SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Introduction to Computer & Emerging Technologies

Semester 1

CODE: 13030101

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:-The objective of this course is introducing the fundamental in information technology. The course covers different aspects in information technology such as

- Basics of Data and Information.
- Acquisition of different types of information like numbers, text, multimedia etc.
- Issues of Data Storage and organization.
- Processing of different types of information.
- Emerging trend, societal impacts and applications of Information technology.

Prerequisites:-To familiarize the trainee with basic concepts of computer programming and developer tools. To present the syntax and semantics of the "C" language as well as data types offered by thelanguage. To allow the trainee to write their own programs using standard language infrastructureregardless of the hardware or software platform

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	Introducing Today's Technologies: Computers, Devices,	8

	and the Web Today's Technology o Computers o Mobile and Game Devices o Data and Information o The Web o Digital Security and Privacy o Programs and Apps o Operating Systems o Applications o Communications and Networks o Wired and Wireless Communications o Networks o Computers and Mobile Devices o Mobile Computers and Desktops o Servers o Supercomputers o Cloud Computing o Ports and Connections	
2	**Processors, Memory, Adapters and Buses** Inside the case : o Motherboard o Processors o Memory o Adapters o Buses **Digital Storage** o Storage o Hard Drives o Portable Flash Memory Storage	6
3	**Input and Output Devices** o Input Devices o Keyboards o Pointing Device o Touch Screens o o Scanners and Reading Devices o **Output Devices** o Displays o Printers o Other Output Devices	6
4	**Computer Codes** o Introduction to Computer Codes o Decimal System o Binary System o Hexadecimal System o Octal System o 4-bit BCD System	7

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	○ 8-bit BCD System ○ ASCII code ○ 16-bit Unicode	
5	**Conversion of Numbers (Includes fixed and fractional numbers)** ○ Non-Decimal to Decimal ○ Binary to Decimal ○ Decimal to Binary ○ Binary to Octal ○ Octal to Binary ○ Octal to Decimal ○ Decimal to Octal ○ Binary to Hexadecimal ○ Hexadecimal to Binary ○ Hexadecimal to Decimal ○ Decimal to Hexadecimal	7

Learning Outcomes:-

On the completion of the course students will be able to:

1) Know the fundamental terms associated with computers, mobile devices and new technologies.
2) Know different types of computers, mobile devices, memory and various input and output devices.
3) Understand the basic uses and applications of computer in business and society.
4) Get familiar with various computer codes

Teaching & Learning Methodology:-

During theory lectures foundations of information technology related concepts will be introduced to students. Emphasis will be given on acquisition, storage and processing of data to generate meaningful information. Students will be made familiar with applications related to information technology. Emerging trends and societal impacts of information technology will be discussed to students. Students will give practical exposure by demonstrating real information technology system.

Books Recommended:-

1. Discovering Computers 2016 (First Edition) Cengage Learning By Misty E. Vermaat; Susan L. Sebok; Steven M. Freund; Jennifer T. Campbell; Mark Frydenberg (Shelly Cashman Series)
2. Pearson India By M. Morris R. Mano
3. Fundamentals of Computer(First Edition- 2009) Publisher: McGraw-Hill by Balaguruswamy
4. Computer Fundamentals(First Edition-2010) Publisher: Pearson by Anita Goel

E-Resources:-

1. http://sct.emu.edu.tr/courses/it/index.php?id=itec103&page_type=file_directory&elemen t_id=2 [Information Technology fundamentals]
2. http://technology.ku.edu/software [Information Technology related applications]
3. http://www.managementstudyguide.com/emerging-trends-in-informationtechnology.htm [Emerging trends in Information Technology]

Practical List:-

Sr. No.	Practical
1	Run different commands of MS DOS – CD, DIR, COPY, REN, CLS, MD, CD, RD etc.
2	Study information of Internet connectivity components line, VSAT, Broadband
3	Study information of Internet connectivity components Modem, IP Sharer, Hub, and Switch.
4	Study different web Browsers- Internet Explorer, Fire fox, downloading of files
5	Connect the Internet; open any website of your choice and save the Webpages. Search any topic related to your syllabus using any search engine and download the relevant material.

