistry – Glasstone .
3. Textbook of physical chemistry – P.Atkins
4. Advanced physical chemistry – Surdeep Raj
5. Advanced physical chemistry – J.N.Gurtu, A.Gurtu
6. Thermodynamics for chemists –Glasstone
7. Physical chemistry – S. Castellian
8. Thermodynamics of non equilibrium processes- Karapitianeh
9. Chemical Kinetics- Laidler
10. Chemical Kinetics – Frost and Pearson
11. Solid state chemistry – H.Keer
12. Solid state chemistry- Hannay
13. Chemistry of solids – Azaroff
14. Surface chemistry – Adamson
15. Surface chemistry – Osipov

E-Resources

- https://chem.libretexts.org/Bookshelves/General_Chemistry/Map%3A_Chemistry_-_The_Central_Science_(Brown_et_al.)/19%3A_Chemical_Thermodynamics
- https://www.slideshare.net/shahzad_ali27/chemical-kinetics-32001888
- https://www.youtube.com/watch?v=W8FhlGNnMkg
- https://byjus.com/jee/surface-chemistry/
- https://www.youtube.com/watch?v=w4yMyWa4-lQ

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF CHEMISTRY

Analytical Chemistry - I

Subject Code: 256020104

M.Sc. Semester-1

Teaching & Evaluation Scheme

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	-	-	4	4	30	-	70	-	100

Objectives

- The students will understand the interdisciplinary nature of chemistry and to integrate knowledge.
- The students will develop the ability to effectively communicate scientific information and research results in written and oral formats.

Prerequisites

Chemistry majors must have a basic understanding of fundamental analytical chemistry.

Course outline

Sr. No.	Course Contents	Teaching hours
1	**Analytical Objectives, Data Handling and Good Laboratory Practice (GLP)** Scope of analytical science and its literature, qualitative and quantitative analysis, ways to express accuracy and precision, types	14

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

	of errors and their causes; significant figures, control charts, confidence limit, test of significance, rejection of a result- the Q-test. GLP- standard operating procedures, quality assurance and quality control, validation of analytical methods.	
2	**Sampling and Calibration Methods** Sampling and sample preparation, general steps in chemical analysis, calibration of glass wares. Finding the best straight line- least square regression, correlation coefficient; Calibration curves, standard addition technique and internal standards. Chemical concentrations.	14
3	**Fundamentals of Spectrophotometry** Properties of light, absorption of light, interaction of light with matter and origin of spectra. The spectrophotometer- calibration, sources of light, monochromators and detectors. Beer's law in chemical analysis, photometric accuracy- Ringbom Plot, derivative spectrophotometry, optical rotatory dispersion and circular dichroism.	14
4	**Applications of Spectrophotometry** Analysis of mixture-resolved and unresolved spectra, measurement of equilibrium constant: Scatchard Plot; Stoichiometry-method of continuous variation- the Jobs plot. Photometric titrations.	14

Learning Outcomes

- At the end of the course the student would have sufficient knowledge of Analytical Chemistry.
- Students will be able to design and carry out scientific experiments as well as accurately record and analyze the result of such experiments.

Teaching & Learning Methodology

We should aim to provide a range of modes of learning, including, for example, individual work, group work and opportunities for off-campus learning through visit to various research institutions across India or collaborative arrangements.

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the programmer/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs.

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOJAN RATHOD
Kalol, Gandhinagar

- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups.
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties.
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a programmer/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.
- Include group work, with groups representing diverse cultures.

Books Recommended

1. Quantitative Chemical Analysis" by Daniel C. Harris, 5th Edition, W.H. Freeman and Company, New York.
2. "Analytical Chemistry" by Gary D. Christian, 6th Edition, John Wiley and Sons Inc. New Jersey.
3. "Principles of Instrumental Analysis" by Douglas A. Skoog, 3rd Edition, HoltSaunders International Edition.
4. "Instrumental Methods of Chemical Analysis" by Galen W. Ewing, 4th Edition, International Student Edition.

E-Resources

- http://c3162802.workcast.net/10211_Introduction,_Objectives,_and_Key_Requirements_for_GLP_Regulations_2011106145213.pdf
- http://web.iyte.edu.tr/~serifeyalcin/lectures/chem201/cn_8.pdf
- https://www.slideshare.net/MuhammadAsif564/fundamentals-of-spectrophotometer
- https://www.slideshare.net/rey216/spect

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF CHEMISTRY

Chemistry Practical

Subject Code: 256020105

M.Sc. Semester-1

Teaching & Evaluation Scheme

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
-	-	12	12	8	-	200	-	-	200

M.Sc. Semester I

Organic Chemistry – I

Preparation of organic compounds:

- i) Nitration
- ii) Bromination
- iii) Acylation
- iv) Reduction
- v) Oxidation
- vi) Condensation reaction
- vii) Diazotization reaction
- viii) Friedl-Craft's reaction
- ix) Cannizzaro reaction

- x) Aldol condensation

References books for practical:

1. A text book of practical organic chemistry – A. I. Vogel
2. Practical organic Chemistry – Mann and Saunders
3. A handbook of quantitative and qualitative analysis – H. T. Clarke
4. Comprehensive Practical Organic Chemistry : Qualitative Analysis V K Ahluwalia& S. Dhingra.
5. Comprehensive Practical Organic Chemistry : Preparations and Quantitative Analysis V K Ahluwalia& R. Aggarwal Universities Press.
6. An Advance Course in practical Chemistry, A K. Nad, B. Mahapatra and A. Ghoshal.

Inorganic Chemistry

1. Semi-microqualitative analysis of 15 mixtures, each having six radicals including less familiar elements (Mo, W, Li, Th, V, Zr, Ce, Be, Ti) and one insoluble compounds.

Books Recommended:

1. Vogel's Qualitative Inorganic Analysis, Revised by G Svehla, Sixth Edition, Longman, 1987

Physical Chemistry

- ### Conductometry

1. Titration of mixture of strong acid and weak acid with strong base (HCl + HAC against NaOH)
   Titration of mixture of strong acid and weak acid with weak base (HCl + HAC against NH_4OH)
2. Solubility product of sparingly soluble salts – $PbSO_4$& $BaSO_4$

- ### Potentiometry

1. Titration of mixture of strong (HCl) and weak (HAC) acid with NaOH / NH_4OH and find the strength of the acids in mixture.
2. Solubility product of silver halides.

- ### pH metry

1. Titration of mixture of strong (HCl) and weak (HAC) acid with NaOH / NH_4OH and find the strength of the acids.

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

2. Titration of mixture of bases (Na_2CO_3& $NaHCO_3$) with standard HCl and find the concentration of bases.

- **Adsorption and kinetics**
  1. Hydrolysis of esters
  2. Reaction between $K_2S_2O_8$ and KI.

- **Distribution method**(any 2)
  1. Distribution of acetic acid between H_2O and Butanol.
  2. Distribution of HAC between H_2O and $CHCl_3$ / CCl_4.
  3. Distribution of I_2 between H_2O and CCl_4.

Books Recommended:

1. Practical physical chemistry –J.B.Yadav
2. Practical in physical chemistry – P.S.Sindhu
3. Experimental physical chemistry – R.C.Das, B.Behera
4. Experiments in physical chemistry- P.H.Parsania, F. Karia

Analytical Chemistry Practicals

1. Calibration of glass wares and balance.
2. Calibration of pH meter, conductometer and potentiometer.
3. Determination of nicotine in tobacco (non-aqueous titration).
4. Determination of available chlorine in bleaching powder.
5. Determination of vitamin C in orange juice/amla.
6. Determination of acetic acid in vinegar.
7. Determination of sodium carbonate and sodium bicarbonate in washing soda.
8. Determination of ascorbic acid in vitamin C tablets.
9. Determination of calcium and magnesium in water sample.
10. Determination of total dissolved solids in water samples.
11. Determination of sulphate in water sample.
12. Determination of chloride in water sample.

Books Recommended:

1. Analytical Chemistry Practice, John H. Kennedy, Saunders College Publishing, Second Edition 1990.
2. Vogels Textbook of Quantitative Chemical Analysis, 6th Edition, 2002.

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF CHEMISTRY

Organic Chemistry - II

Subject Code: 256020201

M.Sc. Semester-2

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
Th	Tu	P	Total		Internal		External		Total
					Th	Pr	Th	Pr	
4	-	-	4	4	30	--	70	-	100

Objectives

- The students will understand the interdisciplinary nature of chemistry and to integrate knowledge.
- The students will develop the ability to effectively communicate scientific information and research results in written and oral formats.

Prerequisites

Chemistry majors must have a basic understanding of fundamental organic chemistry.

Course outline

Sr. No.	Course Contents	Teaching Hours
1	**Spectroscopy** 13 CNMR: General considerations, chemical shift (aliphatic, olefinic, alkyne, aromatic, heteroaromatic and carbonyl carbon), coupling constants.Mass spectroscopy: Introduction, ion production, EI, CI, FD and FAB, factors affecting fragmentation, ion analysis, ion abundance. Mass spectral fragmentation of organic compounds,	14

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

	common functional groups, molecular ion peak, metastable peak, McLafferty rearrangement. Nitrogen rule. High resolution mass spectroscopy.Examples of mass spectral fragmentation of organic compounds, NMR, IR, UV with respect to their structure determination.	
2	**(A) Photochemistry** (1) Photochemical reactions: Principles of energy transfer, electronic excitation and molecular orbital view of excitation, excited states and fate of excited molecules (modified Jablonski diagram), Photosensitization. (2) Photochemistry of carbonyl compounds: Representation of excited states of ketones, photoreduction Norrish typeI& Π reactions, Reactions of cyclic Ketone, oxetane formation (Paterno-Buchi reaction) (3) Di-π methane rearrangement, Dienone photochemistry, cis-trans isomerisation and photochemistry of conjugated olefins. **(B) Chemistry of Heterocycles** (1) Nomenclature of heterocycles: Replacement and systematic nomenclature (Hantzsch-Widman system) for monocyclic, fused and bridged heterocycles. General chemical behavior of aromatic heterocycles. (2) Five-membered and benzo fused five member heterocycles: Oxazole, Isoxazole, Thiazole, Pyrazole, Imidazole, Benzothiazole and Benzimidazole. (3) Six membered and benzofused six membered heterocycles: Pyrazine, Pyridazine, Pyrimidine, Cinnoline, Quinazoline, Quinoxaline, Phenoxaline.	14
3	**Name reactions** General nature, method, mechanism and synthetic applications of the following reactions: (i) Vilsmeier-Haack reaction (ii) Mitsunobu reaction (iii) Suzuki reaction (iv) Buchwald Hartwing reaction (cross coupling) (v) Sonogarshira coupling (vi) Stobbe condensation (vii) Jones oxidation (viii) Swern oxidation reaction (ix) Michael addition (x) Darzen'sglycidic ester synthesis (xi) Mannich reaction (xii) Dickmann reaction (xiii) Birch reduction (xiv) Witting reaction (xv) Knoevanagel reaction	14

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

4	**Stereo Chemistry** Mechanism selectivity and utility of following reagents: (i) Gilman's reagent-Lithium dimethylcuprate (ii) Lithium diisopropylamide (LDA) (iii) Dicyclohexylcarbodiimide (DCC) (iv) 1,3 – Dithiane (Umpolung reagent) (v) Dess- Martin periodinane (vi) Bakers yeast (vii) Diisobutylauminium hydride(DIBAL –H) (viii) Sodium cyanoborohydride (NaBH3(CN)) (ix) Grignard reagents (x) Sodium borohydride (xi) DDQ (xii) n-Butyl lithium (xiii) Phase transfer catalysis: Quaternary ammonium and phosphonium salts, crown ethers.	14

Learning Outcomes

- At the end of the course the student would have sufficient knowledge of Organic Chemistry.
- Students will be able to design and carry out scientific experiments as well as accurately record and analyze the result of such experiments.

Teaching & Learning Methodology

We should aim to provide a range of modes of learning, including, for example, individual work, group work and opportunities for off-campus learning through visit to various research institutions across India or collaborative arrangements.

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the programmer/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs.
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups.
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties.
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

programmer/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Include group work, with groups representing diverse cultures.

Books Recommended:

1. Modern Synthetic Reactions, H.O.House, W.A. Benjamin.
2. Principles of Organic Synthesis, R.O.C. Norman and J.M. Coxon, 3rd Edition, Blackie Academic and Professional.
3. Spectrometric Identification of Organic Compounds by Robert M. Silverstein, 7th Edition,Wiley.
4. Mass Spectrometry – A Textbook Jurgen Gross, 1st Edition, 2002, Springer – Verlag Berlin Heidelberg.
5. Introductory Photochemistry, A.Cox and T.Camp, McGraw Hill.
6. Photochemistry, R.P. Kundall and A. Gilbert, Thomson Nelson.
7. Organic Photochemistry, J. Coxon and B. Halton, 2nd Edition, Cambridge University Press.
8. Strategic Applications of Named Reactions in Organic Synthesis, Laszlo Kurti and Barbara Czak, 1st Edition, Academic Press.
9. Name Reactions and Reagents in Organic Synthesis, Bradford P. Mundy, Michael G. Ellerd , Frank G. Favaloro, 2nd Edition, Wiley – Interscience.
10. Name Reactions. A Collection of Detailed Reaction Mechanisms,Jie Jack Li, 3rd Edition, Springer.
11. Heterocyclic Chemistry, volume 1-3, R.R. Gupta, M. Kumar and V. Gupta, Springer-Verlag.
12. Heterocyclic Chemistry, J.A. Joule, K.Mills, and G.F. Smith, 3rd Edition, Chapman and Hall.
13. Heterocyclic Chemistry, T.L. Gilchrist, Longman Scientific Technical.
14. Contemporary Heterocyclic Chemistry, G.R. Nikome and W.W. Poudler, Wiley.
15. Comprehensive Heterocyclic Chemistry, A.R. Kartizky, and C.W. Rees.
16. Encyclopedia of Reagents for Organic Synthesis, Leo A. Paquette, David Crich and Phillip L. Fuchs, John Wiley and Sons Inc.
17. Organic Chemistry, T.W. Graham Solomons and Graig B. Frymes, John Wiley and Sons.
18. Organic Chemistry, F. A. Carey, McGraw Hill Edition.
19. General Organic Chemistry Sachin Kumar Ghose, New Central book agency.
20. Guidebook to Mechanism in Organic Chemistry by Peter Sykes, 6th Edition, Prentice Hall.
21. Advanced Organic Chemistry Part A: Structure and Mechanism and Part B:Reaction and synthesis ,Francis A. Carey, Richard J. Sundberg, 5th Edition, SPRINGER.
22. Organic chemistry vol 1-2 I.L Finar 5th edition, ELBS.

E-Resources

- file:///C:/Users/admin/Downloads/spectroscopybasics-180519091436.pdf
- https://www.youtube.com/watch?v=p_BMWRaL62w
- https://chem.libretexts.org/Bookshelves/Organic_Chemistry/Book%3A_Basic_Principles_of_Organic_Chemistry_(Roberts_and_Caserio)/28%3A_Photochemistry/28.03%3A_Organic_Photochemistry

SWARRNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

- http://www.chem.gla.ac.uk/staff/stephenc/teaching/HeterocycleLectures2011_2C12.pdf
- https://www.organic-chemistry.org/namedreactions/
- https://byjus.com/chemistry/named-reactions/
- https://nptel.ac.in/courses/104/103/104103111/
- https://byjus.com/jee/organic-chemistry/

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF CHEMISTRY

Inorganic Chemistry - II

Subject Code: 256020202

M.Sc. Semester-2

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	-	-	4	4	30	-	70	-	100

Objectives

- The students will understand the interdisciplinary nature of chemistry and to integrate knowledge.
- The students will develop the ability to effectively communicate scientific information and research results in written and oral formats.

Prerequisites

Chemistry majors must have a basic understanding of fundamental inorganic chemistry.

Course outline

Sr. No.	Course Contents	Teaching Hours
1	**Chemical Bonding** The method of linear combination VSEPR, Walsh diagrams(tri-and penta- atomic molecules), dπ –pπ bonds, Bent rule and energetics of hybridization, some simple reactions of covalently bonded	14

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

	molecules. Simple Huckel theory of linear conjugated systems, simple Huckel theory of the cyclic conjugated system and aromaticity, self-consistent filed method, valence state ionization potentials, Pariser-Parr-Popleappoximation. Band theory of solids, Fermi level, electrical properties, insulators, semiconductors and superconductors (properties).	
2	**Application of symmetry** Application of symmetry to hybrid orbital, molecular orbitals, hybridization schemes for σ orbitals, π bonding and molecular orbital for ABn type of molecules. Application of symmetry to molecular vibrations, interpretation of IR and Raman spectral data.	14
3	**Organometallic Compounds** Organometallic compounds of transition elements, stability of metal carbon bond in complexes. Synthesis, uses and structure of organometallic compounds of π bonding organic ligands, 2-electron ligands, olifinic and acetylinic complexes, compound with 3 electron ligand – allylic complexes, compounds. With 4- electron ligands butadiene complexes, n4 complexes of cyclopentadiene, compounds with 5 electron ligands – cyclopantadionyl, compounds with 6 electron ligands, n6 complexes of benzene and its derivatives. Role of organometallic compounds in catalytic reaction.	14
4	**Reaction Mechanism** Mechanism of substitution reaction in square planar complexes. Kinetics of substitution reaction of platinum (II) complexes Effect of leaving group, effect of charge, steric effect, solvent effect, effect of nucleophile, effect of tempeature and other effects. Oxidation-Reduction reaction, electron transfer, tunnelling effect, Marcus – Hush theory, one and two electron transfer inner sphere and outer sphere, effect of ions on rate, electron transfer through extended bridges, unstable oxidation states, hydrated electron.	14

Learning Outcomes

- At the end of the course the student would have sufficient knowledge of inorganic Chemistry.
- Students will be able to design and carry out scientific experiments as well as accurately record and analyze the result of such experiments.

Teaching & Learning Methodology

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

We should aim to provide a range of modes of learning, including, for example, individual work, group work and opportunities for off-campus learning through visit to various research institutions across India or collaborative arrangements.

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the programmer/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs.
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups.
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties.
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a programmer/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.
- Include group work, with groups representing diverse cultures

Books Recommended

1. Introduction to Quantum Chemistry, A. K. Chandra, Tata MacGraw Hill
2. Quantum Chemistry, Ira N. Levine, Prentice Hall
3. Quantum Chemistry by R. K. Prasad, New Age International Publishers (1985)
4. D. A. McQuarrie Quantum Chemistry, OUP 1983
5. M. W. Hanna, Quantum Mechanics in Chemistry, The Benjamin Pub.
6. Lectures on Chemical Bonding and Quantum Chemistry, S. N. Datta, A Prism Book
7. Group theory and symmetry in chemistry, L. H. Hall(McGraw Hill)
8. Coulson's Valence, R. McWeeny, ELBS
9. F. A. Cotton, Chemical Applications of Group theory, Wiley Eastern 2nd Edn.1992
10. V. Ramkrishnan& M. S. Gopinadhan, Group theory in Chemistry Vishal Pub.1996.
11. Inorganic Chemistry, Third Edition, Alan G. Sharpe
12. Theoretical Inorganic Chemistry, M. C. Day, J. Shellin
13. Chemistry, Fifth Edition, John E. McMurry, Robert C. Fay
14. An Introduction to Theoretical Chemistry, Jack Simons, Cambridge
15. Progress in inorganic Chemistry, Vols 18 and 38 ed. J. J. Lippard, Wiley
16. Mechanism of Inorganic Reactions, F. Basolo and R. G. Persons, Wiley Pub
17. Reaction Mechanism of Coordination Compounds, C. H. Langford and H. B. Gray
18. Inorganic Reaction Mechanisms, M. L. Tobe, Nelson Pub
19. Inorganic Chemistry, K. F. Purcell and J. C. Kotz.
20. Principles of Bioinorganic Chemistry, S. J. Lippard and J. M. Bers
21. Mehrotra R. C. and Singh A. Organo Metallic Chemistry, Willey Eastern Ltd., New Delhi

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

22. Coates G. E. Green MIH Wade, K and Aylett B. J. Organo Metallic Comounds Chapman and Hall, Londo

E-Resources

- https://www.visionlearning.com/en/library/Chemistry/1/Chemical-Bonding/55
- https://www.britannica.com/science/chemical-bonding
- https://chem.libretexts.org/Bookshelves/Inorganic_Chemistry/Modules_and_Websites_(Inorganic_Chemistry)/Chemical_Compounds/Introduction_to_Chemical_Bonding
- https://chem.libretexts.org/Bookshelves/Inorganic_Chemistry/Map%3A_Inorganic_Chemistry_(Miessler_Fischer_Tarr)/04%3A_Symmetry_and_Group_Theory/4.04%3A_Examples_and_Applications_of_Symmetry
- https://sites.cns.utexas.edu/jones_ch431/section-1-symmetry
- https://www.britannica.com/science/organometallic-compound
- https://www.youtube.com/watch?v=Efh5GkVbhEc

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF CHEMISTRY

Physical Chemistry - II

Subject Code: 256020203

M.Sc. Semester-2

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	-	-	4	4	30	-	70	-	100

Objectives

- The students will understand the interdisciplinary nature of chemistry and to integrate knowledge.
- The students will develop the ability to effectively communicate scientific information and research results in written and oral formats.

Prerequisites

Chemistry majors must have a basic understanding of fundamental physical chemistry.

Course outline

Sr. No.	Course Contents	Teaching Hours
1	**Statistical thermodynamics** Concepts of distribution of molecules, thermodynamic probability, permutations and combinations, Boltzmann's most probable distribution, partition function - translational, vibrational, rotational, electronic nuclear partition functions.	14

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

2	**Nuclear chemistry** Nuclear properties-nuclear radius, coulombic and nuclear potential radius, nuclear spin and angular momentum, magnetic moment, nuclear binding energy, nuclear models-shell model, liquid drop model, Fermi gas model, collective model, radioactive decay, nuclear reactions, evaporation, spallation, fragmentation, fission and fusion reactions, accelerators, reaction cross section, use of radioisotopes as tracers.	14
3	**Polymer chemistry** Kinetics and mechanism of polymer processes, criteria of polymer solubility, thermodynamics of polymer solutions, polymer characterization, molecular weight of polymer (number average and weight average) , methods of molecular weight determination, properties of polymers and applications.	14
4	**Electrochemistry** Sign convention-American, European and IUPAC; Determination of dissociation constant of monobasic acids by conductometry, determination of dissociation constants of monobasic and polybasic acids by potentiometry. The electrical double layer, the rate of charge transfer, polarization and overvoltage, basic principle of polarography, origin of different types of current; equation of polarographic wave, Ilkovic equation.	14

Learning Outcomes

- At the end of the course the student would have sufficient knowledge of Physical Chemistry.
- Students will be able to design and carry out scientific experiments as well as accurately record and analyze the result of such experiments.

Teaching & Learning Methodology:-

We should aim to provide a range of modes of learning, including, for example, individual work, group work and opportunities for off-campus learning through visit to various research institutions across India or collaborative arrangements.

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the programmer/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs.

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups.
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties.
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a programmer/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.
- Include group work, with groups representing diverse cultures.

Books Recommended:

1. Textbook of physical chemistry – W.J.Moore
2. Textbook of physical chemistry – Glasstone
3. Textbook of physical chemistry – P.Atkins
4. Advanced physical chemistry – Surdeep Raj
5. Advanced physical chemistry – J.N.Gurtu, A.Gurtu
6. Statistical thermodynamics – M.C.Gupta
7. Polymer chemistry – Gowariker
8. Polymer chemistry – Billmayer
9. Principles of polymer science – Bahadur&Sastry
10. Polymer science & technology – Fried
11. Polymer chemistry- Malcolm P. Stevens
12. Nuclear chemistry – Arniker
13. Nuclear and radio chemistry – J.W. Kannedy, G.Friedlander
14. Electrochemistry – Bockris and Reddy

E-Resources

- https://chem.libretexts.org/Bookshelves/Physical_and_Theoretical_Chemistry_Textbook_Maps/Book%3A_Thermodynamics_and_Chemical_Equilibrium_(Ellgen)/01%3A_Introduction_-_Background_and_a_Look_Ahead/1.04%3A_Statistical_Thermodynamics#:~:text=Statistical%20thermodynamics%20is%20a%20theory,of%20macroscopic%20quantities%20of%20compounds.
- http://web.thu.edu.tw/ghliu/www/0723/CH16StatMech.pdf
- https://uh.edu/engines/StatisticalThermodynamics.pdf
- https://byjus.com/chemistry/nuclear-chemistry/
- http://www.chemistry.wustl.edu/~dgs/chem436/Lectures/Chem-436-Lecture_notes.pdf
- https://wou.edu/chemistry/courses/online-chemistry-textbooks/ch103-allied-health-chemistry/ch103-chapter-3-radioactivity/
- http://web.mit.edu/5.33/www/lec/poly.pdf
- https://www.clearitmedical.com/2019/04/chemistry-notes-electrochemistry.html

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF CHEMISTRY

Analytical Chemistry - II

Subject Code: 256020204

M.Sc. Semester-2

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	-	-	4	4	30	-	70	-	100

Objectives

- The students will understand the interdisciplinary nature of chemistry and to integrate knowledge.
- The students will develop the ability to effectively communicate scientific information and research results in written and oral formats.

Prerequisites

Chemistry majors must have a basic understanding of fundamental analytical chemistry.

Course outline

Sr. No.	Course Contents	Teaching hours
1	**Sample Preparation Techniques** Liquid-liquid extraction/solvent extraction-partition coefficient, distribution ratio and percent extraction. Solvent extraction of metal ions-ion association complexes and metal chelates, multiple batch extraction, Craig's counter-current distribution. Accelerated and	14

SWARRNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

	Microwave assisted extraction, protein precipitation and solid phase extraction (SPE).	
2	**Chromatographic Methods** Principles of chromatography, classification of chromatographic techniques based on mechanism of retention, configuration, mobile and stationary phase. Efficiency of separation- plate theory (theoretical plate concept) and rate theory (Van Deemter equation). Principles and applications of Paper chromatography, thin layer chromatography, HPTLC and Ion exchange chromatography. Counter-current chromatography for isolation of natural products.	14
3	**pHmetry and Conductometry** pH measurement with glass electrode, working of glass electrode, mechanism of pH measurement, calibration of glass electrode, errors in pH measurement. Electrical conductance in solutions of electrolytes, measurement of conductance, conductometric titrations- acid-base, precipitation and complex formation titrations.	14
4	**Potentiometry and Ion selective electrodes** Electrochemical cell, cell potentials, sign convention for electrode potentials, types of reference and indicator electrodes-metallic indicator and membrane indicator electrodes. Classification of membrane electrodes-ion-selective and molecular-selective electrodes. Principle, properties and design of ion-selective electrodes. Crystalline and non-crystalline membrane electrodes. Gas-sensing probes and enzyme substrate electrodes. Applications of potentiometric titrations.	14

Learning Outcomes

- At the end of the course the student would have sufficient knowledge of Analytical Chemistry.
- Students will be able to design and carry out scientific experiments as well as accurately record and analyze the result of such experiments.

Teaching & Learning Methodology

We should aim to provide a range of modes of learning, including, for example, individual work, group work and opportunities for off-campus learning through visit to various research institutions across India or collaborative arrangements.

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

- Work with students at an early stage of the programmer/module, to identify cultural Work with students at an early stage of the programmer/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs.
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups.
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties.
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a programmer/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.
- Include group work, with groups representing diverse cultures.

Books Recommended

1. "Quantitative Chemical Analysis" by Daniel C. Harris, 5th Edition, W.H. Freeman and Company, New York.

2. "Analytical Chemistry" by Gary D. Christian, 6th Edition, John Wiley and Sons Inc. New Jersey.

3. "Principles of Instrumental Analysis" by Douglas A. Skoog, 3rd Edition, HoltSaunders International Editions.

E-Resources

- https://www.intechopen.com/books/ideas-and-applications-toward-sample-preparation-for-food-and-beverage-analysis/overview-of-green-sample-preparation-techniques-in-food-analysis
- https://chem.libretexts.org/Bookshelves/Analytical_Chemistry/Supplemental_Modules_(Analytical_Chemistry)/Analytical_Sciences_Digital_Library/Active_Learning/Contextual_Modules/Sample_Preparation/01_Introduction_to_Sample_Preparation
- https://onlinelibrary.wiley.com/doi/pdf/10.1002/0471457817.fmatter
- https://www.slideshare.net/rey216/spect
- https://www.azolifesciences.com/article/What-is-a-pH-Meter-and-How-Does-it-Work.aspx
- http://web.colby.edu/ch331public/ph-measurements/
- https://chem.libretexts.org/Bookshelves/Ancillary_Materials/Laboratory_Experiments/Wet_Lab_Experiments/General_Chemistry_Labs/Online_Chemistry_Lab_Manual/Chem_12_Experiments/05%3A_pH_Measurement_and_Its_Applications_(Experiment)
- https://www.basinc.com/assets/library/issues/18-3/cs18-3c.pdf
- https://chem.libretexts.org/Bookshelves/Ancillary_Materials/Laboratory_Experiments/Wet_Lab_Experiments/General_Chemistry_Labs/Online_Chemistry_Lab_Manual/Chem_9_Experiments/07%3A_Electrical_Conductivity_of_Aqueous_Solutions_(Experiment)

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF CHEMISTRY

Chemistry Practical

Subject Code: 256020205

M.Sc. Semester-2

Teaching & Evaluation Scheme

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
-	-	12	12	8	-	200	-	-	200

M.Sc. Semester II- Practicals

Organic Chemistry

- Mixture analysis mixture to be given. (S+S+S) or (L+L+L). Type determination separation by physical and chemical methods. (both permitted in case of liquids)
- **Reference books for practical:**

1. A text book of practical organic chemistry – A.I Vogel
2. Practical organic chemistry – Mann and saunders
3. A handbook of quantitative and qualitative analysis – H.T Clarke
4. Comprehensive practical organic chemistry: qualitative analysis V K Ahluwalia& S. Dhingra.
5. Comprehensive practical organic chemistry: Preparations and qualitative analysis V K Ahluvalia and R. Aggarwal universities press.
6. An advance course in practical chemistry, A K Nad, B. Mahapatra and A. Ghoshal.

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

Inorganic Chemistry

1. Preparation and determination of purity of double and complex salts. At least ten preparations should be done.
2. Colorimetric estimation of any five out of Cu, Mn, NO2, Ni, P, Fe, V, Ti, Cr, Co.

Books Recommended:

1. Vogels Textbook of Quantitative Chemical Analysis, 6th Edition, 2002.
2. Advanced Practical Inorganic Chemistry, Gurdeepraj, Goel Publishing House, 2001.
3. An Advanced Course in Practical Chemistry, A.K. Nad, B. Mahapatra, A. Ghosal, New Central Book Agency, 2004

Physical Chemistry

I. Conductometry

1. Test of validity of Ostwald's dilution law and determination of dissociation constant of weak electrolyte like CH_3COOH & $ClCH_2COOH$
2. Verification of Debye-Huckel-Onsager's equation in case of strong electrolytes like HCl, KCl, NaCl.

II Potentiometry

1. Titration of dibasic acid like malonic, oxalic, succinic acid with NaOH and find the dissociation constant of acid.
2. Precipitation titration → Titration of halids with $AgNO_3$.
3. Redox titration Ferrous ammonium sulfate –$KMnO_4$, $K_2Cr_2O_7$.

III pH metry

1. Determination of dissociation constant of weak acid like acetic and monochloroacetic acid

IV Adsorption and kinetics

1. Determination of order of reaction between $K_2S_2O_8$ and KI by a fractional change method.

V Distribution method

1. Determination of the formula of the complex formed between cupric ion and ammonia by distribution method.

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

Books Recommended::

1. Practical physical chemistry –J.B.Yadav
2.Practicals in physical chemistry – P.S.Sindhu
3. Experimental physical chemistry – R.C.Das, B.Behera
4. Experiments in physical chemistry- P.H.Parsania, F. Karia

Analytical Chemistry

1. Determination of saponification value of oil.
2. Determination of iodine value of oil. 3. Determination of acid value of oil.
3. Determination of dissolved oxygen.
4. Determination of chemical oxygen demand.
5. Determination of iron in iron tablets.

(Any 2 estimation practical)

6. Simultaneous estimation of chromium (III) and iron (III) by EDTA titration.
7. Simultaneous estimation of calcium (II) and zinc (II) by EDTA titration.
8. Simultaneous estimation of lead (II) and magnesium (II) by EDTA titration.

9. Separation of amino acids by TLC.
10. Separation of drugs by TLC.
11. Separation of dyes by TLC.

Books Recommended:

1. Analytical Chemistry Practice, John H. Kennedy, Saunders College Publishing, Second Edition 1990.

2. Vogels Textbook of Quantitative Chemical Analysis, 6th Edition, 2002.

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MATHEMATICS

Advanced Abstract Algebra - II

Subject Code: 256050201

M.Sc. Semester -2

Teaching & Evaluation Scheme

This program leading to this degree provides the opportunities to develop and demonstrate knowledge and understanding of the fundamental and advanced content in Mathematics which will be determined by his /her particular choice of courses, according to his/her particular needs and interests.

Teaching Scheme				Credits	Evaluation Scheme				
Th	Tu	P	Total		Internal		External		Total
					Th	Pr	Th	Pr	
4	-	-	4	4	30	-	70	-	100

Objectives :

When one has completed this degree he / she will be able to demonstrate the following skills:

- To connect linear algebra to other fields both within and without mathematics.
- To develop abstract and critical reasoning by studying logical proofs and the axiomatic method as applied to linear algebra .

Prerequisites :

A Candidate for admission to the Master of Science (Mathematics) must have a 10+2 Science and Bachelor degree with mathematics Group. Provisional admission shall be provided subject to the Clearance of examinations and eligibility.

Course outline: The objective of this course is to provide knowledge of Ring theory, Unique factorization domain and Field extension.

Sr. No.	Course Contents	Teaching hours
1	**Unit 1 Ring and Field:** Definition and examples of Field, General theorems on field, Subfield, Necessary and sufficient condition to be a subfield, Characteristic of a ring, Characteristic of a field, Ordered integral domain, Principal ideal, Principal ideal ring, Units and Associates, Embedding of rings	14
2	**Unit 2 Euclidean Ring and Unique Factorization Domains:** Prime and Irreducible element, Definition and examples of Euclidean ring, Properties of Euclidean ring, Unique factorization theorem, Definition of Unique factorization domain (UFD), Properties of UFD, Polynomial ring over UFD, Field of quotients of a UFD, Eisenstein's criterion of irreducibility.	12
3	**Unit 3 Algebraic Extension of a Field:** Field, Subfield, Characteristic of a field, Extension of a field, Simple extension of a field, Algebraic extension of a field, Algebraically closed field.	10
4	**Unit 4 Normal and Separable Extension of Fields:** Root fields, Splitting field or decomposition field, Normal Extension, Separable and inseparable extensions.	10

Learning Outcomes :

On successful completion of the course, students should be able to

- Identify different types of rings and fields .
- Understand basic knowledge of UFD .
- Explain the fundamental concepts of field extensions.

Teaching & Learning Methodology :

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs

- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups.
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties.
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Books Recommended

1. "Advanced Abstract Algebra" by S.K. Pundir, Krishna Prakashan (P) Ltd., Meerut.
2. "A First Course in Abstract Algebra" by John B. Fraleigh, Pearson .
3. "Basic Abstract Algebra" by Bhattacharya, Jain and Nagpal, 2nd Edition.
4. "Algebra" by S. Mc Clane and G. Birkhoff, 2nd Edition.
5. "Basic Algebra" by N. Jacbson, Hind, Pub. Corp, 1984.
6. "A first course in Abstract Algebra" by John Fraleigh (3rd Edition), Narossa Publishing House, New Delhi.

E-Resources

- cims.nyu.edu/~cfgranda/pages/OBDA_fall17/notes…
- www.sxccal.edu/mathematics-lecture-notes
- https://users.math.msu.edu/users/gnagy/teaching/la.pdf

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MATHEMATICS

Complex Analysis
Subject Code:256050202
M.Sc. Semester -2

Teaching & Evaluation Scheme

This program leading to this degree provides the opportunities to develop and demonstrate knowledge and understanding of the fundamental and advanced content in Mathematics which will be determined by his /her particular choice of courses, according to his/her particular needs and interests.

Teaching Scheme				Credits	Evaluation Scheme				
Th	Tu	P	Total		Internal		External		Total
					Th	Pr	Th	Pr	
4	-	-	4	4	30	-	70	-	100

Objectives :

When one has completed this degree he / she will be able to demonstrate the following skills:

- Introductory course in complex analysis which provide a working knowledge of the basic definitions and theorems of the differential and integral calculus of functions of a complex variable
- know the similarities and differences between real and complex analysis.

Prerequisites :

A Candidate for admission to the Master of Science (Mathematics) must have a 10+2 Science and Bachelor degree with mathematics Group. Provisional admission shall be provided subject to the Clearance of examinations and eligibility.

Course outline: The objective of this course is to provide knowledge of Complex number , The Elementary Functions and Complex Integral , Some definition and Residue .

Sr.No.	Course Contents	Teaching hours
1	**Unit 1 Complex Number :** Complex numbers and its polar and exponential forms, powers and roots, Regions in the complex plane, Continuity and differentiability of complex functions, Analytic functions, Cauchy- Riemann equations, Harmonic Functions of two variables, Infinite series of complex numbers, Power series functions.	10
2	**Unit 2 The Elementary Functions and Complex Integral:** Exponential, Trigonometric, Hyperbolic functions, Logarithmic functions and its branches rectifiable arcs, Complex line integral, Complex contour integral, Cauchy's theorem for triangular contours, Anti derivatives.	14
3	**Unit 3 Some Important Theorems:** Cauchy's integral formula, Derivative of analytic functions, Morera's theorem, Liouville's theorem, Fundamental theorem of algebra, Taylor expansions, Laurent expansions .	10
4	**Unit 4 residue:** Singularities, Zeros of analytic functions, Poles, Residues, Residue Theorem, Residue at poles, Evaluations of improper integrals.	12

Learning Outcomes :

On successful completion of the course, students should be able to

- Develop facility with complex numbers and the geometry of the complex plane culminating in finding the n nth roots of a complex number.
- Set up and directly evaluate contour integrals .
- Identify and classify zeros and singular points of functions.

Teaching & Learning Methodology :

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups.
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties.
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Books Recommended

1. John Duncan, The Elements of Complex Analysis, John Wiley and Sons Ltd.London(1968).
2. L V Ahlfors, Complex Analysis,3rd edition, McGraw Hill, International Ed. (1966).
3. J B Conway, Functions of One Complex Variables, 2nd edition, Springer Verlag, New York (1967) [Indian edition: Narosa Publication House, New Delhi (1982)].
4. Serge Lang, Complex Analysis, Addison- Wesley, Publishing Co. (1997).
5. B Choudhary, The Elements of Complex, Analysis, 2nd edition, New Age International Ltd Publishers, New Delhi (1992).
6. Dr. Shailesh S. Patel, Dr. Narendra B. Desai, Complex Analysis and Numerical Techniques, Volume IV, Atul Prakashan .