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Programming in C

Semester 1

CODE: 13030102

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	0	4	7	7	30	50	70	-	150

Objectives:-Thecourse fully covers the basics of programming in the "C" programming language anddemonstrates fundamental programming techniques, customs.

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Introductionto Programming Languages:** • Introduction to Machine level language • Introduction to Assembly language • Introduction to Higher level language • Limitations and Features. • Classification of Computer Language- Procedural Language and Non Procedural Language	5
2	**Tools and Techniques of Problem Analysis** • Algorithm Development and Flow Chart • Numerous Examples in Algorithm Development and Flow Chart	4
3	**Getting Started With 'C' Language:** • Basic Structure of C	9

	• Executing C program • Character set & C Tokens • Identifiers & Keywords • DataTypes • Constants and Variables • Type Casting • o Comments	
4	**C Language Operators and Decision Making:** **Operators& Expression** • TypesofOperatorsandExpression • Precedence&Associativity **Console based I/O andrelated built-inI/Ofunction** • printf(),scanf(),getch(),getchar(),putchar() • Concept of HeaderFile and #include,#define **Decision Making Structure** • If • If-else • NestedIf-else • Switch	10
5	**Control Structure & Array:** **Loop ControlStructure** • While • Do-While • For • Nested loop **Other Statements** • break,continue,goto,exit **Array** • One,Two – Dimensional Arrays • Initializationand workingwith Array. • Introduction to MultidimensionalArrays.	10

Learning Outcomes:-

On the completion of the course students will be able to:

1. To create their own logic and implement using C Programming.

2. To understand how to use programming in day to day application

TEXT BOOK/S:

1. Introduction to C Programming

Publication : Oxford

By Reema Thareja

REFERENCE BOOKS:

1. Computer Fundamentals & Programming in C

Publication :Oxford

By Pradip Dey, Manas Ghosh

2. Programming in ANSIC (Fifth Edition 2011)

Publication :McGraw Hill

By Balagurusamy

WEB RESOURCES:

1. https://www.tutorialspoint.com/cprogramming/
2. http://www.javatpoint.com/c-programming-language-tutorial
3. https://www.programiz.com/c-programming
4. http://www.cprogramming.com/tutorial/c-tutorial.html
5. http://www.programmingsim

Practical List:-

Sr. No.	Practical's
1	Write a program to print "HELLO".
2	Write a program to display multiplication table.
3	Write a program to print +1/2+1/3+1/4+.....+1/N series.
4	Write a program to find sum of all integers greater than 100 & less than 200 and are divisible by 5.
5	Write a program to convert days into months and days
6	Write a program to print following patterns.

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	<table><tr><td>* * * * * * * * * *</td><td>1 2 3 4 5 2 3 4 5 3 4 5 4 5 5</td></tr><tr><td>AAAAA BBBB CCC DD E</td><td>1 0 1 1 0 1 0 1 0 1</td></tr></table>
7	Write a program for factorial number.
8	Write a program to find sum of all integers greater than 100 & less than 200 and are divisible by 5.
9	Make a programs using If, If-else, If-else-if and Nested If statements.
10	Make a program using goto and break statement.
11	Write a programs using while loop and do-while loop.
12	Write a program to read array of integers and print it in reverse order

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Internet Web Designing I

Semester 1

CODE: 13030103

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Theory	Tutorial	Pr	Total		Theory	Practical	Theory	Practical	
3	0	4	7		30	50	70		150

Objectives: -To develop the skill about the basic and important terminology of Internet.To make the students able for web site design fundamentals using HTML scripting.

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Introduction to Internet:** Introduction to Internet • How does Internet works? • Internet addressing & DNS • Internet Vs Intranet • Switching: o Circuit switching o Packet switching o Message switching	

	• Different types of connections o Dial-UP connections o ISDN o ADSL o Leased Line Connections o Satellite Connections • Internet service provider • Computer Networks o Use of computer Networks o Network Devices o Network Types o Network Topologies • E-Mail o Introduction o E-mail System o E-mail Protocols o About E-mail addresses o Structure of E-mail Message o E-mail clients and server o Mailing list o E-mail security • World Wide Web o Introduction o Basic Elements • Search engines o Introduction o Criteria o Search Agent o About Popular search engines	
2	**Getting Started With HTML 5:** o New Structure o New Form Elements and Attributes	

	o Browser support • Defining HTML Markup • Basic structure of HTML Document o The <!DOCTYPE html> Element o The <HTML> Element o The <head> Element o The <title> Element o The <Body> Element • Modifying the background of an HTML webpage o Adding Background color o Adding Background Image • Specifying Metadata about an HTML webpage • Introduction to new elements in HTML 5 o The Markup Elements o The Media Elements o The Canvas Elements o The form elements o The Input type attribute values	
3	**Working with Text,List,Tables and Frames:** • Adding a plain text to an HTML webpage • Adding text in new line • Creating Headings on webpage • Creating a paragraph • Creating a Horizontal Rule • Creating a Subscript and Superscript • Aligning the Text • Formatting the Text • Grouping the Text • Indenting Quotations • Working with character entities	

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	• Commenting the Text • Working with Lists o Creating an Unordered List o Creating an Ordered List o Creating an Definition List o Nested Lists • Working with Tables o Creating a Table o Specifying a caption to a Table o Adding a Table Headings o Setting the Table Borders o Aligning a Table and Cell content o Changing the background color of a Table o Setting a Cell Padding and Cell Spacing o Nesting Tables • Working with Frames o Creating a Frames o Defining new element specific attributes o Specifying width and height of the Frame o Applying Hyperlink Target to a frame	
4	**Working with Hyperlinks, Images, Multimedia, Forms and Controls:** • Working with Hyperlinks o Creating Hyperlins o Setting hyperlink color o Linking Different sections of page • Working with Images o Inserting an Image on webpage o Display alternate text for an Image	

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	o Adding Border to an Image o Align an Image o Using Image as a Links • Creating Image Maps • Working with Multimedia o Embedding multimedia on web page o Handling Browser that do not support embedding o Creating a link to a multimedia file o Using <object> tag insert objects • Creating an HTML Form o Specifying the Action URL and The method to send form • Adding Controls to an HTML Form o Using the<input> tag o Adding Text Area<textarea> o Adding Selection Control • Understanding new form elements o The <datalist> element o The <keygen>Element • Grouping the controls of HTML Form • Specifying Label for a control	

Learning Outcomes: -

On the completion of the course students will:

1.Understand the meaning and syntax of different tags of HTML5

2.Learn the basic differences between HTML and HTML5

3.Understand the basic internet terminology and technology

4.To design web pages using simple and advanced tags of HTML5.

5.To understand the fundamental concept of Google AdSense and Analytics.

Books Recommended:

1. World wide web Design with HTML(First Edition-2010)
Tata McGraw Hill
By C Xavier

2. Web Enabled commercial application development using HTML, Javascript, DHTML and php
BPB Publication.By Ivan Bayross

3. The Complete Reference HTML and CSS (Fifth Edition)
McGraw Hill Education
Thomas A Powell

E-Resources:

1. HTML5 Introduction(https://www.w3schools.com/html/html5_intro.asp)
2. http://www.tutorialspoint.com/ht...
3. https://www.udemy.com/learn-html...
4. HTML 5 Cheat Sheet (PDF) - Smashing Magazine
5. http://html5please.com/
6. http://diveintohtml5.info/

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SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF COMPUTER APPLICATION

Discrete mathematics (New Syllabus 2021)

Code: _13030104

B.C.A.: 1st SEMESTER

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Viva	
3	-	2	5	5	30	30	70	20	150

Objectives:-The BASIC MATHS program at SSIU provides Mathematics majors with a quality undergraduate education in liberal studies, mathematics, science, to prepare them

- To, within a few years of graduation, have attained positions as professionals in industry, government, or academia;
- To have become responsible, accountable, current professionals who work effectively in multidisciplinary teams, readily adapt to broad technical challenges, and demonstrate leadership.

Prerequisites:- Students will able to understand Sets and functions, Limit of a Function and derivative of a functions. In Co-ordinate geometry they will learn about Quadrants and area of triangles. In integration they will learn simple basic formula of integration. Matrices, Types of Matrices, Algebraic Operations on Matrices, Transpose of a Matrix, Symmetric and Skew Symmetric Matrices, Elementary Operation (Transformation) of a Matrix, Minors and Cofactors of matrices, Adjoint and Inverse of a Matrix.