E-Resources

- cims.nyu.edu/~cfgranda/pages/OBDA_fall17/notes…
- www.sxccal.edu/mathematics-lecture-notes
- https://users.math.msu.edu/users/gnagy/teaching/la.pdf

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MATHEMATICS

Special Function

Subject Code: 256050203

M.Sc. Semester -2

Teaching & Evaluation Scheme

This program leading to this degree provides the opportunities to develop and demonstrate knowledge and understanding of the fundamental and advanced content in Mathematics which will be determined by his /her particular choice of courses, according to his/her particular needs and interests.

Teaching Scheme				Credits	Evaluation Scheme				
Th	Tu	P	Total		Internal		External		Total
					Th	Pr	Th	Pr	
4	-	-	4	4	30	-	70	-	100

Objectives :

The objective of this course is

- To provide an understanding of statistical concepts like measurements of location and dispersion, probability, probability distributions, sampling, estimation, hypothesis testing, regression, correlation analysis, multiple regression and business/economic forecasting .

Prerequisites :

A Candidate for admission to the Master of Science (Mathematics) must have a 10+2 Science and Bachelor degree with mathematics Group. Provisional admission shall be provided subject to the Clearance of examinations and eligibility .

Course outline: The objective of the course is to introduce some special functions that appear in different areas of applied mathematics .

Sr. No.	Course Contents	Teaching hours
1	**Unit 1 Legendre's Equation:** Definition and general solution of Legendre's equation, Definition of Pn(x) and Qn(x), Generating function of Pn(x), Laplace's definite integral for Pn(x), Orthogonal properties of Pn(x), Recurrence formulae for Pn(x), Beltrami's result, Christoffel's expansion, , Christoffel's summation formula, Rodrigue's formula, Legendre's function of second kind, Recurrence formula for Qn(x), Relation between Pn(x) and Qn(x), Christoffel's second summation formula	12
2	**Unit 2 Hypergeometric Function :** Definition of Hyper geometric series, Particular cases of Hyper geometric series, Solution of Hyper geometric equation, Integral formula for hyper geometric function, Kummer's theorem, Gauss theorem, Vandermonde's theorem, Differentiation of Hyper geometric function, The confluent Hyper geometric function, Integral representation of the confluent Hyper geometric function, Differentiation of confluent Hyper geometric function, Continuous Hyper geometric function.	10
3	**Unit 3 Hyper geometric Function :** Definition of Hyper geometric series, Particular cases of Hyper geometric series, Solution of Hyper geometric equation, Integral formula for hyper geometric function, Kummer's theorem, Gauss theorem, Vandermonde's theorem, Differentiation of Hyper geometric function, The confluent Hyper geometric function, Integral representation of the confluent Hyper geometric function, Differentiation of confluent hyper geometric function, Continuous hyper geometric function.	12

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

4	**Unit 4 Boundary value problems :** Hermite Polynomial: Hermite differential equation, Solution of Hermite equation, Hermite's polynomials, Generating function, Other forms of Hermite polynomials, To find first few Hermite polynomials, Orthogonal properties of Hermite polynomials, Recurrence formulae for Hermite polynomials. Chebyshev Polynomials: Chebyshev's differential equation, Chebyshev polynomials, To prove that Tn(x) and Un(x) are independent solutions of Chebyshev's equation, Relation for Tn(x) and Un(x), To find first few terms of Chebyshev polynomials, Generating function, Orthogonal properties of Chebyshev polynomials, Recurrence formulae for Tn(x) and Un(x).	12

Learning Outcomes :

On successful completion of the course, students will be able to

- Apply and understand the application of Bessel's and Legendre's functions.
- Apply and understand the application of Hypergeometric function.
- Apply and understand the application of Hermite and Chebyshev polynomials

Teaching & Learning Methodology :

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups.
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties.
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Books Recommended

1. Differential equations with application and historical notes, George F Simmons Tata McGraw Hill, Publishing Co. Ltd., New Delhi, 1974.

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

2. Special Functions, J. N. Sharma and R. K. Gupta, Krishna Prakashan Media (P) Ltd. Meerut .
3. An Introduction to Ordinary Differential Equations, E.A Coddington., Prentice-Hall of India Private Ltd., New Delhi, 2001.
4. Elementary Differential Equations (3rd Edition), W. T Martain and E. Relssner, Addison Wesley Publishing Company, inc 1995.
5. Theory of Ordinary Differential Equations, E. A Codington and N Levinson, Tata McGraw hill Publishing co Ltd., New Delhi, 1999.

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MATHEMATICS

ORDINARY DIFFERENTIAL EQUATIONS

Subject Code: 256050204

M.Sc. Semester -2

Teaching & Evaluation Scheme

This program leading to this degree provides the opportunities to develop and demonstrate knowledge and understanding of the fundamental and advanced content in Mathematics which will be determined by his /her particular choice of courses, according to his/her particular needs and interests.

Teaching Scheme				Credits	Evaluation Scheme				
Th	Tu	P	Total		Internal		External		Total
					Th	Pr	Th	Pr	
4	-	-	4	4	30	-	70	-	100

Objectives :

When one has completed this degree he / she will be able to demonstrate the following skills:

- The ability to advance your own knowledge and understanding through independent learning
- Communicate clearly knowledge, ideas and conclusions about mathematics
- Develop problem- solving skills and apply them dependently to problems in pure, applied and applicable mathematics
- Communicate effectively in writing about the subject
- prove his/her own learning and performance.

Prerequisites :

A Candidate for admission to the Master of Science (Mathematics) must have a 10+2 Science and Bachelor degree with mathematics Group. Provisional admission shall be provided subject to the Clearance of examinations and eligibility.

Course outline: On successful completion of the course, students will be able to Distinguish between linear, non-linear, partial and ordinary differential equations .

Sr. No.	Course Contents	Teaching hours
1	**Unit 1 Introduction to ODE :** Singular solution and extraneous loci, Review of Simultaneous Ordinary Differential Equations of First Order, linear differential equation of second order, Exact linear differential equation of nth order	14
2	**Unit-2 Non-linear Differential Equations :** Non-linear differential equations of particular forms, Total differential equation.	10
3	**Unit: 3 Series solution :** Ordinary and singular point, Cauchy Euler equation, Series solution near a regular singular point.	12

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

4	**Unit: 4 Numerical Solution :** Numerical solution of ordinary differential equations using Euler's method, Runge Kutta method (one stage and two stage)	10

Learning Outcomes :

Identify an ordinary differential equation and its order

- Verify whether a given function is a solution of given ordinary differential equation
- Classify ordinary differential equation in linear and non-linear equations
- Solve first order linear differential equations
- Find solution of separable differential equation and exact differential equation
- Find the general solution of second order linear homogeneous equation with constant coefficient

Teaching & Learning Methodology :

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups.
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties.
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Books Recommended

1. M.D Raisinghania, Ordinary and Partial Differential Equations, S Chand & Co.
2. H.K. Dass, Advanced Engineering Mathematics, S.Chand
3. Differential Equations, Vol II, Bansal, H.L. and Dhami, H.S.
4. Gupta, Malik and Mittal, Differential Equations, Pragati Prakashan
5. Sharma & Gupta, Differential Equations, Krishna Prakashan Media (P) Ltd.

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

E- **Resources**

- cims.nyu.edu/~cfgranda/pages/OBDA_fall17/notes…
- www.sxccal.edu/mathematics-lecture-notes
- https://users.math.msu.edu/users/gnagy/teaching/la.pdf

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MATHEMATICS

Abstract Algebra - I
Subject Code: 256050101
M.Sc. Semester -1

Teaching & Evaluation Scheme

This program leading to this degree provides the opportunities to develop and demonstrate knowledge and understanding of the fundamental and advanced content in Mathematics which will be determined by his /her particular choice of courses, according to his/her particular needs and interests.

Teaching Scheme				Credits	Evaluation Scheme				
Th	Tu	P	Total		Internal		External		Total
					Th	Pr	Th	Pr	
4	-	-	4	4	30	-	70	-	100

Objectives :

When one has completed this degree he / she will be able to demonstrate the following skills:

- The ability to advance your own knowledge and understanding through independent learning.
- Communicate clearly knowledge, ideas and conclusions about mathematics.
- Develop problem- solving skills and apply them dependently to problems in pure, applied and applicable mathematics
- Communicate effectively in writing about the subject
- Improve his/her own learning and performance.

Prerequisites :

A Candidate for admission to the Master of Science (Mathematics) must have a 10+2 Science and Bachelor degree with mathematics Group. Provisional admission shall be provided subject to the Clearance of examinations and eligibility.

Course outline: This Course is Designed to enable student to understand and apply the conceptual structure of group theory.

Sr. No.	Course Contents	Teaching hours
1	**Unit 1 Homomorphism and Isomorphism of Groups:** Definition and basic examples of Group, Sub group, Normal subgroups, Quotient group and Cyclic group. Homomorphism of Group, Fundamental Theorem on homomorphism, Isomorphism of groups, Laws of Isomorphism	14
2	**Unit 2 Automorphism of Groups:** Conjugacy relation on a group and its applications, Class Equation, Automorphism of a group, Inner Automorphism, External direct product of groups, Inner direct products.	10
3	**Unit 3 Sylow's Theorems:** Cauchy's theorem for abelian groups, Cauchy's theorem for finite groups, Sylow's p-subgroup, Sylow's Theorems, Finite Abelian Group.	12
4	**Unit: 4 Solvable Groups:** Subnormal and normal series, Composition series, Nilpotent group, Solvable groups.	10

Learning Outcomes :

On successful completion of the course, students should be able to

- Differentiate between homomorphism, isomorphism and Automorphism.
- Recognize and apply Sylow's theorem to characterize certain finite groups.
- Determine whether a given set is solvable group or not.
- Use the skills of proof by contradiction, proof by contraposition, proof of set equality, and proof using both forms mathematical induction.

Teaching & Learning Methodology :

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups.
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties.
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Books Recommended

1. Topics in Algebra by I. N. Herstein, John Wiley and Sons Inc., 2nd Edition.
2. "Advanced Abstract Algebra" by S.K. Pundir, Krishna Prakashan (P) Ltd., Meerut.
3. "A First Course in Abstract Algebra" by John B. Fraleigh, Pearson
4. "Basic Abstract Algebra" by Bhattacharya, Jain and Nagpal, 2nd Edition.
5. "Algebra" by S. Mcclane and G. Birkhoff, 2nd Edition.
6. "Basic Algebra" by N. Jacbson, Hind, Pub. Corp, 1984.
7. "A first course in Abstract Algebra" by John Fraleigh (3rd Edition), Narossa Publishing House, New Delhi.
8. "Contemporary Abstract Algebra" Joseph A. Gallian, Narossa Publishing House, New Delhi.

E-Resources

- cims.nyu.edu/~cfgranda/pages/OBDA_fall17/notes…
- www.sxccal.edu/mathematics-lecture-notes
- https://users.math.msu.edu/users/gnagy/teaching/la.pdf

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MATHEMATICS

Real Analysis

Subject Code: 256050102

M.Sc. Semester -1

Teaching & Evaluation Scheme

This program leading to this degree provides the opportunities to develop and demonstrate knowledge and understanding of the fundamental and advanced content in Mathematics which will be determined by his /her particular choice of courses, according to his/her particular needs and interests.

Teaching Scheme				Credits	Evaluation Scheme				
Th	Tu	P	Total		Internal		External		Total
					Th	Pr	Th	Pr	
4	-	-	4	4	30	-	70	-	100

Objectives :

When one has completed this degree he / she will be able to demonstrate the following skills:

- The ability to advance your own knowledge and understanding through independent learning
- Communicate clearly knowledge, ideas and conclusions about mathematics
- Develop problem- solving skills and apply them dependently to problems in pure, applied and applicable mathematics \
- Communicate effectively in writing about the subject
- Improve his/her own learning and performance.

Prerequisites :

A Candidate for admission to the Master of Science (Mathematics) must have a 10+2 Science and Bachelor degree with mathematics Group. Provisional admission shall be provided subject to the Clearance of examinations and eligibility.

Course outline: To provide knowledge of the theory of measurable sets, integration and differentiation of measurable functions.

Sr. No.	Course Contents	Teaching hours
1	**Unit 1 Lebesgue outer measure:** Algebra and σ- algebra of sets, σalgebra of Borel sets, Lebesgue outer measure on R, Measurable sets, Lebesgue measure	10
2	**Unit 2 Measurable function:** Measurable function, Littlewoods's three principles, Egoroff's theorem, Integral of a simple function, Lebesgue integral of bounded functions, Comparison of Reimann and Lebesgue integration, Bounded convergence theorem.	12
3	**Unit 3 Integration of non-negative functions:** Integral of nonnegative measurable functions, General Lebesgue (integral), Fatou's lemma, Monotone convergence theorem, Lebesgue's convergence theorem, Convergence in measure	12
4	**Unit 4 Differentiation of measurable functions:** Differentiation of monotone functions, Functions of bounded variation, Differentiation of an integral, Absolutely continuous functions and indefinite integrals	12

Learning Outcomes :

On successful completion of the course, students will be able to

- Identify and formulate the basic concepts and theorems of sigma algebras, measure and abstract measure spaces .
- Synthesize techniques that have been developed in the course to solve particular problems and explain the basic concepts and main theorems of Lebesgue and different types of convergence theorems.

Teaching & Learning Methodology :

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs.

- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups.

- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties.

- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Books Recommended

1. "Real Analysis" by H. L Ryoden, Macmillan Pub. Co 3rd Ed.
2. "Theory of Functions of a Real Variable"- by I. N. Natansen, Fredrik Pub Co., 1964.
3. "Measure Theory"- by P. R. Halmos, East and West Press.
4. "Introduction to Real Variable Theory"- by S.C. Saxena and S. N Shah Prentice Hall of India 1980.
5. "Real and Complex Analysis", Rudin, W., 2nd Edition, Tata McGraw- Hill Publishing Co., Ltd 1974.

E-Resources

- cims.nyu.edu/~cfgranda/pages/OBDA_fall17/notes…
- www.sxccal.edu/mathematics-lecture-notes
- https://users.math.msu.edu/users/gnagy/teaching/la.pdf

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MATHEMATICS

Statistical Methods

Subject Code: 256050103

M.Sc. Semester -1

Teaching & Evaluation Scheme

This program leading to this degree provides the opportunities to develop and demonstrate knowledge and understanding of the fundamental and advanced content in Mathematics which will be determined by his /her particular choice of courses, according to his/her particular needs and interests.

Teaching Scheme				Credits	Evaluation Scheme				
Th	Tu	P	Total		Internal		External		Total
					Th	Pr	Th	Pr	
4	-	-	4	4	30	-	70	-	100

Objectives :

The objective of this course is

· To provide an understanding of statistical concepts like measurements of location and dispersion, probability, probability distributions, sampling, estimation, hypothesis testing, regression, correlation analysis, multiple regression and business/economic forecasting.

Prerequisites :

A Candidate for admission to the Master of Science (Mathematics) must have a 10+2 Science and Bachelor degree with mathematics Group. Provisional admission shall be provided subject to the Clearance of examinations and eligibility.

Course outline: To provide knowledge of the Descriptive Statistics and Correlation , Probability & Probability Distribution , Statistical Inference , Regression Analysis .

Sr. No.	Course Contents	Teaching hours
1	**Unit 1 Descriptive Statistics and Correlation:** Introduction to Statistics, Applications in Business & Economics, Data Summarizing Qualitative & Quantitative Data, Exploratory Data Analysis, The Stem and leaf Display, Cross tabulation & Scatter Diagrams, Measures of location, Mean, Median, Mode, Percentiles, Quartiles, Measures of variability, Range, Inter quartile range,Variance, Standard deviation, Coefficient variation, Measures of distribution shape, Relative location and detecting outliers, Measures of association between two variables, Covariance, Correlation.	12
2	**Unit 2 Probability & Probability Distribution:** Basic probability concepts, Experiment, Sample space, Events, Exclusive events, Exhaustive events, Independent events, Dependent events, Methods for assigning probability: Classical method, Relative frequency method, Subjective method, Events and their Probability, Addition rule (not to be proved or derived), Conditional probability, Multiplication rule (not to be proved or derived), Baye's theorem (statement only not to be proved or derived), Random variable, Discrete and continuous random variable, Expected value and variance of random variable, Probability distribution: Binomial distribution, Poisson distribution, Normal distribution.	12

3	**Unit 3 Statistical Inference:** Sampling methods, Sampling distribution, Central limit theorem (statement only), Point and interval estimation, Sampling distribution of sample mean, Sampling distribution of sample proportion, Hypothesis tests: Null and alternative hypothesis, Type I & II errors, One and two tails test, Rejection rule using p- value and critical value approach, Test of hypothesis about population mean (known), Test of hypothesis about population and proportion, Sampling distribution and test of hypothesis about difference between two population means(known and unknown), Sampling distribution and test of hypothesis about difference between two population and proportions analysis of variance.	12
4	**Unit 4 Regression:** Introduction to Regression, Simple linear Regression Model, Least Square Method, Coefficient of Determination, Correlation Coefficient, Model Assumptions, Residual Analysis, Validating Model Assumptions, Outliers and Influential Observations, Using the Estimated Regression Equation for Estimation and Prediction.	10

Learning Outcomes :

On successful completion of the course, students will be able to

- How to calculate and apply measures of location and measures of dispersion to grouped and ungrouped data cases.
- How to apply discrete and continuous probability distributions to various business problems.
- Perform Test of Hypothesis as well as calculate confidence interval for a population parameter for single sample and two sample cases.
- Learn non-parametric test such as the Chi-Square test for Independence as well as Goodness of Fit.
- Compute and interpret the results of Bivariate and Multivariate Regression and Correlation Analysis, for forecasting and also perform ANOVA and F-test

Teaching & Learning Methodology :

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups.
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties.
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Books Recommended

1. Anderson, Sweeney, Williams, "Statistics for Business and Economics", 9 th edition, Cengage Publication.
2. S.P. Gupta, "Statistical Method", Sultan Chand and Sons, 37th edition (2008).

E-Resources

- cims.nyu.edu/~cfgranda/pages/OBDA_fall17/notes…
- www.sxccal.edu/mathematics-lecture-notes
- https://users.math.msu.edu/users/gnagy/teaching/la.pdf

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MATHEMATICS

Advanced Linear Algebra

Subject Code: 256050104

M.Sc. Semester -1

Teaching & Evaluation Scheme

This program leading to this degree provides the opportunities to develop and demonstrate knowledge and understanding of the fundamental and advanced content in Mathematics which will be determined by his /her particular choice of courses, according to his/her particular needs and interests.

Teaching Scheme				Credits	Evaluation Scheme				
Th	Tu	P	Total		Internal		External		Total
					Th	Pr	Th	Pr	
4	-	-	4	4	30	-	70	-	100

Objectives :

When one has completed this degree he / she will be able to demonstrate the following skills:

- To connect linear algebra to other fields both within and without mathematics.
- To develop abstract and critical reasoning by studying logical proofs and the axiomatic method as applied to linear algebra

Prerequisites :

A Candidate for admission to the Master of Science (Mathematics) must have a 10+2 Science and Bachelor degree with mathematics Group. Provisional admission shall be provided subject to the Clearance of examinations and eligibility.

Course outline: · To provide knowledge of the theory of Vector Space, Linear Transformation and Rational Conical Form .

Sr. No.	Course Contents	Teaching hours
1	**Unit 1 Characteristic roots & Matrices:** The Algebra of Linear Transformation, Characteristic roots, Characteristic vectors, Diagonalization of Matrices.	10
2	**Unit 2 Triangular canonical forms:** Triangular canonical form and its theorems, Nilpotent linear transformations and its theorems.	10
3	**Unit 3 Decomposition theorem & Jordan canonical forms:** Trace and transpose, Decomposition theorem, Jordan canonical forms.	10
4	**Unit 4 Rational canonical forms & Determinants:** Rational canonical forms, Determinants	10

Learning Outcomes :

On successful completion of the course, students will be able to

- Analyze and evaluate the accuracy of common numerical methods
- Demonstrate understanding of common numerical methods and how they are used to obtain approximate solutions to otherwise intractable mathematical problems.

Teaching & Learning Methodology :

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups.
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties.
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

Books Recommended

1. Topics in Algebra", 2nd edition, by I N Herstein, John Wiley and Sons, Student Edition, New York (2004).
2. Lenneth Hoffman, Ray Kunze, Linear Algebra, 2nd edition Prentice Hall of India, New Delhi (1971).
3. S. K. Pundir, Advanced Abstract Algebra, Krishna Prakashan Media (P) Ltd. Meerut
4. P B Bhattacharya, Phani Bhusan Bhattacharya, S K Jain and S R Nagpaul, Advanced linear algebra, New Age International Ltd Publishers, New Delhi (2008).
5. Steven Roman, Advanced Linear Algebra, 3rd Edition, Springer (2008).

E-Resources

- SWAYAM PORTEL/ NPTEL- online courses on mathematical and quantum mechanics. https://swayam.gov.in/ and https://nptel.ac.in/
- cims.nyu.edu/~cfgranda/pages/OBDA_fall17/notes…
- www.sxccal.edu/mathematics-lecture-notes
- https://users.math.msu.edu/users/gnagy/teaching/la.pdf

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MICROBIOLOGY

Biogeohydrotechnology and Biofuels
Subject Code: 256030104
M.Sc. Semester-1

Teaching & Evaluation Scheme

Teaching Scheme				Credits	Evaluation Scheme				
Th	Tu	P	Total		Internal		External		Total
					Th	Pr	Th	Pr	
4	-	-	4	4	30	-	70	-	100

Objectives

- To provide applied knowledge of waste management with different biological methods, marine biotechnology, microbiology of minerals and fuel biology.
- Learn about the Methodology of waste treatment, marine bacterial diversity, bioleaching methods & bio-oxidation.
- Get awareness on the conservation of energy and migration towards bioenergy such as biogas, bio-hydrogen, bioethanol, etc.

Prerequisites

Student must have basic knowledge about waste treatment, bacterial diversity as well as energy resources.

Course outline

Unit. No.	Course Contents	Teaching hours
1	**Waste treatment:** • Classification and characterization of waste • Principles and mechanisms of waste treatment • Biological methods of liquid waste treatment • Biological methods for solid waste management	10
2	**Marine Biotechnology:** • Marine environment and bacterial diversity • Cultivation and enumeration of marine bacteria • Application of indicators of marine microbial enzymes, polysaccharide, antimicrobial peptides and carotenoids	10
3	**Microbiology of Minerals:** • Bioleaching and Bio-oxidation • Biogeohydrotechnology of sulphidic minerals • Biobeneficiation • Acid mine drainage formation and control • Bioleaching methods and factors affecting bioleaching	10
4	**Fuel Biotechnology:** • Types of energy resources and their uses • Biotechnology for biogas, bioethanol, biodiesel and bio-hydrogen production ➢ Desirable and undesirable features of biofuels ➢ Energy crops ➢ MEOR ➢ Mode of utilization of biomass	10
		40

Learning Outcomes

- The students will be able to apply the knowledge of the biological methods for solid and liquid waste treatment, also get knowledge about classification and characterization of waste.

- Student should be able to understand marine bacterial diversity and also learn techniques for cultivation and enumeration of marine bacteria and get knowledge about indicators of marine microbial enzymes and its applications.

- The course is designed to give students understanding different methods of bioleaching, bio-oxidation, bio-beneficiation as well as biogeohydrotechnology of sulphidic minerals. The study fuel biotechnology also helps students to understand importance of energy resources with knowledge of biogas, bioethanol, biodiesel, bio-hydrogen technology.

GE, SSIU, KALOL, GANDHINAGAR
SSIU
N RATHOD
andhinagar
SWARNIM

- Access information on a topic from a variety of sources, and be able to learn new things on one's own.

- Communicate verbally, graphically, and/or in writing the theoretical data and laboratory experiments clearly and concisely that incorporates the stylistic conventions used by microbiologists worldwide.

Teaching & Learning Methodology

- We should aim to provide a range of modes of learning, including, for example, individual work, group work and opportunities for off-campus learning through visit to various research institutions across India or collaborative arrangements.
- The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:
- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Books Recommended

- Bimal C Bhattacharyya., & Rintu Banerjee (2007). *Environmental biotechnology.*
- Ronald M. Atlas., & Richard Bartha (1998). *Microbial Ecology: Fundamentals and Applications*, 4th Edition
- Brierley, C. L., Ehrlich, H. Lutz. (1990). *Microbial mineral recovery.*
- T. Scheper (1983). *Advances in biochemical engineering/biotechnology.*
- Garg, Sudhi. (2011). *Environmental Security: Human and Animal Health.*

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARRNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MICROBIOLOGY

Bioinstrumentation
CODE:256030102
M.Sc. 1st Semester

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	-	4	4	4	30	-	70		100

Objectives:-

- To provide students basic knowledge of Bio-analytical techniques. This course begins with a review of basic bio analytical technique and an introduction to general terminologies
- The purpose of the course is to introduce students to methods of Bioanalysis and to develop required microbiological skills which will be helpful in their future.
- This course contains bio analytical techniques along with their theory, working principal, common instrumentation and possible applications. This course will be equally beneficial to various scientific areas including, life science, chemical science, material science and environmental science.

Prerequisites:-

Student must have passed B.Sc in Microbiology as major subject and have knowledge about biology field.

Course outline:-

Sr. No.	Course Contents	Number of Hours
1.	Electrochemistry: pH and buffers, potentiometric and conductometric titration. Principle and application of light, phase contrast, fluorescence, scanning and transmission electron microscopy, scanning tunneling microscopy, atomic force microscopy, confocal microscopy, cytophotometry and flow cytometry. Preparation of microbial, animal and plant samples for microscopy.	**10**
2.	Principle methodology and applications of gel – filtration, ion –exchange and affinity chromatography; Thin layer and gas chromatography; High performance liquid chromatography, FPLC. Electrophoresis: Principle and applications of Native and SDS PAGE; Agarose and 2D gel electrophoresis.	**10**
3.	Spectroscopy: UV, Visible, IR, NMR and ESR spectroscopy. Atomic absorption and plasma emission spectroscopy; MS and MALDI-TOF.	**10**
4.	Centrifugation: Basic principle and application; Differential, density and Ultracentrifugation. Principle of biophysical method and used for analysis of biopolymer structure; X ray diffraction, flurorescence, Principle and applications of tracer technique in biology: Radioactive Isotopes and half life of isotopes; Effect of radiation on biological system; autoradiography; cerenkov radiation; radiation dosimetry; scintillation counting. Biosensors: Principle and application	**10**

Learning Outcomes:

- The students will be able to use selected analytical techniques. Familiarity with working principals, tools and techniques of analytical techniques. student should be able to understand basic concepts of the present day scope and applications of Bioanalytical techniques.
- The course is designed to understand the strengths, limitations and creative use of techniques for problem-solving.
- The students will be able to select analytical technique for case study. able to design

experiments and understand the instrumentation. Students can use their knowedge in Academic and industrial research organization ,Industries based on biotechnology, pharmacy, agriculture, and chemical

Teaching & Learning Methodology

- We should aim to provide a range of modes of learning, including, for example, individual work, group work and opportunities for off-campus learning through visit to various research institutions across India or collaborative arrangements.
- The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:
- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Books Recommended

- K. Wilson, J. M. Walker, Eds., Principles and techniques of biochemistry and molecular biology (Cambridge University Press, Cambridge, UK : New York, 7th ed., 2009).
- R. F. Boyer, Biochemistry laboratory: modern theory and techniques (Prentice Hall, Boston, 2nd ed., 2012).
- R. Katoch, Analytical techniques in biochemistry and molecular biology (Springer, New York, 2011).
- D. L. Spector, R. D. Goldman, Eds., Basic methods in microscopy: protocols and concepts from cells: a laboratory manual (Cold Spring Harbor Laboratory Press, Cold Spring Harbor, N.Y, 2006).
- R. L. Switzer, Experimental biochemistry (W. H. Freeman and Co, New York, 3rd ed., 1999).

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

- R. F. Boyer, Modern experimental biochemistry (Benjamin Cummings, San Francisco, 3rd ed., 2000).
- J. R. Lakowicz, Principles of fluorescen

E-Resources

- https://www.slideshare.net/drmohsin3/colorimetry-spectrophotometry
- https://www.tandfonline.com/doi/abs/10.1081/SPM-100100006?journalCode
- https://www.fishersci.se/se/en/scientific-products/centrifuge-guide/centrifugation-theory.html
- https://en.wikipedia.org/wiki/Chromatography#:~:text=Chromatography
- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1122955/#:~:text=Bi

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MICROBIOLOGY

GENE STRUCTURE AND FUNCTION
Subject Code: 256030101
M.Sc. Semester -1

Teaching & Evaluation Scheme

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	-	-	4	4	30	--	70	-	100

Objectives

- To provide students basic knowledge of Molecular biology of prokaryotes as well as eukaryotes.
- The purpose of the course is to give students to introduction of replication, transcription, translation and post-translation protein processing in prokaryotes and eukaryotes.
- To provide an understanding of Gene regulation and expression system and also get idea about transposons and topology of DNA.

Prerequisites

Student Must have studied B.Sc. with Biotechnology or Microbiology as a major subject and knowledge of basic biology.

Course outline

Sr. No.	Course Contents	Teaching hours
1	**DNA structure** Chemistry of DNA, Forces stabilizing DNA structure, Helix parameters, Forms of DNA, Watson –Crick and Hoogsteen base pairing, Physical properties of ds DNA (UV-Absorption spectra, Denaturation and Renaturation, Cot curves, DNA hybridization), Chemicals that react with DNA. DNA topology: DNA supercoiling, Supercoiled forms of DNA, Superhelical density, energetics of supercoiled DNA, Biology of supercoiled DNA (Topological domains of DNA, DNA topoisomerases, Mechanisms of supercoiling in cells, Mechanism of action of Topoisomerase I and II, effect of supercoiling on structure of DNA and role of supercoiling in gene expression and DNA replication) DNA-protein Interactions: General features, Interaction of Helix-turn Helix motif, B-sheet, Zn- DNA binding domains, etc with DNA.	08
2	**Organization of DNA into chromosomes** Packaging of DNA and organization of chromosome in bacterial cells; Packaging of DNA in eukaryotic nucleosome and chromatin condensation, assembly of nucleosomes upon replication, Chromatin modification and genome expression. DNA replication: Mechanism of DNA polymerase catalyzed synthesis of DNA, Types of DNA polymerases in bacteria and their role. Initiation of chromosomal DNA replication and its regulation in prokaryotes, assembly of replisome and progress of replication fork, termination of replication. Types and function of eukaryotic DNA polymerases, initiation of replication in eukaryotes, role of telomerases in replication of eukaryotic chromosomes. Inhibitors of DNA replication (blocking precursor synthesis, nucleotide polymerization, altering DNA structure).	08
3	**Transcription** RNA polymerases, features of prokaryotic and eukaryotic promoters, assembly of transcription initiation complex in prokaryotes and eukaryotes and its regulation; synthesis and processing of prokaryotic and eukaryotic transcripts. Transport of RNA within eukaryotic cell. **Translation** Structure and role of t-RNA in protein synthesis, ribosome structure, basic features of genetic code and its deciphering, translation (initiation, elongation and termination in detail in prokaryotes as well as eukaryotes).	08
4	**Processing of proteome** Posttranslational processing of proteins (protein folding, processing by proteolytic cleavage, processing by chemical modification),	08

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

	Protein degradation. Regulation of gene expression in prokaryotes: Operon concept, positive and negative regulation. Examples of lac-, Ara-, His- and Trp-operon regulation; antitermination, global regulatory responses; Regulation of gene expression in eukaryotes: Transcriptional, translational and processing level control mechanisms.	

Learning Outcomes

- The students will be able to apply the knowledge of the Molecular biology to understands concepts of various fields like research fields, Gene manipulation, Genetic engineering, Genetics, etc.
- Student should be able to understand basic concepts of Replication, transcription and translation in prokaryotes as well as eukaryotes, gene regulations, protein targeting, transposons, retrotransposons, application of transposons, protein degradation, gene expression, operon systems.
- Access information on a topic from a variety of sources, and be able to learn new things on one's own.
- Communicate verbally, graphically, and/or in writing the theoretical data clearly and concisely that incorporates the stylistic conventions used by biotechnologist worldwide.

Teaching & Learning Methodology

We should aim to provide a range of modes of learning, including, for example, individual work, group work and opportunities for off-campus learning through visit to various research institutions across India or collaborative arrangements.

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties
- Provide learning materials in different formats (written, online, audio, video podcast etc.) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

Books Recommended

1. Lewin's GENES X, Volume 10Benjamin Lewin, Jocelyn Krebs, Stephen Kilpatrick, Elliott Goldstein-Jones & Bartlett Learning, 2011
2. Molecular Biology of the gene – Watson, Hopkins, Roberts 4TH edition
3. Molecular biology of the cell (third edition): By B Alberts, D Bray, J Lewis, M Raff, K Roberts and J D Watson.
4. iGenetics: A Molecular Approach (3rd Edition). by Peter J. Russell

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MICROBIOLOGY

Microbial Diversity
Subject Code: 256030103
M.SC. Semester -1

Teaching & Evaluation Scheme

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	-	4	4	4	30	-	70	-	100

Objectives

- To provide students the basic knowledge cell, cell structure & its function and role of various biomolecules.
- The purpose of the course is to give student to introduction of Evolution of the cell, Chemical and physical foundations of biomolecules, Nucleotides, Biological membranes.
- To provide an understanding of various cell organelles, amino acids, Lipids, vitamins, and membrane structure and transport mechanisms.

Prerequisites

Student must have studied M.Sc. with microbiology as a major subject and knowledge of basic Microbial diversity.

Course outline

Sr. No.	Course Contents	Teaching hours
1.	**Principles of microbial diversity** • Principles and concepts of microbial diversity • Culturable and non-culturable diversity • Methods of studying diversity • Principles and concepts of metagenomics • Conservation of microbial diversity • Metabolic diversity in bacteria	10
2.	**Bacterial systematics** • Conventional and molecular systematics and general discussion on the occurrence, diversity, characteristic features, significance and potential applications of various groups of bacteria, comparison of Bergey's Manual of Systematic Bacteriology (Edition 1 and 2) • Diversity of actinomycetes • Diversity of cyanobacteria	10
3.	**Diversity of yeast and moulds** • Systematics and classification of fungi • Properties, structure and reproduction of economically important fungi • Mycorrhizal fungi • Biology of yeast and its role in industry • Ecological importance and significance of fungi	10
4.	**Diversity of Archaea** • Systematics occurrence, diversity, characteristics features, of different groups of archaea bacteria • Survival, adaptation and potential applications: Halophiles, Thermophiles, Alkalophiles and Acidophile	10

Learning Outcomes

- The students will be able to understand the Knowledge of Diversity.
- Student should be able to understand basic concepts of Microbial diversity ,Diversity of Yeast and moulds ,Diversity of Archaea.
- Access information on a topic from a variety of sources, and be able to learn new things on one's own.

Teaching & Learning Methodology

We should aim to provide a range of modes of learning, including, for example, individual work, group work and opportunities for off-campus learning through visit to various research institutions across India or collaborative arrangements.

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Books Recommended

- Oladele Ogunseitan(2004), Microbial Diversity. Form and Function in Prokaryotes**.**
- Mikel A. Becerro, Maria J. Uriz, Manuel Maldonado and Xavier Turon (Eds.)(2012), Advances in Sponge Science: Physiology, Chemical and Microbial Diversity, Biotechnology.
- Christine E. Salomon; Nathan A. Magarvey; David H. Sherman(2004), Merging the Potential of Microbial Genetics with Biological and Chemical Diversity: An Even Brighter Future for Marine Natural Product Drug Discovery
- Burnet et.al(1980), A guide to identifying and classifying yeast.
- Colwd. D,Microbial diversity.

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF BIOTECHNOLOGY

Diversity of Prokaryotic and Eukaryotic Microorganisms-103
Subject Code: 56010103
M.SC. Semester -1

Teaching & Evaluation Scheme

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	-	2	6	6	30	50	70	-	150

Objectives

- To provide students the basic knowledge cell, cell structure & its function and role of various biomolecules.
- The purpose of the course is to give student to introduction of Evolution of the cell, Chemical and physical foundations of biomolecules, Nucleotides, Biological membranes.
- To provide an understanding of various cell organelles, amino acids, Lipids, vitamins, and membrane structure and transport mechanisms.

Prerequisites

Student must have studied M.Sc. with microbiology as a major subject and knowledge of basic Microbial diversity.

Course outline

Sr. No.	Course Contents	Teaching hours
1.	**Principles of microbial diversity** • Principles and concepts of microbial diversity • Culturable and non-culturable diversity • Methods of studying diversity • Principles and concepts of metagenomics • Conservation of microbial diversity • Metabolic diversity in bacteria	10
2.	**Bacterial systematics** • Conventional and molecular systematics and general discussion on the occurrence, diversity, characteristic features, significance and potential applications of various groups of bacteria, comparison of Bergey's Manual of Systematic Bacteriology (Edition 1 and 2) • Diversity of actinomycetes • Diversity of cyanobacteria	10
3.	**Diversity of yeast and moulds** • Systematics and classification of fungi • Properties, structure and reproduction of economically important fungi • Mycorrhizal fungi • Biology of yeast and its role in industry • Ecological importance and significance of fungi	10
4.	**Diversity of Archaea** • Systematics occurrence, diversity, characteristics features, of different groups of archaea bacteria • Survival, adaptation and potential applications: Halophiles, Thermophiles, Alkalophiles and Acidophile	10

Learning Outcomes

- The students will be able to understand the Knowledge of Diversity.
- Student should be able to understand basic concepts of Microbial diversity ,Diversity of Yeast and moulds ,Diversity of Archaea.
- Access information on a topic from a variety of sources, and be able to learn new things on one's own.

Teaching & Learning Methodology

We should aim to provide a range of modes of learning, including, for example, individual work, group work and opportunities for off-campus learning through visit to various research institutions across India or collaborative arrangements.

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Books Recommended

- Oladele Ogunseitan(2004), Microbial Diversity. Form and Function in Prokaryotes**.**
- Mikel A. Becerro, Maria J. Uriz, Manuel Maldonado and Xavier Turon (Eds.)(2012), Advances in Sponge Science: Physiology, Chemical and Microbial Diversity, Biotechnology.
- Christine E. Salomon; Nathan A. Magarvey; David H. Sherman(2004), Merging the Potential of Microbial Genetics with Biological and Chemical Diversity: An Even Brighter Future for Marine Natural Product Drug Discovery
- Burnet et.al(1980), A guide to identifying and classifying yeast.
- Colwd. D,Microbial diversity.

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MICROBIOLOGY

Bioprocess Technology

CODE: 256030201

M.Sc. 2nd Semester

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	-	-	4	4	30	-	70		100

Objectives:-

- To provide basic knowledge of bioprocess technology in the industry, how to isolate the micro-organisms, its preservation. How the strain can be improved for industrially important organisms. Types of substrate used for fermentation and about medium optimization.
- This study gives idea about the bioreactor design. Types of bioreactor used in the industry. how the sterilization of media and air can be done. Importance of mass transfer and determination of Kla, inoculum development.
- The student will get an idea about kinetic of substrate and utilization of batch, types of fermentation i.e fed batch and batch fermentation. What can be control system for monitoring the fermentation process.
- To provide the idea about down streaming process how to get end product in the fermentation. What different methods can be used for down streaming process.

Prerequisites: -

Student must have passed BSc Microbiology as major subject with basic knowledge of biology.

Course outline: -

Sr. No.	Course Contents	Number of Hours
1.	Introduction to bioprocess technology Isolation, preservation and improvement of industrially important organisms. Substrates for fermentation processes Medium optimization	**10**
2.	Bioreactor design: Laboratory, pilot and large scale reactors. Plug flow reactors, enzyme reactors. Sterilization of media and air. Scale up and Scale down Mass transfer of oxygen: Agitation and aeration, Determination of K_La, factors affecting K_La, fluid rheology. Inoculum development, aseptic inoculation and sampling.	**10**
3.	Bioprocess kinetics: Kinetics of growth and substrate utilization in batch, fed batch and continuous systems. Control of process parameters: Instrumentation for monitoring bioreactor and fermentation processes, Sensors, Controllers, fermentation control systems and architecture, Incubation and sequence control, advanced control. Dynamic modelling of fermentation processes.	**10**
4.	Downstream processing: Methods of Cell separation, Disruption and product purification. Fermentation Economics	**10**

Learning Outcomes:

- Student will learn about the bioprocess technology in the industry, how to isolate the micro-organisms, its preservation. How the strain can be improved for industrially important organisms. Types of substrate used for fermentation and about medium optimization.
- Provide an idea about the bioreactor design. Types of bioreactor used in the industry. how the sterilization of media and air can be done. Importance of mass transfer and determination of Kla, inoculum development.
- Get knowledge about kinetic of substrate and utilization of batch, types of fermentation i.e fed batch and batch fermentation. What can be control system for monitoring the fermentation process.

- To provide the idea about down streaming process how to get end product in the fermentation. What different methods can be used for down streaming process.

Teaching & learning Methodology:

- We should aim to provide a range of modes of learning, including, for example, individual work, group work and opportunities for off-campus learning through visit to various research institutions across India or collaborative arrangements.
- The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:
- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Basic Text & Reference Books:

- Principles of Fermentation Technology : Whitaker & Stanbury Comprehensive
- Biotechnology : Murray Moo Young
- Methods in Industrial Microbiology : Sikyta
- Fermentation Microbiology and Biotechnology, El Mansi and Bryc

E-Resources

- https://www.slideshare.net/zeal_eagle/fermentation-technology
- https://www.slideshare.net/asertseminar/bioreactor-ppt
- https://www.cheric.org/files/education/cyberlecture/e200402/e200402-901.pdf
- https://science.sciencemag.org/content/219/4585/728
- https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/downstream-processing
- https://www.slideshare.net/AyushJain378/downstream-processing-73275843

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MICROBIOLOGY

Immunology
Subject Code: 256030202
M.SC. Semester -2

Teaching & Evaluation Scheme

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	-	-	4	4	30	--	70	-	100

Objectives

- To provide students the basic knowledge of immunity, system of immunology, interaction of Ag-Ab.
- The purpose of the course is to give student to introduction of Types of immunity, antigen- antibody reaction, Hypersensitivity reaction etc.
- To provide an understanding of immune system in the body, types of cells etc..

Prerequisites

Student Must have studied M.Sc. with microbiology as a major subject and knowledge of basic Immunology and medical microbiology.

Course outline

Sr. No.	Course Contents	Teaching hours
1.	Adaptive immunity and innate immunity: inflammation, role of cells, receptors and proteins in innate immunity, ubiquity of the innate system. Cells and organs of the immune system: Hematopoiesis, cells of the immune system, primary and secondary lymphoid organs. Antigens and antibodies: properties of immunogens, haptens, epitopes, structure and classes of immunoglobulins, biological activities and effector functions, monoclonal antibodies and anzymes. Antibody diversity: models, organization of Ig genes, mechanism of gene rearrangement, generation of diversity; expression, synthesis and class switching, antibody engineering.	10
2.	Antigen-antibody interactions: principles and applications. Complement: components of the system, activation, regulation, biological consequences and deficiency diseases. Major histocompatibility complex and antigen presentation: MHC-organization, inheritance, genes, molecules and peptide binding, expression, disease susceptibility, immune responsiveness, self MHC restriction, cytosolic and endocytic pathway for antigen processing.	10
3.	T-cell receptor, T-cell maturation, activation and differentiation: TCR- genetic organization and rearrangement of genes, TCR-complex, peptide binding, thymic selection, activation and differentiation of T cells. Generation, activation and differentiation of B cells: B cell maturation, activation and proliferation, germinal centres, regulation of the responses. Cytokines: properties, receptors, associated diseases, therapeutic applications. Leukocyte activation and migration: CAM, chemokines, recirculation and extravasation, inflammation and anti-inflammatory agents. Cell mediated cytotoxicity: effector T cells, cytotoxic T cells, NK cells, ADCC.	10
4.	Hypersensitivity reactions: classification and types of hypersensitivity reactions. Immune tolerance and autoimmunity: establishment and failure of tolerance, autoimmune diseases, mechanisms for the induction, animal models, treatment. Transplantation immunology: basis and manifestation of graft rejection, immunosuppressive therapy, immune tolerance. Cancer and immune system. Immunodeficiency.	10

SHARDABEN SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

Learning Outcomes

- The students will be able to understand the Knowledge of the types of immune system , Ag-Ab reaction techniques in the body ,hypersensitivity reaction etc.
- Student should be able to understand basic concepts of immunity and types of the cell, classification of the hypersensitivity :its types and function.
- Access information on a topic from a variety of sources, and be able to learn new things on one's own.
- At the end of the course the student would have basic knowledge of immunity, system of immunology, interaction of Ag-Ab.

Teaching & Learning Methodology

We should aim to provide a range of modes of learning, including, for example, individual work, group work and opportunities for off-campus learning through visit to various research institutions across India or collaborative arrangements.

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Books Recommended

- Kuby-Immunology: T. J. Kindt, R. A. Goldsby and B. A. Osborne; W. H. Freeman
- Janeway's Immunology: K. Murphy, P. Travers and M. Walport; Garland Sciences
- Immunology: Ivan Roitt, J. Brostoff and D. Male; Mosby
- Essential immunology: Ivan Roitt; Oxford: Blackwell
- Topic related review articles.

E-Resources

- https://www.slideshare.net/mobile/Jsjahnabi/types-of-immunity
- https://www.slideshare.net/mobile/mprasadnaidu/immunity-32908889
- https://www.slideshare.net/mobile/ArunimaSur/antigen-antibody-interaction-55880086
- https://www.slideshare.net/mobile/VELSPHARMD/hypersensitivity-24449005
- https://www.slideshare.net/mobile/VamsiIntellectual/types-of-cells-and-tissues

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MICROBIOLOGY

Microbial Genetics

CODE: 256030201

M.Sc. 2nd Semester

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	-	-	4	4	30	--	70		100

Objectives:-

- To provide basic knowledge of bioprocess technology in the industry, how to isolate the micro-organisms, its preservation. How the strain can be improved for industrially important organisms. Types of substrate used for fermentation and about medium optimization.
- This study gives idea about the bioreactor design. Types of bioreactor used in the industry. how the sterilization of media and air can be done. Importance of mass transfer and determination of Kla, inoculum development.
- The student will get an idea about kinetic of substrate and utilization of batch, types of fermentation i.e fed batch and batch fermentation. What can be control system for monitoring the fermentation process.
- To provide the idea about down streaming process how to get end product in the fermentation. What different methods can be used for down streaming process.

Prerequisites: -

Student must have passed BSc Microbiology as major subject with basic knowledge of biology.

Course outline: -

Sr. No.	Course Contents	Number of Hours
1.	Introduction to bioprocess technology Isolation, preservation and improvement of industrially important organisms. Substrates for fermentation processes Medium optimization	**10**
2.	Bioreactor design: Laboratory, pilot and large scale reactors. Plug flow reactors, enzyme reactors. Sterilization of media and air. Scale up and Scale down Mass transfer of oxygen: Agitation and aeration, Determination of K_La, factors affecting K_La, fluid rheology. Inoculum development, aseptic inoculation and sampling.	**10**
3.	Bioprocess kinetics: Kinetics of growth and substrate utilization in batch, fed batch and continuous systems. Control of process parameters: Instrumentation for monitoring bioreactor and fermentation processes, Sensors, Controllers, fermentation control systems and architecture, Incubation and sequence control, advanced control. Dynamic modelling of fermentation processes.	**10**
4.	Downstream processing: Methods of Cell separation, Disruption and product purification. Fermentation Economics	**10**

Learning Outcomes:

- Student will learn about the bioprocess technology in the industry, how to isolate the micro-organisms, its preservation. How the strain can be improved for industrially important organisms. Types of substrate used for fermentation and about medium optimization.
- Provide an idea about the bioreactor design. Types of bioreactor used in the industry. how the sterilization of media and air can be done. Importance of mass transfer and determination of Kla, inoculum development.
- Get knowledge about kinetic of substrate and utilization of batch, types of fermentation i.e fed batch and batch fermentation. What can be control system for monitoring the fermentation process.

- To provide the idea about down streaming process how to get end product in the fermentation. What different methods can be used for down streaming process.

Teaching & learning Methodology:

- We should aim to provide a range of modes of learning, including, for example, individual work, group work and opportunities for off-campus learning through visit to various research institutions across India or collaborative arrangements.
- The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:
- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Basic Text & Reference Books:

- Principles of Fermentation Technology : Whitaker & Stanbury Comprehensive
- Biotechnology : Murray Moo Young
- Methods in Industrial Microbiology : Sikyta
- Fermentation Microbiology and Biotechnology, El Mansi and Bryc

E-Resources

- https://www.slideshare.net/zeal_eagle/fermentation-technology
- https://www.slideshare.net/asertseminar/bioreactor-ppt
- https://www.cheric.org/files/education/cyberlecture/e200402/e200402-901.pdf
- https://science.sciencemag.org/content/219/4585/728
- https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/downstream-processing
- https://www.slideshare.net/AyushJain378/downstream-processing-73275843

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MICROBIOLOGY

Tools and techniques in synthetic microbiology

CODE: 256030204

M.Sc. 2nd Semester

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	-	-	4	4	30	-	70		100

Objectives:-

- To provide basic knowledge of microscopy & its types, fixation & storage & cytology.
- The aim of the course is to provide students with the basic principles of cytochemistry and histochemistry.
- The preparation techniques for sample analysis used in cytochemistry, histochemistry, immunocytochemistry and in situ hybridization will be illustrated.
- Basic knowledge will also be provided for optical and electronic visualization of biological interest macromolecules.
- Theoretical lessons will be associated with seminars / workshops relating to examples of application of these methods to the study of cellular biology and instrument observation tools.
- The Microscope. Learning Objectives By the end of this topic, you will be able to: Name the parts of the microscope and their functions.

Prerequisites:-

- Student Must have studied B.Sc. with microbiology/biotechnology as a major subject and knowledge of basic biology

Course outline:-

Sr. No.	Course Contents	Number of Hours
1.	Light microscopy:- Optical corrections, Properties and types of objectives. Oculars, Illumination. Types of light microscopes: Bright field, dark field, fluorescence, phase contrast, polarizing, differential interference contrast. Micrometry.	**10**
2.	Electron microscopy: Basic components of electron microscopes. Thermionic and field emission electron guns. Types of electron microscopes: TEM, SEM, STEM, ESEM and HVEM	**10**
3.	Fixation and storage: Classification of fixatives , formulas. (Plant, animal and microbial samples). Factors affecting fixation. Procedures for fixation. Dehydration, infiltration and embedding. Media for embedding. Microtomes: Rotary, sliding cryostat, ultramicrotome and freezing ultra microtome. Preparation of biological samples for light and electron microscopy: Sectioning, maceration, squash and clearing technique. Freeze etching and freeze fracturing. Stains for light and electron microscopy. Staining procedures. Photomicrography.	**10**
4.	Histochemistry: Histo chemical localization of metabolites:- Starch, proteins, lipids, total carbohydrates, lignin, polyphenols, nucleic acid, histones, cutin, suberin and waxes. Localization of enzymes: Peroxidase, acid phosphatase and succinic dehydrogenase. Ultra structural cytochemistry:- Localization of tannin, protein, cell wall polysaccharide, lignin and membrane. Enzymes: Peroxidase, acid phasphatase. Immunocytochemistry	**10**

Learning Outcomes:

- At the end of the course the student would have basic knowledge of microscopy & its types, fixation & storage & cytology.

- At the end of the course, the student will have acquired basic theoretical knowledge related to:
    - -preparation techniques of histological samples and their cyto-histochemical staining;
      -main techniques of immunohistochemistry and in situ hybridization;
      - main methods of in situ observation of biological macromolecules in cells and tissues.
    - It is therefore timely to investigate how microscopy techniques can be taught most efficiently.
    - In this study, different teaching activities (TAs) that are currently used for microscopy training of students will be assessed regarding their value for the realization of intended learning outcomes

Teaching & Learning Methodology

We should aim to provide a range of modes of learning, including, for example, individual work, group work and opportunities for off-campus learning through visit to various research institutions across India or collaborative arrangements.

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Books Recommended

- Kuby-Immunology: T. J. Kindt, R. A. Goldsby and B. A. Osborne; W. H. Freeman
- Janeway's Immunology: K. Murphy, P. Travers and M. Walport; Garland Sciences
- Immunology: Ivan Roitt, J. Brostoff and D. Male; Mosby

- Essential immunology: Ivan Roitt; Oxford: Blackwell
- Topic related review articles.

E-Resources

- https://microbenotes.com/category/microscopy/
- https://www.khanacademy.org/science/high-school-biology/hs-cells/hs-introduction-to-cells/a/microscopy
- https://www.sciencedirect.com/topics/neuroscience/histochemistry
- https://www.sciencedirect.com/topics/medicine-and-dentistry/cytochemistry
- http://cytochemistry.net/

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MATHEMATICS

Advanced Abstract Algebra - II

Subject Code: 256050201

M.Sc. Semester -2

Teaching & Evaluation Scheme

This program leading to this degree provides the opportunities to develop and demonstrate knowledge and understanding of the fundamental and advanced content in Mathematics which will be determined by his /her particular choice of courses, according to his/her particular needs and interests.

Teaching Scheme				Credits	Evaluation Scheme				
Th	Tu	P	Total		Internal		External		Total
					Th	Pr	Th	Pr	
4	-	-	4	4	30	-	70	-	100

Objectives :

When one has completed this degree he / she will be able to demonstrate the following skills:

- To connect linear algebra to other fields both within and without mathematics.
- To develop abstract and critical reasoning by studying logical proofs and the axiomatic method as applied to linear algebra .

Prerequisites :

A Candidate for admission to the Master of Science (Mathematics) must have a 10+2 Science and Bachelor degree with mathematics Group. Provisional admission shall be provided subject to the Clearance of examinations and eligibility.

Course outline: The objective of this course is to provide knowledge of Ring theory, Unique factorization domain and Field extension.

Sr. No.	Course Contents	Teaching hours
1	**Unit 1 Ring and Field:** Definition and examples of Field, General theorems on field, Subfield, Necessary and sufficient condition to be a subfield, Characteristic of a ring, Characteristic of a field, Ordered integral domain, Principal ideal, Principal ideal ring, Units and Associates, Embedding of rings	14
2	**Unit 2 Euclidean Ring and Unique Factorization Domains:** Prime and Irreducible element, Definition and examples of Euclidean ring, Properties of Euclidean ring, Unique factorization theorem, Definition of Unique factorization domain (UFD), Properties of UFD, Polynomial ring over UFD, Field of quotients of a UFD, Eisenstein's criterion of irreducibility.	12
3	**Unit 3 Algebraic Extension of a Field:** Field, Subfield, Characteristic of a field, Extension of a field, Simple extension of a field, Algebraic extension of a field, Algebraically closed field.	10
4	**Unit 4 Normal and Separable Extension of Fields:** Root fields, Splitting field or decomposition field, Normal Extension, Separable and inseparable extensions.	10

Learning Outcomes :

On successful completion of the course, students should be able to

- Identify different types of rings and fields .
- Understand basic knowledge of UFD .
- Explain the fundamental concepts of field extensions.

Teaching & Learning Methodology :

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs

- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups.
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties.
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Books Recommended

1. "Advanced Abstract Algebra" by S.K. Pundir, Krishna Prakashan (P) Ltd., Meerut.
2. "A First Course in Abstract Algebra" by John B. Fraleigh, Pearson .
3. "Basic Abstract Algebra" by Bhattacharya, Jain and Nagpal, 2nd Edition.
4. "Algebra" by S. Mc Clane and G. Birkhoff, 2nd Edition.
5. "Basic Algebra" by N. Jacbson, Hind, Pub. Corp, 1984.
6. "A first course in Abstract Algebra" by John Fraleigh (3rd Edition), Narossa Publishing House, New Delhi.

E-Resources

- cims.nyu.edu/~cfgranda/pages/OBDA_fall17/notes…
- www.sxccal.edu/mathematics-lecture-notes
- https://users.math.msu.edu/users/gnagy/teaching/la.pdf

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MATHEMATICS

Complex Analysis
Subject Code:256050202
M.Sc. Semester -2

Teaching & Evaluation Scheme

This program leading to this degree provides the opportunities to develop and demonstrate knowledge and understanding of the fundamental and advanced content in Mathematics which will be determined by his /her particular choice of courses, according to his/her particular needs and interests.

Teaching Scheme				Credits	Evaluation Scheme				
Th	Tu	P	Total		Internal		External		Total
					Th	Pr	Th	Pr	
4	-	-	4	4	30	-	70	-	100

Objectives :

When one has completed this degree he / she will be able to demonstrate the following skills:

- Introductory course in complex analysis which provide a working knowledge of the basic definitions and theorems of the differential and integral calculus of functions of a complex variable
- know the similarities and differences between real and complex analysis.

Prerequisites :

A Candidate for admission to the Master of Science (Mathematics) must have a 10+2 Science and Bachelor degree with mathematics Group. Provisional admission shall be provided subject to the Clearance of examinations and eligibility.

Course outline: The objective of this course is to provide knowledge of Complex number , The Elementary Functions and Complex Integral , Some definition and Residue .

Sr.No.	Course Contents	Teaching hours
1	**Unit 1 Complex Number :** Complex numbers and its polar and exponential forms, powers and roots, Regions in the complex plane, Continuity and differentiability of complex functions, Analytic functions, Cauchy- Riemann equations, Harmonic Functions of two variables, Infinite series of complex numbers, Power series functions.	10
2	**Unit 2 The Elementary Functions and Complex Integral:** Exponential, Trigonometric, Hyperbolic functions, Logarithmic functions and its branches rectifiable arcs, Complex line integral, Complex contour integral, Cauchy's theorem for triangular contours, Anti derivatives.	14
3	**Unit 3 Some Important Theorems:** Cauchy's integral formula, Derivative of analytic functions, Morera's theorem, Liouville's theorem, Fundamental theorem of algebra, Taylor expansions, Laurent expansions .	10
4	**Unit 4 residue:** Singularities, Zeros of analytic functions, Poles, Residues, Residue Theorem, Residue at poles, Evaluations of improper integrals.	12

Learning Outcomes :

On successful completion of the course, students should be able to

- Develop facility with complex numbers and the geometry of the complex plane culminating in finding the n nth roots of a complex number.
- Set up and directly evaluate contour integrals .
- Identify and classify zeros and singular points of functions.

Teaching & Learning Methodology :

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups.
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties.
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Books Recommended

1. John Duncan, The Elements of Complex Analysis, John Wiley and Sons Ltd.London(1968).
2. L V Ahlfors, Complex Analysis,3rd edition, McGraw Hill, International Ed. (1966).
3. J B Conway, Functions of One Complex Variables, 2nd edition, Springer Verlag, New York (1967) [Indian edition: Narosa Publication House, New Delhi (1982)].
4. Serge Lang, Complex Analysis, Addison- Wesley, Publishing Co. (1997).
5. B Choudhary, The Elements of Complex, Analysis, 2nd edition, New Age International Ltd Publishers, New Delhi (1992).
6. Dr. Shailesh S. Patel, Dr. Narendra B. Desai, Complex Analysis and Numerical Techniques, Volume IV, Atul Prakashan .

E-Resources

- cims.nyu.edu/~cfgranda/pages/OBDA_fall17/notes…
- www.sxccal.edu/mathematics-lecture-notes
- https://users.math.msu.edu/users/gnagy/teaching/la.pdf

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MATHEMATICS

Special Function

Subject Code: 256050203

M.Sc. Semester -2

Teaching & Evaluation Scheme

This program leading to this degree provides the opportunities to develop and demonstrate knowledge and understanding of the fundamental and advanced content in Mathematics which will be determined by his /her particular choice of courses, according to his/her particular needs and interests.

Teaching Scheme				Credits	Evaluation Scheme				
Th	Tu	P	Total		Internal		External		Total
					Th	Pr	Th	Pr	
4	-	-	4	4	30	-	70	-	100

Objectives :

The objective of this course is

- To provide an understanding of statistical concepts like measurements of location and dispersion, probability, probability distributions, sampling, estimation, hypothesis testing, regression, correlation analysis, multiple regression and business/economic forecasting .

Prerequisites :

A Candidate for admission to the Master of Science (Mathematics) must have a 10+2 Science and Bachelor degree with mathematics Group. Provisional admission shall be provided subject to the Clearance of examinations and eligibility .

Course outline: The objective of the course is to introduce some special functions that appear in different areas of applied mathematics .

Sr. No.	Course Contents	Teaching hours
1	**Unit 1 Legendre's Equation:** Definition and general solution of Legendre's equation, Definition of Pn(x) and Qn(x), Generating function of Pn(x), Laplace's definite integral for Pn(x), Orthogonal properties of Pn(x), Recurrence formulae for Pn(x), Beltrami's result, Christoffel's expansion, , Christoffel's summation formula, Rodrigue's formula, Legendre's function of second kind, Recurrence formula for Qn(x), Relation between Pn(x) and Qn(x), Christoffel's second summation formula	12
2	**Unit 2 Hypergeometric Function :** Definition of Hyper geometric series, Particular cases of Hyper geometric series, Solution of Hyper geometric equation, Integral formula for hyper geometric function, Kummer's theorem, Gauss theorem, Vandermonde's theorem, Differentiation of Hyper geometric function, The confluent Hyper geometric function, Integral representation of the confluent Hyper geometric function, Differentiation of confluent Hyper geometric function, Continuous Hyper geometric function.	10
3	**Unit 3 Hyper geometric Function :** Definition of Hyper geometric series, Particular cases of Hyper geometric series, Solution of Hyper geometric equation, Integral formula for hyper geometric function, Kummer's theorem, Gauss theorem, Vandermonde's theorem, Differentiation of Hyper geometric function, The confluent Hyper geometric function, Integral representation of the confluent Hyper geometric function, Differentiation of confluent hyper geometric function, Continuous hyper geometric function.	12

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

4	**Unit 4 Boundary value problems :** Hermite Polynomial: Hermite differential equation, Solution of Hermite equation, Hermite's polynomials, Generating function, Other forms of Hermite polynomials, To find first few Hermite polynomials, Orthogonal properties of Hermite polynomials, Recurrence formulae for Hermite polynomials. Chebyshev Polynomials: Chebyshev's differential equation, Chebyshev polynomials, To prove that Tn(x) and Un(x) are independent solutions of Chebyshev's equation, Relation for Tn(x) and Un(x), To find first few terms of Chebyshev polynomials, Generating function, Orthogonal properties of Chebyshev polynomials, Recurrence formulae for Tn(x) and Un(x).	12

Learning Outcomes :

On successful completion of the course, students will be able to

- Apply and understand the application of Bessel's and Legendre's functions.
- Apply and understand the application of Hypergeometric function.
- Apply and understand the application of Hermite and Chebyshev polynomials

Teaching & Learning Methodology :

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups.
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties.
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Books Recommended

1. Differential equations with application and historical notes, George F Simmons Tata McGraw Hill, Publishing Co. Ltd., New Delhi, 1974.

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

2. Special Functions, J. N. Sharma and R. K. Gupta, Krishna Prakashan Media (P) Ltd. Meerut .
3. An Introduction to Ordinary Differential Equations, E.A Coddington., Prentice-Hall of India Private Ltd., New Delhi, 2001.
4. Elementary Differential Equations (3rd Edition), W. T Martain and E. Relssner, Addison Wesley Publishing Company, inc 1995.
5. Theory of Ordinary Differential Equations, E. A Codington and N Levinson, Tata McGraw hill Publishing co Ltd., New Delhi, 1999.

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MATHEMATICS

ORDINARY DIFFERENTIAL EQUATIONS

Subject Code: 256050204

M.Sc. Semester -2

Teaching & Evaluation Scheme

This program leading to this degree provides the opportunities to develop and demonstrate knowledge and understanding of the fundamental and advanced content in Mathematics which will be determined by his /her particular choice of courses, according to his/her particular needs and interests.

Teaching Scheme				Credits	Evaluation Scheme				
Th	Tu	P	Total		Internal		External		Total
					Th	Pr	Th	Pr	
4	-	-	4	4	30	-	70	-	100

Objectives :

When one has completed this degree he / she will be able to demonstrate the following skills:

- The ability to advance your own knowledge and understanding through independent learning
- Communicate clearly knowledge, ideas and conclusions about mathematics
- Develop problem- solving skills and apply them dependently to problems in pure, applied and applicable mathematics
- Communicate effectively in writing about the subject
- prove his/her own learning and performance.

Prerequisites :

A Candidate for admission to the Master of Science (Mathematics) must have a 10+2 Science and Bachelor degree with mathematics Group. Provisional admission shall be provided subject to the Clearance of examinations and eligibility.

Course outline: On successful completion of the course, students will be able to Distinguish between linear, non-linear, partial and ordinary differential equations .

Sr. No.	Course Contents	Teaching hours
1	**Unit 1 Introduction to ODE :** Singular solution and extraneous loci, Review of Simultaneous Ordinary Differential Equations of First Order, linear differential equation of second order, Exact linear differential equation of nth order	14
2	**Unit-2 Non-linear Differential Equations :** Non-linear differential equations of particular forms, Total differential equation.	10
3	**Unit: 3 Series solution :** Ordinary and singular point, Cauchy Euler equation, Series solution near a regular singular point.	12

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

4	**Unit: 4 Numerical Solution :** Numerical solution of ordinary differential equations using Euler's method, Runge Kutta method (one stage and two stage)	10

Learning Outcomes :

Identify an ordinary differential equation and its order

- Verify whether a given function is a solution of given ordinary differential equation
- Classify ordinary differential equation in linear and non-linear equations
- Solve first order linear differential equations
- Find solution of separable differential equation and exact differential equation
- Find the general solution of second order linear homogeneous equation with constant coefficient

Teaching & Learning Methodology :

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups.
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties.
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Books Recommended

1. M.D Raisinghania, Ordinary and Partial Differential Equations, S Chand & Co.
2. H.K. Dass, Advanced Engineering Mathematics, S.Chand
3. Differential Equations, Vol II, Bansal, H.L. and Dhami, H.S.
4. Gupta, Malik and Mittal, Differential Equations, Pragati Prakashan
5. Sharma & Gupta, Differential Equations, Krishna Prakashan Media (P) Ltd.

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

E- **Resources**

- cims.nyu.edu/~cfgranda/pages/OBDA_fall17/notes…
- www.sxccal.edu/mathematics-lecture-notes
- https://users.math.msu.edu/users/gnagy/teaching/la.pdf

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MATHEMATICS

Abstract Algebra - I
Subject Code: 256050101
M.Sc. Semester -1

Teaching & Evaluation Scheme

This program leading to this degree provides the opportunities to develop and demonstrate knowledge and understanding of the fundamental and advanced content in Mathematics which will be determined by his /her particular choice of courses, according to his/her particular needs and interests.

Teaching Scheme				Credits	Evaluation Scheme				
Th	Tu	P	Total		Internal		External		Total
					Th	Pr	Th	Pr	
4	-	-	4	4	30	-	70	-	100

Objectives :

When one has completed this degree he / she will be able to demonstrate the following skills:

- The ability to advance your own knowledge and understanding through independent learning.
- Communicate clearly knowledge, ideas and conclusions about mathematics.
- Develop problem- solving skills and apply them dependently to problems in pure, applied and applicable mathematics
- Communicate effectively in writing about the subject
- Improve his/her own learning and performance.

Prerequisites :

A Candidate for admission to the Master of Science (Mathematics) must have a 10+2 Science and Bachelor degree with mathematics Group. Provisional admission shall be provided subject to the Clearance of examinations and eligibility.

Course outline: This Course is Designed to enable student to understand and apply the conceptual structure of group theory.

Sr. No.	Course Contents	Teaching hours
1	**Unit 1 Homomorphism and Isomorphism of Groups:** Definition and basic examples of Group, Sub group, Normal subgroups, Quotient group and Cyclic group. Homomorphism of Group, Fundamental Theorem on homomorphism, Isomorphism of groups, Laws of Isomorphism	14
2	**Unit 2 Automorphism of Groups:** Conjugacy relation on a group and its applications, Class Equation, Automorphism of a group, Inner Automorphism, External direct product of groups, Inner direct products.	10
3	**Unit 3 Sylow's Theorems:** Cauchy's theorem for abelian groups, Cauchy's theorem for finite groups, Sylow's p-subgroup, Sylow's Theorems, Finite Abelian Group.	12
4	**Unit: 4 Solvable Groups:** Subnormal and normal series, Composition series, Nilpotent group, Solvable groups.	10

Learning Outcomes :

On successful completion of the course, students should be able to

- Differentiate between homomorphism, isomorphism and Automorphism.
- Recognize and apply Sylow's theorem to characterize certain finite groups.
- Determine whether a given set is solvable group or not.
- Use the skills of proof by contradiction, proof by contraposition, proof of set equality, and proof using both forms mathematical induction.

Teaching & Learning Methodology :

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups.
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties.
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Books Recommended

1. Topics in Algebra by I. N. Herstein, John Wiley and Sons Inc., 2nd Edition.
2. "Advanced Abstract Algebra" by S.K. Pundir, Krishna Prakashan (P) Ltd., Meerut.
3. "A First Course in Abstract Algebra" by John B. Fraleigh, Pearson
4. "Basic Abstract Algebra" by Bhattacharya, Jain and Nagpal, 2nd Edition.
5. "Algebra" by S. Mcclane and G. Birkhoff, 2nd Edition.
6. "Basic Algebra" by N. Jacbson, Hind, Pub. Corp, 1984.
7. "A first course in Abstract Algebra" by John Fraleigh (3rd Edition), Narossa Publishing House, New Delhi.
8. "Contemporary Abstract Algebra" Joseph A. Gallian, Narossa Publishing House, New Delhi.

E-Resources

- cims.nyu.edu/~cfgranda/pages/OBDA_fall17/notes…
- www.sxccal.edu/mathematics-lecture-notes
- https://users.math.msu.edu/users/gnagy/teaching/la.pdf

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MATHEMATICS

Real Analysis

Subject Code: 256050102

M.Sc. Semester -1

Teaching & Evaluation Scheme

This program leading to this degree provides the opportunities to develop and demonstrate knowledge and understanding of the fundamental and advanced content in Mathematics which will be determined by his /her particular choice of courses, according to his/her particular needs and interests.

Teaching Scheme				Credits	Evaluation Scheme				
Th	Tu	P	Total		Internal		External		Total
					Th	Pr	Th	Pr	
4	-	-	4	4	30	-	70	-	100

Objectives :

When one has completed this degree he / she will be able to demonstrate the following skills:

- The ability to advance your own knowledge and understanding through independent learning
- Communicate clearly knowledge, ideas and conclusions about mathematics
- Develop problem- solving skills and apply them dependently to problems in pure, applied and applicable mathematics \
- Communicate effectively in writing about the subject
- Improve his/her own learning and performance.

Prerequisites :

A Candidate for admission to the Master of Science (Mathematics) must have a 10+2 Science and Bachelor degree with mathematics Group. Provisional admission shall be provided subject to the Clearance of examinations and eligibility.

Course outline: To provide knowledge of the theory of measurable sets, integration and differentiation of measurable functions.

Sr. No.	Course Contents	Teaching hours
1	**Unit 1 Lebesgue outer measure:** Algebra and σ- algebra of sets, σalgebra of Borel sets, Lebesgue outer measure on R, Measurable sets, Lebesgue measure	10
2	**Unit 2 Measurable function:** Measurable function, Littlewoods's three principles, Egoroff's theorem, Integral of a simple function, Lebesgue integral of bounded functions, Comparison of Reimann and Lebesgue integration, Bounded convergence theorem.	12
3	**Unit 3 Integration of non-negative functions:** Integral of nonnegative measurable functions, General Lebesgue (integral), Fatou's lemma, Monotone convergence theorem, Lebesgue's convergence theorem, Convergence in measure	12
4	**Unit 4 Differentiation of measurable functions:** Differentiation of monotone functions, Functions of bounded variation, Differentiation of an integral, Absolutely continuous functions and indefinite integrals	12

Learning Outcomes :

On successful completion of the course, students will be able to

- Identify and formulate the basic concepts and theorems of sigma algebras, measure and abstract measure spaces .
- Synthesize techniques that have been developed in the course to solve particular problems and explain the basic concepts and main theorems of Lebesgue and different types of convergence theorems.

Teaching & Learning Methodology :

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs.

- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups.

- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties.

- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Books Recommended

1. "Real Analysis" by H. L Ryoden, Macmillan Pub. Co 3rd Ed.
2. "Theory of Functions of a Real Variable"- by I. N. Natansen, Fredrik Pub Co., 1964.
3. "Measure Theory"- by P. R. Halmos, East and West Press.
4. "Introduction to Real Variable Theory"- by S.C. Saxena and S. N Shah Prentice Hall of India 1980.
5. "Real and Complex Analysis", Rudin, W., 2nd Edition, Tata McGraw- Hill Publishing Co., Ltd 1974.

E-Resources

- cims.nyu.edu/~cfgranda/pages/OBDA_fall17/notes…
- www.sxccal.edu/mathematics-lecture-notes
- https://users.math.msu.edu/users/gnagy/teaching/la.pdf

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MATHEMATICS

Statistical Methods

Subject Code: 256050103

M.Sc. Semester -1

Teaching & Evaluation Scheme

This program leading to this degree provides the opportunities to develop and demonstrate knowledge and understanding of the fundamental and advanced content in Mathematics which will be determined by his /her particular choice of courses, according to his/her particular needs and interests.

Teaching Scheme				Credits	Evaluation Scheme				
Th	Tu	P	Total		Internal		External		Total
					Th	Pr	Th	Pr	
4	-	-	4	4	30	-	70	-	100

Objectives :

The objective of this course is

· To provide an understanding of statistical concepts like measurements of location and dispersion, probability, probability distributions, sampling, estimation, hypothesis testing, regression, correlation analysis, multiple regression and business/economic forecasting.

Prerequisites :

A Candidate for admission to the Master of Science (Mathematics) must have a 10+2 Science and Bachelor degree with mathematics Group. Provisional admission shall be provided subject to the Clearance of examinations and eligibility.

Course outline: To provide knowledge of the Descriptive Statistics and Correlation , Probability & Probability Distribution , Statistical Inference , Regression Analysis .

Sr. No.	Course Contents	Teaching hours
1	**Unit 1 Descriptive Statistics and Correlation:** Introduction to Statistics, Applications in Business & Economics, Data Summarizing Qualitative & Quantitative Data, Exploratory Data Analysis, The Stem and leaf Display, Cross tabulation & Scatter Diagrams, Measures of location, Mean, Median, Mode, Percentiles, Quartiles, Measures of variability, Range, Inter quartile range,Variance, Standard deviation, Coefficient variation, Measures of distribution shape, Relative location and detecting outliers, Measures of association between two variables, Covariance, Correlation.	12
2	**Unit 2 Probability & Probability Distribution:** Basic probability concepts, Experiment, Sample space, Events, Exclusive events, Exhaustive events, Independent events, Dependent events, Methods for assigning probability: Classical method, Relative frequency method, Subjective method, Events and their Probability, Addition rule (not to be proved or derived), Conditional probability, Multiplication rule (not to be proved or derived), Baye's theorem (statement only not to be proved or derived), Random variable, Discrete and continuous random variable, Expected value and variance of random variable, Probability distribution: Binomial distribution, Poisson distribution, Normal distribution.	12

3	**Unit 3 Statistical Inference:** Sampling methods, Sampling distribution, Central limit theorem (statement only), Point and interval estimation, Sampling distribution of sample mean, Sampling distribution of sample proportion, Hypothesis tests: Null and alternative hypothesis, Type I & II errors, One and two tails test, Rejection rule using p- value and critical value approach, Test of hypothesis about population mean (known), Test of hypothesis about population and proportion, Sampling distribution and test of hypothesis about difference between two population means(known and unknown), Sampling distribution and test of hypothesis about difference between two population and proportions analysis of variance.	12
4	**Unit 4 Regression:** Introduction to Regression, Simple linear Regression Model, Least Square Method, Coefficient of Determination, Correlation Coefficient, Model Assumptions, Residual Analysis, Validating Model Assumptions, Outliers and Influential Observations, Using the Estimated Regression Equation for Estimation and Prediction.	10

Learning Outcomes :

On successful completion of the course, students will be able to

- How to calculate and apply measures of location and measures of dispersion to grouped and ungrouped data cases.
- How to apply discrete and continuous probability distributions to various business problems.
- Perform Test of Hypothesis as well as calculate confidence interval for a population parameter for single sample and two sample cases.
- Learn non-parametric test such as the Chi-Square test for Independence as well as Goodness of Fit.
- Compute and interpret the results of Bivariate and Multivariate Regression and Correlation Analysis, for forecasting and also perform ANOVA and F-test

Teaching & Learning Methodology :

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups.
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties.
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Books Recommended

1. Anderson, Sweeney, Williams, "Statistics for Business and Economics", 9 th edition, Cengage Publication.
2. S.P. Gupta, "Statistical Method", Sultan Chand and Sons, 37th edition (2008).

E-Resources

- cims.nyu.edu/~cfgranda/pages/OBDA_fall17/notes…
- www.sxccal.edu/mathematics-lecture-notes
- https://users.math.msu.edu/users/gnagy/teaching/la.pdf

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MATHEMATICS

Advanced Linear Algebra

Subject Code: 256050104

M.Sc. Semester -1

Teaching & Evaluation Scheme

This program leading to this degree provides the opportunities to develop and demonstrate knowledge and understanding of the fundamental and advanced content in Mathematics which will be determined by his /her particular choice of courses, according to his/her particular needs and interests.