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Set Theory** ➢ Basic Definitions of Set theory ➢ Set Operations (Union, Intersection, Complement of a set,	03

	Cartesian product of a set) ➢ Properties of set operations ➢ De-Morgan's Law	
2	**Groups and Graph Theory:** ➢ Definition and examples ➢ Permutation groups, subgroups , cyclic group ➢ Finites and infinite graphs, paths and circuits ➢ Isomorphism, connected Graphs, Euler and Hamiltonian graphs , Sub graphs ➢ Trees ➢ Distance and center of tree ➢ Binary and spanning tree.	08
3	**Limit And Differentiation** ➢ Concept of Limit ➢ Some Standard Limits ➢ Continuity of a functions ➢ Definition of Derivative ➢ Rules for differentiation, Chain rule , ➢ logarithmic differentiation , ➢ higher order derivative ➢ Differentiation of function of a function	06
4	**Integration** ➢ Introduction to indefinite integral and Definite Integrals ➢ Substitution method and Integration by parts of Definite and indefinite integrals,	05
5	**MATRIX** ➢ Definition of Matrix ➢ Types of Matrix ➢ Invertible Matrix ➢ Rank of Matrix ➢ Solution of Simultaneous equations	06
6	**Lattices And Boolean Algebra** ➢ Introduction to Lattice ➢ Lattice as Partially Ordered Sets ➢ Properties of Lattices ➢ Sub-Lattice ➢ Types of lattices ➢ Definition and Properties of Boolean Algebra ➢ Boolean Sub-Algebra ➢ Isomorphic Boolean Algebra Boolean Expressions and their Equivalence	12

Learning Outcomes:-

1. Properties of set operations, application of De-Morgan's Law.
2. Represent domain, co domain and type of a function.
3. Decide limit, continuity and discontinuity of a function.
4. Apply the knowledge to solve some practical problems, such as constrained optimization problems and other problems involving Partial differentiation.
5. Able to evaluate distance, quadrant and area of a triangle.
6. Evaluate integration using standard formulas.
7. Evaluate determinants and inverse of a matrix., solution of linear system of equations

Teaching & Learning Methodology:-

- 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.
- Include inquiry based learning exercises in international or intercultural contexts.
- Include group work, with groups representing diverse cultures and nationalities.

Books Recommended:-

1. Business mathematics by V.K.Kapoor ,S.chand &sons Publication
2. Thomas' Calculus, Maurice D. Weir, Joel Hass, Frank R. Giordano, Pearson Education
3. Introduction to Linear Algebra with Application, Jim Defranza, Daniel Gagliardi, Tata McGraw-Hill
4. Advanced Engineering Mathematics, Erwin Kreysig, Wiley Publication.
5. Elementary Linear Algebra, Ron Larson, Cengage Learning
6. Engineering mathematics by Anthony Craft,Robert Davison & Martin Hargreaves, Pearson Education

E-Resources:-

The above mentioned contents can be referred through:
http://www.gujaratuniversity.org.in/web/NWD/Downloads/Syllabus/List%20of%20Syllabus/20%20-%20UG-CBCS%20Syallabus%20(wef%20Jun-2011)/BCA/Syllabus_BCA_Sem-1.pdf

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Communication Skills

Semester 1

CODE: 13030105

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
2	-	-	2		30	-	70	-	100

Objectives: -

- To enhance students' communicative and linguistic approach in English
- To provide icebreaking approach through LSRW skills and soft skills
- To learn ways to enhance overall communication skills

Prerequisites:-

- Being able to communicate effectively is the most important of all life skills; hence, students are expected to have good spirit for learning English as second language.