Teaching Scheme				Credits	Evaluation Scheme				
Th	Tu	P	Total		Internal		External		Total
					Th	Pr	Th	Pr	
4	-	-	4	4	30	-	70	-	100

Objectives :

When one has completed this degree he / she will be able to demonstrate the following skills:

- To connect linear algebra to other fields both within and without mathematics.
- To develop abstract and critical reasoning by studying logical proofs and the axiomatic method as applied to linear algebra

Prerequisites :

A Candidate for admission to the Master of Science (Mathematics) must have a 10+2 Science and Bachelor degree with mathematics Group. Provisional admission shall be provided subject to the Clearance of examinations and eligibility.

Course outline: · To provide knowledge of the theory of Vector Space, Linear Transformation and Rational Conical Form .

Sr. No.	Course Contents	Teaching hours
1	**Unit 1 Characteristic roots & Matrices:** The Algebra of Linear Transformation, Characteristic roots, Characteristic vectors, Diagonalization of Matrices.	10
2	**Unit 2 Triangular canonical forms:** Triangular canonical form and its theorems, Nilpotent linear transformations and its theorems.	10
3	**Unit 3 Decomposition theorem & Jordan canonical forms:** Trace and transpose, Decomposition theorem, Jordan canonical forms.	10
4	**Unit 4 Rational canonical forms & Determinants:** Rational canonical forms, Determinants	10

Learning Outcomes :

On successful completion of the course, students will be able to

- Analyze and evaluate the accuracy of common numerical methods
- Demonstrate understanding of common numerical methods and how they are used to obtain approximate solutions to otherwise intractable mathematical problems.

Teaching & Learning Methodology :

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups.
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties.
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

Books Recommended

1. Topics in Algebra", 2nd edition, by I N Herstein, John Wiley and Sons, Student Edition, New York (2004).
2. Lenneth Hoffman, Ray Kunze, Linear Algebra, 2nd edition Prentice Hall of India, New Delhi (1971).
3. S. K. Pundir, Advanced Abstract Algebra, Krishna Prakashan Media (P) Ltd. Meerut
4. P B Bhattacharya, Phani Bhusan Bhattacharya, S K Jain and S R Nagpaul, Advanced linear algebra, New Age International Ltd Publishers, New Delhi (2008).
5. Steven Roman, Advanced Linear Algebra, 3rd Edition, Springer (2008).

E-Resources

- SWAYAM PORTEL/ NPTEL- online courses on mathematical and quantum mechanics. https://swayam.gov.in/ and https://nptel.ac.in/
- cims.nyu.edu/~cfgranda/pages/OBDA_fall17/notes…
- www.sxccal.edu/mathematics-lecture-notes
- https://users.math.msu.edu/users/gnagy/teaching/la.pdf

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF SCIENCE

DEPARTMENT OF CHEMISTRY

Basic Chemistry-1

CODE : 253020101

B.Sc. 1st Semester

Teaching & Evaluation Scheme: -

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	-	-	4	4	30	-	70	-	100

Objectives: -

Prerequisites: - Students should have basic knowledge of chemistry up to 10+2 level.

Course outline: -

Sr. No.	Course Contents	Number of Hours
1	**Unit I : Inorganic Chemistry (14 Marks)** **(a) Lanthanides:-** Electron configuration, Oxidation states, Magnetic properties, Color and absorption spectra of lanthanide ions, Lanthanide contraction, Separation and purification of Lanthanides: Ion-exchange and solvent extraction methods. **(b) Actinides:-** Electron configuration, Oxidation states, Magnetic properties, Color and absorption spectra of actinide ions, actinide contraction, Nuclear synthesis of trans uranic elements, Chain reaction, importance of Uranium, Comparison with lanthanide.	10
2	**Unit II : Organic Chemistry (14 Marks)** **(a) Quantitative Analysis & Determination of Molecular Formula:-** Determination of Nitrogen by Kjeldahl's method and Kjeldahl's method modified with boric acid . Molecular weight of organic acid by Ag-salt	12

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

	method and organic base by Chloroplatinate method, Numerical based on empirical and molecula formula. **(b) Fundamentals of Organic Reactions:-** Fission of covalent bond, types of reagents, Substitution Nucleophilic Unimolecular reaction mechanism (SN_1), Substitution Nucleophilic Bimolecular reaction mechanism (SN_2), Electrophilic Aromatic Substitution – Elementary treatment only (Nitration, Sulfonation, Halogenation & Friedel- Crafts Alkylation and Acylation)	
3	**Unit III : Organic Chemistry (14 Marks)** **(a) Alkanes:- (Saturated Hydrocarbons)** Introduction, IUPAC nomenclature, Reduction of R-X, Wurtz's reaction, Hydrolysis of R-Mg-X, Decarboxylation of acid, Kolbe's electrolytic process, Free radical mechanism (Chlorination of Methane). **(b) Alkenes & Alkynes**:- **(Unsaturated Hydrocarbons)** Introduction, IUPAC nomenclature, Preparations (dehydration, dehalogenation, dehydrohalogenation), Reactions with H_2, X_2, HX, HOCl, H_2SO_4, and Hydroboration; Oxidation reactions: (i) with cold alkaline $KMnO_4$ (Baeyer's reagent), (ii) Oxidative cleavage with acidified or hot $KMnO_4$, (iii) Ozonolysis (O_3); Polymerization; Reactions of terminal Acetylenes: (i) Addition of water, (ii) Na / liquid NH_3.	10
4	**Unit IV: Physical Chemistry (14 Marks)** **(a) Thermodynamics**:- Zeroth law, first law, Second law of thermodynamics; proof of 2nd law (Carnot's Cycle); Entropy, of Gas and calculation of entropy for different processes; Kirchhoff's equation. **(b) Chemical Kinetics**:- Basic terms: molecularity, order of reactions. Unit for rate constant; Derivation of: first order rate constant, Second order rate constant for (a=b) and ($a \neq b$). Third order rate equation (a=b=c). Determination of Half Life Time for 1st, 2nd and 3rd order reactions.	10

Learning Outcomes:-

- Basic knowledge of valence bond theory and its applications.
- Knowledge of f-block elements and their periodic properties.
- Understanding of the concept of lanthanide contraction.
- Understanding of the concepts of general organic chemistry.
- Knowledge of reactions and mechanisms in organic chemistry.
- Basic concepts and theories of thermodynamic chemistry.
- Introduction of analytical chemistry and related terms.

Teaching & Learning Methodology:- Chalk and Talk, Video Lectures

Books Recommended:-

1	‘Source Book on Atomic Energy' by Glastone, 1969.
2	‘Modern Inorganic Chemistry' by G.F. Liporni, ELBS, 4th edn, Colling Educational, 1983.
3	'Organic reaction and mechanism, P.S. Kalsi, New Age international Publishers.
4	Text book of organic Chemistry, P.S. Kalsi, New Age international Publishers.
5	Text book of Organic Chemistry, ArunBahal, S.Chand.
6	Physical Chemistry (Question and Answer) by R.N. Madan, G.D. Tuli, S.Chand.
7	Fundamentals of Analytical Chemistry by Skoos& West.
8	Analytical Chemistry, Garry D. Christain.
1	‘Inorganic Chemistry' D.F. Shriver, P.W. Atkinss and C.H. Longford, 3 rdedn, ELPS Oxford University Press, 1999.
2	‘Nuclear and Redio Chemistry' by G fried lander, J.W. Kennedy, E.S. Macias and J.M. Miller, 3rd edn, John Wiley, 1981.
3	Essentials of Nuclear Chemistry' H.J. Arnical, 4th edn, New Age International, 1995
4	‘Concise Inorganic Chemistry' J.D. Lee, 5th edn.
5	‘Inorganic Chemistry', D.F. Shriver, P.W. Atkinss, 3rd edn, Oxferd, 1999.
6	Concise Inorganic Chemistry' J.D. Lee, 4th edn, Champman and Hall ELBS, 1991.
7	Inorganic Chemistry' by A.G. Sharp, 3rd edn, ELBS, Longman, 1990.
8	Organic Chemistry Vol. I & II, S.M. Mukherji, S.P.Singh, R.P. Kapoor.
9	Reaction mechanism in Organic Chemistry, S.M. Mukhergi, S.P. Singh. 3rd edn, Macmillan.
10	Reaction Mechanism and Reagents in Organic Chemistry, Gurdeep R. Chatwal 4th edn, Himalaya Publication House.
11	Advance Physical Chemistry by Gurdeepraj.
12	Organic Chemistry, R. Morrison and R. Boyd, 6th edn, Pearson Education 2003.
13	Organic Chemistry, T.W. Graham Solomons , 4th edn, John Wilay, 1998.
14	Principal of Physical Chemistry by Puri, Sharma, Pathania.
15	Chemical Thermodynamics by R.P. Rastogi and R.R. Misra.
16	Nuclear Chemistry by C.V. Shekhar, Dominent-Publisher, New Delhi.
17	Essentials of physical Chemistry by B.S. Bahal, ArunBahal, G.D. Tuli.
18	Physical Chemistry by P.W.Atkins, 5th edn, Oxford 1994 7th edn-2002.
19	Physical Chemistry by R.A. Albert and R.J. Silby, John Wiley1995.
20	Physical Chemistry by G.H. Barrow, 5th edn, Mac Graw Hill, 1988, 6th edn, 1996.
21	Physical Chemistry by W.J. Moore, 4th edn, Orient Longmans 1969.
22	Analytical Chemistry, Day & Underwood.
23	Analytical Chemistry by Lerry&Hergins.
24	Qualitative Analysis by A.I. Vogel, 5th edn.

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

Practical List:- Chemistry Practicals-253020102

Sr. No.	Practical
1	**Inorganic Chemistry Semi micro Analysis:-** • Cation analysis; separation and identification of ions from group I, II, III-A, III-B, IV, V-A, V-B. **Inorganic Qualitative Analysis (Two Radicals) (Minimum Eight Salts)** Water Soluble and Insoluble Inorganic salts of following cations and anions: **Cations :** Na^{+}, K^{+}, NH_4^{+}, Mg^{2+}, Ba^{2+}, Ca^{2+}, Sr^{2+}, Fe^{2+}, Fe^{3+}, Al^{3+}, Cr^{3+}, Zn^{2+}, Mn^{2+}, Co^{3+}, Pb^{2+}, Cu^{2+}. **Anions :** S^{2-}, SO_4^{2-}, CO_3^{2-}, PO_4^{3-}, CrO_4^{2-}, Cl^{-}, Br^{-}, I^{-}, NO_3^{-}, O^{2-}.
2	**Volumetric Analysis (Acid and Base)** (1) Preparation and Standardization of NaOH and HCl (2) Succinic Acid -------- NaOH (3) Oxalic Acid ---------- NaOH (Hydrated & Anhydrous) (4) Na_2CO_3 ..... HCl

SWARRNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF SCIENCE

DEPARTMENT OF PHYSICS

Basic Physics-1

Subject Code: 253050101

B.Sc. Semester 1

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
Th	Tu	P	Total		Internal		External		Total
					Th	Pr	Th	Pr	
4	-	-	4	4	30	--	70	-	100

Objectives: -

- Develop a solid grasp of core concepts and applications of classical mechanics, electricity and magnetism, quantum mechanics, and statistical physics. They learn how physics and other disciplines have impacted and continue to impact each other and society
- They develop laboratory skills throughout our curriculum via hands-on experiences with diverse experimental techniques and tools. They learn various approaches to data analysis and become comfortable using computational methods to analyze and solve problems.

Prerequisites

Basic matheamatics and fundamentals of Physics.

Course outline

Sr. No.	Course Contents	Teaching Hours
1	**Waves** Traveling Waves Speed of propagation of waves in a stretched string longitudinal waves in a bar, Plane waves in a fluid, transmission of energy by a traveling wave. Sound waves Introduction, Intensity & intensity level, Loudness & pitch radiation from a piston, diffraction, radiation efficiency of a sound source. Newton's and Langrang correction. Ultrsonics Magneostriction method,Piezo-electric oscillator, Piezo-electric detectors, Measurement of velocity of ultrasonic waves, diffraction effect & its application to determine the velocity of the waves, the ultrasonic waves & its use.	8
2	**Vector Algebra & Vector Analysis Scalar** Triple product, Reciprocal vectors ,vector. Triple product, Pseudo vectors and Pseudo Scalars,Differentiation of a vector with respect to time, Integration of vector ,Line Integral ,Surface Integral, Partial differentiation, Gradient of a scalar point function, Divergence of vector, The equation of continuity, Curl of a vector , More about the vector differential operator,Multiple Del operations, Irrotational and Solenoidal vectors, Some useful identities, Gauss' Theorem , Green's theorem , Stokes Theorem, Physical Significance of the Curl of a vector, Related Examples & Problem.	8
3	**Optics** **Farmat's principle and its applications** Farmat's principle of least time, laws at reflection, laws of refraction. Interference in thin films Thin film, Plane parallel film, Interference due to transmitted light, Haidinger fringes, variable thickness (wedge-shaped) film, Newton's ring. **Matrices** Types of matrices, Inversion of a Matrix, Rank of a Matrix, Diagonalization (3X3 only). **Matrix Method in Optics** Introduction, The matrix method, Unit planes, Nodal point planes, A system of two thin lenses.	8
4	**LASERS**	8

	Introduction, Attenuation of light in an optical medium, Thermal equilibrium, Interaction of light with matter, Einstein coefficients and their relations, Light amplification, Meeting the three requirements, Components of Laser, Lasing action, Principal pumping schemes, Type of lasers, Semiconductor laser, Laser beam characteristics, Applications	

Learning Outcomes

- Exercise the use of physical intuition, including the ability to guess an approximate or conceptual answer to a physics problem and recognize whether or not the result of a calculation makes physical sense.

- Access information on a topic from a variety of sources, and be able to learn new things on one's own.

- Communicate verbally, graphically, and/or in writing the results of theoretical calculations and laboratory experiments in a clear and concise manner that incorporates the stylistic conventions used by physicists worldwide.

Teaching & Learning Methodology

We should aim to provide a range of modes of learning, including, for example, individual work, group work and opportunities for off-campus learning through visit to various research institutions across India or collaborative arrangements.

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the programme/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a programme/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Books Recommended

- Mechanics, Wave motion & Heat by Francis Weston Sears (Addision Wesley Publication)
- A text book on oscillations, waves & Acoustics by M. Ghosh, D. Bhattacharya (S. Chand)
- Mathematical Methods in Physical Sciences by M. L. Boas (John Wiley & Sons)

- Introduction to Classical Mechanics by R. G. Takwalw and P. S. Puranik (Tata McGraw-Hill Pub. Com. Ltd.)
- A text book of Optics by N. Subrahmanyam, Brijlal and M. N. Avadhnulu, S. Chand Publication.
- Optics – Ajay Ghatak, TMH Edition,
- Principle of optics – B. K. Mathur
- A text book of Optics by N. Subrahmanyam, Brijlal and M. N. Avadhnulu, S. Chand Publication.
- Fiber Optics and optoelectronics by R. P. Khare, Oxford University Press.
- An introduction to LASERS- Theory and Applications by M. N. Avadhanulu, S. Chand & Comp. Ltd.,

E-Resources

- The Flying Circus of Physics 2nd edition by Jearl Walker, Wiley India
- Six Ideas that shaped physics by Thomas A Moore, McGraw Hill education
- http://www.howstuffworks.com/ -- Tech stuff
- How things works by Louis A Bloomfeild, Wiley Publications
- Physics of Everyday Phenomena by W. Thomas Griffith, Juliet Brosing, McGraw Hill
- Education
- Latest journals like BBC Knowledge, How things work-everyday technology explained by

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARNIM STARTUP & INNOVATION UNIVERSITY (SSIU)

SWARNIM SCIENCE COLLEGE

DEPARTMENT OF PHYSICS

PHYSICS -102

B.Sc. Semester 1

Practical List

Sr. No.	Practical Name
1	**Newton's Ring** To find the wave length of light of given monochromatic source To find the radius of curvature of given lens
2	**Melde's Experiment** (i) To prove P/L constant. (ii) To prove T/l^2 constant
3	**Resonator** To test the accuracy of relation $n^2(V + Kv)$ = constant and to determine the frequency of unknown fork.
4	**Value of capacitance** For given two capacitors determine the value of capacitance for each of them. AND (i) by connecting them in series. (ii) by connecting them parallel.
5	**Value of inductance** For given two inductors determine the value of inductance for each of them and (i) by connecting them in series (ii) by connecting them parallel
6	**Logic Gates (AND, OR, NOT) (Using discrete components).** Verification of truth tables and giving understanding of voltage level for '0'and '1'level
7	**Find Solar Cell Efficiency**
8	**Young's Modulus** Study and perform the elasticity of materials like Iron, Aluminium or Brass using Young's Modulus Experiment.
9	**Half-Wave Rectifier** Obtain load characteristic and %regulation for Full-wave rectifier with-out filter circuit and by using capacitor filter circuit. Determine ripple factor for Full wave rectifier without filter only.

10	**To Determine Wave length of LASER light**
11	**Diagonalization of given matrix (2x2). Evaluate trace of a matrix**
12	**Decay Constant of Capacitor** Decay Constant To verify the exponential law for the decay of a charged capacitor and determine the decay constant of the capacitor.
13	**Series Resonance** Series Resonance To determine the frequency of a.c. emf by series resonance circuit varying capacitor.
14	**Study of Transformer** Study of Transformer To determine (i) turn ratio (ii) percentage efficiency (iii) energy loss due to copper, for a given transformer.

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MATHEMATICS

CALCULUS AND MATRICES

Subject Code: 253030101

B.Sc. Semester -1

Teaching & Evaluation Scheme

The objective of evaluation is not only to measure the performance of student,but also to motivate them for better performance .Student are evaluated on the basis of Mid term examination and end examination Conducted by university.

Teaching Scheme				Credits	Evaluation Scheme				
Th	Tu	P	Total		Internal		External		Total
					Th	Pr	Th	Pr	
4	-	-	4	4	30	-	70	-	100

Objectives

- To provide students the Concept of vector valued function,determinant and its properties of higher order,matrix ,eigen value and eigen vectors of matrices.
- The aim is to present the important ideas in matix to student whose principal interest lie outside the field of mathematics.
- The emphasis throughout is on imparting an understanding of the significance of the mathematical techniques .
- It is a subject which provide a vital arena where students can see the interaction of mathematics and machine computation.

Prerequisites

A Candidate for admission to the bachelor of Science (Mathematics) must have a 10+2 Science with A and B (Maths and Physics) Group. Provisional admission shall be provided subject to the Clearance of examinations and eligibility.

Course outline: This Course is Designed to enable student to acquire the understanding and practice the application of calculus and Matrices and their properties **.**

Sr. No.	Course Contents	Teaching hours
1	**Unit 1** Successive Derivatives, standard results for n^{th} derivative, Leibniz's Theorem. Definition of limit of a sequence, Convergence and divergence of an infinite series, Comparison test, Ratio test and Root test.	10
2	**Unit-2** Rolle's Theorem, Lagrange's and Cauchy's Mean ValueTheorems(MVT), Increasing and decreasing functions, Taylor's and Maclaurin's Theorems (both without proof). Using Taylor's and Maclaurin's Theorem find Maclaurin power series expansion of sin$x$, cos$x$, log $(1+x)$, e^x, $(1+x)^n$ under proper restrictions(if any). Indeterminate forms: all forms of L'Hospital's Rules with proof and all forms	10
3	**Unit: 3** Introduction to matrices, different types of matrices, operations on matrices, Theorems on matrices, Elementary operations on matrices and types of matrices, Symmetric and skew-symmetric matrices, Hermitian and skew-hermitian matrices. Linear dependence and independence of row and column matrices. Row rank, column rank and rank of a matrix. Row Reduced Echelon (RRE) form of a matrix and matrix inversion using it.	12
4	**Unit: 4** Eigen values, Eigen vectors and the characteristic equation of a matrix. Cayley-Hamilton (CH) theorem and its use in finding inverse of a matrix. Crammer's rule.find A^{-1} by Gauss-Jordan method .	10

Learning Outcomes

After Successfully Completion of the Course the student will be ….

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

- Find the n^{th} Derivative of a function as well as the n^{th} derivative of the product of two functions.
- Practice the application of definite integral for a.)Summation of the series b.)Find the limit of the Series.
- Know about the Convergent and Divergent of the Series .
- Aware with Matrices and their uses in real life .
- Find the Summation and Product of Matrices and apply different properties of Matrices.

Teaching & Learning Methodology

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups.
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties.
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Books Recommended

1. Differential calculus , by Shantinarayan .
2. Integral Calculus , By Shantinarayan .
3. Calculus , Dr.R.C.Shah .
4. Adavance Mathematics , Prin. G.C. Patel .
5. Calculus – James Stewart, Sixth edition, (E-Book).
6. Calculus – T. M. Apostol. Volume I.
7. Differential Calculus – Shanti Narayan, P.K. Mittal, S. Chand and Co.
8. Differential Calculus – Harikishan, Atlantic Publishers.
9. Calculus – M. Spivak

E-Resources

- SWAYAM PORTEL/ NPTEL- online courses on mathematical and quantum mechanics. https://swayam.gov.in/ and https://nptel.ac.in/

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

- cims.nyu.edu/~cfgranda/pages/OBDA_fall17/notes…
- www.sxccal.edu/mathematics-lecture-notes
- https://users.math.msu.edu/users/gnagy/teaching/la.pdf

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF BIOTECHNOLOGY

INTRODUCTION TO BIOTECHNOLOGY

Subject Code: 253010101

B.Sc. Semester -1

Teaching & Evaluation Scheme

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	-	-	4	4	30	-	70	-	100

Objectives:-

- To provide introduction to biotechnology, basic concepts of genes, DNA & RNA, basic concepts of genetic engineering and applications of biotechnology in industries.
- The graduate program in Biotechnology is a joint interdisciplinary program of the five Departments namely Biology, Chemistry, Food Engineering, Environmental Engineering and Chemical Engineering offering M.Sc. and Ph. D. degrees with thesis.
- Biotechnology will result only from integration of multiplicity of scientific disciplines and technologies, including microbiology, biochemistry, genetics, molecular biology, bioinformatics, chemistry, chemical and process engineering, metabolic engineering and more recently a variety of fields.
- As a merger of science and business, biotechnology industry demands a multi-disciplinary workforce skilled in basic-research, product development, regulatory affairs, technology transfer and commercialization.

Prerequisites:-

- Students have basic knowledge of biotechnology, basic concepts of genes, DNA & RNA, basic concepts of genetic engineering and applications of biotechnology in industries.

Course outline:-

Unit No.	Course Contents	Teaching Hours
1.	**Introduction to Biotechnology:** • What is Biotechnology? History, Interdisciplinary nature, Branches of Biotechnology, • Biotechnology in India.	**10**
2.	**Basic concepts of Genes, DNA & RNA:** • Gene Concepts, Chemical nature of DNA, chemical composition of DNA, Nucleotides, Nucleosides, Polynucleotide, Physical nature of DNA, • Chargaff's rule of equivalence, Watson and cricks model of DNA, circular and super helical DNA, • Organization of DNA in eukaryotes, • Types of DNA, RNA, Various types of RNA, Structure of RNA.	**10**
3.	**Basic of Genetic Engineering:** • What is Genetic Engineering?, • Basic steps involved in Genetic Engineering, • Scope and Importance of Genetic engineering	**10**
4.	**Application of Biotechnology:** • Forensics –parental test, DNA fingerprint • Transgenic crop- Bt cotton, Bt Brinjal • Transgenic Animals-Dolly • Biotechnology in Health care- Diagnostic and treatment. • Biotechnology in industries.	**10**
		40

Learning Outcomes:

- At the end of the course the student would have basic knowledge of Biotechnology and its application
- Cognitive Knowledge: To provide education that leads to comprehensive understanding of the principles and practices of biotechnology.
- Information and Computer Literacy: To educate and make them up to date with the current scientific literature, computer programs and web information.
- Experimental Skills: To provide broad based training in technical skills in methods of biotechnology.
- Critical Thinking: To empower students with the ability to think and solve problems in the field of biotechnology.
- Scientific Communication: To ensure students are able to effectively communicate with biotech and other interdisciplinary professionals.
- Professional Attitude: To produce responsible biotechnologists that can work within the interdisciplinary framework of biotechnology and related fields.

Teaching & learning Methodology:

We should aim to provide a range of modes of learning, including, for example, individual work, group work and opportunities for off-campus learning through visit to various research institutions across India or collaborative arrangements.

The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area:

- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties

- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Basic Text & Reference Books:

- BD Singh. (2003) *Fundamentals of genetics.*
- HK Das. (2004) *Textbook of biotechnology*
- PK Gupta. (2000) *Genetics*
- U. Satyanarayan. *Biotechnology*
- U. Satyanarayan. *Biochemistry*

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MICROBIOLOGY

Introduction to Microbial world

Subject Code: 253040101

B.Sc. Semester-1

Teaching & Evaluation Scheme

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	-	-	4	4	30	-	70	-	100

Objectives

- To provide basic knowledge of Applications of Microbiology
- The purpose of the course is to provide basic knowledge of natural history of infectious organisms, contribution of various scientist in the field of microbiology, developments of first microscope and other technique used for isolation, study, characterization of microorganism. Instruments required to study the morphology of the microorganisms.
- The present course opens the door to all of the abundant careers in and out of the area of biological sciences including health/ Industrial field/ medical / Environmental Sciences.

Prerequisites

Student Must have Basic idea about Microorganisms, dyes and staining.

Course outline

Unit. No.	Course Contents	Teaching hours
1	**Developments of Microbiology as a new discipline of Biological science** • Discovery of Microbial World • Theory of Biogenesis, Discovery of viruses • Developments in Pure culture techniques • Germ Theory of disease and fermentation • Vaccines and Chemotherapy	10
2	**The Microbial World** • Habitats of Microbes, • Introduction to Prokaryotes and Eukaryotes • Comparison of Prokaryotes and Eukaryotes • Significance of Microbiology • Branches of Microbiology • Applied Microbiology • Genetic Engineering and Biotechnology	10
3	**Pure Culture Technique** • Principle and Method of Pure Culture Techniques • Method of Isolation and Preservation of Pure Culture • Culture Collection • Techniques used to Study Microorganisms • Principle of Microscopy, Light Microscopy, Dark Field Microscopy • Phase Contrast Microscopy, Fluorescence Microscopy, Electron Microscopy	10
4	**Dyes and Staining** • Chemistry of Dyes and stain, Smear • Mechanism and type of staining • Microbiological uses of dyes and stains.	10
		40

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

Learning Outcomes

- The students will be able to understand the historical developments , the tools and techniques of Microbiology.
- The course is designed to give students an understanding of the types of organisms and application of Microbiology in various fields.
- At the end of the course the student would have basic knowledge of microbiology, different microbial techniques, learn about dyes and staining, structure of bacteria, method to isolate the microbes.
- Handling of microscopes and specimen preparation

Teaching & Learning Methodology

- We should aim to provide a range of modes of learning, including, for example, individual work, group work and opportunities for off-campus learning through visit to various research institutions across India or collaborative arrangements.
- The following are some examples of learning and teaching strategies and methods which you may wish to develop for use in your subject area
- Work with students at an early stage of the program/module, to identify cultural differences in their previous educational experience, their individual learning approaches and needs
- Draw upon the knowledge and understanding brought by students from different backgrounds, by encouraging them to share and discuss personal knowledge and experience of an issue in tutorial/seminar groups
- Use teaching formats such as discussion groups that encourage the participation of all students and help identify areas where students are having difficulties
- Provide learning materials in different formats (written, online, audio, video podcast etc) to support key concepts/knowledge. Particularly at the start of a program/module or for key areas, providing online or hard copy notes before classes can aid comprehension and accessibility.

Books Recommended

- Gerard Tortora . Berdell Funke . Christine Case. Derek Weber. Warner Bair III

  Microbiology: An Introduction 13th Edition Published by Pearson (January 17th 2018)
- H.A. Modi.(2019) Elementary Microbiology ASIN : B081HCRN82
- Pelczar Jr. M J, Chan E C S. Krieg N R. (1986)
- Atlas R. (2015) Principles of Microbiology 2 nd Edition
- Ingraham J L and Ingraham C A Introduction to Microbiology: Thomson Brooks/Cole
- Michael T. Madigan & John M. Martinko (2010) Basic biology of microorganisms (11th edition)

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARNIM STARTUP & INNOVATION UNIVERSITY (SSIU)

SWARNIM SCIENCE COLLEGE

DEPARTMENT OF PHYSICS

PHYSICS

B.Sc. Semester 1

Practical List

Sr. No.	Practical Name
1	**Newton's Ring** To find the wave length of light of given monochromatic source To find the radius of curvature of given lens
2	**Melde's Experiment** (i) To prove P/L constant. (ii) To prove T/l^2 constant
3	**Resonator** To test the accuracy of relation $n^2 (V + Kv)$ = constant and to determine the frequency of unknown fork.
4	**Value of capacitance** For given two capacitors determine the value of capacitance for each of them. AND (i) by connecting them in series. (ii) by connecting them parallel.
5	**Value of inductance** For given two inductors determine the value of inductance for each of them and (i) by connecting them in series (ii) by connecting them parallel
6	**Logic Gates (AND, OR, NOT) (Using discrete components).** Verification of truth tables and giving understanding of voltage level for '0'and '1'level
7	**Find Solar Cell Efficiency**
8	**Young's Modulus** Study and perform the elasticity of materials like Iron, Aluminium or Brass using Young's Modulus Experiment.
9	**Half-Wave Rectifier** Obtain load characteristic and %regulation for Full-wave rectifier with-out filter circuit and by using capacitor filter circuit. Determine ripple factor for Full wave rectifier without filter only.

10	**To Determine Wave length of LASER light**
11	**Diagonalization of given matrix (2x2). Evaluate trace of a matrix**
12	**Decay Constant of Capacitor** Decay Constant To verify the exponential law for the decay of a charged capacitor and determine the decay constant of the capacitor.
13	**Series Resonance** Series Resonance To determine the frequency of a.c. emf by series resonance circuit varying capacitor.
14	**Study of Transformer** Study of Transformer To determine (i) turn ratio (ii) percentage efficiency (iii) energy loss due to copper, for a given transformer.

SWARRNIM
INSTITUTE OF HEALTH SCIENCES

AARIHANT
INSTITUTE OF NURSING
(Approved by Government of Gujarat, GNC & INC)

THIRD YEAR
B.SC NURSING
SYLLABUS

SWARRNIM
STARTUP & INNOVATION
UNIVERSITY
WHERE IDEAS COME ALIVE.

Swarrnim Startup & Innovation University
+91 - 95123 43333 | info@swarrnim.edu.in | www.swarrnim.edu.in
st Bhoyan Rathod, Nr. ONGC WSS, Opp. IFFCO Adalaj-Kalol Highway, Gandhinagar, Gujarat - 382420

Scheme of Examination

Third year B.sc Nursing

Sr. No	Subject	Assessment			
		Hours	Internal	External	Total
1	Medical surgical-II	3	25	75	100
2	Child Health Nursing	3	25	75	100
3	Mental Health Nursing	3	25	75	100
4	Nursing Research and Statistics	3	25	75	100
	Practical & Viva Voice				
5	Medical Surgical Nursing-II		50	50	100
6	Child Health Nursing		50	50	100
7	Mental Health Nursing		50	50	100

Medical Surgical Nursing

(Adult including Geriatrics) – II

Placement -Third Year

Time -Theory – 120 hours
Practical – 270 hours

Course Description -The purpose of this course is to acquire knowledge and develop proficiency in caring for patients with medical and surgical disorders in varieties of health care settings and at home.

Unit	Time (Hrs)	Learning Objectives	Content	Teaching Learning Activities	Assessment Methods
I	15	Describe the etiology, pathophysiology, clinical manifestations, diagnostic measures and management of patients with disorders of Ear, Nose and Throat	**Nursing management of patient with disorders of Ear, Nose and Throat :** • Review of anatomy and physiology of the Ear, Nose and Throat • Nursing assessment - History and Physical assessment • Etiology, Pathophysiology , clinical manifestations, diagnosis, treatment modalities and medical & Surgical nursing management of Ear, Nose & Throat disorders : o External Ear - deformities otalgia, foreign bodies, and tumours o Middle Ear - Impacted wax, Tympanic membrane perforation, otitis media, otosclerosis, mastoiditis, tumours o Inner ear - Meniere's Disease, labyrinthitis, ototoxicity, tumours o Upper airway infections – Common cold, sinusitis, ethinitis, rhinitis, pharyngitis, tonsillitis and adenoiditis, peritonsilar abscess, laryngitis • Upper respiratory airway – epistaxis • Nasal obstruction, laryngeal obstruction, cancer of the larynx • Cancer of the oral cavity • Speech defects and speech therapy	• Lecture Discussion • Explain using Charts, graphs, Models, films, slides • Demonstration • Practice session • Case discussions / Seminar • Health education • Supervised clinical practice • Drug book / presentation	- Essay type - Short answers - Objectives type - Assessment of skills `with check list - Assessment of patient management problem

Swarrnim Startup & Innovation University
Bhoyan Rathod Gandhinagar

			• Deafness – Prevention, control and rehabilitation • Hearing Aids, implanted hearing devices Special Therapies Nursing procedures Drugs used in treatment of disorders of Ear, Nose and Throat Role of nurse in communicating with hearing impaired and muteness		
	15	Describe the etiology, pathophysiology, clinical manifestations, diagnostic measures and management of patients with disorders of Eye.	**Nursing management of patient with disorder of Eye :** • Review of anatomy and physiology of the eye • Nursing Assessment - History and Physical assessment • Etiology, Pathophysiology , clinical manifestations, diagnosis, treatment modalities and medical & Surgical nursing management of eye disorders - ◦ Refractive errors ◦ Eyelids - infection, tumours & deformities ◦ Conjunctiva - inflammation and infection, bleeding ◦ Cornea - inflammation and infection ◦ Lens - Cataracts ◦ Glaucoma ◦ Disorder of the uveal tract, ◦ Ocular tumours ◦ Disorders of posterior chamber & retina - retinal and vitreous problems ◦ Retinal detachment ◦ Ocular emergencies and their prevention • Blindness • National Blindness Control Program ○ Eye Banking ○ Eye prostheses and Rehabilitation Role of nurse - Communication with visually impaired patient, Eye camps Special Therapies Nursing procedures Drugs used in treatment of disorders of eye	• Lecture Discussion • Explain using Charts, graphs, Models, films, slides • Demonstration • Practice session • Case discussions / Seminar • Health education • Supervised clinical practice • Drug book/ presentation • Visit to eye bank • Participation in eye-camps	- Essay type - Short answers - Objectives type - Assessment of skills `with check list - Assessment of patient management problem

Swarnim Startup & Innovation University
Bhoyan Rathod Gandhinagar

III	16	Describe the etiology, pathophysiology, clinical manifestations, diagnostic measures & nursing management of patients with Neurological disorders	**Nursing management of patient with Neurological disorders :** • Review of anatomy and physiology of the neurological system • Nursing Assessment - History and Physical and neurological assessemnt and Glasgo Coma Scale • Etiology, Pathophysiology , clinical manifestations, diagnosis, treatment modalities and medical & Surgical nursing management of neurological disorders - • Congenital malformations • Headache • Head Injuries • Spinal Injuries - o Paraplegia o Hemiplegia o Quadraplegia • Spinal cord compression - herniation of inter-vertebral disc • Tumors of the brain & spinal cord • Intra cranial & cerebral aneurysms • Infections : o Meningitis, Encephalitis, Brain abscess, neurocysticercosis • Movement disorders - o Chorea o Seizures o Epilepsies • Cerebro Vascular Accidents (CVA) • Cranial, Spinal Neuropathies - Bell's palsy, trigeminal neuralgia • Peripheral Neuropathies - Guillain-Barr'e Syndrome • Myasthenia gravis • Multiple sclerosis • Degenerative diseases - o Delirium o Dementia o Alzheimer's disease o Parkinson's disease	• Lecture Discussion • Explain using Charts, graphs • Models, films, slides • Demonstration • Practice session • Case discussions/ Seminar • Health education • Supervised clinical practice • Drug book/ presentation • Visit to rehabilitation centre	- Essay type - Short answers - Objectives type - Assessment of skills with check list - Assessment of patient management problem

Swarnim Startup & Innovation University
Bhoyan Rathod Gandhinagar

			• Diseases of breasts - Deformities, Infections, Cysts and Tumours • Menopause and Hormonal Replacement Therapy • Infertility • Contraception – Types, Methods, Risk and effectiveness o Spacing Methods - - Barrier methods, Intra Uterine Devices, Hormonal & Post Conceptional Methods, etc o Terminal methods - Sterilization • Emergency Contraception methods • Abortion – Natural, Medical & surgical abortion – MTP Act • Toxic Shock Syndrome • Injuries & Trauma; Sexual violence Special Therapies Nursing procedures Drugs used in treatment of gynaecological disorders National Family Welfare Programme		
V	10	Describe the etiology, pathophysiology, clinical manifestations, diagnostic measures & nursing management of patients with Burns, re-constructive and cosmetic surgery	**Nursing management of patients with Burns, re-constructive & cosmetic surgery :** • Review of anatomy and physiology of the skin & connective tissues and various deformities • Nursing Assessment - History and Physical assessment & Assessment of burns & fluid and electrolyte loss • Etiology, classification, pathophysiology, clinical manifestations, diagnosis, treatment modalities and medical & Surgical nursing management of Burns & Re-constructive and Cosmetic surgery - • Types of Re-constructive and Cosmetic surgery - for burns, congenital deformities, injuries & cosmetic purposes • Role of Nurse • Legal aspects	• Lecture Discussion • Explain using Charts, graphs • Models, films, slides • Demonstration • Practice session • Case discussions/ Seminar • Health education • Supervised clinical practice • Drug book/ presentation	- Essay type - Short answers - Objectives type - Assessment of skills `with check list - Assessment of patient management problem

Swarnim Startup & Innovation University
Bhoyan Rathod Gandhinagar

			• Rehabilitation • Special therapies - Psycho social aspects Nursing procedures Drugs used in treatment of Burns, re-constructive and cosmetic surgery		
VI	10	Describe the etiology, pathophysiology, clinical manifestations, diagnostic measures & nursing management of patients with Oncology	**Nursing management of patients with oncological conditions :** • Structure & characteristics of normal & cancer cells • Nursing Assessment - History and Physical assessment • Prevention, Screening, Early detection, Warning signs of cancer • Epidemiology, Etiology, Classification, Pathophysiology, Staging, clinical manifestations, diagnosis, treatment modalities and medical & Surgical nursing management of oncological conditions - • Common malignancies of various body systems - Oral, larynx, lung, Stomach & Colon, Liver, Leukemias & lymphomas, Breast, Cervix, Ovary, Uterus, Sarcoma, Brain, Renal, Bladder, Prostate, etc • Oncological emergences • Modalities of treatment - o Immunotherapy o Chemotherapy o Radiotherapy o Surgical Interventions o Stem cell and Bone marrow transplants o Gene therapy o Other forms of treatment • Psychosocial aspects of cancer • Rehabilitation • Palliative care - Symptom and Pain Management, Nutritional support • Home care • Hospice care • Stomal Therapy • Special therapies - Psycho social aspects • Nursing procedures	• Lecture Discussion • Explain using Charts, graphs • Models, films, slides • Demonstration • Practice session • Case discussions/ Seminar • Health education • Supervised clinical practice • Drug book/ presentation	- Essay type - Short answers - Objectives type - Assessment of skills `with check list - Assessment of patient management problem