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Introduction to Communication Skills : LSRW** 1. Need for Effective communication 2. Importance of English as second language 3. Importance of Communication 4. Know What You Want To Say	6
2	**Grammar** Subject Verb agreement, Auxiliary and Modal auxiliary verb, parts and types of sentences, active and passive voice, Tenses.	4
3	**Basics of Communication** 1. Definition & types of Communication, 2. Cycle of communication 3. Forms of communication	8

	4. Components of Verbal & Non-verbal communication 5. Kinesics 6. Paralinguistic/ paralanguage 7. Chronemics 8. Proxemics	
4	**Listening Skill** 1. Definition & Types of Listening 2. Barriers to effective listening 3. Techniques to be good listener 4. Listening audio clips (practical exercise)	4
5	**Reading Skill** 1. Reading techniques 2. Reading Strategies 3. Comprehensive reading 4. Book review	6
6	**Speaking Skill & Phonetics transcription**	6
7	**Writing Skill** 1. Answering comprehension practical 2. Business Letters 3. Email writing	5
8	**Short Stories** • The Selfish Giant by Oscar Wilde • How Much Land Does a Man Need? By Leo Tolstoy	3
	Total hours:	42

Learning Outcomes: -

* Students will be able to communicate effectively.

* They feel confident in speaking and writing English language.

* Students will be able to improve the language skills i.e. Listening Skill, Speaking Skill, Reading Skill, and Writing Skill (LSRW).

* To make them learn about life skills and soft skills.

Teaching & Learning Methodology:-

- Power point presentation
- 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.
- It includes audio video clips that can provide ample number of exercise to the students
- Face- to face oral communication to provide a platform where they can perform and practice well.

Books Recommended:

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1. Lesikar R V, Flatley M E ,Rentz K and Pandey Business Communication: Making Connections in a Digital World 2009: New Delhi, Tata Mcgrow Hill
2. Raman Minakshi, Communication Skills, 2011: New Delhi, Oxford University Press.
3. Leech, Geoffrey and Jan Svartvik. A Communicative Grammar of English. New Delhi: Pearson, 2009.
4. Wren & Martin, High school English Grammar, S. Chand and Co. Ltd

E-Resources:

1. http://www.free-english-study.com/
2. http://www.english-online.org.uk/course.htm
3. http://www.english-online.org.uk/

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SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF COMPUTER APPLICATION

Statistical Method and Operation Research

CODE :__13030201_____

BCA : 2nd 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	50	70	-	150

Objectives: - Operation research and statistical method program at SSIU provides Mathematics majors with a quality undergraduate education in liberal studies, mathematics, science, and to prepare them

- To, within a few years of graduation, have attained positions as professionals in industry, government, or academia;
- To have become responsible, accountable, current professionals who work effectively in multidisciplinary teams, readily adapt to broad technical challenges, and demonstrate leadership.

Prerequisites:- Student should be able to understand Measures of Central Tendency and Dispersion. Students entering in Probability should have a firm grasp of mathematics. Permutation and combinations of functions, Factorial Representation of Permutation and Combinations and Linear Programming Problem, Transportation and Assignment and Game theory from operation research.

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Measures of Central Tendency and Dispersion:** ➢ Arithmetic mean, Median,Mode, Harmonic	05

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	Mean, Geometric mean for grouped and ungrouped data. ➢ Concept of dispersion, Absolute and relative measure of dispersion, range variance, Standard deviation,Coefficient of variation	
2	**Permutation and Combinations** ➢ The Fundamental principle of counting ➢ Factorial Representation of Permutation ➢ Permutation Problems ➢ Combinations ➢ Factorial Representation of Combinations ➢ Combination Problems	03
3	**Sample space, Events and Probability** ➢ Experiments and random experiments, ➢ Ideas of deterministic and non-deterministic experiments; ➢ Definition of sample space, discrete sample space, events; Types of events, ➢ Union and intersections of two or more events, mutually exclusive events, Complementary event, Exhaustive event; Simple examples. ➢ Classical definition of probability, ➢ Addition theorem of probability without Proof (up to three events are expected). ➢ Definition of conditional probability ➢ Definition of independence of two events, simple numerical problems	08
4	**Linear Programming Problem:** ➢ Introduction, Requirement of LP, ➢ Basic Assumptions, Formulation of LP, General Statement of LP, ➢ Solution techniques of LP: Graphical Methods, ➢ Analytical Methods: Simplex, Big M and Two Phase, ➢ Sensitivity Analysis, ➢ Primal and Dual Problems, ➢ Economic Interpretation	12
5	**Transportation and Assignment:** ➢ Transportation Problems definition, Linear form, ➢ Solution methods: North west corner method,	08

	➢ least cost method. ➢ Vogel's approximation method. ➢ Transshipment Problems. ➢ Assignment Problems and Travelling sales man Problem	

Learning Outcomes Course Outcome:

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 able to define and formulate mathematical problems.
3. Students will be able to select optimal problems solving techniques for a given problemusing LP.
4. Students will be able to formulate and solve transportation, travelling sales man andtransshipment problems.
5. Students will be able to formulate and solve optimization problems related to job/ workassignments.
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 fordifferent applications.\
8. Student also learn basic concept of statistics and probability .