Swarrim Startup & Innovation University
Bhoyan Rathod Gandhinagar

VII	10	Describe organization of emergency & disaster care services Describe the role of nurse in disaster management Describe the role of nurse in management of common Emergencies	**Nursing management of patient in Emergency & Disaster situations :** **Disaster Nursing -** • Concepts & principles of Disaster Nursing • Causes and Types of Disaster - Natural and Man-made ○ Earthquakes, Floods, Epidemics, Cyclones ○ Fire, Explosion, Accidents ○ Violence, Terrorism - Biochemical & War • Policies related to emergency / disaster management - International, National, State, Institutional • Disaster preparedness • Team, Guidelines, protocols, Equipments, Resources • Co-ordination and involvement of - Community, various govt. departments, non-govt. organizations & International agencies • Role of nurse - working • Legal Aspects of Disaster Nursing • Impact on Health and after effects - Post Traumatic Stress Disorder • Rehabilitation - physical, psycho-social, financial, relocation **Emergency Nursing -** • Concept, priorities, principles & scope of emergency nursing • Organization of emergency services-physical set up, staffing, equipment and supplies, protocols, Concepts of triage & role of triage nurse • Coordination & involvement of different	• Lecture Discussion • Explain using Charts, graphs, Models, films, slides • Demonstrate on • Practice session • Case discussions/ Seminar • Health education • Supervised clinical practice • Drug book/ presentation • Disaster management t t drills	- Essay type - Short answers - Objectives type - Assessment of skills `with check list - Assessment of patient management t problem

Swarnim Startup & Innovation University
Bhoyan Rathod
Gandhinagar

			departments & facilities • Nursing Assessment - History and Physical assessment • Etiology, Pathophysiology , clinical manifestations, diagnosis, treatment modalities and medical & Surgical nursing management of patient with			

Swarnim Startup & Innovation University
Bhoyan
Rathod
Gandhinagar

			medical & surgical Emergency - • Principles of emergency management • Common Emergencies • Respiratory Emergencies • Cardiac Emergencies • Shock & Haemorrhage • Pain • Poly - Trauma, road accidents, crush injuries, wound • Bites • Poisoning - Food, Gas, Drugs & Chemical poisoning • Seizures • Thermal Emergencies - Heat stroke & Cold injuries • Paediatric Emergencies • Psychiatric Emergencies • Obstetrical Emergencies • Violence, Abuse, Sexual assault • Cardio Pulmonary Resuscitation • Crisis Intervention • Role of the nurse - Communication & Inter personal Relations • Medico-Legal Aspects		
VIII	10	Explain the concept and problems of Ageing Describe nursing care of the elderly	**Nursing care of the elderly :** • Nursing Assessment – History & Physical assessment • Ageing • Demography - Myths and realities • Concepts & theories of ageing • Cognitive Aspects of Ageing • Normal biological ageing • Age related body systems changes • Psychosocial Aspects of Ageing • Medications and elderly • Stress & coping in older adults • Common Health Problems & Nursing Management - Cardiovascular, Respiratory, Musculoskeletal, Endocrine, genitor-urinary, Gastrointestinal, Neurological, Skin and other Sensory organs o Psychosocial and Sexual o Abuse of elderly	• Lecture Discussion • Explain using Charts, graphs, Models, films, slides • Demonstration • Practice session • Case discussions/ Seminar • Health education • Supervised clinical practice • Drug book/ presentation • Visit to old age home	- Essay type - Short answers - Objectives type - Assessment of skills `with check list - Assessment of patient managemen t problem

Swarnim Startup & Innovation University
Bhoyan Rathod Gandhinagar

			• Role of nurse for care of elderly-ambulation, nutritional, communicational, psychosocial & spiritual • Role of nurse for caregivers of elderly • Role of family and formal and non formal caregivers • Use of aids & prosthesis (hearing aids, dentures) • Legal & Ethical Issues • Provisions & Programmes for elderly - Privileges, Community Programs and health services • Home & institutional care		
IX	10	Describe organization of critical care units Describe the role of nurse in management of patients in critical care units	**Nursing management of patient in critical care units :** • Nursing Assessment – History & Physical assessment • Classification • Principles of critical care nursing • Organization - Physical set-up, Policies, Staffing norms • Protocols, equipment and supplies • Special equipments - ventilators, cardiac monitors, defibrillators, Resuscitation equipments • Infection Control Protocols • Nursing management of critically ill patient - Monitoring of critically ill patient • CPR - Advance Cardiac Life support • Treatments & procedures • Transitional care • Ethical & Legal Aspects • Communication with patient and family • Intensive care records • Crisis Intervention • Death & Dying - coping with such a patient • Drugs used in critical care unit	• Lecture Discussion • Explain using Charts, graphs, Models, films, slides • Demonstration • Role plays • Counselling • Practice session • Case discussions/ Seminar • Health education • Supervised clinical practice • Drug book/ presentation	- Essay type - Short answers - Objectives type - Assessment of skills `with check list - Assessment of patient management problem
X	8	Describe the etiology, pathophysiolog	**Nursing management of patients (adults including elderly) with Occupational and Industrial health disorders :**	• Industrial visit	• Report of visit

Swarrnim Startup & Innovation University
Bhoyan Rathod
Gandhinagar

		clinical manifestations, assessment, diagnostic measures & management of patients with Occupational and Industrial health disorder	• Nursing Assessment –History & Physical assessment • Etiology, Pathophysiology, clinical manifestations, diagnosis, treatment modalities and medical & Surgical nursing management of Occupational and Industrial health disorders • Role of nurse Special Therapies, alternative therapies Nursing procedures Drugs used in treatment of Occupational & Industrial disorders		

Swarrnim Startup & Innovation University
Bhoyan Rathod Gandhinagar

Medical Surgical Nursing – II Practical

(Adult and Geriatrics) – II

Placement -Third Year

Time - Theory – 120 hrs

Practical – 270 hrs
Internship – 430 hrs

Areas	Duration (in wks)	Objectives of Posting	Skills to be developed	Assignments	Assessment methods
ENT	1	Provide care to patients with ENT disorders Counsel and educate patient and families	• Perform examination of ear, nose and throat • Assist with diagnostic procedures • Assist with therapeutic procedures • Instillation of drops • Perform/assist with irrigations • Apply ear bandage • Perform tracheostomy care • Teach patients & families	Provide care to 2-3 assigned patients Nursing care plan -1 Observation reports of OPD Maintain drug book	- Assess each skill with check-list - Assess performance with rating scale - Evaluation of observation report of OPD - Completion of activity record
Ophthalmology	1	Provide care to patients with Eye disorders Counsel and educate patient and families	• Perform examination of eye • Assist with diagnostic procedures • Assist with therapeutic procedures • Perform/assist with irrigations • Apply eye bandage • Apply eye drops/ ointments • Assist with foreign body removal • Teach patients & families	Provide care to 2-3 assigned patients Nursing care plan -1 Observation reports of OPD & Eye bank Maintain drug book	- Assess each skill with checklist - Assess performance with rating scale - Evaluation of observation report of OPD / Eye bank - Completion of activity record

Swarrnim Startup & Innovation University
Bhoyan Rathod Gandhinagar

Swarrnim Institute
Bhoyan Rathod Gandhinagar

Neurology	2	Provide care to patients with neurological disorders Counsel and educate patient and families	• Perform Neurological Examination • Use Glasgow coma scale • Assist with diagnostic procedures • Assist with therapeutic procedures • Teach patients & families • Participate in rehabilitation program	Provide care to assigned 2-3 patients Case study/ case presentation – 1 Maintain drug book Health teaching-1	- Assess each skill with checklist - Assess performance with rating scale - Evaluation of case study & health teaching - Completion of activity record
Gynaecology ward	1	Provide care to patients with gynaecological disorders Counsel and educate patient and families	• Assist with gynaecological Examination • Assist with diagnostic procedures • Assist with therapeutic procedures • Teach patients & families • Teaching Breast Self Examination • Assist with PAP smear collection	Provide care to 2-3 assigned patients Nursing care plan -1 Maintain drug book	- Assess each skill with checklist - Assess performance with rating scale - Evaluation of care plan - Completion of activity record
Burns Unit	1	Provide care to patients with Burns Counsel and educate patient and families	• Assessment of the burns patient • Percentage of burns • Degree of burns • Fluid & electrolyte replacement therapy – Assess, Calculate, Replace • Record intake/output • Care of Burn wounds – Bathing, Dressing	Provide care to 1-2 assigned patients Nursing care plan - 1 Observation reports of Burns unit	- Assess each skill with checklist - Assess performance with rating scale - Evaluation of care plan - Completion of activity record

PRINCIPAL

Bhoyan Rathod Gandhinagar

Swarnim Startup & Innovation University

ADANI INSTITUTE OF NURSING

			• Perform active & passive exercises • Practice medical & surgical asepsis • Counsel & Teach patients and families • Participate in rehabilitation program		
Onologl y Unit	1	Provide care to patients with Cancer Counsel and educate patient and families	• Screen for common can-cers - TNM classification • Assist with diagnostic procedures – Biopsies, Pap smear, Bone-marrow aspiration • Breast examination • Assist with therapeutic procedures • Participate in various modalities of treatment – Chemotherapy, Radiotherapy • Pain management • Stoma therapy • Hormonal therapy • Immuno therapy • Gene therapy • Alternative therapy • Participating palliative care • Counsel and teach patients families • Breast Self Examination • Warning signs	Provide care to 2-3 assigned patients Nursing care plan -1 Observation report of cancer unit	- Assess each skill with checklist - Assess performance with rating scale - Evaluation of care plan - Completion of activity record

Swarnim Startup & Innovation University
Bhoyan Rathod Gandhinagar

			• Participate in rehabilitation program		
Critical care unit	2	Provide care to critically ill patients Counsel patient and families for grief and bereavement	• Monitoring of patients in ICU • Maintain flow sheet • Care of patient on ventilators • Perform Endotracheal suction • Demonstrates use of ventilators, cardiac monitors, etc. • Collect specimens and interpret ABG analysis • Assist with arterial puncture • Maintain CVP line • Pulse oximetry • CPR – ALS • Defibrillators • Pace makers • Bag - mask ventilation • Emergency tray / trolley • Administration of drugs - Infusion pump, • Epidural, Intra thecal, Intracardiac • Total parenteral therapy • Chest physiotherapy • Perform active & passive exercises • Counsel the patient and family in dealing with grieving and bereavement	Provide care to 1 assigned patient Observation report of critical care unit Drugs book	- Assess each skill with checklist - Assess performance with rating scale - Evaluation of observation report - Completion of activity record

Swarnim Startup & Innovation University
Bhoyan Rathod Gandhinagar

Casualty / Emergency	1	Provide care to patients in emergency and disaster situation Counsel patient and families for grief and bereavement	• Practice "Triage" • Assist with assessment, examination, investigations & their interpretations in emergency & disaster situations • Assist in documentations • Assist in legal procedures in emergency unit • Participate in managing crowd • Counsel patient & families in grief and bereavement	Observation report of emergency unit	- Assess performance with rating scale - Evaluation of observation report - Completion of activity record

Placement - Internship **Time** - 9 weeks

Areas	Duration (in week)	Objective	Skills	Assessment
Medical ward	2	Provide comprehensive care to patients with medical and surgical conditions including emergencies Assist with common operations	Integrated Practice	- Assess clinical performance with rating scale
Surgical ward	2			
Critical care unit / ICCU	1			
Casualty/Emergency	2			
Operation Theatre (Eye, ENT, Neuro)	2			

P.R. Ghoghari

Swarrnim Startup & Innovation University Bhoyan Rathod Gandhinagar

Aakrant Institute of Nursing Bhoyan Rathod Gandhinagar

Child Health Nursing

Placement - Third Year

Time -Theory - 90 hours

Practical - 270 hours
Internship - 145 hours

Course Description -This course is designed for developing an understanding of the modern approach to child – care, identification, prevention and nursing management of common health problems of neonates and children.

Unit	Time (Hrs)	Learning Objectives	Content	Teaching Learning Activities	Assessment Methods
I	15	Explain the modern concept of child care & principles of child health Nursing Describe national policy programs and legislation in relation to child health and welfare List major causes of death during infancy, early & late childhood Describe the major functions and role of the paediatric nurse in caring for a hospitalized child.	**Introduction modern concepts of childcare :** • Internationally accepted rights of the child • National policy & legislations in relation to child health and welfare • National programmes related to child health and welfare • Agencies related to welfare services to the children • Changing trends in hospital care - preventive, promotive & curative aspects of child health • Child morbidity and mortality rates • Differences between an adult and child • Hospital environment for a sick child • Impact of hospitalization on the child and family • Grief and bereavement • The role of a Child health nurse in caring for a hospitalised child • Principles of pre and post operative care of infants and children • Child health nursing procedures	• Lecture Discussion • Demonstration of common paediatric procedures	- Short answers - Objective type - Assessment of skills with checklist

Swarnim Startup & Innovation University Bhoyan Rathod Gandhinagar

		Describe the principles of child health nursing			
II	20	Describe the Normal growth & development of children at different ages Identify the needs of children at different ages & provide parental guidance Identify the nutritional needs of children at different ages and ways of meeting the needs Appreciate the role of play for normal & sick children Appreciate the preventive measures and strategies for children	**The healthy child :** • Principles of growth and development • Factors affecting growth & development • Growth and development from birth to adolescence • The needs of normal children through the stages of developmental and parental guidance • Nutritional needs of children & infants - breast feeding, exclusive breast feeding, supplementary / artificial feeding and weaning • Baby Friendly Hospital Concept • Accidents - causes and prevention • Value of play and selection of play material • Preventive immunization, Immunization Programme and Cold chain • Preventive paediatrics • Care of under five & under five clinics / well baby clinics	• Lecture Discussion • Developmental study of infant and children • Observation on study of normal and sick child • Field visit to Anganwadi, Child guidance clinic • Film show on breast feeding • Clinical practice / field	- Short answers - Objective type - Assessment of field visits and developmental study reports
III	15	Provide care to normal & high risk neonates	**Nursing care of a neonate :** • Nursing care of a normal newborn / Essential newborn care • Neonatal resuscitation	• Lecture Discussion • Workshop on	- Short answers - Objective type -

Swarnim Startup & Innovation University
Bhoyan Rathod
Gandhinagar

		Perform neonatal resuscitation Recognize and manage common neonatal problems	• Nursing management of a low birth weight baby • Kangaroo mother care • Nursing management of common neonatal disorders • Organization of neonatal unit • Identification & nursing management of common congenital malformations	neonatal resuscitation • Demonstration • Practice session • Clinical practice	Assessment of skills with checklist
IV	10	-	**Integrated management of neonatal and childhood illnesses (IMNCI)**	-	-
V	20	Provide nursing care in common childhood diseases Identify measures to prevent common childhood diseases including immunization	**Nursing management in common childhood diseases :** • Nutritional deficiency disorders • Respiratory disorders and infections • Gastrointestinal infections, infestations and congenital disorders • Cardio vascular problem - congenital defects and rheumatic fever, rheumatic heart disease • Genitor-urinary disorders - acute glomerulo nephritis, nephrotic syndrome, Wilms' tumor, infection and congenital disorders • Neurological infections and disorders - convulsions, epilepsy, meningitis, hydrocephalus, spina-bifida • Hematological disorders - Anemias, Thalassemia, ITP, Leukemia, hemophilia • Endocrine disorders - Juvenile Diabetes Mellitus • Orthopedic disorders - club feet, hip dislocation and fracture • Disorders of skin, eye, & ears • Common communicable diseases in children, their identification, nursing management in hospital and home and prevention	• Lecture Discussion • Demonstration • Practice session • Clinical practice	- Short answers - Objective type - Assessment of skills with checklist

Swarnim Startup & Innovation University
Bhoyan Rathod Gandhinagar

			• Child health emergencies - poisoning, foreign bodies, haemorrhage, burns & drowning • Nursing care of infant and children with HIV / AIDS		
VI	10	Manage the child with behavioural & social problems Identify the social & welfare services for challenged children	**Management of behavioural & social problems in children :** • Management of common behavioural disorders • Management of common psychiatric problems • Management of challenged children - Mentally, Physically & socially challenged • Welfare services for challenged children in India • Child Guidance Clinics	• Lecture Discussion • Field visits to Child Guidance Clinics, school for mentally & physically, socially challenged	- Short answers - Objective type - Assessment of field reports.

Swarnim Startup & Innovation University
Bhoyan Rathod Gandhinagar

Child Health Nursing – Practical

Placement - Third Year
Fourth Year
Weeks)

Time -270 hours (9 Weeks)
Internship -145 hours (3

Areas	Duration (in weeks)	Objectives	Skills	Assignments	Assessment Methods
Paediatric Medicine ward	3	Provide nursing care to children with various medical disorders Counsel and educate parents	• Taking paediatric History • Physical examination and assessment of children • Administration of oral, IM & IV medicine / fluids • Calculation of fluid requirements • Prepare different strengths of IV fluids • Apply restraints • Administer O_2 inhalation by different methods • Give baby bath Feed children by Katori spoon, etc. • Collect specimens for common investigations • Assist with common diagnostic procedures • Teach mothers / parents - o Malnutrition o Oral rehydration therapy o Feeding & Weaning o Immunization Schedule o Play therapy o Specific Disease conditions	Give care to 3 assigned paediatric patients Nursing Care Plan – 1 Case study/presentations-1 Health Talk -1	Assess clinical performance with rating scale Assess each skill with checklist OSCE/ OSPE Evaluation of care plan, case study/presentation & Health education session Completion of activity record
Paediatric Surgery	3	Recognize different paediatric	• Calculate, prepare and administer I/V	Give care to 3 assigned paediatric	Assess clinical performance with rating scale

Swarnim Startup & Innovation University
Bhoyan Rathod Gandhinagar

Ward		surgical conditions / malformations Provide pre and post operative care to children with common paediatric surgical conditions / malformation Counsel and educate parents	fluids • Do bowel wash • Care for ostomies : ○ Colostomy irrigation ○ Ureterostomy ○ Gastrostomy ○ Enterostomy • Urinary catheterization and drainage • Feeding – Naso-gastric, Gastrostomy, Jejunostomy • Care of surgical wounds – Dressing & Suture removal	surgical patients Nursing Care Plan – 1 Case study/presentation-1	Assess each skill with checklist OSCE/ OSPE Evaluation of care plan, case study/presentation Completion of activity record
Paediatric OPD/ Immunization room	1	Perform assessment of children - Health, Developmental and Anthropometric Perform Immunization Give Health Education / Nutritional Education	• Assessment of children - Health assessment, Developmental assessment, Anthropometric assessment • Immunization • Health / Nutritional Education	Developmental study -1	Assess clinical performance with rating scale Completion of activity record
Paediatric medicine and surgery ICU	1+1	Provide nursing care to critically ill children	• Care of a baby in incubator / warmer • Care of a child on ventilator • Endotracheal suction • Chest physiotherapy • Administer fluids with infusion pump • Total parenteral nutrition • Phototherapy • Monitoring of babies	Nursing care plan - 1 Observation report - 1	Assess clinical performance with rating scale Completion of activity record Evaluation of Care plan & observation report

Swarnim Startup & Innovation University Bhoyan Rathod Gandhinagar
Adhiant Institute of Nursing Bhoyan Rathod Gandhinagar

			• Cardio Pulmonary Resuscitation – Neonatal & Paediatric		

Internship

Internship -145 hours (3 Weeks)

Areas	Duration (in week)	Objective	Skills	Assessment
Paediatric medicine ward / ICU	1	Provide comprehensive care to children with medical conditions	Integrated Practice	Assess clinical performance with rating scale
Paediatric surgery ward / ICU	1	Provide comprehensive care to children with surgical conditions	Integrated Practice	Assess clinical performance with rating scale
NICU	1	Provide intensive care to neonates	Integrated Practice	Assess clinical performance with rating scale

Parikh Institute of Nursing Bhoyan Rathod Gandhinagar

Swarnim Startup & Innovation University Bhoyan Rathod Gandhinagar

Mental Health Nursing

Placement - Third Year

Time - Theory - 90 hours
Practical - 270 hours Internship
- 95 hours (2 weeks)

Course Description -This course is designed for developing an understanding of the modern approach to mental health, identification, prevention and nursing management of common mental health problems with special emphasis on therapeutic interventions for individuals, family and community.

Unit	Time (Hrs)	Learning Objectives	Content	Teaching Learning Activities	Assessment Methods
I	5	Describe the historical development & current trends in mental health nursing Describe the epidemiology of mental health problems Describe the National Mental Health Act, programmes and mental health policy Discuss the scope of mental health nursing Describe the concept	**Introduction :** • Perspectives of Mental Health and Mental Health nursing - evolution of mental health services, treatments and nursing practices, • Prevalence and incidence of mental health problems and disorders • Mental Health Act • National Mental Health Policy vis a vis National Health Policy • National Mental health Programme • Mental Health team • Nature and scope of mental health nursing • Role and functions of mental health nurse in various settings and factors affecting the level of nursing practice • Concepts of normal and abnormal behaviour	Lecture Discussion Field visit	- Short answers - Objective type - Assessment of field visit reports.

Swarnim Startup & Innovation University
Shoyan Rathod
Gandhinagar

		of normal & abnormal behaviour			
II	5	Define the various terms used in mental health nursing Explain the classification of mental disorders Explain psycho dynamics of maladaptive behaviour Discuss the etiological factors, psychopathology of mental disorders Explain the Principles & standards of mental health nursing Describe the conceptual models of mental health nursing	**Principles and Concepts of Mental Health Nursing :** • Definition - mental health nursing and terminology used • Classification of mental disorders - ICD • Review of personality development, defence mechanisms • Maladaptive behaviour of individuals and groups - stress, crisis and disaster(s) • Etiology-bio-psycho-social factors • Psychopathology of mental disorders - review of structure & function of brain, limbic system and abnormal neuro transmission • Principles of Mental health Nursing • Standard of mental health nursing practice • Conceptual models and the role of nurse - o Existential Model o Psycho - analytical models o Behavioural model o Interpersonal model	Lecture discussion Explain using charts Review of personality development	- Short answers - Objective type - Essay type
III	8	Describe nature, purpose & process of assessment of mental health	**Assessment of mental health status :** • History taking • Mental status examination • Mini mental status examination	Lecture discussion Demonstration Practice session	- Short answers - Objective type - Assessment of skills

Swarnim Startup & Innovation University
Bhoyan Rathod Gandhinagar

		status	• Neurological examination - review • Investigations - Related Blood chemistry, EEG, CT & MRI • Psychological tests • Role and Responsibilities of nurse	Clinical practice	with check list
IV	6	Identify therapeutic communication techniques Describe therapeutic relationship Describe therapeutic impasse and its intervention	**Therapeutic communication and nurse - patient relationship :** • Therapeutic communication - types, techniques, characteristics • Types of relationship • Ethics and responsibilities • Elements of nurse patient contract • Review of technique of IPR-Johari Window • Goals, phases, tasks, therapeutic techniques • Therapeutic impasse and its intervention	Lecture discussion Demonstration Role play Process recording	- Short answers - Objective type
V	14	Explain treatment modalities & therapies used in mental disorders and role of the nurse	**Treatment modalities and therapies used in mental disorders :** • Psycho Pharmacology • Psychological therapies - Therapeutic community, Psycho therapy-individual-psycho-analytical, cognitive & supportive, Family, Group, behavioural. Play, Psycho-drama, Music, Dance, Recreational & Light therapy, Relaxation therapies -Yoga, Meditation, bio feedback • Alternative systems of medicine • Occupational therapy • Physical Therapy - Electro convulsive therapy • Geriatric considerations Role of nurse in above therapies	Lecture discussion Demonstration Group work Practice session Clinical practice	- Short answers - Objective type - Essay type.
VI	5	Describe the etiology, psychopathology, clinical	**Nursing management of patient with Schizophrenia and other psychotic disorders :** • Classification - ICD • Etiology, psycho-pathology, types, clinical manifestations,	Lecture discussion Case discussion Case	- Short answers - Assessment of patient managemen

Bhoyan Rathod Gandhinagar

		manifestations, diagnostic criteria & management of patients with Schizophrenia and other psychotic disorders	diagnosis • Nursing Assessment - History, Physical & mental assessment • Treatment modalities and nursing management of patients with Schizophrenia & other psychotic disorders • Geriatric considerations • Follow up and home care and rehabilitation	presentation Clinical practice	t problems - Essay type.
VII	5	Describe the etiology psycho-pathology, clinical manifestations, diagnostic criteria and management of patients with mood disorders	**Nursing management of patient with mood disorders :** • Mood disorders - Bipolar affective disorder, Mania, depression & dysthamia etc • Etiology, psycho-pathology, clinical manifestations, diagnosis • Nursing Assessment – History, Physical and mental assessment • Treatment modalities and nursing management of patients with mood disorders • Geriatric considerations • Follow-up and home care and rehabilitation	Lecture discussion Case discussion Case presentation Clinical practice	- Essay type - Short answers - Assessment of patient management problems
VIII	8	Describe the etiology , psycho-pathology, clinical manifestations, diagnostic criteria and management of patients with neurotic, stress related and somatization disorders	**Nursing management of patient with neurotic, stress related and somatization disorders :** • Anxiety disorder - Phobias, Dissociation and Conversion disorder, Obsessive Compulsive Disorder, somatoform disorders, Post traumatic stress disorder • Etiology, psycho-pathology, clinical manifestations, diagnosis • Nursing Assessment- History, Physical & mental assessment • Treatment modalities and nursing management of patients with neurotic, stress related and somatization disorders	Lecture discussion Case discussion Case presentation Clinical practice	- Essay type - Short answers - Assessment of patient management problems

Swarnim Startup & Innovation University
Bhoyan Rathod Gandhinagar

			• Geriatric considerations • Follow-up and home care and rehabilitation		
IX	5	Describe the etiology psycho-pathology, clinical manifestations, diagnostic criteria and management of patients with substance use disorders	**Nursing management of patient with substance use disorders :** • Commonly used psychotropic substance - Classification, forms, routes, action, intoxication & withdrawal • Etiology of dependence - tolerance, psychological and physical dependence, withdrawal syndrome, diagnosis • Nursing Assessment - History, Physical, mental assessment and drug assay • Treatment (detoxification, antagonism and narcotic antagonist therapy and harm reduction) & nursing management of patients with substance use disorders • Geriatric considerations • Follow-up and home care and rehabilitation	Lecture discussion Case discussion Case presentation Clinical practice	- Essay type - Short answers - Assessment of patient management problems
X	4	Describe the etiology psycho-pathology, clinical manifestations, diagnostic criteria and management of patients with Personality, Sexual & Eating disorders	**Nursing management of patient with Personality, Sexual & Eating disorders :** • Classification of disorders • Etiology, psycho-pathology, characteristics, diagnosis • Nursing assessment - History, Physical and mental assessment • Treatment modalities and nursing management of patients with Personality, Sexual & Eating disorders • Geriatric considerations • Follow-up and home care and rehabilitation	Lecture discussion Case discussion Case presentation Clinical practice	- Essay type - Short answers - Assessment of patient management problems
XI	6	Describe the etiology psycho-pathology, clinical manifestations, diagnostic	**Nursing management of child-hood and adolescent disorders including mental deficiency :** • Classification • Etiology, psycho-pathology, characteristics, diagnosis • Nursing assessment -	Lecture discussion Case discussion Case presentation	- Essay type - Short answers - Assessment of patient management problems

Shantilal Shanglia Startup & Innovation University
Bhoyan Rathod Gandhinagar

		criteria and management of childhood and adolescent disorders including mental deficiency	History, Physical, mental and IQ assessment • Treatment modalities and nursing management of childhood disorders including mental deficiency • Follow-up and home care and rehabilitation	Clinical practice	
XII	5	Describe the etiology, psycho-pathology, clinical manifestations, diagnostic criteria and management of organic brain disorders	**Nursing management of organic brain disorders :** • Classification - ICD • Etiology, psycho-pathology, clinical features, diagnosis, and Differential diagnosis (Parkinsons and Alzheimers) • Nursing assessment - History, Physical, mental and neurological assessment • Treatment modalities and nursing management of organic brain disorders • Geriatric considerations • Follow-up and home care and rehabilitation	Lecture discussion Case discussion Case presentation Clinical practice	- Essay type - Short answers - Assessment of patient management problems
XIII	6	Identify psychiatric emergencies and carry out crisis intervention	**Psychiatric emergencies and crisis intervention :** • Types of psychiatric emergencies and their management • Stress adaptation Model - stress and stressor, coping, resources and mechanism • Grief-theories of grieving process, principles, techniques of counselling • Types of crisis • Crisis Intervention- Principles, Techniques and Process • Geriatric considerations • Role and responsibilities of nurse	Lecture discussion Case discussion Case presentation Clinical practice	- Short answers - Objectives types
XIV	4	Explain legal aspects applied in mental health settings and	**Legal issued in Mental Health Nursing :** • The Mental Health Act 1987 - Act, Sections, Articles & their implications etc. • Indian Lunacy Act - 1912 • Rights of mentally ill clients	Lecture discussion Case discussion	- Short answers - Objectives types

		role of the nurse	• Forensic psychiatry • Acts related to narcotic and psychotropic substances and illegal drug trafficking • Admission and discharge procedures • Role and responsibilities of nurse		
XV	4	Describe the model of preventive psychiatry Describes Community Mental health services & role of the nurse	**Community Mental Health Nursing :** • Development of Community Mental Health Services : • National Mental Health Programme • Institutionalization Versus De-institutionalization • Model of Preventive Psychiatry - Levels of Prevention • Mental Health Services available at the primary, secondary, tertiary levels including rehabilitation and Role of nurse • Mental Health Agencies - Government and voluntary, National and International • Mental health nursing issues for special populations - Children, Adolescence, Women, Elderly, Victims of violence and abuse, Handicapped, HIV / AIDS etc.	Lecture discussion Clinical / Field practice Field visits to mental health service agencies.	- Short answers - Objectives types - Assessment of the field visit reports

P.R. Ghoghare

Swarnim Startup & Innovation University
Bhoyan Rathod Gandhinagar

Mental Health Nursing – Practical

Placement - Third Year

Time -Practical - 270 hours (9 Weeks)

Fourth Year

Clinical Training - 95 hours (2 Weeks)

Areas	Duration (in week)	Objectives	Skills	Assignments	Assessment Methods
Psychiatric OPD	1	Assess patients with mental health problems Observe & assist in therapies Counsel & educate patient, & families	• History taking • Perform mental status examination (MSE) • Assist in Psychometric assessment • Perform Neurological examination • Observe and assist in therapies • Teach patients and family members	History taking and mental status examination – 2 Health education - 1 Observation report of OPD	Assess performance with rating scale Assess each skill with checklist Evaluation of health education, MSE Assessment of observation report Completion of activity record
Child Guidance clinic	1	Assessment of children with various mental health problems Counsel and educate children, families & significant others	• History taking • Assist in psychometric assessment • Observe and assist in various therapies • Teach family and significant others	Case work – 1 Observation report of different therapies - 1	Assess performance with rating scale Assess each skill with checklist Evaluation of the observation report & case work
Inpatient ward	6	Assess patients with mental health problems To provide nursing care for patients with various mental health problems Assist in various therapies	• History taking • Perform mental status examination (MSE) • Perform Neurological examination • Assist in psychometric assessment • Record therapeutic communication	Give care to 2-3 patients with various mental disorders Case study - 1 Care plan - 2 Clinical Presentation - 1 Process	Assess performance with rating scale Assess each skill with checklist Evaluation of the case study, care plan, clinical presentation, process recording

		Counsel & educate patients, families & significant others	• Administer medications • Assist in Electro-Convulsive Therapy (ECT) • Participate in all therapies • Prepare patients for Activities of Daily living (ADL) • Conduct admission and discharge counselling • Counsel and teach patients and families	recording - 2 Maintain drug book	Completion of activity record
Community Psychiatry	1	To identify patients with various mental disorders To motivate patients for early treatment & follow up To assist in follow up clinic Counsel and educate patient, family and community	• Conduct case work • Identify individuals with mental health problems • Assists in mental health camps and clinics • Counsel and Teach family members, patients and community	Case work - 1 Observation report on field visits	Assess performance with rating scale Evaluation of case work and observation report Completion of activity record

Internship – 95 Hours (2 Weeks)

Areas	Duration (in week)	Objectives	Skills	Assessment Methods
Psychiatric Ward	2	Provide comprehensive care to patient with mental health problems	• Integrated practice	Assess clinical performance with rating scale

P.R. Ghoghrod

Bhoyan Rathod Gandhinagar

Nursing Research and Statistics

Placement - Third Year

Time - Theory – 45 Hours

Practical - 45 Hours

Course Description-The course is designed to enable students to develop and understanding of basic concepts of research, research process and statistics. It is further, structured to conduct / participate in need based research studies in various settings and utilize the research findings to provide quality nursing care. The hours for Practical will be utilized for conducting Individual / group research project.

Unit	Time (Hrs)	Learning Objectives	Content	Teaching Learning Activities	Assessment Methods
I	4	Describe the concept of research, terms, need and areas of research in Nursing Explain the steps of research process	**Research and Research Process :** * Introduction and need for nursing research * Definition of research & nursing research * Steps of scientific method * Characteristics of good research * Steps of Research process - overview	* Lecture discussion * Narrate steps of research process followed from examples of published studies	- Short answer - Objective type
II	3	Identify and state the research problem and objectives	**Research problem / question :** * Identification of problem area * Problem statement * Criteria of a good research problem * Writing objectives	* Lecture discussion * Exercise on writing statement of problem and objectives	- Short answer - Objective type

Swarnim Startup & Innovation University
Bhoyan Rathod Gandhinagar

III	3	Review the related literature	**Review of Literature :** * Location * Sources * On-line search - CINHAL, COCHRANE etc * Purposes * Method of review	* Lecture discussion * Exercise on reviewing one research report/article for a selected research problem * Prepare annotated bibliography	- Short answer - Objective type
IV	4	Describe the research approaches and designs	**Research approaches and designs :** * Historical, survey and experimental * Qualitative and Quantitative designs	* Lecture discussion * Explain types of research approaches used from examples of	- Short answer - Objective type published and unpublished research studies with rationale

Swarrim Startup & Innovation University
Bhoyan Rathod Gandhinagar

V	8	Explain the sampling process Describe the methods of data collection	**Sampling and Data Collection :** * Definition of population, sample, sampling criteria, factors influencing sampling process, types of sampling techniques * Data - why, what, from, whom, when , where to collect * Data collection methods and instruments : o Methods of data collection o Questioning, interviewing o Observations, record analysis and measurements o Types of instruments o Validity and reliability of the instrument o Pilot study o Data collection procedure	* Lecture discussion * Reading assignment on examples of data collection tools * Preparation of sample data collection tools * Conduct group research project	- Short answer - Objective type
VI	4	Analyse, interpret and summarize the research data	**Analysis of data :** * Compilation, Tabulation, classification, summarization, presentation, interpretation of data	* Lecture discussion * Preparation of sample tables	- Short answer - Objective type
VII	15	Explain the use of statistics, scales of measurement and graphical presentation of data Describe the measures of central tendency and variability and methods of correlation.	**Introduction to statistics :** * Definition, use of statistics, scales of measurement * Frequency distribution and graphical presentation of India * Mean, Median, Mode, Standard deviation * Normal probability and tests of significance. * Co-efficient of correlation * Statistical packages and its application	* Lecture discussion * Practice on graphical presentation * Practice on computation of measures of central tendency, variability and correlation	- Short answer - Objective type

Swarnim Startup & Innovation University
Bhoyan Rathod Gandhinagar

VIII	4	Communicate and utilize the research findings	**Communication and Utilization of Research :** * Communication of Research findings o Verbal report o Writing research report o Writing scientific article / paper - Critical review of published research - Utilization of research findings	* Lecture discussion * Read / presentations of a sample published / unpublished research report * Writing group research project	- Short answer - Objective type

PRGthoghasa

Swarnim Startup & Innovation University
Bhoyan Rathod Gandhinagar

Midwifery and Obstetrical Nursing

Placement - Fourth Year

Time - Theory - 90 hours
Practical - 180 hours

Course Description -This course is designed for students to appreciate the concepts and principles of midwifery and obstetrical nursing. It helps them to acquire knowledge and skills in rendering nursing care to normal and high risk pregnant women during antenatal, natal and post natal periods in hospitals and community settings. It also helps to develop skills in managing normal & high risk neonates & participate in family welfare programme.

Unit	Time (Hrs)	Learning Objectives	Content	Teaching Learning Activities	Assessment Methods
I	3	Recognise the trends & issues in midwifery and obstetrical nursing	**Introduction to midwifery and obstetrical Nursing :** • Introduction to concepts of midwifery and obstetrical nursing • Trends in midwifery and obstetrical nursing - o Historical perspectives and current trends o Legal and ethical aspects o Pre-conception care and preparing for parenthood o Role of nurse in midwifery and obstetrical care o National policy and legislation in relation to maternal health & welfare o Maternal morbidity, mortality and fertility rates o Perinatal morbidity and mortality rates	Lecture discussion Explain using Charts and graphs	Short answers Objective type
II	8	Describe the anatomy & physiology of female reproductiv e system	**Review of anatomy & physiology of female reproductive system and foetal development :** • Female pelvis- general description of the bones, joints, ligaments, planes of the pelvis, diameters of the true pelvis, important landmarks, variations in pelvis shape • Female organs of reproduction - external genetalia, internal genital organs and their anatomical relations, musculature, blood supply, nerves,	Lecture discussion Review with Charts and models	Short answers Objective type

Swarnim Startup & Innovation University
Bhoyan Rathod Gandhinagar

			lymphatics, pelvic cellular tissue, pelvic peritoneum • Physiology of menstrual cycle • Human sexuality • Foetal development - o Conception o Review of fertilization, implantation (embedding of the ovum), development of the embryo & placenta at term functions, abnormalities, foetal sac, amniotic fluid, the umbilical cord o Foetal circulation o Foetal skull, bones, sutures and measurements • Review of Genetics		
III	8	Describe the diagnosis & management of women during antenatal period	**Assessment and management of pregnancy (Antenatal) :** • Normal pregnancy • Physiological changes during pregnancy - o Reproductive system o Cardio vascular system o Respiratory system o Urinary system o Gastero intestinal system o Metabolic changes o Skeletal changes o Skin changes o Endocrine system o Psychological changes o Discomforts of pregnancy • Diagnosis of pregnancy - o Signs o Differential diagnosis o Confirmatory tests • Ante-natal care - o Objectives o Assessment - History and physical examination, Antenatal Examination o Signs of previous child birth o Relationship of foetus to uterus and pelvis - Lie, Attitude, Presentation, Position o Per vaginal examination	Lecture Discussion Demonstration Case discussion / presentation Health talk Practice session Counselling session Supervised clinical practice	Short answers Objective type Assessment of skills with check list Assessment of patient management problem

Swarnim Startup & Innovation University
Bhoyan Rathod Gandhinagar

			• Screening & assessment for high risk • Risk approach • History and Physical Examination • Modalities of diagnosis - Invasive & Non-Invasive, ultrasonics, cardio-tomography, NST, CST • Antenatal preparation - o Antenatal counselling o Antenatal exercises o Diet o Substance use o Education for child-birth o Husband and families o Preparation for safe-confinement o Prevention from radiation • Psycho-social and cultural aspects of pregnancy - o Adjustment to pregnancy o Unwed mother o Single parent o Teenage pregnancy o Sexual violence • Adoption		
IV	12	Describe the physiology and stages of labour Describe the manageme nt of women during intra-natal period	**Assessment and management of intra natal period :** • Physiology of labour, mechanism of labour • Management of labour - o <u>First stage -</u> • Signs and symptoms of onset of labour - normal & abnormal • Duration • Preparation of - Labour room & Woman • Assessment & observation of women in labour • Partogram – maternal and foetal monitoring • Active management of labour, induction of labour • Pain relief and comfort in labour o <u>Second stage</u> - • Signs and symptoms - normal & abnormal	Lecture Discussion Demonstration Case discussion/ presentation Simulated practice Supervised clinical practice	Essay type Short answers Objective type Assessment of skills with check-list Assessment of patient managemen t problems

			• Duration • Conduct of delivery - principles and techniques • Episiotomy (only if required) • Receiving the new born - - Neonatal resuscitation - initial steps and subsequent resuscitation - Care of umbilical cord - Immediate assessment including screening for congenital anomalies - Identification - Bonding - Initiate feeding - Screening and transportation of the neonate o <u>Third stage</u> - • Signs and symptoms - normal & abnormal • Duration • Method of placental expulsion • Management - Principles and techniques • Examination of the placenta • Examination of perineum • Maintaining records and reports o <u>Fourth Stage</u>		
V	5	Describe the physiology of puerperium Describe the manageme nt of women during post-natal period	**Assessment and management of women during post natal period :** • Normal puerperium - Physiology & Duration • Postnatal assessment and management - o Promoting physical and emotional well-being o Lactation management o Immunization • Family dynamics after child-birth • Family welfare services - methods, counselling • Follow-up • Records and reports	Lecture Discussion Demonstration Health talk Practice session Supervised clinical practice	Essay type Short answers Objective type Assessment of patient managemen t problems Assessment of skills with check list
VI	6	Describe the	**Assessment and management of normal neonates :**	Lecture Discussion	Essay type

Swarnim Startup & Innovation University
Bhoyan Rathod Gandhinagar

		assessment and management of normal neonate	• Normal Neonate - Physiological adaptation • Initial & Daily assessment • Essential newborn care - Thermal control • Breast feeding & prevention of infections • Immunization • Minor disorders of newborn and its management • Levels of Neonatal care (level I, II & III) at primary, secondary and tertiary levels • Maintenance of Reports and Records	Demonstration Practice Session Supervised clinical practice	Short answers Objective type Assessment of patient management problems Assessment of skills with check list
VII	10	Describe the Identification and management of women with high risk pregnancy	**High-risk pregnancy - Assessment & Management :** • Screening and assessment - Ultrasonics, cardiotomography, NST, CST, non-invasive & invasive, Newer modalities of diagnosis • High – risk approach • Levels of care - primary, secondary & tertiary levels • Disorders of pregnancy - o Hyper-emesis gravidarum, bleeding in early, pregnancy, abortion, ectopic Pregnancy, vesicular mole, o Ante-partum haemorrage • Uterine abnormality and displacement • Diseases complicating pregnancy - o Medical and surgical conditions o Infections, RTI (STD), UTI, HIV, TORCH o Gynaecological diseases complicating pregnancy o Pregnancy induced hypertension & diabetes, Toxemia of pregnancy, hydramnios o Rh incompatibility o Mental disorders • Adolescent pregnancy, Elderly primi and grand	Lecture Discussion Demonstration using video films, scan report, partograph etc. Case discussion / presentations Health talk Practice Session Supervised clinical practice	Essay type Short answers Objective type Assessment of patient management problems Assessment of skills with check list

Bhoyan Rathod Gandhinagar
Sardar Vallabhbhai Patel Institute of Nursing

			multipara • Multiple pregnancy • Abnormalities of placenta & cord • Intra Uterine Growth Retardation • Nursing management of mothers with high-risk pregnancy • Maintenance of Records and Report		
VIII	10	Describe management of abnormal labour and obstetrical emergencies	**Abnormal Labour – Assessment and Management :** • Disorders in labour - • CPD and contracted pelvis • Mal positions and Mal presentations • Premature labour, disorders of uterine actions - precipitate labour, prolonged labour • Complications of third stage - injuries to birth canal • Obstetrical emergences & their management - Presentation and prolapse of cord, Vasa praevia, amniotic fluid embolism, rupture of uterus, shoulder dystocia, obstetrical shock • Obstetrical procedures and operations - Induction of labour, forceps, vacuum, version, manual removal of placenta, caesarean section, destructive operations • Nursing management of women undergoing Obstetrical operations & procedures	Lecture Discussion Demonstration Case discussion / presentations Practice Session Supervised clinical practice	Essay type Short answers Objective type Assessment of patient management problems Assessment of skills with check list
IX	4	Describe management of post natal complications	**Abnormalities during Postnatal Periods :** • Assessment and management of women with postnatal complications - Puerperial infections, breast engorgement & infections, UTI, Thrombo-embolic disorders, Post-partum haemorrage, Eclampsia & Subinvolution	Lecture discussion Demonstration Case discussion / presentations Practice Session Supervised clinical practice	Essay type Short answers Objective type Assessment of patient management problems

Swarnim Startup & Innovation University
Bhoyan Rathod
Gandhinagar

			• Psychological complications - Post partum Blues, Post partum Depression, Post partum Psychosis		Assessment of skills with check list
X	10	Identify the high risk neonates and their nursing management	**Assessment and management of High risk newborn :** • Admission of neonates in the neonatal intensive care units - protocols • Nursing management of - Low birth weight babies - Infections - Respiratory problems - haemolytic disorders - Birth injuries - Malformations • Monitoring of high risk neonates • Feeding of high risk neonates • Organisation & management of neonatal intensive care units • Infection control in neonatal intensive care units • Maintenance of reports and records	Lecture discussion Demonstration Case discussion / presentations Practice Session Supervised clinical practice	Essay type Short answers Objective type Assessment of patient management problems Assessment of skills with check list
XI	4	Describe indication, dosage, action, side effects and nurses responsibilities in the administration of drugs used for mothers	**Pharmaco-therapeutics in obstetrics :** • Indication, dosage, action, contra-indication & side effects of drugs • Effect of drugs on pregnancy, labour & puerperium • Nursing responsibilities in the administration of drug in Obstetrics – oxytocins, antihypertensives, diuretics, tocolytic agents, anti-convulsants, Analgesics and anesthesics in obstetrics • Effects of maternal medication on foetus & neonate	Lecture discussions Drug book Drug presentation	Short answers Objective type
XII	10	Appreciate the importance of family welfare programme	**Family Welfare Programme :** • Population trends and problems in India • Concepts, aims, importance & history of family welfare programme	Lecture Discussion Demonstration Practice session	Essay type Short answers

Swarnim Startup & Innovation University
Bhoyan Rathod
Gandhinagar

		Describe the methods of contraception & role of nurse in family welfare programme	• National Population - dynamics, policy & education • National family welfare programme - RCH, ICDS, MCH, Safe motherhood • Organization & administration at - national, state, district, block and village levels • Methods of contraception - spacing, temporary & permanent, emergency contraception • Infertility and its management • Counselling for family welfare • Latest research in contraception • Maintenance of vital statistics • Role of national, international & voluntary organizations • Role of a nurse in family welfare programme • Training / Supervision / Collaboration with other functionaries in community like ANMs, LHVs, Anganwadi workers, TBAs (Traditional birth attendant-Dai)	Supervised practice Group projecting Counselling session Field visits	Objective type Assessment of skills with check list, project and field visit reports

Swarnim Startup & Innovation University
Bhoyan Rathod Gandhinagar

Midwifery and Obstetrical Nursing – Practical

Placement- Fourth Year

Time- Practical - 180 hours

(Each in Third year & Fourth Year)
Internship - 240 hours

Areas	Duration (in week)	Objectives	Skills	Assignments	Assessment Methods
Antenatal clinic/ OPD	2	• Assessment of pregnant women	• Antenatal history taking • Physical examination • Recording of Weight & B.P. • Hb & Urine testing for sugar and albumin • Antenatal examination- abdomen and breast • Immunization • Assessment of risk status • Teaching antenatal mothers • Maintenance of Antenatal records	Conduct Antenatal examinations – 30 Health talk – 1 Case book recordings	Verification of findings of antenatal examinations Completion of casebook recordings
Labour room / O.T.	4	• Assess women in labour • Carry out per-vaginal examinations • Conduct normal deliveries • Perform episiotomy & suture it • Resuscitate newborns • Assist with Caesarean Sections, MTP and other surgical procedures	• Assessment of women in labour • Per-vaginal examinations & interpretation • Monitoring & caring of woman in labour • Maintenance of partograph • Conduct normal delivery • Newborn assessment & immediate care • Resuscitation of newborns • Assessment of risk status of newborn • Episiotomy & suturing • Maintenance of labour & birth records	Conduct normal deliveries-20 Per-vaginal examinations - 5 Perform & suture the episiotomies -5 Resuscitate newborns-5 Assist with Caesarean sections-2 Witness abnormal deliveries-5	Assessment of clinical performance with rating scale Assessment of each skill with check-lists Completion of case book recordings

Swarnim Startup & Innovation University
Bhoyan Rathod Gandhinagar

			• Arrange for & assist with caesarean section and care for woman & baby during caesarean • Arrange for and assist with MTP and other surgical procedures	Assist with MTP & other surgical procedures-1 Case book recordings	
Post natal ward	4	• Providing nursing care to post natal mother & baby • Counsel & teach mother & family for parenthood	• Examination and assessment of mother and baby • Identification of deviations • Care of postnatal mother and baby • Perineal care • Lactation management • Breast feeding • Baby bath • Immunization • Teaching postnatal mother : - Mother craft - Post natal care & Exercises - Immunization	Give care to Post natal mothers – 20 Health talks – 1 Case study – 1 Case presentation -1 Case book recordings	Assessment of clinical performance Assessment of each skill with check lists Completion of case book recording Evaluation of case study & presentation and health education sessions
Newborn nursery	2	• Provide nursing care to newborn at risk	• Newborn assessment • Admission of neonates • Feeding of at risk neonates - Katori spoon, paladi, tube feeding, total parenteral nutrition • Thermal management of neonates - kangaroo mother care, care of baby in incubator • Monitoring and care of neonates • Administering medications • Intravenous therapy • Assisting with diagnostic procedure • Assisting with exchange	Case study-1 Observation study -1	Assessment of clinical performance Assessment of each skill with check lists Evaluation of case study and observation study

Swarnim Startup & Innovation University Bhoyan Rathod Gandhinagar

P.R.G

			transfusion • Care of baby on ventilator, Photo-therapy • Infection control protocols in the nursery • Teaching & counselling of parents • Maintenance of neonatal records		
Family Planning clinic	Rotation from post natal ward - 1 wk	• Counsel for and provide family welfare services	• Counselling technique • Insertion of IUD • Teaching on use of family planning methods • Arrange for & Assist with family planning operations • Maintenance of records and reports	IUD insertion -5 Observation study -1 Counselling -2 Simulation exercise on recording & reporting - 1	Assessment of each skill with check lists Evaluation of observation study

*** Essential Requirements for registration as midwife -**

S. N.	*Assignments*	*Numbers*
1.	Antenatal examination	30
2.	Conducting normal deliveries in hospital / home / health centre	20
3.	Vaginal examination	5
4.	Episiotomy and Suturing	5
5.	Neonatal resuscitation	5
6.	Assist with Caesarean Section	2
7.	Witness / Assist abnormal deliveries	5
8.	Postnatal cases nursed in hospital / home / health centre	20
9.	Insertion of IUD	5

Note - All casebooks must be certified by teacher on completion of essential requirements.

P.R. Ghoghari

Swarnim Startup & Innovation University
Bhoyan Rathod Gandhinagar

Ashiana Institute of Nursing
Bhoyan Rathod Gandhinagar

Internship Obstetrical Nursing

Clinical Training Duration - 5 weeks

Area	Duration (in weeks)	Objective	Skills	Assignment	Assessment Methods
Labour ward	2	Provide comprehensive care to mothers and neonates	Integrated Practice	Completion of other essential requirements Case book recordings	Assess clinical performance with rating scale Completion of case book recordings
Neonatal intensive care unit / NICU	1				
Antenatal OPD / Ward	2				

Swarnim Startup & Innovation University
Bhoyan Rathod Gandhinagar

1. Introduction:

The course is directed towards students who will enter into the formation of new enterprise, management of family businesses, either their own family's or someone else's and students who will consider entrepreneurship as a career choice, etc. The focus of this course is on seeding the entrepreneurial spirit and makes them ready for idea identification, opportunities exploration, by motivating and mentoring support. We will explore the risk and rewards associated with entrepreneurship.

Through case studies, market survey by students and talk by guest speakers, we may understand the entrepreneurship and its process, various opportunities, entrepreneurial ecosystem, various influencing factors, entrepreneurial characteristics, different personality types, developing entrepreneurial mindset, and university support for start-ups and new enterprise.

2. The course has the following objectives:

- Increase your understanding of entrepreneurship, entrepreneur and enterprise.
- Identify the various influencing factors associated with entrepreneurship process.
- Understanding the role of the entrepreneurship ecosystem and entrepreneurship education.
- Understanding entrepreneurial personality and traits, entrepreneurial skills.
- Identify the new venture possibilities/ entrepreneurial opportunities: especially in emerging economy context.

3. Course Outcomes

Upon successful completion of this course, a student will be able to:

- Apply the basic principles of entrepreneurship

Swarrnim Startup & Innovation University Bhoyan Rathod Gandhinagar

- Distinguish the concepts of the entrepreneurship ecosystem, entrepreneurship education, and various entrepreneurial opportunities.
- Understanding various individual attributes of entrepreneurial personality and traits, entrepreneurial characteristics, behavioural attributes and importance of creativity and innovation
- Developing an understanding of best techniques for idea generation, opportunities exploration, and market research.

4. Teaching Methods and Course Materials:

- The course will include lectures, case studies discussion, group research, workshop, readings, videos and discussions
- Some cases are identified which students will read and prepare for the discussion
- Guest speakers from 'Startups' who will share their entrepreneurial journey.

5. Individual/Group Presentation:

You should choose any Start-up that it is in at growth (scaling or establishing) phase. Topics to be included:

- Company History and Description
- The journey of the entrepreneur
- The vision of the company/ entrepreneur
- Significant steps were taken by an entrepreneur
- Current stage/ situation of the business
- Conflict/split in business (if any)
- Learning from the case (case Summary)

Swarnim Startup & Innovation University
Bhoyan Rathod
Gandhinagar

6. Cases for Class Presentation:

Sl. No.	Name of the Case	Students' Names

PR Ghoghari

7. **Study Material:** Compiled study material will be provided by the Faculty. Additional materials will be provided as and when the course progresses.
8. **Assessment Components:**

Sr. No.	Components	Weightage %
I.	Case Presentation	15%
II.	Mid-term Examination	20%
III.	End-term Examination	40%
IV.	Attendance and Class Participation	5%
V.	Accessibility to new Ideas, Extra-curricular knowledge, market study (Survey), Analytical Ability	20%

9. **Course Outlines**

Unit 1 Entrepreneurship and StartUp: An Overview

Unit 2 Entrepreneurial Characteristics and Personality Traits

Unit 3 Types of Startup Firms and Registration Process

Unit 4 Creativity and Innovation for Startups

Unit 5 Identifying and analyzing Business Opportunities

Unit 6 Developing Successful Business Idea

Unit 7 Developing Effective Business Model

Unit 8 Feasibility Analysis

Unit 9 Entrepreneurship Ecosystem and Influencing Factors: Startup Ecosystem Partners, University Ecosystem and different Stakeholders.

Unit 10 Role of Academic Collaboration, Industrial linkage and Mentorship Support for Startups

Swarnim Startup & Innovation University
Bhoyan Rathod Gandhinagar

10. Reference Books

a) Frederick-Kuratko (2010). Entrepreneurship-Theory-Process

b) Bruce R. Barringer and R. Duane Ireland (2016). Entrepreneurship_ Successfully Launching New Ventures-Pearson

c) Hisrich_Peters (2017). Entrepreneurship

d) Peter Drucker - Innovation And Entrepreneurship (Powertalk, Resumido).

e) Paresh Sinha, Jenny Gibb, Michele Akoorie, Jonathan M. Scott. Research Handbook on Entrepreneurship in Emerging Economies Publisher: Edward Elgar.

f) Boston, Timmons, Jerry A., and Spinelli, Stephen (2009). New Venture Creation: Entrepreneurship for the 21st Century, 8th Edition,: Irwin McGraw-Hill

11. Instructions:

Assignment - Business opportunities identification for Startup

Individual assignment submission/ Group presentation is a must for every student.

Swarnim Startup & Innovation University
Bhoyan Rathod Gandhinagar

1. Introduction:

The course is directed towards students who will enter into the formation of new enterprise, management of family businesses and students who will consider entrepreneurship as a career choice, etc. The focus of this course is on fund raising, financial structure development, understanding the Intellectual Property Rights (IPR) and providesmentors network and industrial collaboration.

Through case studies, student research and guest speakers, we consider questions of understanding Entrepreneurship, various opportunities, entrepreneurial ecosystem, various influencing factors, entrepreneurial characteristics, different personality types, developing entrepreneurial mindset, and university support for start-ups and new business.

2. The course has the following objectives:

- Increase your understanding of entrepreneurial finance and financial support for start-ups.
- Understanding the role of the intellectual property rights and new product innovation for start-ups.
- Identify the entrepreneurial opportunities using property rights and innovative products.

3. Course Outcomes

Upon successful completion of this course, a student will be able to:

- Apply the basic principles of entrepreneurial finance.
- Understanding of IPR and new product development.
- Understandingthe importance of industrial collaboration and triple helix model for industrial innovation.

4. Teaching Methods and Course Materials:

- The course will include lectures, case studies discussion, group research, workshop, readings, videos and discussions
- Some cases are identified which students will read and prepare for the discussion
- Guest speakers from 'Startups' who will share their entrepreneurial journey.

5. **Individual/Group Presentation:**

You should choose any Start-up that it is in at growth (scaling or establishing) phase. Topics to be included:

- Company History and Description
- The journey of the entrepreneur
- The vision of the company/ entrepreneur
- Significant steps were taken by an entrepreneur
- Current stage/ situation of the business
- Conflict/split in business (if any)
- Learning from the case (case Summary)

6. **Study Material:** Compiled study material will be provided by the Faculty. Additional materials will be provided as and when the course progresses.

7. **Assessment Components:**

Sr. No.	Components	Weightage %
1.	Case Presentation	15%
2.	Mid-term Examination	20%
3.	End-term Examination	40%
4.	Attendance and Class Participation	5%
5.	Familiarity with entrepreneurial finance, Understanding of IPR and Process of Technology Transfer	20%

8. **Course Outlines**

Unit 1 Entrepreneurial Finance: An overview

Unit 2 Managing Finance for Start-Up

Swarrnim Startup & Innovation University Bhoyan Rathod Gandhinagar

Unit 3 Infrastructure Support for Entrepreneurship

Unit 4 Intellectual Property Right Overview and its Classification

Unit 5 Intellectual Property Right Guidelines

Unit 6 Role of IPR in Innovation and Entrepreneurship

Unit 7 Managing IPR for Start-Up

Unit 8 Intellectual Property Issues in University-Industry Collaboration

Unit 9 Triple Helix Structure Model for Innovation

Unit 10 Entrepreneurship and University-Based Technology Transfer

11. Instructions:

Assignment I- Accessing the market funds and infrastructure support

Individual/ Group presentation is a must for every student.

Active participation in the call and discussions will be appreciated.

9. Reference Books

a) Smith, Janet, Smith, Richard, Bliss, Richard (2011). Entrepreneurial Finance_ Strategy, Valuation, and Deal Structure-Stanford Economics and Finance.

b) Paul Pignataro. Financial Modeling and Valuation, Wiley publisher.

c) James McNeill Stancill (2003). Entrepreneurial Finance for New and Emerging Businesses-South-Western College Pub.

d) Philip J. Adelman, Alan M. Marks (2013). Entrepreneurial Finance, Prentice Hall.

e) Startup Guide to Intellectual Property, Pete Tormey& Jay Tormey, Createspace Independent Pub.

f) Drucker, P. (2014). Innovation and entrepreneurship. Routledge.

g) Etzkowitz, H., & Zhou, C. (2017). The triple helix: University–industry–government innovation and entrepreneurship. Routledge.

P.R. Thakkar.

Swarrnim Startup & Innovation University
Bhoyan
Rathod
Gandhinagar

1) Introduction:

The course is directed towards students who will enter into the formation of new enterpriseand students who will consider entrepreneurship as a career choice, etc. The focus of this course is on market funding and Product development for incubated start-ups.

Through case studies, student research and guest speakers, we consider questions of understanding Entrepreneurship, various opportunities, entrepreneurial ecosystem, various influencing factors, entrepreneurial characteristics, different personality types, developing entrepreneurial mindset, and university support for start-ups and new business.

Swami Vivekanand Startup & Innovation University Bhoyan Rathod Gandhinagar

2) The course has the following objectives:

- Increase your understanding of various sources of fund available in market for start-ups.
- Understanding the product design and development process.

3) Course Outcomes

Upon successful completion of this course, a student will be able to:

- Understand various market funds for start-ups.
- Understanding of new product design and development.

4) Teaching Methods and Course Materials:

- The course will include lectures, case studies discussion, group research, workshop, readings, videos and discussions
- Some cases are identified which students will read and prepare for the discussion
- Guest speakers from 'Startups' who will share their entrepreneurial journey.

5) Individual/Group Presentation:

You should choose any Start-up that it is in at growth (scaling or establishing) phase. Topics to be included:

- Company History and Description
- The journey of the entrepreneur

- The vision of the company/ entrepreneur
- Significant steps were taken by an entrepreneur
- Current stage/ situation of the business
- Conflict/split in business (if any)
- Learning from the case (case Summary)

6) **Study Material:** Compiled study material will be provided by the Faculty. Additional materials will be provided as and when the course progresses.

7) **Assessment Components:**

Sr. No.	Components	Weightage %
6.	Case Presentation	15%
7.	Mid-term Examination	20%
8.	End-term Examination	40%
9.	Attendance and Class Participation	5%
10.	Soft and communication Skills, Attitude & risk-taking capability, strategic thinking and decision making	20%

8) **Course Outlines**

Unit 1 Market funds for Startups

Unit 2 Pitching Investors

Unit 3 Business Negotiation

Unit 4 Product development and Organization Process

Unit 5 Product Planning and Identifying Customer Needs

Unit 6 Sales and marketing for startups

Unit 7 Startup scalability and Business model development

Unit 8 Business Growth Strategies

Swarrim Startup & Innovation University Bhoyan Rathod Gandhinagar

Unit 9 Categorization of Growth Strategy Plan

Unit 10 Creating a Strategic Growth Plan

9) Reference Books

a) Ulrich, K. T. (2003). Product design and development. Tata McGraw-Hill Education.

b) Cremades, A. (2016). The art of startup fundraising: pitching investors, negotiating the deal, and everything else entrepreneurs need to know. John Wiley & Sons.

c) https://strategyforexecs.com/growth-strategy/

d) Feldman, David N. The entrepreneur's growth startup handbook : 7 secrets to venture funding and successful growth (2013, John Wiley & Sons)

e) William Sarris. Harvard Business Review Handbook: Everything You Need to Launch and Grow Your New Business.

1. Instructions:

Assignment I: Development of Business Idea into working Prototype

Individual/ Group presentation is a must for every student.

Active participation in the call and discussions will be appreciated.

Swarrnim Startup & Innovation University
Bhoyan Rathod Gandhinagar

1. **Introduction:**

The course is directed towards students who will enter into the formation of new enterprise and students who will consider entrepreneurship as a career choice, etc. The focus of this course is on market funding and Product development for incubated start-ups.

Through case studies, student research and guest speakers, we consider questions of understanding Entrepreneurship, various opportunities, entrepreneurial ecosystem, various influencing factors, entrepreneurial characteristics, different personality types, developing entrepreneurial mindset, and university support for start-ups and new business.

2. **The course has the following objectives:**

- To create awareness towards business model design and business plan writing among students.
- To enhance the abilities of students to analyse market demand of the products and decision making process for product development

3. **Course Outcomes**

Upon successful completion of this course, a student will be able to:

- Understand business model design and business plan writing
- Understand the market demand and process of decision making for product development

4. **Teaching Methods and Course Materials:**

- The course will include interaction with mentors, startups and venture capitalists, angel investors for strengthen and validating the business model and product prototype testing.

5. **Study Material:** Compiled study material will be provided by the Faculty. Additional materials will be provided as and when the course progresses.

6. **Assessment Components:**

Sr. No.	Components	Weightage %
11.	Presentation on Startup internship	20%

	(work progress and learning)	
12.	Progress report on internship key objective and leanings	20%
13.	End-term Examination (Presentation on Selection of startup idea, business plan development, Results of market research and prototype testing)	30%
14.	Project report submission of your own start up	30%

7. Projects

Project I- Internship With startups

Project II- Project report and detailed business plan for your own startup

P.R.Gheghavat.

Swarrim Startup & Innovation University
Bhoyan Rathod Gandhinagar

SWARRNIM START UP AND INNOVATION UNIVERSITY

FACULTY OF MEDICINE

DEGREE OF MASTER OF PHYSIOTHERAPY (M.PHYSIO.)

Courses of studies prescribed for First & Second M. Physiotherapy examination

(In force for students admitted in October 2023 & thereafter)

RULES OF DEGREE OF THE MASTER OF PHYSIOTHERAPY

INDEX

1. The Course.
2. Nomenclature.
3. Objectives of the course.
4. Eligibility criteria for admission.
5. Intake of students.
6. Duration of the course.
7. Medium of Instruction.
8. Course of study.
9. Method of training.
10. Monitoring progress of studies.
11. Attendance.
12. Teaching& learning experience & graded responsibility. 13.Dissertation.
14. Guide.
15. Change of guide.
16. Schedule of examination
17.Scheme of examination.
18. Examiners
19. Criteria for declaring as pass in the university examination 20.Definition of Trial
21. Type of questions in the written papers
22.Course contents-I year M.P.T.
23. Course contents-II year M.P.T.
24.Recommended books & journals.

R.M PHYSIO. 1:- THE COURSE

1.1. The Master of Physiotherapy Course will be a regular full time course of 2 years duration. During an academic year, a candidate enrolled in the program shall not appear in any other examination of the university enrolled in/or any other university. Any break in the career, power of extension of the course and the fixation of the term will be vested with the university.

R.M PHYSIO 2:- NOMENCLATURE

The course will be referred to as a Master of Physiotherapy.

R.M PHYSIO 3:- OBJECTIVES OF THE COURSE

1. To prepare a postgraduate student towards professional autonomy with self-regulating discipline.
2. To form base of professional practice by referral as well as first contact mode using evidence based practices.
3. To impart research basis in order to validate techniques & technologies in practice of physiotherapy.
4. To acquaint a student with concept of quality care at the institutional as well as at the community levels.
5. To inculcate appropriate professional relationship in multi-disciplinary set up, patient management & co-partnership basis.
6. To prepare students to address problems related to health education & community physiotherapy.
7. To practice the concept of protection of the community during referral as well as first contact practice.
8. To incorporate concept of management in physiotherapy.
9. To provide experience in clinical training & under graduate training partly.
10. To provide honest competent & accountable physiotherapy services to the community.

R.M. PHYSIO 4:- ELIGIBILITY CRITERIA FOR ADMISSION

4.1. He/ She must be an Indian, Foreign student can also join program under Foreign student policy of Government of India.

4.2. Candidate must have completed the recognized B. Physiotherapy or equivalent course and compulsory rotating internship before the date of interview. All candidates shall have to submit the documentary proof from the Principal/ Dean of college regarding the date of completion of internship along with the application, failing which their application shall be summarily rejected. However candidate should have to produce full internship completion certificate at the time of interview, failing which, candidate will not be eligible for admission.

4.3. Candidate who is currently engaged in P.G. Physiotherapy studies in any University or any other University or equivalent body is not eligible. On completion of course he / she become eligible. Completion of course means he/ she must have completed the course training and passed the course examination conducted by concerned University.

4.4. Candidate, who in the past selected and admitted to any P.G. Physiotherapy course of this or any other university or equivalent body and did not complete that course, is not eligible.

4.5 Candidate who had applied earlier to this University and who was disqualified because of reasons mentioned in Rules 6.5 is not eligible.

4.6. Candidate who is graduate of a University other than Swarrnim Startup and Innovation University should have to submit provisional eligibility certificate (P.E.C.) and/or Migration certificate from your previous University within one month from the date of his / her admission, failing which the admission of candidate shall be cancelled and will not be eligible to apply in future.

4.7. Candidate has to appear in Competitive examination for admission to Post – graduate Physiotherapy courses held by Swarrnim Startup and Innovation University and admission to P.G. Course will be given as per merit of entrance test. (See Rules 4.1, 4.2, 4.3, 5.0 &7.0)
Admission Committee Admission and Placement of these candidates under particular Post Graduate Teacher shall be decided by the "Admission Committee" of this University. The Admission Committee will be asunder:
Dean, Medical Faculty –Chairman
Head of the P.G. Institute / College where P.G. courses are conducted and one of its nominees from teaching staff.
Maximum up to five members of the teaching staff nominated by Chairman.
One member of Executive Council nominated byVice- chancellor.
Pro-Vice-Chancellor will be the permanent invitee.
Total seats of PG M. Physiotherapy will be filled up by the Admission Committee of the University.

For this purpose selection will be done once in each academic year.
First Academic Term: 1st May to 30th October.
Second Academic Term: 1st November to 30th April Next Year.

4.8. Selection: Selection of candidates eligible under Rule 1 for seats under Rule 3.0 will be done category wise on the basis of merits as laid down herein further.
Preference shall be given to candidates graduating from this University who has completed internship/horsemanship.

4.9. Candidates graduating from any other University located in Gujarat State and completed the compulsory

internship/ horsemanship.

4.10. Candidates graduating from any other University located outside Gujarat State, in INDIA, and completed the compulsory internship/ horsemanship.

4.11. The candidate will be given a choice of subject and Post –Graduate Teacher according to his merit level. He / she will have to choose Registration with Residency out of the available choices in different subjects under particular teacher at his merit level. No student shall be given P.G. Admission without Residency (or higher post).

4.12. Seats can be utilized in the same academic year only and vacancy in any one academic year cannot be utilized in subsequent academic year.

4.13. The affiliated PG college separately will prepare the category wise seat list in each subject. 7% of seats available for PG Degree Rule 3 will be reserved for the candidates belonging to Scheduled Caste, 15% of seats will be similarly reserved for ST candidates and 27% of seats will be reserved for candidates belonging to socially and Educationally Backward Class (SEBC) students including widows and orphan children. The students desiring admissions under SEBC category will have to submit a certificate of current academic or financial year i.e. issued on or after 1st April every year that they are not included in the creamy layer from competent authority as prescribed by the Govt. of Gujarat from time to time along with the application.

4.14. Three percent (3%) of available seats in each category (SC/ ST/ SEBC/ OPEN) in Loco-motor disability (PH) shall be reserved for loco-motor disabled candidates of the respective category provided that a candidate having "loco-motor disability of lower limbs between 50% to 70% (upper limbs being normal). The certificate must be obtained as per the Performa annexed to the application form from Medical Board constituted for the purpose regarding disability and suitability of such candidate for undertaking the course shall be treated as final. For allocation of seats to physically handicapped category in said year, Roster point guideline given by Govt. of Gujarat will be followed.

4.15. These seats are reserved for the candidates belonging to SC/ ST & SEBC recognized as such in the State of Gujarat and not those or whose parents have migrated from other State to Gujarat State.
For allocation of seats (SC/ ST/ SEBC) in the said year to this reserved category a 100 point Roster, register will be followed, record of which will be maintained by University/ respective College/ Institutions.

(a) In case the seats reserved under rule 5.0 remain vacant due to non- availability of the candidates of the specified category up to Rule 4.1 selection, they shall be treated as unreserved seats and will be filled up by the candidates on the basis of merit from those who are eligible as per Rule4.1.
of these, unfilled seats will be subsequently re-reserved after operation of Rule 4.1 and if some seats remain vacant due to non- availability of Candidates from Merit List of reserved candidates, these will be again unreserved and filled up by open category candidate under Rule4.3.
After operation of Rule 4.3 remaining vacant seats will be filled by candidate under Rule4.5.

4.16. Determination of inter-se-merit of candidates obtaining equal merit number in case of two or more candidates obtaining equal merit number, the inter-se-merit of such candidates shall be determined in order of preference as under.

Candidates scoring less negative marks.

Candidate's who secure higher percentage in final Year undergraduate examination after deduction of 1.5 for each unsuccessful trial in final year examination.

Note: First trial is deemed to take place when he/ she is due to appear for the examination, irrespective of his/ her actual appearance, provided that non-appearance is not a result of reasons beyond his control.

According to age, older will get preference over younger.

Notification: Merit Lists will be notified asunder:
Merit list – 1.A.= Candidates under Rule 4.1 belonging to Open (Unreserved Seats)
Merit list – 1.B. = Candidates under Rule 4.1 belonging to SC.
Merit list – 1.C. = Candidates under Rule 4.1 belonging to ST.
Merit list – 1.D. = Candidates under Rule 4.1 belonging to SEBC.
Merit list – 2.A. = Candidates under Rule 4.3 belonging to Open (Unreserved Seats)
Merit list – 2.B. = Candidates under Rule 4.3 belonging to SC.
Merit list – 2.C. = Candidates under Rule 4.3 belonging to ST.
Merit list – 2.D. = Candidates under Rule 4.3 belonging to SEBC.
Merit list – 3.A. = Candidates under Rule 4.25 belonging to Open (Unreserved Seats)
These Merit Lists will be placed on the notice board of the University.

4.17. A candidate having objection to the merit list may submit it in writing to the admission committee within 72 hours of publication of merit list. The admission committee will duly consider the objection and decide the case, If candidate is not satisfied, he/ she may make a written appeal to the Provost, whose shall befinal.
The sequence of interview for selection and admission will be as per Regulations.

4.18. PG courses are full-time and the candidate shall not indulge in private practice or employment of any nature (Part-time or full-time, paid or stipendiary or unpaid) during the course. If the candidate is employed, he/ she shall have to produce proof that he/ she has left the service or taken leave for full period of course before he/ she is given admission order. No concession will be given regarding joining period of 7 days counted from the day of selection. If he/ she fails to produce the above proof within 7 days, his/ her admission shall stand cancelled. (If the candidate is serving as Resident or Tutor in the same speciality under the same teacher under whom he/ she is selected, he/ she may continue the post).

4.19. If violation of this condition is detected anytime after the admission, his admission shall be cancelled without giving any notice and he/ she will not be eligible to apply in future.

4.20. The selected and admitted candidate will have to join within stipulated time of 7 days. If he/ she fails to do so as if he leaves before completion of the course, he/ she will lose his admission (and registration) and will not be eligible to apply in future.
For granting of each term candidate shall have attended minimum 75% of the total number of the days in each term.

4.21. If any Post Graduate student is found absent for more than 30 days without permission of concerned authority, his/ her admission or registration in P.G. course will be cancelled without any notice, thereof fees and deposits will be forfeited and he/ she not be eligible to apply in future.

4.22. All these admissions will be decided by “Admission Committee” constituted as per Rule no. 1A on behalf of the Swarrnim Startup and Innovation University.
A candidate admitted to Post Graduate degree course for any of the subject, may subsequently be required to work maximum for 6 months in another allied subject/ unit/ hospital/ super speciality related to the discipline concerned. Provided he/ she has kept remaining period of postgraduate training under his/ her own PG Teacher in the original subject, (one month training is compulsory in emergency care/ casualtydepartment).

4.23. The University reserves the right to introduce any new Rule or Regulations or to make changes in any of the existing Rules or Regulations at any time to deal with diverse problems arising out of infinite variety of situations.

4.24. After the PG interviews, remaining vacancies, if any, remains in any subjects in the concerned department/ Physiotherapy college then the same subject to be offered to the Tutor, Jr. lecturer, Demonstrator, Assistant Lecturer of the concern department/ Physiotherapy college those who have applied for the same on the basis of merit of their First, Second, Third and fourth year marks of Physiotherapy course.

4.25. Regulation for Sequence of Interviews for Selection & Admission
Before the candidate is offered choice of post, his original documents are compared with the attested copies, he/ she had submitted with his application form. If all the originals are not available with him or if there is discrepancy in any of the documents, he/ she become in eligible. His interview will not be held and next candidate will be called.
If all attested copies of his documents are found to be exact copies of originals, he/ she will be offered the Seat. If he/ she choose the seat, he/ she is asked to pay the fees and deposit. After the payment of fees his admission, order will be prepared. Inability to pay requisite fees and deposit will render him ineligible and the next candidate will be called.

However, if he/ she brings the fees and deposit when interviews are still going on, he/ she may be allotted new merit number next to the candidate being interviewed (or just concluded). E.g. 39A and offered Seat available at that time. All future procedures in respect of this candidate will be according to this new position in merit list.

A candidate who corrects the deficiency described in R. 1 (he/ she produces all originals and attested copies submitted by him with the application are found to be exact copies of the original) is dealt with similar to the candidate described in R.3.

A candidate who is absent when called, but reports late, is also dealt with similar to the candidate described in R. 3.

Unless the interview of one candidate is over, the next candidate is not called. Interview is considered over if,
He/ She has chosen the subject/ seat, paid fees, deposit, bond, bank surety etc. and his admission order is ready.
He/ She has declined to take any of the seats offered.
He/ She is ineligible under R. 1 or R. 2.

First candidates belonging to merit list 1.B. followed by 1.C. followed by 1.D. will be called for the interview, one by one according to merit and offered subjects belonging to their reserved categories.