Teaching & Learning Methodology:-

- 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.
- Include inquiry based learning exercises in international or intercultural contexts.
- Include group work, with groups representing diverse cultures and nationalities.

Books Recommended:-

1. Advanced Engineering Mathematics, Erwin Kreysig, Wiley Publication.
2. Gupta and Kapoor : Fundamentals of Statistics, Sultan Chand and Sons.
3. Operation Research by J.K. Sharma

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Logic Development and Programming II

Semester 2

CODE: 13030202

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	0	2	5	4	30	50	70	-	150

Objectives:-The course fully covers the basics of programming in the "C" programming language and demonstrates fundamental programming techniques, customs.

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Structures & Unions:** **Structures** • Defining a structure • Accessing a structure variable • Operations on structure members • Copying and comparing variables • Arrays of structure • Arrays within Structures **Unions** • Defining Unions	11
2	**Pointer:** • Definition and Concept • Advantage of using pointer • Pointer Arithmetic	11

	• Array of Pointers • Pointers and Functions • Pointers with UDFs	
3	**Dynamic Memory Allocation &Link List:** • Dynamic Memory Allocation • Memory Allocation Function • malloc() • calloc() • realloc() • free() **Linked List** • Concepts • Advantages • Overview of types of Linked list • Operations on Singly Linked List(create,display, insert at • first,insert at last,delete at first,delete at last) • Application of Link list	8
4	**C Language Operators and Decision Making:** • **Files** • Concepts of File Management • Files functions – fopen(), fclose(), fprintf(), fscanf(), • fseek(), ftell(),rewind(), putc(), getc(), putw(),getw() • Error handling functions • **Preprocessors** • Types of Preprocessors • Macro substitution directives • File inclusion directives • Compiler control directives	8

Learning Outcomes:-

On the completion of the course students will:

1. To obtain in depth knowledge of C language.

2. To understandadvancedfeatures of C Programming Language.

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TEXT BOOK/S:

1. Introduction to C Programming

Publication : Oxford

By Reema Thareja

REFERENCE BOOKS:

1. Computer Fundamentals & Programming in C

Publication :Oxford

By Pradip Dey, Manas Ghosh

2. Programming in ANSIC (Fifth Edition 2011)

Publication :McGraw Hill

By Balagurusamy

WEB RESOURCES:

1. https://www.tutorialspoint.com/cprogramming/
2. http://www.javatpoint.com/c-programming-language-tutorial
3. https://www.programiz.com/c-programming
4. http://www.cprogramming.com/tutorial/c-tutorial.html
5. http://www.programmingsim

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Database Management System

Semester 2

CODE:13030203

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	4	7	5	30	50	70	-	150

Objectives: -This course introduces students to information of data, working of related data to gainknowledge. Students also will design the real life application

Prerequisites:-(1) Elementary knowledge about computers including some experience Using UNIX or Windows.

(2)Computer Programming & Utilization

(3) Knowledge about data structures and algorithms, corresponding to the basic course on Data Structures and Algorithms.

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Introduction:** • Data Vs. Information • Introduction of the Database and the DBMS • Role, Advantage and Disadvantages of DBMS • Types of Database	4
2	**Distributed Database Management Systems:** • Evolution of DDBMS • Distributed Processing and Distributed Database	2

	• DDBMS Advantages and Disadvantages • Characteristics of DDBMS • Components of DDBMS	
3	**Database Systems:** • The Database System Environment • DBMS Functions • The Relational Model • The E-R Model	4
4	**The Relational Database Model:** • A logical view of Data • Keys • Integrity Rules • Concept of Functional Dependency • Relational Set Operators • The Data Dictionary and The System Catalog • Relationship within the Relational Database	10
5	**The Entity Relationship Model:** • Entities • Attributes • Relationships • Connectivity and Cardinality • Existence Dependence • Relationship Strength • Weak Entities • Relationship Participation • Relationship Degree • Recursive Relationship • Composite Entities • Developing an ER diagram (Using Crow's-foot Model)	10
6	**Normalization of Database Tables:** • The need of Normalization • The Normalization process	10