If he/ she selects the subject:
He/ she is allotted that subject and is called again along with candidates of merit list 1.A. for Selection of Teacher according to General Merit, and His / her name is deleted from merit list 1.A., if it is included in 2 or more lists.
If he/ she does not accept any of the subjects offered to his name is retained in Merit List 1.A.
Conversion of Reserved Seats into open merit (unreserved) Seats: When the Merit Lists 1.B., 1.C., 1.D. are exhausted and seats reserved for SC, ST, SEBC still vacant all these seats are converted into Open Merit Seats.
Next, candidates belonging to Merit List 1.A. will be called for interview one by one, according to the Merit. Open merit seats including those converted from reserved seats and supernumerary seats are offered to open merit candidates. If any reserved seat is not filled, corresponding supernumerary seat is not offered.
Simultaneously, candidates of Merit Lists 1.B., 1.C. and 1.D. who had selected their subjects as per R. 7 and R. 9 will be called as per their General Merit Level and they will choose their Teachers.

(J) After Merit List 1.A. is exhausted, candidates belonging to Merit Lists 2.B., 2.C.., 2.D. are called after re-reservation as per provisions in Rule 5.5(b). They will be dealt with an exactly similar lines as Gujarat University candidates are dealt, with by R.7 & R.8. Next, candidates belonging to Merit List 2.A. are dealt with exactly similar lines to
R.9 and R. 10. (K) Admission orders are handed over to the candidates after selection of teachers, also copies of such orders are sent to Heads of Institution where they are admitted. These orders are withheld for those who are employed till proof is produced to the effect that he has left service or taken requisite leave and have actually handed over charge (Rule 7.8)Original mark sheets etc. of admitted candidates should be retained by authority.

R.M PHYSIO 5:- INTAKE OF STUDENTS

The intake of students to the course shall be in accordance with the ordinance in this behalf. The guide student ratio shall be 1:3. The intake of students to the course shall be once in a year. No postgraduate seat left unfilled in an academic year shall be carried forward to the next or subsequent academic years.

R.M PHYSIO 6:- DURATION OF THE COURSE

The duration of master of physiotherapy course shall be extended over a period of 2 continuous years on a full time basis. Any break in the course, power of extension of the course & the fixation of the term shall be vested with the university.

R.M PHYSIO 7:- MEDIUM OF INSTRUCTION

English will be the medium of instruction for the subjects of study, text books & for the examination of the MPT course.

R.M PHYSIO 8:- COURSE OF THE STUDIES

The course of study, subjects & teaching schedule for I& II year MPT course is shown separately in Table 1 & 2.

Academic Year (52 Weeks)						
Teaching (38Weeks)		Exam (8 Weeks)		Vacation (6 Weeks)		
1st Term (19 Weeks)	2nd Term (19 Weeks)	Preliminary (4 Weeks)	University (4 Weeks)	Diwali Vacation (2 Weeks)	Summer Vacation (2 Weeks)	Holidays (2 Weeks)

- 1 Week must include 36 teaching Hours.
- Theory and Practical 1hour = 1 Credit
- Clinical Education 2Hour= 1 Credit

SWARRNIM START-UP AND INNOVATION UNIVERSITY

VENUS INSTITUTE OF PHYSIOTHERAPY

MASTER OF PHYSIOTHERAPY (M.P.T.)

1ST YEAR

COURSE CODE	COURSE TITLE	TEACHING SCHEME			EXAMINATION SCHEME				
		CREDIT HRS.			THEORY		PRACTICAL		Total
		THEORY	PRACTICAL	TOTAL	INTERNAL	EXTERNAL	INTERNAL	EXTERNAL	
66021101	Basic Sciences Part-I i) Work & exercise Physiology ii) Electro physiology iii) Biomechanics &Kinesiology	5	-	8	30	70	-	-	**100**
	*History & Principles of physiotherapy education & Practice.	-	-	1					
66021102	Basic Science Part-II i) Research Methodology & Biostatistics ii) Education Technology iii) Ethics and Administration.	6	-	6	30	70	-	-	**100**
66021103	Advanced Physiotherapeutics (Clinical applied & allied therapeutics, Medical & Surgical)	6	-	9	30	70	-	-	**100**
66021104	Non – Elective Case + Micro-Teaching	-	6	3			60	140	**200**
	Clinical Training	-	-	9					
TOTAL		**17**	**6**	**36**	**90**	**210**	**60**	**140**	**500**

* Not for University Examination

MASTER OF PHYSIOTHERAPY (M.P.T.)
2nd YEAR

COURSE CODE	COURSE TITLE	TEACHING SCHEME			EXAMINATION SCHEME				
		CREDIT HRS.			THEORY		PRACTICAL		Total
		THEORY	PRACTICAL	TOTAL	INTERNAL	EXTERNAL	INTERNAL	EXTERNAL	
66021201	Physical &Functional diagnosis-Part-I& II	3.5	3.5	7	30	70	-	-	**100**
66021202/ 66021202-C	**Elective:** Basics, Assessment and Evaluation	4	4	8	30	70	-	-	**100**
66021203/ 66021203-C	**Elective:** Clinical Conditions & Physiotherapeutic Interventions	4	4	8	30	70	-	-	**100**
66021204	Dissertation.	-	-	4	-	-	-	-	**Pass/ Fail**
66021205	Non-Elective Case + Elective Case (Separate for Each elective), Viva Voce	-	-	1	-	-	60	140	**200**
	Clinical Training	-	-	8	-	-	-	-	
TOTAL		**11.5**	**11.5**	**36**	**90**	**210**	**60**	**140**	**500**

Table 1: First year MPT (First 12 months)

Sr No.	SUBJECTS	Teaching Hours			Credit Hours
		Theory	Clinical/ Practical's	Total	
1	Basic Sciences Part-I i)Work & exercise Physiology ii) Electro physiology iii)Biomechanics & Kinesiology	190	----------	190	**4**
	iv)*History & Principles of Physiotherapy education & Practice.	38	----------	38	**1**
2	Basic Science Part-II i)Research Methodology & Biostatistics ii)Education Technology iii)Ethics and administration.	228	----------	228	**3**
3	Advanced Physiotherapeutic (Clinical applied & allied therapeutic, Medical & Surgical)	228	----------	228	**5**
4	Non – Elective Case + Micro-Teaching	----------	342	342	**14**
5	Clinical Training	----------	684	684	**9**
	Total	----------	----------	1710	**36**

Table 2: Second year MPT (13-24 months)

Sr. No.	Subjects	Teaching Hours			Credit Hours
		Theory	Clinical/ Practicals	Total	
1	Physical &Functional diagnosis-Part-I& II	133	----------	133	4
2	**Elective:** Basics, Assessment and Evaluation	152	----------	152	4
3	**Elective:** Clinical Conditions & Physiotherapeutic Interventions	152	----------	152	4
4	Dissertation			152	4
5	Non-Elective Case + Elective Case (Separate for Each elective), Viva Voce	----------	513	513	36
6	Clinical Training	----------	608	608	8
	Total	437	969	1691	36

R.M.PHYSIO 9:- METHOD OF TRAINING

The training of post graduate for MPT Degree shall be on a full time pattern with graded responsibilities in the management & treatment of patients entrusted to his/her care. Training should include involvement in laboratory, experimental work & research studies. The participation of students in all facets of educational process is essential. Every candidate should take part in seminars, group discussion, clinical rounds, case demonstration, clinics, journal review meetings & other continue education activities. Every candidate should be required to participate in the teaching & training program of under graduate students.

R.M PHYSIO 10:- MONITORING PROGRESS OF STUDIES (INTERNAL MONITORING)
It is essential to monitor the learning progress of each candidate through continuous appraisal & regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring is done by the staff of the department based on the participation of the students in various teaching/learning activities. It may be structured & assessment be done by using checklists that assess various aspects. Model checklists are given in table III toIX.

Work Diary:-
Every candidate shall maintain a work diary & record his/her participation in the training programs conducted by the department such as journal reviews, seminars etc.
Special mention may be made of the presentation by the candidate as well as details of the clinical or laboratory procedures, if any, conducted by the candidate. The work diary shall be scrutinized & certified by the head of the department & head of the institution & presented in the university examination.

Periodic Tests:-

The college may conduct 2 tests, one of them be an annual test at the end of the first year & the end of second year three months before the final year examination. The tests may include written theory papers, practical, viva voice & clinical in the pattern of university examination. Records & marks obtained in such tests will be maintained by the head of the department & sent to the university, when called for by the principal.

R.M PHYSIO 11:- ATTENDANCE

A candidate is required to attend a minimum of 80% of training &of the total classes conducted during each academic year of the MPT course. Provided further, leave of any kind shall not counted as part of academic term without prejudice to minimum 80% of training period every year. Any student who fails to complete the course in this manner shall not be permitted to appear for the university examinations.

R.M PHYSIO 12:-

A. TEACHING & LEARNING EXPERIENCE

(a)	Journal review meetings	Minimum six in 2 years
(b)	Seminars	Minimum four in 2 years
(c)	Clinical presentation	Minimum 25 cases in 2 years
(d)	Special clinics	Minimum 20 in 2 years
(e)	Inter departmental meetings	Minimum five in 2 years
(f)	Community work, Camps/Field visits	Minimum four in 2 years
(g)	Clinical rounds	Minimum 250 in 2 years
(h)	Dissertation works	Minimum 200 hours in 2 Years
(i)	Participation in conferences/presentation of papers	Minimum two in 2 years
(j)	Teaching activities-U.G Teaching	10 hours / month
(k)	Learning activities: Self learning, Use of computers & library	----------
(l)	Participation in departmental activities	----------
(m)	Any other-Specify(eg: CME)	----------

Rotation & posting in other departments if any-minimum 2 months in one speciality.

B. GRADED RESPONSIBILITY IN CARE OF PATIENTS AND OPERATIVEWORK.
(Structured training schedule for clinical & elective subjects only)

Category	Ist Year MPT	II year MPT
O	20 cases	20 cases
A	20 cases	30 cases
PA	100 cases	60 cases
PI	20 cases	50 cases

Key: O-Observer
A-Assisted a senior physiotherapist
PA-Performed procedure under the direct supervision of a senior Physiotherapist.
PI-Performed independently.

R.M PHYSIO 13:- DISSERTATION

Every candidate pursuing MPT degree course is required to carry out work on a selected research project under the guidance of a recognized post graduate teacher. The results of such a work shall be submitted in the form of dissertation.
The dissertation is aimed to train a graduate student in research methods & techniques. It includes identification of a problem, formulation of a hypothesis, search & review of literature getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, and comparison of results & drawing conclusions.
Every candidate shall submit to the registrar (academic) of the university in the prescribed, a synopsis containing particulars of proposed dissertation work within 6 months from the date of commencement of course on or before the dates notified by the university. The synopsis shall be sent through the proper channel.
Such synopsis will be reviewed & the university will register the dissertation topic. No change in the dissertation topic or guide shall be made without prior approval of the university.

The dissertation should be written under the following heading

1. Introduction.
2. Aims or objectives of study.
3. Review of literature.
4. Material &methods.
5. Results.
6. Discussion.
7. Conclusion.
8. Summary.
9. References.
10. Tables.
11. Annexure.

The written text of dissertation shall not be less than 50 pages & shall not exceed 100 pages excluding references, tables, questionnaires & other annexure. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27”x 11.69”) and bound properly. Spiral binding should be avoided. The guide, Head of Department & Head of the institution shall certify the dissertation.
Four copies of dissertation thus prepared shall be submitted to the registrar (evaluation), 3 months before final examination on or before the dates notified by the university.
The examiners appointed by the university shall value the dissertation Approval of dissertation work is an essential precondition for a candidate to appear in the university examination. Two evaluators (examiners) apart from the guide shall value the dissertation. One of the evaluator is external from outside Swarrnim Startup and Innovation University. The other one shall be internal from another college affiliated to Swarrnim Startup and Innovation University. Acceptance from any one evaluator other than the guide will

be sufficient for the candidate to be eligible to take up the examination.

R.M. PHYSIO.14:- GUIDE

The academic qualification and teaching experience required for recognition by this university is as per the criteria for recognition of MPT teachers for guides as per GSCPT.

Criteria for recognition of MPT teacher/ Guide:

1. M.Sc. (PT) / MPT with five years teaching experience after completion of MPT degree working on a full time position at an institution recognized by Swarrnim Startup and Innovation University and GSCPT. Notwithstanding above, in view of acute shortage of teachers, the teachers having three years teaching experience after MPT and working on a full time basis be considered as PG teachers for a period of five years (i.e. up to2022)

R.M. PHYSIO 15: - CHANGE OF GUIDE

In the event of a recognized guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the university.

R.M. PHYSIO 16: - SCHEDULE OF EXAMINATION

a) The examination for MPT course shall be held at the end of each academic year (2 academic terms)
b) There shall be two university examination sessions in an academic year
i.e. in the month of October and April approximately.

R.M. PHYSIO 17: - SCHEME OF EXAMINATION

The degree of Master of Physiotherapy will be taken by papers, practical and viva-voice only.

Written Examination (Theory)

A written examination consisting of 5 question papers, each of three hours duration and each paper carrying 100 marks. Examination for paper I and paper II will be conducted at the end of first academic year. Paper III,IV and V examination will be conducted at the end of the second academic year. Recent advances in physiotherapy may be asked in any or all the 5 papers.

The paper IV and V will be for Elective subject in the branch chosen by candidates.

The Theory examination shall be held sufficiently earlier than clinical/practical examination.

Clinical Examination – 400 marks

It should be aimed at examining clinical skills and competency of the candidates undertaking independent work as a specialist.

Viva – Voice – 100 marks

Viva – Voice examination shall aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills. Candidates will present dissertation work during viva- voice. However, no marks shall be assigned. The marks of Viva – Voice examination shall be included in the clinical examination to calculate the percentage and declaration of results.

R.M. PHYSIO 18: - EXAMINERS

All examiners shall be recognized postgraduate teachers with three years PG teaching experience.

50% of total examiners shall be externals.

An external examiner must be a faculty of physiotherapy, preferably be from out of university and

ordinarily may be appointed for not more than 3 years consecutively.
The same set of examiner shall ordinarily be responsible for the written, practical or part of examination.

R.M. PHYSIO 19: - CRITERIA FOR DECLARING AS PASS IN UNIVERSITY EXAMINATION

(a) To pass any M. Physiotherapy Examination, a student must obtain 50% marks in the theory aggregate and 50% marks in the practical aggregate in concerned examination.

(b) Award of classes:

First class with distinction - 75% and above in aggregate provided the Candidates pass the examination in first Attempt.

First class - 60% and above in aggregate provided the candidate pass in First attempt.

Pass class:- 50% of marks in theory aggregate and 50% of maximum Marks in clinical and Viva-voice aggregate.

R.M.PHYSIO 20: - DEFINITION OF TRIAL

First trial is deemed to take place when the candidate is due to appear for the examination irrespective of his/ her actual appearance, provided that non- appearance is not a result of reasons beyond his/ her control. Similarly 2nd, 3rd, etc, trials relating to subsequent examination.

R.M. PHYSIO 21: - TYPE OF QUESTIONS IN WRITTEN PAPER Theory – 70 Marks each paper

1. Long Essay (2 questions) – 2 x 15 = 30 Marks.
2. Short Essay (2 questions) –2x 10 = 20 Marks.
3. Short Answer (4 questions)- 4x5= 20 Marks

R.M PHYSIO 22:- COURSE CONTENTS I YEAR MPT

MPT 1st year

Paper I – Basic Sciences Part- I

Teaching Scheme			Evaluation Scheme				
Theory	Practical	Total	Internal		External		Total
			Th	Pr	Th	Pr	
5	3	8	30	30	70	70	**200**

i) WORK & EXERCISE PHYSIOLOGY		
1	Sources of Energy, Energy Transfer and Energy Expenditure at rest and various physical activities.	**5**
2	Nutrition, Body consumption, caloric balance, food for the athlete, regulation of food intake, ideal body weight, optional supply of Nutrients.	**5**
3	Metabolic consideration — VO2, Lactate threshold, RQ, energy expenditure in terms of calorimetry.	**5**
4	Acute effects of exercise on — Cardiovascular, Respiratory, Metabolic (aerobic & anaerobic), Thermo-regulatory, Buffer (pH), Neuro-musculoskeletal,	**5**

	Endocrine, Immune systems.	
5	Conditioning effects (adaptations) of exercise on — Cardiovascular, Respiratory, Metabolic (Aerobic & anaerobic), Thermo regulatory, Buffer (pH), Neuro- Musculoskeletal (strength, power, endurance, speed, flexibility, agility, skill), Endocrine, Immune systems.	**5**
6	Body composition	**4**
7	Exercise at different altitudes.	**4**
8	Exercise at various climatic conditions.	**3**
9	Special aids to performance and conditioning.	**4**
10	Exercise prescription for health and fitness with special emphasis to cardiovascular disease, Obesity and Diabetes.	**4**
11	Principles of health promotion for Growing Children, Healthy Adults, Pregnant / Lactating females, Elderly, Sports person	**5**
12	Aerobic and Anaerobic Exercise Training	**4**
13	Fatigue assessment, Types, and Relevance with Exercise Tolerance tests & Training and management	**5**
14	Fitness Testing for: a. Aerobic power b. anaerobic power and capacity c. Muscular strength and power, flexibility.	**5**
15	Obesity –exercises for weight reduction	**5**
16	Exercise and aging	**4**
17	Clinical exercise physiology	**4**

ii) ELECTRO PHYSIOLOGY		
1	Characteristics and components of Electro therapeutic stimulation systems and characteristic and components of Electro physiological assessment devices.	**4**
2	Electrical excitability of muscle and nerve and composition of peripheral nerves.	**4**
3	A. muscle plasticity in response to electrical stimulation. B. Instrumentation for Neuromuscular electrical stimulation (NMES)	**4**
4	Neurobiology of afferent pain transmission and central nervous system mechanisms of pain modulation.	**4**
5	Electrical stimulation and circulation.	**3**
6	Clinical Electro physiological testing.	**3**
7	Bio-electricity(R.M.P-Action Potential)	**3**
8	Neuro-transmitters. Synapse & Synaptic transmission.	**3**
9	Classification-muscle fiber, nerve fiber, motor unit.	**3**
10	Propagation of nerve impulse & physiology of muscle contraction.	**3**
11	Reflex-classification & properties.	**4**
12	Sensations-Pathways & classification.	**4**
13	Type of nerve injury &wallerian degeneration.	**4**

iii) BIOMECHANICS & KINESIOLOGY		
1	**Applied Anatomy** Anatomy of musculoskeletal system (Osteology, Myology, Arthrology)	**3**
2	Anatomy of Cardio Pulmonary system (Structure of heart, Structure of lung, broncho pulmonary segments)	**4**

3	Anatomy of nervous system (Dermatomes and myotomes, cerebrum and cerebral hemispheres, cerebral cortex, cerebellum and its connections, brain stem midbrain, Pons, medulla)	**4**
4	Structure of kidney and bladder	**3**
5	Anatomy of Reproductive system	**3**

Kinesiology		
1	**Kinematics:** a. Types of motion (accessory and joint play of axial and peripheral skeletal) b. Location of motion (instantaneous axis of movement, shifting axis of movement) c. Magnitude of motion (factors determining it) d. Direction of motion e. Angular motion and its various parameters f. Linear motion and its various parameters g. Projectile motions	**5**
2	**Kinetics:** a. Definition of forces b. Force vectors (composition, resolution, magnitude) c. Naming of Force (gravity and anti-gravity force, JRF) d. Force of gravity and COG e. Stability f. Reaction forces g. Equilibrium & Balance h. Linear forces system i. Friction and its various parameters j. Parallel force systems k. Concurrent force systems l. Work power and energy m. Moment arms of force & its application n. Force components o. Equilibrium of force	**5**
3	Mechanical energy, work and power h. Definition i. Positive and Negative work of muscles j. Muscle mechanical power k. Causes of inefficient movement l. Co-contractions m. Isometric contraction against gravity jerky movement n. Energy generation at one joint and absorption at another o. Energy flow and Energy system used by the body p. Energy storage	**5**

	Biomechanics for different aspects	
1	Biomechanics of: Bone and soft tissues, including muscles, ligaments, tendon and nerves.	**4**
2	Biomechanics of Joints: Classification, structure and function including kinematics and kinetics of joints.	**4**

3	Spine: Structure and function including kinematics and kinetics of Various Vertebral joints.	**4**
4	Changes in physical and mechanical properties because of aging, exercise, Immobilization and position	**4**
5	Mechanoreceptors: its types, distribution with respect to joint, structure and function and Clinical applications	**4**
6	(a) Gait: a. Normal Gait and its determinants b. Gait parameter including temporal and spatial c. Kinematic and Kinetic of normal human gait d. Pathological gait e. Running f. Stair climbing (b) Gait Analysis. a. Overview of normal gait analysis : kinetic and kinematic analysis; Description of some of the most commonly used types of observational gait analysis; Advantages and disadvantages of kinematic qualitative and kinematic quantitative gait analyses. b. Gait Training, Pre ambulation programme, assistive devices and gait patterns, Recent advances in analysis of Gait	**8**
7	Posture Control, Optimal Posture and their deviations in different planes.	**5**
8	Ergonomics and its application in working environments	**5**
	Total	**190**

HISTORY AND PRINCIPLES OF PHYSIOTHERAPY EDUCATION		
1	History of Physiotherapy	**2**
2	Aims of physiotherapy education	**3**
3	Concepts of teaching and learning; Theories of teaching.	**3**
4	Principles and methods of teaching; a) Strategies of teaching b) Planning of teaching c) Organization d) Writing lesson plans e) Audio visual aids f) Teaching methods	**10**
5	Guidance and counseling; principles and concepts, guidance and counseling services of students and faculty	**10**
6	Practical a) Design a curriculum for a basic physiotherapy programme b) Prepare a lesson plan and conduct classes c) Construct a written objective type test for the lessons you have taken d) Prepare a plan for evaluating students e) Internal assessment tests in all topics f) Lectures and seminars.	**10**
	Total Hours	**38**

Practical's of Basic Science Part-I		
1	Evaluation of Body composition	10
2	Fitness Testing for: d. Aerobic power e. anaerobic power and capacity f. Muscular strength and power, flexibility.	20
3	Practical Demonstration of Neuromuscular electrical stimulation (NMES)	10
4	Practical Demonstration of Electrical stimulation	10
5	Practical Demonstration of Clinical Electro physiological testing. • EMG • NCV • Repetitive Nerve Stimulation • Evoke Potential 1. Brain Stem Auditory Evoked Potential 2. Sensory Evoked Potential 3. Visual Evoked Potential • FES	30
6	Practical Demonstration of Gait Analysis. c. Normal gait analysis: kinetic and kinematic analysis; Demonstration of some of the most commonly used types of observational gait analysis. d. Gait Training, Pre ambulation programme, assistive devices and gait patterns, Recent advances in analysis of Gait	20
7	Practical Demonstration of Ergonomics and its application in working environments	14
	Total	114

Paper II – Basic Sciences Part II

Teaching Scheme			Evaluation Scheme				
Theory	Practical	Total	Internal		External		Total
			Th	Pr	Th	Pr	
6	-	6	30	-	70	-	**100**

i) RESEARCH METHODOLOGY & BIOSTATISTICS		
1	Research in Physiotherapy a. Introduction b. Research for Physiotherapist: Why? How? And When? c. Research – Definition, concept, purpose, approaches i. Internet sites for Physiotherapist	**5**
2	Research Fundamentals a) Types of variable b) Reliability & Validity c) Drawing Tables, graphs, master chart etc	**5**

3	Writing a Research Proposal a) Defining a problem b) Hypothesis: function of hypothesis in quantitative research c) Types of hypothesis, characteristics of testable hypothesis, wording of the hypothesis d) Review of Literature e) Formulating a question, Operational Definition f) Inclusion & Exclusion criteria g) Forming groups h) Data collection & analysis i) Results, Interpretation, conclusion, discussion j) Informed Consent k) Limitations	**8**
4	Research Design a. Qualitative and Quantitative research designs - Difference between qualitative and quantitative designs b. Experimental design Quasi experimental research; advantages and disadvantages of quasi experiments Non experimental design - Controlled trials -Parallel or concurrent controls - Randomized - Non randomized Sequential controls - Self controlled - Crossover - External controls - Studies with no controls c. Observational Study design - Descriptive or case series - Case control studies (retrospective) - Cross sectional studies, surveys - Cohort studies (prospective) -Historical Cohort studies d. Meta analyses	**8**
5	Population and sample 1. Definition of population and sample 2. Types of sampling 3. Sample size determination and calculation 4. Sample rationale 5. Non-probability sampling ; convenience sampling , quota sampling, purposive sampling, advantages and disadvantages of non probability sampling 6. Probability sampling; Simple random sampling, stratified random sampling, 7. Cluster sampling, systematic sampling, advantages and disadvantages of probability sampling	**8**
6	Data collection methods	**6**

	a. Scales and techniques of psychological measures b. Research reliability, validity and criteria for assessing, measuring the tools c. Presentation of data d. Analysis and interpretation of research data e. Role of computers f. Pilot study	
7	Interpretation of statistical results 1. Interpreting significant and non significant results 2. Discussion and conclusion of obtained results 3. Guidelines to interpret and critique research results	**6**
8	Writing research for publication 1. Guidelines to publish a research paper and its contents	**4**
9	Presenting a research report 1. Writing the report 2. Documentation 3. Details of the study 4. Arrangement of report 5. Practice - Presentation of study for discussion 6. Method of teaching - lecture and discussion- Seminars and practices	**8**
10	Research Ethics 1. Importance of Ethics in Research, Ethical issues in human subjects research, Ethical principles that govern research with human subjects 2. Components of an ethically valid informed consent for research	**3**
11	Plagiarism	**3**

BIOSTATISTICS		
1	Biostatistics a. Introduction b. Definition c. Types d. Application in Physiotherapy	**2**
2	Data a. Definition b. Types c. Presentation d. Collection methods e. Various types of graphs, obtaining graphs using statistical software like excel	**5**
3	Measures of central value a. Arithmetic mean, median, mode, Relationship between them b. Partitioned values- Quartiles, Deciles, Percentiles c. Graphical determination	**5**
4	Measures of Dispersion a. Range	**5**

	b. Mean Deviation c. Standard Deviation	
5	Normal Distribution Curve a. Properties of normal distribution b. Standard normal distribution c. Transformation of normal random variables. d. Inverse transformation e. Normal approximation of Binomial distribution.	**5**
6	Correlation analysis a. Bivariate distribution b. Scatter Diagram c. Coefficient of correlation d. Calculation & interpretation of correlation coefficient e. T-test, Z-test, P-value	**5**
7	Regression analysis a. Lines of regression b. Calculation of Regression coefficient	**5**
	2. Sampling a. Methods of Sampling b. Sampling distribution c. Standard error d. Types I & II error	3
	Probability (in Brief) a. Probability and sampling b. Probability as a mathematical system c. Population and samples d. Sampling distribution e. Sampling methods f. Point and interval estimation for proportion mean g. Hypothesis testing, simple test of significance h. Inferential technique: normal	**5**
	Hypothesis Testing a) Null Hypothesis b) Alternative hypothesis c) Acceptance & rejection of null Hypothesis d) Level of significance	**5**
	Parametric & Non parametric tests a. Chi square test b. Mann-Whitney U test c. Wilcoxon Signed test d. Kruskal-Wallis test e. Friedman test f. T-test/student T test g. Analysis of variance g. Standard errors of differences	**5**
	Learn SPSS software application and Graph Software application. [Not for Exam].	**4**

	i) EDUCATION TECHNOLOGY	
1.	Education:	**5**

	a. Educational aims, b. Agencies of education, c. Formal and informal education, d. Major philosophies of education (naturalism, idealism, pragmatism, realism) including Gandhi and Tagore. Modern and contemporary philosophies of education (Existentialism, Progressivism, Reconstructionism, Perennialism). e. Philosophies of education in India – past, present and future. Role of educational philosophy, Current issues and trends in education.	
2.	Concepts of teaching and learning: a. Theories of teaching, b. Relationship between Teaching and Learning, c. Psychology of Education, d. Dynamics of behavior, e. Motivational process of learning, f. Perception, g. Individual differences, h. Intelligence personality.	**5**
3.	Curriculum: a. Curriculum committee, b. Developments of a curriculum for P.T., c. Types of curriculum, d. Formation of philosophy, e. Courses objectives. f. Course placements, g. Time allotment. h. Selection and organization of learning experience master plans of courses. i. Master rotational plan – individual rotational plan, j. Correlation of theory and practice, k. Hospital and community areas for clinical instruction, l. Clinical assignments, m. Current trends and curriculum planning.	**6**
4.	Principles and methods of teaching: a. Strategies of teaching, b. Planning of teaching, c. Organization, writing lesson plan, d. Audio visual aids, e. Teaching methods – Socialized teaching methods.	**5**
5.	Measurement and evaluation: a. Nature of measurement of education, meaning, process, personal, Standardized, b. Non-standardized tests. c. Steps of constructing a test, d. Measurement of cognitive domain, e. Assessment techniques of affective and psychomotor domains, f. Administering scanning and reporting. g. Standardized tools, h. Important tests of intelligence, i. Attitude, instrument, personality, j. Achievement and status scale.	**6**

	k. Programme evaluation Cumulative evaluation.	
6.	Guidance and counseling : a. Philosophy, b. Principles and concepts, c. Guidance and counseling, d. Services of student and faculty. e. Faculty development and development of personnel for P.T. services	**5**

ii) ETHICS AND ADMINISTRATION		
1.	Concept of Morality, Ethics and Legality.	**4**
2.	Rules of Professional conduct, Medico Legal and Moral Implications.	**4**
3.	Communication skills, Client interest and Satisfaction.	**4**
4.	Inter Disciplinary Relation, Co-partnership, Mutual Respect, Confidence and Communication, Responsibilities of the Physiotherapists, Status of Physiotherapist in Health Care.	**4**
5.	Role of Professional in Socio Personal and Socio Economical context.	**4**
6.	Need of Council Act for regulation of Professional Practice.	**4**
7.	Self- Regulatory role of Professional Association.	**4**
8.	Rules of Professional Conduct.	**4**
9.	Role of WCPT, Various branches and special interest group of WCPT	**4**
10.	Indian association of physiotherapists: rules, regulations, framework, aims, and objectives. Physiotherapy and law. Medico legal aspects of physiotherapy, liability, negligence, malpractice, licensure, workman's compensation.	**4**
11.	Administration & Marketing – personnel Policies –Communication & Contract. Administration principles based on Goal & Function at large Hospital / Domiciliary set up / Private Clinic / Academic Institution.	**5**
12.	Methods of maintaining records – Budget planning	**3**
13.	Performance analysis – Physical structure, reporting system, Man P Status, Functions, Quality & Quantity of Services, Turnover – Cost benefit, Contribution.	**3**
14.	Hospital as an organization - Functions and types of hospitals	**3**
15.	Roles of Physical therapist, Physical therapy Director, Physiotherapy Supervisor, Physiotherapy assistant, Physiotherapy aide.	**4**
16.	Confidentially of the Patient's status	**4**
17.	Legal responsibility	**3**
18.	Consumer protection law, health law, MCI.	**4**
19.	Standards of practice for physiotherapists	**3**
20.	Liability and obligations in the case of medical legal action	**3**
21.	Law of disability & discrimination.	**3**
	Total Hours	**228**

Paper-III ADVANCE PHYSIOTHERAPEUTIC (Clinical Applied & Allied Therapeutic, Medical and Surgical)

Teaching Scheme			Evaluation Scheme				
Theory	Practical	Total	Internal		External		Total
			Th	Pr	Th	Pr	
6	3	9	30	30	70	70	**200**

	Part I	
1.	Pain: Neurobiology, Various theories, Modulation and Physiotherapy Management including electromagnetic radiations, ultrasound, Electro acupuncture etc.	**8**
2.	Maternal and child care in general physiotherapy.	**5**
3.	Applied neuro- anatomy and neuro-physiotherapy.	**6**
4.	Inhibition and facilitation techniques.	**5**
5.	Theories of motor learning.	**5**
6.	Therapeutic bio feedback & psychosomatic training.	**5**
7.	Combination therapy, shock wave therapy, long wave therapy.	**6**
8.	Functional training – Respiratory exercises, Training for feeding, bladder and bowel training, coughing and compression	**8**
9.	Artificial respiration, inhalation therapy & intensive care unit procedures.	**5**
10.	Yogasanas& Pranayama a. Physiological & therapeutic principles of yoga b. Yogasanas for physical culture, relaxation and meditation. c. Application of Yogasanas in physical fitness, flexibility, cardiac rehabilitation and neuromotor learning. d. Pranayama and respiratory physiology. e. Kriyas and their physiological significance. Therapeutic application of yoga. f. Yoga – a holistic approach.	**10**
11.	Acupuncture: definition, principles, techniques, physiological effects, indications, contra-indications, dangers & integration of acupuncture with physiotherapy.	**6**
12.	Magneto therapy	**5**
13.	Naturopathy	**5**
14.	Dry Needling in various conditions	**5**
15.	History of manual therapy, overview of manual therapy approaches for all the joints	**5**
16.	Clinical Reasoning and differential clinical diagnosis and practical application of different approaches such as – Maitland, Kaltenborne, Cyriax, Mulligan and Mackenzie.	**6**
17.	Soft tissue approaches: MyoFascial Release techniques, Neural tissue mobilization, Muscle Energy Techniques (MET), Position Release Therapy (PRT), Kinetic chain approach along with practical application.	**8**
18.	Massage, mobilization and manipulations	**5**
19.	Ergonomics	**2**

20.	Recent advances and Evidence based Practice in all physiotherapeutic conditions	**5**

	Part II:- Medical	
1.	Physiotherapy in common conditions of skin	**8**
2.	Physiotherapy in common vascular diseases.	**5**
3.	Physiotherapy in nutritional deficiency diseases.	**5**
4.	Physiotherapy in respiratory disorders.	**5**
5.	Physiotherapy Management of ischemic heart diseases.	**6**
6.	Exercise planning and prescriptions.	**5**
7.	Physiotherapy in psychiatry.	**5**
8.	Management of pain in neurological and Musculo-skeletal disorders.	**6**
9.	Physiotherapy management in arthritis and allied conditions.	**6**
	Part III:- Surgical)	
1.	Monitoring systems, defibrillator and Artificial respirators.	**6**
2.	Physiotherapy in post operative management of metabolic, hormonal, neoplastic and infective conditions of bones and joints.	**6**
3.	Pre and post operative physiotherapy in tendon transfer.	**6**
4.	Physiotherapy management following head injuries, in intensive care and neurosurgical procedures.	**7**
5.	Physiotherapy following general surgery.	**6**
6.	Physiotherapy following uro-surgery.	**6**
7.	Physiotherapy following plastic surgery.	**7**
8.	Physiotherapy management following selective and common cases of oncologic surgeries	**10**
9.	Physiotherapy following obstetric and gynecological disorders.	**6**
	Total Hours	**228**

Practical's of Advance Physiotherapeutic		
1	Practical Demonstration of Ante Natal Exercises	4
2	Practical Demonstration of Post Natal Exercises	4
3	Practical Demonstration of Inhibition and facilitation techniques.	4
4	Practical Demonstration of Therapeutic bio feedback	4
5	Practical Demonstration of Combination therapy, shock wave therapy, long wave therapy.	4
6	Practical Demonstration of Functional training – Respiratory exercises, Training for feeding, bladder and bowel training, coughing and compression	4
7	Practical Demonstration of Artificial respiration, inhalation therapy & intensive care unit procedures.	4
8	Practical Demonstration of Various Asan of Yoga and Pranayama	4
9	Practical Demonstration of Acupuncture	4
10	Practical Demonstration of Dry Needling in various conditions	4
11	Practical Demonstration of Massage and its various techniques	4
12	Clinical Reasoning and differential clinical diagnosis and practical application of different approaches such as – Maitland, Kaltenborne, Cyriax, Mulligan and Mackenzie.	4
13	Practical Demonstration of Soft tissue approaches: MyoFascial Release techniques, Neural tissue mobilization, Muscle Energy Techniques (MET), Position Release Therapy (PRT), Kinetic chain approach along with practical application.	4

14	Clinical Reasoning and differential clinical diagnosis and practical application of different approaches such as – Maitland, Kaltenborne, Cyriax, Mulligan and Mackenzie.	4
15	Practical Demonstration of Physiotherapy in common conditions of skin	4
16	Practical Demonstration of Physiotherapy in common vascular diseases.	4
17	Practical Demonstration of Physiotherapy in nutritional deficiency diseases.	4
18	Practical Demonstration of Physiotherapy in respiratory disorders.	4
19	Practical Demonstration of Physiotherapy Management of ischemic heart diseases.	4
20	Practical Demonstration of Exercise planning and prescriptions.	4
21	Practical Demonstration of Physiotherapy in psychiatry.	3
22	Management of pain in neurological and Musculo-skeletal disorders.	3
23	Practical Demonstration of Physiotherapy management in arthritis and allied conditions.	3
24	Practical Demonstration of Physiotherapy in post operative management of metabolic, hormonal, neoplastic and infective conditions of bones and joints.	3
25	Practical Demonstration of Pre and post operative physiotherapy in tendon transfer.	3
26	Practical Demonstration of Physiotherapy management following head injuries, in intensive care and neurosurgical procedures.	3
27	Practical Demonstration of Physiotherapy following general surgery.	3
28	Practical Demonstration of Physiotherapy following uro-surgery.	3
29	Practical Demonstration of Physiotherapy following plastic surgery.	3
30	Practical Demonstration of Physiotherapy management following selective and common cases of oncologic surgeries	3
31	Practical Demonstration of Physiotherapy following obstetric and gynecological disorders.	3
	Total	114

2nd year MPT

Teaching Scheme			Evaluation Scheme				
Theory	Practical	Total	Internal		External		Total
			Th	Pr	Th	Pr	
3.5	3.5	7	30	30	70	70	**200**