Learning Outcomes:-

Install, configure, and interact with a relational database management system;Describe, define and apply the major components of the relational database model todatabase design;Learn and apply the Structured Query Language (SQL) for database definition and manipulation;Utilize a database modeling technique for a single entity class, a onetoone (1:1) relationship between entity classes, a one-to-many (1:M) relationship between entity classes, a many-to-many (M:M)relationship between entity classes, and recursive relationships;Define, develop and process single entity, 1:1, 1:M, and M:M database tables;Learn and implement the principles and concepts of information integrity, security and confidentiality;Apply ethical computing concepts and practices to database design and implementation

Megh Parul

Teaching & Learning Methodology:-

The challenge that teaching and learning computerprogramming presents, has encouraged thedesign and implementation of various new and innovativecomputer programming teaching methods.The presented methods aim to improve thestudents' success rates by increasing their motivationand encouraging the greater self-engagement, not only in assignments provided within a course, but also in further exploration of the programming challenges outside the assignments' boundaries.

Books Recommended:-

1.An introduction to Database Systems, C J Date, Addition-Wesley.
2, C Programming: Test Your Skills, 1/e by Ashok Kamthane
3, Database System Concepts, Abraham Silberschatz, Henry F. Korth& S. Sudarshan, McGraw-Hill.
4, Understanding SQL by Martin Gruber, BPB
5, SQL-PL/SQL by Ivan bayross

E-Resources:-

1,https://en.wikipedia.org/wiki/Database_management_system
2,https://searchdatamanagement.techtarget.com/resources/Database
3, https://searchsqlserver.techtarget.com/.../database-management-system

Practical List:-

Sr. No.	Practical
1	To study DDL-create and DML-insert commands. **(I)**Create tables according to the following definition. CREATE TABLE DEPOSIT (ACTNO VARCHAR2(5) ,CNAME VARCHAR2(18) , BNAME VARCHAR2(18) , AMOUNT NUMBER(8,2) ,ADATE DATE); CREATE TABLE BRANCH(BNAME VARCHAR2(18),CITY VARCHAR2(18)); CREATE TABLE CUSTOMERS(CNAME VARCHAR2(19) ,CITY VARCHAR2(18)); CREATE TABLE BORROW(LOANNO VARCHAR2(5), CNAME VARCHAR2(18), BNAME VARCHAR2(18), AMOUNT NUMBER (8,2)); **(ii)**Insert the data in above tables **(iii)**From the above given tables perform the following queries: (1)Describe deposit, branch. (2)Describe borrow, customers. (3)List all data from table DEPOSIT. (4)List all data from table BORROW. (5)List all data from table CUSTOMERS. (6)List all data from table BRANCH. (7)Give account no and amount of depositors. (8)Give name of depositors having amount greater than 4000.

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	(9)Give name of customers who opened account after date '1-12-96'.
2	Create the below given table and insert the data accordingly 1. Create Table Job (job_id, job_title, min_sal, max_sal) 2. Create table Employee (emp_no, emp_name, emp_sal, emp_comm, dept_no) 3. Create table deposit(a_no,cname,bname,amount,a_date). 4. Create table borrow(loanno, cname, bname, amount). Perform following queries (1)Retrieve all data from employee, jobs and deposit. (2)Give details of account no. and deposited rupees of customers having account opened between dates 01-01-06 and 25-07-06. (3)Display all jobs with minimum salary is greater than 4000. (4)Display name and salary of employee whose department no is 20. Give alias name to name of employee. (5)Display employee no,name and department details of those employee whose department liesin(10,20)..
3	To Perform various data manipulation commands, aggregate functions and sorting concept onall created tables. (1)List total deposit from deposit. (2)List total loan from karolbagh branch (3)Give maximum loan from branch vrce. (4)Count total number of customers (5)Count total number of customer's cities. (6)Create table supplier from employee with all the columns. (7)Create table sup1 from employee with first two columns. (8)Create table sup2 from employee with no data (9)Insert the data into sup2 from employee whose second character should be 'n'and string should be 5 characters long in employee name field. (10)Delete all the rows from sup1. (11)Delete the detail of supplier whose sup_no is 103. (12)Rename the table sup2. (13)Destroy table sup1 with all the data. (14)Update the value dept_no to 10 where second character of emp. name is 'm'. (15)update the value of employee name whose employee number is 103.
4	To study Single-row functions. (1) Write a query to display the current date. Label the column Date (2) For each employee, display the employee number, job, salary, and salary increased by 15% and expressed as a whole number. Label the column NewSalary (3) Modify your query no 4.(2) to add a column that subtracts the old salary fromthe new salary. Label the column Increase (4) Write a query that displays the employee's names with the first letter capitalized and all other letters lowercase, and the length of the names, for all employees whose name starts with J, A, or M. Give each column an appropriate label. Sort the results by the employees' last names.