Paper V – Physical and Functional Diagnosis Part 1 & Part 2

	Part I	
1.	Clinical Decision Making - Planning Effective Treatment. Clinical decision making models, Team approach, Foundation for clinical decision making.	**10**
2.	Vital Signs. Identification of reasons for monitoring vital signs; importance of monitoring vital signs; common techniques of monitoring vital signs; identification and analysis of normal values with that of abnormal values.	**10**
3.	Principles and application of investigative and imaging techniques in Physiotherapy a. Blood test b. Arterial Blood Gas (ABG) analysis c. Pulmonary Function Test (PFT) d. Radiological examination e. Computerized Tomography (CT) f. Magnetic Resonance Imaging (MRI) g. Ultrasonography (US) h. Electrocardiography (ECG) i. Dope testing	**15**
4.	Evaluation assessment and treatment planning strategies for musculoskeletal, neurological, cardiopulmonary, sports specific and other physiotherapy conditions: Principles of evaluation, clinical manifestations, general and specific clinical examination. A. Physiotherapy assessment of the following: a. Range of motion (ROM) b. Tone c. Muscular strength and endurance d. Flexibility e. Coordination i. Non equilibrium test ii. Equilibrium test f. Sports specific skills g. Cardiac efficiency h. Sensory evaluation i. Functional Evaluation i. Various scoring methods in functional assessment ii. Validity and reliability j. Fitness evaluation	**15**

	i. Aerobic ii. Anaerobic k. Spasm l. Trigger Point m. Tender Point n. Spasm B. Assessment of cognitive, perceptual dysfunctions and vestibular dysfunction.	
5.	Electro-Diagnosis: 1. Characteristics and components of Electro therapeutic stimulation systems and Electro physiological assessment devices. 2. Instrumentation for neuromuscular electrical stimulation 3. Electrical properties of muscle and nerve. 4. Neurobiology of afferent pain transmission and central nervous system mechanisms of pain modulation. 5. Electrical stimulation and circulation. 6. Clinical Electro physiological testing: Instruments, Techniques and Interpretations of a. Nerve conduction velocity including Repetitive Nerve Stimulation (RNS) b. Electromyography c. Bio-feedback technique. d. Late responses 7. Concepts of electro physiological studies in neuro muscular diseases as a diagnostic and therapeutic tool 8. Evoked potentials – VEP, SSEP, MEP, BAE	**15**
	Part II	
1	Psychological aspects of rehabilitation in disability: Psychological tests.	**8**
2	Developmental Screening (a) Factors Motor control assessment (b) Motor control theories/mechanism (c) Patterns of normal development (d) specific procedures and tests used to assess motor control defects	**10**
3	Anthropometry a. Body measurements - Height - Weight - Circumference b. Body Proportion - Body Mass Index (BMI) - Waist Hip Ratio (WHR) c. Body Composition - Somatotyping - Methods of measurement • Water displacement • Skin fold measurement • Under water weighing • Bioelectric Impedance Analysis (BIA)	**15**
4	Differential diagnosis in Physiotherapy	**10**
5	Functional evaluation.	**15**

	a. The concepts of health status impairment; functional limitations; disability and handicap; definition of functional activity and the purposes and components of the functional assessment; selection of activity and roles for an individual based on his or her capabilities and functional limitations. b. Various forms of functional tests; physical function test and multi-dimensional functional assessment instrument, identification of instrument for testing function. c. Various scoring methods used in functional assessment; d. Reliability and validity of various functional assessments.	
6	Evaluation of aging	**10**
	Total Hours	**133**

Practical's of PFD Part-I and Part-II		
1	Principles and application of investigative and imaging techniques in Physiotherapy d. Blood test e. Arterial Blood Gas (ABG) analysis f. Pulmonary Function Test (PFT) j. Radiological examination k. Computerized Tomography (CT) l. Magnetic Resonance Imaging (MRI) m. Ultrasonography (US) Electrocardiography (ECG)	20
2	1) Clinical Electro physiological testing: Instruments, Techniques and Interpretations of a. Nerve conduction velocity including Repetitive Nerve Stimulation (RNS) b. Electromyography c. Bio-feedback technique. d. Late responses 2) Concepts of electro physiological studies in neuro muscular diseases as a diagnostic and therapeutic tool a. Evoked potentials – VEP, SSEP, MEP, BAE	20
3	Evaluation assessment and treatment planning strategies for musculoskeletal, neurological, cardiopulmonary, sports specific and other physiotherapy conditions: Principles of evaluation, clinical manifestations, general and specific clinical examination. C. Physiotherapy assessment of the following: o. Range of motion (ROM) p. Tone q. Muscular strength and endurance r. Flexibility s. Coordination i. Non equilibrium test ii. Equilibrium test t. Sports specific skills u. Cardiac efficiency v. Sensory evaluation w. Functional Evaluation i. Various scoring methods in functional assessment	20

	ii. Validity and reliability x. Fitness evaluation i. Aerobic ii. Anaerobic y. Spasm z. Trigger Point aa. Tender Point bb. Spasm cc. Assessment of cognitive, perceptual dysfunctions and vestibular dysfunction.	
4	Vital Signs. Identification of reasons for monitoring vital signs; importance of monitoring vital signs; common techniques of monitoring vital signs; identification and analysis of normal values with that of abnormal values	11
5	Developmental Screening (e) Factors Motor control assessment (f) Patterns of normal development (g) specific procedures and tests used to assess motor control defects	12
6	Anthropometry d. Body measurements - Height - Weight - Circumference e. Body Proportion - Body Mass Index (BMI) - Waist Hip Ratio (WHR) f. Body Composition - Somatotyping - Methods of measurement • Water displacement • Skin fold measurement • Under water weighing • Bioelectric Impedance Analysis (BIA)	30
7	Functional evaluation. e. The concepts of health status impairment; functional limitations; disability and handicap; definition of functional activity and the purposes and components of the functional assessment; selection of activity and roles for an individual based on his or her capabilities and functional limitations. f. Various forms of functional tests; physical function test and multi-dimensional functional assessment instrument, identification of instrument for testing function. g. Various scoring methods used in functional assessment; Reliability and validity of various functional assessments.	20
	Total	133

Master of Physiotherapy in Musculoskeletal (Orthopedic) Sciences

Paper-VI

Elective-I: Physiotherapy in Musculoskeletal (Orthopedic) Sciences ANATOMY, PHYSIOLOGY AND BIOMECHANICS

Teaching Scheme			Evaluation Scheme				
Theory	Practical	Total	Internal		External		Total
			Th	Pr	Th	Pr	
4	4	8	30	30	70	70	**200**

1	Embryological development of musculoskeletal system.	**4**
2	Osteology; structure of bone, ossification of bones, skull bones, facial bones, bones of upper extremity,, lower extremity, pelvis, vertebral column, ribs.	**4**
3	Myology; Structure of muscles , type of muscle, muscle fibers, origin , insertion, nerve supply of muscles of upper extremity, lower extremity, Trunk.	**5**
4	Structure of joints, types of joints, detailed structure and formation of all the joints, detailed structure and formation of al the joints, neurobiology of joint	**4**
5	Neurology: peripheral nerves, dermatomes and myotomes,	**4**
6	Physiology: Joint physiology (movements), muscle physiology	**4**
7	Biomechanics of normal joints and Pathomechanics of fractures, deformed joints.	**5**

Musculoskeletal Conditions- Assessment and Evaluation

Introduction, principles and concepts of Patient history, observation, Examination, Principles, scanning examination, examination of specific joints, functional assessment, specific tests, reflexes, cutaneous distribution, joint play movements, palpation and diagnostic imaging.

1.	Head and Face: Patient history, observation Examination, examination of the head, examination of the face, examination of the eye, examination of the nose, examination of the teeth, examination of the ear, special tests, reflexes and cutaneous distribution, joint play movements, palpation, diagnostic imaging.	**8**
2.	Cervical Spine: Patient history, observation Examination, active movements, passive movements, resisted isometric movements, peripheral joint scanning examination, myotomes, functional assessment, special tests, reflexes and cutaneous distribution, joint play movements , palpation, diagnostic imaging.	**8**
3.	Thoracic (dorsal) Spine: Patient history, observation Kyphosis, scoliosis, breathing chest deformities. Examination, active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution, joint play movements , palpation, diagnostic imaging.	**8**
4.	Lumbar Spine: Patient history, observation Examination, active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution, joint play movements , palpation, diagnostic imaging.	**8**
5.	Shoulder: Patient history, observation Examination, active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution, joint play movements , palpation, diagnostic imaging.	**8**
6.	Elbow: Patient history, observation Examination, active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution, joint play movements , palpation, diagnostic imaging.	**4**
7.	Temporomandibular Joint: Patient history, observation Examination, active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution, joint play movements , palpation, diagnostic imaging.	**4**
8.	Forearm, Wrist and Hand: Patient history, Observation – common hand and finger deformities, other physical findings Examination, active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution, joint play movements , palpation, diagnostic imaging.	**4**
9.	Pelvis: Patient history, observation Examination, active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution, joint play movements , palpation, diagnostic imaging.	**8**
10.	Hip: Patient history, observation Examination, active movements, passive movements,	**8**

	resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution, joint play movements , palpation, diagnostic imaging.	
11.	Knee: Patient history, observation Examination, active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution, joint play movements , palpation, diagnostic imaging.	**10**
12.	Lower leg, Ankle and Foot: Patient history, observation Examination, active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution, joint play movements, palpation, diagnostic imaging.	**4**
13.	Assessment of Gait: a. Normal patterns of gait, stance phase, swing phase , joint motion during normal gait Normal parameters of gait, base width, step length, stride length, lateral pelvic shift, vertical pelvic shift, pelvic rotation centre of gravity, normal cadence. Overview and patient history, Observation – foot wear Examination, locomotion score, compensatory mechanisms. b. Abnormal gait, antalgic (painful) gait, arthrogenic gait (stiff hip or knee), ataxic gait, contracture gait, equines gait, gluteus maximus gait, gluteus medius (Trendelenburg's) , hemiplegic or hemiparetic gait, parkinsonian gait, plantar flexor gait, psoatic limp, quadriceps gait, scissors gait, short leg gait, steppage or drop foot gait.	**8**
14.	Assessment of Posture: Postural development, factors affecting posture, causes of posture Common spinal deformities, Lordosis, kyphosis, scoliosis Patient history, Observation – standing, forward flexion, sitting, supine lying prone lying Examination	**8**
15.	Assessment after acute injury of bone, ligament, and tendon a. Mechanism of injury b. History c. Observation d. Examination e. Special tests f. Palpation and diagnostic imaging	**6**
16.	Assessment of the Amputee: a. Levels of amputation b. Patient history, observation c. Examination, measurements related to amputation active movements, passive movements, resisted isometric movements, functional assessment, sensation testing, psychological testing , palpation, diagnostic imaging.	**4**
17.	Pre operative and post operative assessment in orthopaedic surgeries	**8**
18.	Assessment and evaluation of pain	**6**
	Total Hours	**152**

Apart from the above; the student is expected to learn assessment and evaluation in the following clinical conditions (pre operative and post operative).

Practical's of Elective-I: Physiotherapy in Musculoskeletal (Orthopedic) Sciences		
1	Practical Assessment and Evaluation of Head and Face	9
2	Practical Assessment and Evaluation of Cervical Spine	9
3	Practical Assessment and Evaluation of Thoracic (dorsal) Spine	9
4	Practical Assessment and Evaluation of Lumbar Spine	9
5	Practical Assessment and Evaluation of Shoulder	9
6	Practical Assessment and Evaluation of Elbow	9
7	Practical Assessment and Evaluation of Temporomandibular Joint	9
8	Practical Assessment and Evaluation of Forearm, Wrist and Hand	9
9	Practical Assessment and Evaluation of Pelvis	9
10	Practical Assessment and Evaluation of Hip	9
11	Practical Assessment and Evaluation of Knee	9
12	Practical Assessment and Evaluation of Lower leg, Ankle and Foot	9
13	Assessment of Gait	10
14	Assessment after acute injury of bone, ligament, and tendon	10
15	Assessment of the Amputee	10
16	Pre operative and post operative assessment in orthopaedic surgeries	10
17	Assessment and evaluation of pain	4
	Total	152

Paper-VII
Elective-2: Physiotherapy in Musculoskeletal (Orthopedic) Sciences
CLINICAL MUSCULOSKELATAL CONDITIONS

Teaching Scheme			**Evaluation Scheme**				
Theory	Practical	Total	Internal		External		Total
			Th	Pr	Th	Pr	
4	4	8	30	30	70	70	**200**

1.	General Musculoskeletal disorders: Degenerative disorders of joints Infections of bones and joints Arthropathies Tumors of the bone Congenital deformities Spinal deformities	**18**

	Developmental disorders of bone Metabolic and endocrine disorders Conditions related to upper extremity, lower extremity and spine Soft tissue: overuse injuries Musculoskeletal problems in neuromuscular disorders	
2.	Traumatic Orthopedics: Classification of fractures Dislocation of various joints Fractures and dislocation of upper extremity Fractures and dislocation of lower extremity Fractures and dislocation of spine and pelvis Fractures of skull, face bones and ribs Soft tissue: acute traumatic injuries.	**18**
3.	Orthopedic surgeries: Amputation Joint replacement surgeries Osteotomy and Arthrodesis Surgery for correction of bone deformities and contractures Surgical procedures for fracture, dislocation Tendon transfer principles and procedures Bone grafting Nerve suturing and grafting Implants in Orthopedics	**15**

PHYSIOTHERAPY INTERVENTIONS IN MUSCULOSKELATAL CONDITIONS

1	Physiotherapy management procedures in general musculoskeletal disorders: Degenerative disorders of joints Infections of bones and joints Arthropathies	**18**

	Tumors of the bone Congenital deformities Spinal deformities Developmental disorders of bone Soft tissue: overuse injuries Musculoskeletal Problems in Neuromuscular disorders Conditions related to upper extremity, lower extremity and spine Metabolic and endocrine disorders soft tissue acute traumatic injuries	
2	Physiotherapy management procedures in Traumatic Orthopedics: Fractures and dislocation of upper extremity Fractures and dislocation of lower extremity Fractures and dislocation of spine Fractures of sternum and ribs	**10**
3	Physiotherapy management procedures in orthopedic surgeries: Amputation Joint replacement surgeries Osteotomy and arthrodesis Surgery for correction of bone deformities and contractures Surgical procedures for fracture, dislocation Tendon transfers Bone grafting Nerve suturing and grafting	**10**
4	Orthosis, Prostheses and mobility aids in musculoskeletal problems: Principles of Orthosis and prostheses Biomechanical compatibility, materials and designs of mobility aids Different types of Orthosis and Prostheses used in musculoskeletal problems Functional training with Orthosis and Prostheses	**10**

5	Physiotherapeutic approaches in musculoskeletal conditions: Manual therapy approaches for specific joints of upper extremity, lower extremity and spine Therapeutic exercises commonly used in musculoskeletal conditions including correction exercises and home exercises Pilates and core stability exercises Proprioceptive Neuromuscular Facilitation (PNF) Hydrotherapy in common musculoskeletal conditions Swiss ball exercises Taping, Wrapping Bracing techniques.	**10**
6	Ergonomic principles and its application	**10**
7	Recent advances in Orthopedic Physiotherapy.	**12**
8	Community based rehabilitation in musculoskeletal conditions	**10**
9	Evidence based physiotherapy management for different musculoskeletal conditions	**11**
	Total Hours	**152**

Practical's of Elective-II Physiotherapy in Musculoskeletal (Orthopedic) Sciences Clinical Musculoskeletal Conditions		
1	Practical Demonstration of Physiotherapy management procedures in general musculoskeletal disorders: Degenerative disorders of joints Infections of bones and joints Arthropathies Tumors of the bone Congenital deformities Spinal deformities Developmental disorders of bone Soft tissue: overuse injuries Musculoskeletal Problems in Neuromuscular disorders Conditions related to upper extremity, lower extremity and spine	30

	Metabolic and endocrine disorders soft tissue acute traumatic injuries	
2	Practical Demonstration of Physiotherapy management procedures in Traumatic Orthopedics: Fractures and dislocation of upper extremity Fractures and dislocation of lower extremity Fractures and dislocation of spine Fractures of sternum and ribs	20
3	Practical Demonstration of Physiotherapy management procedures in orthopedic surgeries: Amputation Joint replacement surgeries Osteotomy and arthrodesis Surgery for correction of bone deformities and contractures Surgical procedures for fracture, dislocation Tendon transfers	30

	Bone grafting Nerve suturing and grafting	
4	Practical Demonstration of Orthosis, Prostheses and mobility aids in musculoskeletal problems: Principles of Orthosis and prostheses Biomechanical compatibility, materials and designs of mobility aids Different types of Orthosis and Prostheses used in musculoskeletal problems Functional training with Orthosis and Prostheses	20
5	Practical Demonstration of Physiotherapeutic approaches in musculoskeletal conditions: Manual therapy approaches for specific joints of upper extremity, lower extremity and spine Therapeutic exercises commonly used in musculoskeletal conditions including correction exercises and home exercises Pilates and core stability exercises Proprioceptive Neuromuscular Facilitation (PNF) Hydrotherapy in common musculoskeletal conditions	20

	Swiss ball exercises Taping, Wrapping and Bracing techniques.	
6	Practical Demonstration of Ergonomic principles and its application	12
7	Practical Demonstration of Physiotherapy management procedures in general musculoskeletal disorders: Degenerative disorders of joints Infections of bones and joints Arthropathies Tumors of the bone Congenital deformities Spinal deformities Developmental disorders of bone Soft tissue: overuse injuries Musculoskeletal Problems in Neuromuscular disorders Conditions related to upper extremity, lower extremity and spine Metabolic and endocrine disorders soft tissue acute traumatic injuries	20
	Total	152

Master of Physiotherapy in Cardio-Pulmonary Science

Paper-VI
Elective-1: Physiotherapy in Cardio-Pulmonary and Respiratory Science Anatomy

Teaching Scheme			Evaluation Scheme				
Theory	Practical	Total	Internal		External		Total
			Th	Pr	Th	Pr	
4	4	8	30	30	70	70	**200**

Fundamentals in cardio-respiratory conditions		
1	Cardio-Vascular System: Mediastinum: Divisions and contents Pericardium: Thoracic Wall: position, shape and parts of the heart; conducting System; blood Supply and nerve supply of the heart, anatomy of arteries, veins, and capillaries.	**4**
2	Respiratory system: Outline of respiratory passages**.** Pleura and lungs: position, parts, relations, blood supply and nerve supply; Lungs – emphasize on Broncho-pulmonary segments**.** Diaphragm: Origin, insertion, nerve supply and action, openings in the diaphragm. Intercostal muscles and Accessory muscles of respiration: Origin, insertion, nerve supply and action.	**4**

Physiology

Cardiac System:		
1	Cardiac muscles: Structure. Ionic basis of action potential and pacemaker potential Properties.	**3**
2	Conducting system: Components. Cardiac Cycle: Definition. Phases of cardiac cycle. Heart sounds – causes, character.	**3**
3	Cardiac Output: Definition. Normal value. Determinants. Stroke volume and its regulation. Heart rate and its regulation and their variations.	**3**
4	Arterial Blood Pressure: Definition. Normal values and its variations. Determinants. Peripheral resistance. Regulation of BP.	**2**
5	Arterial pulse.	**2**
6	Shock – Definition. Classification–causes and features	**1**
7	Regional Circulation: Coronary, Cerebral and Cutaneous circulation	**2**
Respiratory System:		
1	Function of respiratory system: Pleura, tracheo-bronchial tree, alveolus, respiratory membrane and their nerve supply. Respiratory muscles.	**2**
2	Mechanics of breathing: Intrapleural and Intrapulmonary pressure changes during respiration.	**2**
3	Lung compliance: Normal value, pressure-volume curve, factors affecting	**2**

	compliance and its variations. Surfactant – Composition, production, functions.	
4	Spirometry: Lung volumes and capacities. Timed vital capacity and its clinical significance. Maximum ventilation volume. Respiratory minute volume.	**2**
5	Dead Space: Types and their definition.	**2**
6	Pulmonary Circulation. Ventilation-perfusion ratio and its importance.	**2**
7	Transport of respiratory gases: Diffusion across the respiratory membrane. Oxygen- haemoglobin dissociation curve. Factors affecting it. Haldane and Bohr Effect. Carbon dioxide transport: Different forms, chloride shift.	**2**
8	Neural Regulation of Respiration. Hering-breuer's reflex. Voluntary control. Chemical Regulation.	**2**
9	Physiology of microcirculation and edema	**2**
10	Hypoxia: Effects of hypoxia. Types of hypoxia. Asphyxia. Cyanosis – types and features.	**4**
11	Periodic breathing – definition and types.	**2**
12	Artificial respiration	**2**

Cardio-Pulmonary Conditions- Biomechanics, pathomechanics & Applied Anatomy

1	General structure and function	**2**
2	Rib cage and the muscles associated with the rib cage	**2**
3	Ventilatory motions: its coordination and integration	**2**
4	Developmental aspects of structure and function	**2**
5	Body positioning and various systemic changes	**2**
6	Changes in normal structure and function I relation to pregnancy, scoliosis and COPD	**2**
7	Respiratory muscle fatigue and training	**2**
8	Development of the Cardio Vascular, Pulmonary systems and deviations from the normal development.	**4**
9	Age related changes in Cardiovascular & Pulmonary System	**2**
10	Normal and abnormal responses of Cardiovascular & Pulmonary System during Exercise	**4**

Cardio-Pulmonary Conditions - Assessment and Evaluation

1	Assessment of cardio-pulmonary system, Adult and Pediatric: a) Medical Chart Review b) Patient/Family interview	**4**
2	Vitals a) Heart rate measurement b) Blood pressure measurement c) Respiratory rate measurement d) Temperature measurement	**4**
3	Physical Therapy Examination a) Inspection b) Auscultation	**4**

	c) Palpation d) Percussion	
4	Exercise Assessment a) Exercise Stress testing b) Activity and Endurance Evaluation c) Walk tests	**5**
5	Clinical Monitoring: a) Heart Rate and heart rate response to exercise b) Heart rhythm c) ECG monitoring d) Pace-maker rhythm e) Blood Pressure and Blood pressure response to exercise f) Respiratory rate and respiratory response to exercise g) ABG analyses h) Pulse Oximetry, oxygen saturation monitoring i) RPE j) Other signs and symptoms of exercise intolerance k) Exercise capacity	**5**
6	Other assessment tools: Body composition and body composition measures	**5**
7	Respiratory muscle strength and endurance	**5**
8	Autonomic dysfunction	**3**
9	Questionnaires survey and Scales	**5**
10.	Assessment of findings: a) Chest assessment b) Activity and endurance evaluation c) Defining the physiotherapy problem	**5**
11	Pulmonary function test	**5**
12	Evaluation Of peripheral vascular diseases	**5**
13	Clinical decision making skills in functional diagnosis in neonate, pediatrics, adults and geriatrics	**4**
14	Laboratorial investigations	**5**
15	Differential diagnosis	**5**
16	ADL analysis	**4**
17	Evidence based practice	**5**
	Total Hours	**152**

Practical's of Elective-1: Physiotherapy in Cardio-Pulmonary and Respiratory Science		
1	Assessment of cardio-pulmonary system, Adult and Pediatric: c) Medical Chart Review d) Patient/Family interview	15
2	Practical Demonstration of Vitals e) Heart rate measurement f) Blood pressure measurement g) Respiratory rate measurement h) Temperature measurement	15
3	Practical Demonstration of Physical Therapy Examination e) Inspection f) Auscultation g) Palpation h) Percussion	15
4	Exercise Assessment d) Exercise Stress testing e) Activity and Endurance Evaluation f) Walk tests	15
5	Practical Demonstration of Clinical Monitoring: l) Heart Rate and heart rate response to exercise m) Heart rhythm n) ECG monitoring o) Pace-maker rhythm p) Blood Pressure and Blood pressure response to exercise q) Respiratory rate and respiratory response to exercise r) ABG analyses s) Pulse Oximetry, oxygen saturation monitoring t) RPE u) Other signs and symptoms of exercise intolerance v) Exercise capacity	20
6	Practical Demonstration of Other assessment tools: Body composition and body composition measures	10
7	Practical Demonstration of Respiratory muscle strength and endurance	10
8	Assessment of Autonomic dysfunction	10
9	Assessment of findings: d) Chest assessment e) Activity and endurance evaluation f) Defining the physiotherapy problem	15
10	Pulmonary function test	10
11	Evaluation Of peripheral vascular diseases	10
12	Laboratorial investigations	7
	Total	152

Paper-VII

Elective-2: Physiotherapy in Cardio-Pulmonary Science Clinical Cardio-Pulmonary Conditions

Causes, clinical features, pathophysiology, general investigation, Medical and surgical management of the below mentioned conditions

Teaching Scheme			Evaluation Scheme				
Theory	Practical	Total	Internal		External		Total
			Th	Pr	Th	Pr	
4	4	8	30	30	70	70	**200**

1	**Respiratory Conditions:** a) Obstructive lung disease: Asthma, Chronic bronchitis, emphysema, Bronchiectasis, Cystic fibrosis, etc. b) Restrictive lung disease: Atelectesis, pneumonia, Pleural effusion, Pneumothorax, ARDS, c) Suppurative lung diseases like lung abscess, etc. d) Occupational lung diseases-occupational asthma, inhalation injuries, etc. e) Chest trauma f) Chest wall deformities g) Lung cancers h) Pediatric/Neonatal Pulmonary diseases i) Sleep apnea j) Respiratory failure	**10**
2	**Cardio Vascular Conditions:** a) Pediatric Cardio-vascular disorder: Fallot's tetralogy, Co-arctation of aorta, Patent ductusarteriosus, Arterial septal defect, ventricular septal defect, Transposition of great vessels. b) Acquired heart diseases: Coronary Artery Diseases, Cardiac arrhythmias, Valvular heart diseases, Cardiomyopaties, c) Myocardial infarction d) Hypertension and diabetes e) Diseases of the myocardium f) Pericardial diseases g) Tumors of the heart h) Peripheral vascular diseases: Definition, Etiology, Clinical features, signs and symptoms, complications, management and treatment of following diseases : Arteriosclerosis, Atherosclerosis, Aneurysm, Buerger's disease, Raynaud's Disease, Thrombophlebitis, Deep Vein Thrombosis, Pulmonary Embolism, Varicose Veins. i) Cardiac arrest	**10**

Physiotherapy Interventions in Cardio-Pulmonary Conditions

- Student should be able to plan appropriate treatment regime based on the knowledge of various subjects learned during the two year programme for the below mentioned conditions.
- Additionally emphasis should be on special techniques/ approaches like Suctioning, Chest PNF, Inhalation and Humidification therapy, FET's.
- Student should update himself/ herself with latest advancement in the therapeutic approaches.

1	Cardio respiratory physiotherapy management principles, pre and post surgical intervention including critical care.	**10**
2	Cardio-Respiratory physiotherapeutic techniques in adult and pediatric: a) To improve lung volumes b) To decrease work of breathing c) To clear secretions d) To Increase exercise tolerance e) To improve ventilation and gas exchange f) To Improve ADL demands	**10**
3	Physiotherapy management in Obstructive and Restrictive lung diseases.	**6**
4	Post operative management of Respiratory conditions	**6**
5	Pulmonary rehabilitation	**6**
6	Adjuncts to chest PT	**6**
7	Post operative management of cardiac conditions	**6**
8	PT management in acquired and congenital heart diseases	**5**
9	Cardiac rehabilitation	**5**
10	CPR	**5**
11	PT management in Peripheral vascular diseases	**6**
12	Cardiac transplantation	**6**
13	Lung transplantation	**6**
14	Respiratory and cardiology pharmacology in brief.	**6**
15	Surgical interventions in brief: Cardio-Respiratory and Peripheral Vascular Disorder.	**6**

ICU Management

1	Intensive Care unit: concept and set up, equipments for advanced methods resuscitation, monitoring and patient management	**10**
2	Artificial airways, ventilators, pulse oximetry, O2 therapy	**5**
3	PT management in ICU	**5**
4	Transfer and turning of patient	**6**
5	Common complications in ICU	**5**
6	PICU and NICU management	**6**
	Total Hours	**152**

Practical's of Elective-II Physiotherapy in Cardio-Pulmonary Science Clinical Cardio-Pulmonary Conditions		
1	Cardio respiratory physiotherapy management principles, pre and post surgical intervention including critical care.	9
2	Cardio-Respiratory physiotherapeutic techniques in adult and pediatric: a) To improve lung volumes b) To decrease work of breathing c) To clear secretions d) To Increase exercise tolerance e) To improve ventilation and gas exchange f) To Improve ADL demands	15
3	Physiotherapy management in Obstructive and Restrictive lung diseases.	9
4	Post operative management of Respiratory conditions	9
5	Pulmonary rehabilitation	9
6	Adjuncts to chest PT	5
7	Post operative management of cardiac conditions	9
8	PT management in acquired and congenital heart diseases	9
9	Cardiac rehabilitation	9
10	CPR	5
11	PT management in Peripheral vascular diseases	9
12	Intensive Care unit: concept and set up, equipments for advanced methods resuscitation, monitoring and patient management	5
13	Artificial airways, ventilators, pulse oximetry, O2 therapy	10
14	PT management in ICU	10
15	Transfer and turning of patient	10
16	Common complications in ICU	10
17	PICU and NICU management	10
	Total	152

PAPER VIII - DISSERTATION

R.M PHYSIO 24:- RECOMMENDED BOOKS :-

I YEAR M.P.T

1. Scientific basis of human movement - Gowitzke, Williams & Wilkins, Baltimore 1988 3rd edition.
2. Clinical biomechanics of spine-White A,A and Punjabi-J.B Lippincot, Philadelphia1978.
3. Kinesiology - Brunnstrom Singe, F.ADavis-Philadelphia-1966
4. Textbook of work physiology – Guyton, Prim Books Banglore – 1991 8th edition
5. Handbook of physiology in Aging – Masoro, C.R.C Press,1981.
6. Research for physiotherapists – Hicks C., Churchill Living stone, Edingburgh 1995 Ed.S
7. Introduction to research in Human Sciences – Polgar S., Churchill Living stone, London,1988.
8. Elements of Research in Physical Therapy – Currier D.P., Williams & Wilkins, Baltimore, 1990, Ed.3.
9. Handbook of Research Method – Sproull, Scarecrow Press,1998.
10. Physical Therapy Research – Domholdt, W.B. Saunders, Philadelphia. 1993.
11. Public power & Administration – Wilenski, Hale &Iremonger,1986.
12. Physical Therapy Administration & Management – Hickik RobertJ.
13. Management Principles for physiotherapists – Nosse LorryJ.
14. Human Neuro-anatomy – Carpenter M. B., Williams & Wilkins, Baltimore,1983.
15. Physical Therapy Assessment in Early Infancy – Wilhelm Churchill Living stone, New York,1993.
16. Physical Therapy for Children – Campbell Suzann K, W.B. Saunders, Philadelphia,1994.
17. Physical Management of Multiple Handicapped – Fraser, William & Wilkins,Baltimore.
18. Elements of paediatric Physiotherapy – Eckerley p, Churchill Living stone, Edinburgh,1993.
19. Physiotherapy in paediatrics – Shepherd R. Heinmann, London, 1980 2nd edition
20. The growth chart – WHO, Geneva,1986.
21. Orthotics in neurological rehabilitation – Alsen, Demos Publication, New York1992.

II Year MPT

1. Manual of nerve conduction velocity techniques – De Lisa, Raven press, New York,1982.
2. Electro-diagnosis in diseases of nerve and muscle – Kimura j, F.A. Davis,Philadelphia.
3. Mobilization of the extremity joints – Kalternbore, Harper and Row, Philadelphia,1980.
4. Chest Physiotherapy in Intensive Care Unit – Makezie, Williams & Wilkins,Baltimore.
5. Cardiopulmonary Symptoms in Physiotherapy – Cohen M, Churchill Livingstone, London –1988.
6. Physical Rehabilitation: assessment and Treatment –O'Sullivan,F.A. Davis, Philadelphia 1994.
7. Neuro-rehabilitation – Faber, W.B. Saunders, Philadelphia1982.
8. Orthopaedic Physical therapy – Donatteli, London, Churchill Livingstone,1994.
9. Yoga therapy – Kuvalayananda Swami and Vinekar, Popular prakrashan, Bombay,1992.
10. Gait Analysis – Perry J., Black Thorofare, New Jersy, 1992.
11. Biofeedback – A practitioner's guide – KerthD, Guiford press.
12. The neural basis of motor control – Black I, Churchill Livingstone, London – 1987.
13. Physical therapy Management of Parkinson's disease – Tumbell Gerode I, Churchill Livingstone, London –1994.
14. Abnormal postural reflex activity caused by Brain lesions – Bobath B. Aspen publications, Rockville,1897.
15. Disorders of voluntary muscle – Eagal, Churchill Livingstone, Edingburgh,1988.
16. A clinician's view of neuro muscle disorder – Brook M. H Williams and Wilkins, Baltimore, 1986.
17. Proprioception, neuro muscular facilitation techniques – Knot M. and Voss, Harper and Row, New York 1972 2nd edition
18. Stroke rehabilitation – Laidler, Capman and Hall, London 1994.
19. Motor relearning programme for stroke – Carr, Aspen publication, Rock ville, 1987.
20. Adult hemiplegia: evaluation and treatment – Bobath B. Heinmann, London1983.
21. Paraplegia and tetraplegia – Brombley, Churchill Livingstone, Edingbourgh1991.
22. Child with spinabifida – Anderson E.M, and Spain B Methun, London1977.
23. A manual of neonatal intensive care – Robert N.R.C, Edward Arnold, London 1986.
24. Measurement in Physical therapy – Churchill Livingstone, London1988.
25. Soft tissue pain and disability – Cailliet Rene, Jaypee Brothers, New Delhi1992.
26. Myofascial Pain And Dysfunction – Travell, Williams & Wilkins,

Baltimore1983.
27. Physical Therapy of the low back – Twomoy, Churchill Livingstone, London1995.
28. Sports Injuries of the Shoulder – Souza Thomas A, Churchill Livingstone, London1994.
29. Vertebral Manipulation – Maitland G.D, Boston, Butterworth & Co. Boston,1997.
30. Peripheral Manipulation – Maitland G.D, Boston, Butterworth & Co. Boston,1997.
31. Sports and physical therapy – Bernhardt Donna, Churchill Livingstone, London1995.
32. Hand rehabilitation – Christine, Churchill Livingstone, London 1995.
33. Cardiopulmonary Symptoms in Physiotherapy practice –Cohen M. Churchill Livingstone, London 1988.
34. Clinical application of ventilatory support – Kinby, Churchill Livingstone, New York1990.
35. Cardiopulmonary Physiotherapy – Irwin C.V., Mosby, St. Louis 1990.
36. Pulmonary rehabilitation: Guidelines to success – Hoidkins, Butterworth, Boston1984.
37. Cardiac Rehabilitation – Amundsen L.R, Churchill Livingstone, London1988.
38. Obstetrics and Gynecological Physical Therapy – Wilder Elnine, Churchill Livingstone, New York1988.
39. Physiotherapy in Obstetrics and gynecology – Polden& Mantle, Jaypee Brothers, New Delhi1994.
40. Physical Therapy of the cancer Patient – McGaryexcharles. Churchill Livingstone, New York 1989.
41. Industrial Therapy – Key G.L, Mosby, St. Louis1987.

JOURNALS

1. Journal of Indian Association of Physiotherapy

2. Physical Therapy (APTA, America)
3. Physiotherapy (CSP, London)
4. American journal of Physical Medicine &Rehabilitation
5. Physiotherapy(Canada)
6. Physiotherapy – theory &Practice
7. Australian Journal of Physiotherapy
8. Clinical Kinesiology
9. Journal of Bio-mechanics
10. American Journal of Sports Exercises
11. Pediatric Physical Therapy
12. Journal of Rehabilitation – Research &Development
13. Archives of Physical Medicine &Rehabilitation
14. Journal of Pediatric Orthopedics.
15. Journal of Neurological Sciences.

SECTION – III

TABLE – III

MODEL CHECK-LIST FOR EVALUATION OF JOURNAL REVIEW PRESENTATIONS

Name of the student:

Name of Faculty / Observer:

Date:

Sr. No	**Items for observation during Presentation**	**Poor (0)**	**Below Average (1)**	**Average (2)**	**Good (3)**	**Very Good (4)**
1	Article chosen was					
2	Extent of understanding of Scope & objectives of the paper by the candidate					
3	Whether cross references have been Consulted					
4	Whether other relevant publications Consulted					
5	Ability to respond to questions on the paper/ subject					
6	Audio-visual aids used					
7	Ability to defend the paper					
8	Clarity of presentation					
9	Any other observation					
	Total Score					

TABLE – IV

MODEL CHECK-LIST FOR EVALUATION OF SEMINAR PRESENTATIONS

Name of the student:

Name of Faculty / Observer:

Date:

Sr. No.	Items for observation during presentation	Poor (0)	Below Average (1)	Average (2)	Good (3)	Very Good (4)
1	Whether other relevant publications consulted					
2	Whether cross references have been consulted					
3	Completeness of preparation					
4	Clarity of presentation					
5	Understanding of subject					
6	Ability to answer the questions					
7	Time schedule					
8	Appropriate use of Audio – Visual aids					
9	Overall performance					
10	Any other observations					
	Total score					

TABLE – V

MODEL CHECK-LIST FOR EVALUATION OF CLINICAL WORK

Name of the student: Name of Unit Head: Date:

Sr. No.	Points to be considered	Poor (0)	Below Average (1)	Average (2)	Good (3)	Very Good (4)
1	Regularity of the attendance					
2	Punctuality					
3	Interaction with collegues and supportive staff					
4	Maintenance of case records					
5	Presentation of cases during rounds					
6	Investigation work up					
7	Besides manners					
8	Rapport with patients					
9	Treatment approaches & techniques					
10	Overall quality of ward work					
	Total score					

TABLE – VI

EVALUATION FOR CLINICAL PRESENTATION

Name of the student:

Name of Faculty:

Date:

Sr. No	Points to be considered	Poor (0)	Below Average (1)	Average (2)	Good (3)	Very Good (4)
1	Completeness of History					
2	Whether all relevant points elicited					
3	Clarity of presentation					
4	Logical order					
5	Mentioned all positive and negative points of importance					
6	Accuracy of general physical examination					
7	Whether all physical signs elicited Correctly					
8	Whether any major signs missed or misinterpreted					
9	Diagnosis – Whether it follows logically from history & findings					
10	Investigation required Special investigation					
11	AIMS					
12	MEANS					
13	Treatment Techniques					
14	Other					
	Grand Total					

TABLE – VII

MODEL CHECK-LIST FOR EVALUATION OF TEACHING SKILL PRACTICE

Name of the student:

Name of Faculty:

Date:

Sr. No.	Details	Strong Point	Weak Point
1	Communication of the purpose of the talk		
2	Evokes audience interest in the subject		
3	The introduction		
4	The sequence of ideas		
5	The use of practical examples & / or illustrations		
6	Speaking style (enjoyable, monotonous, etc., Specify)		
7	Attempts audience participation		
8	Summary of main points at the end		
9	Asks questions		
10	Answer questions asked by the audience		
11	Rapport of the speaker with his audience		
12	Effectiveness of the talk		
13	Uses Audio – Visual aids appropriately		

TABLE – VIII

MODEL CHECK – LIST FOR DISSERTATION PRESENTATION

Name of the student:

Name of Faculty:

Date:

Sr. No.	Points to be considered divine	Poor (0)	Below Average (1)	Average (2)	Good (3)	Very Good (4)
1	Interest shown in selecting a topic					
2	Appropriate review of literature					
3	Discussion with guide & other faculty					
4	Quality of protocol					
5	Preparation of proforma					
	Total score					

TABLE – IX

CONTINUOUS EVALUATION OF DISSERTATION WORK BY GUIDE

Name of the student:

Name of Faculty:

Date:

Sr. No.	Items for observation during presentation	Poor (0)	Below Average (1)	Average (2)	Good (3)	Very Good (4)
1	Periodic consultation with guide					
2	Regular collection of case material					
3	Depth of analysis / discussion					
4	Departmental presentation of Findings					
5	Quality of final output					
6	Others					
	Total score					