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Internet Web Designing – II

Semester 2

CODE: 13030204

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Theory	Tutorial	Pr	Total		Theory	Practical	Theory	Practical	
3	-	2	5	4	30	50	70	-	150

Objectives: -To develop the skill about the basic and important terminology of Internet.To make the students able for web site design fundamentals using HTML scripting,CSS & XML, javascript.

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Introduction to HTML 5** Introduction • Basic Elements of HTML 5 • Markup Element o <article> o <aside> o <command> o <detail> o <summery> o <figure>	

	o <footer> o <header> o <hgroup> o <mark> o <meter> o <nav> o <progress> o <ruby> o <rt> o <rp> o <section> o <time> • Media Element o <audio> o <video> o <source> o <embed> • Canvas Element • Form Elements o <detailist> o <keygen> o <output> o The Input type attribute values o tel, search, url, email, datetime, date, month, week, time, datetime-local, number, range, colo	
2	**Style sheets :** o Need for CSS o introduction to CSS o basic syntax and structure using CSS o background images o colors and properties	

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	o manipulating texts using fonts, borders and boxes o margins o padding lists o positioning using CSS,	
3	**Introduction to JavaScript** • JavaScript Introduction o Understanding JavaScript o About Dynamic HTML o Selecting an development environment forjavaScript o HTML and JavaScript • Advanced JavaScript o Element of JavaScript o Variables o Operators o Flow control statement o Arrays o Functions o Event handling o Browser and JavaScript o Web page and JavaScript o Frames and JavaScript • Frames and Validation in JavaScript o Frames and JavaScript o Validating User forms	
4	**Introduction to XML and XML Document Type Definition** • XML o Introduction o XML versus HTML o XML terminologies o XML standards(XML,XML namespace,	

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	DTD,CSS,XSL,XML schema, Xquery, Xlink,Xpointer,Xpath) o XHTML • XML Documentation o Introduction to DTD o Document type declaration o Element type declaration o Attribute declaration o Conditional sections, limitations of DTD	

Learning Outcomes: -

On the completion of the course students will:

1.Understand the meaning and syntax of different tags of HTML

2.Learn the basic differences between HTML and HTML5

3.Understand the basic internet terminology and technology

4.To design web pages using simple and advanced tags of HTML.

Books Recommended:

1. HTML 5 in Simple Steps
   Publisher: DreamTech PressByKongent solution
   (Chapter-2 for unit 1)
2. Javascript 2nd Edition Step by step
   Author: Steve suehring
   (Chapter-22 for unit 3)
3. XML and Related Technologies (First Edition 2009)
   Pearson Education

E-Resources:

1. HTML5 Introduction(https://www.w3schools.com/html/html5_intro.asp)
2. http://www.tutorialspoint.com/ht...
3. https://www.udemy.com/learn-html...
4. HTML 5 Cheat Sheet (PDF) - Smashing Magazine
5. http://html5please.com/
6. http://diveintohtml5.info/

Parh

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Digital Electronics

Semester 2

CODE: 13030205

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	2	5	4	30	50	70	-	150

Learning Outcomes:

- Learn various number systems and their conversion used in digital components
- Introduce significant evolution in digital electronics
- Understand basic digital components for circuit design.
- Design basic electronics circuit for various applications and their analysis

Course outline:-

Sr.No.	Course Contents	Lectures (Hours)
1	**Introduction to Computer Organization** Digital computers, Basic components of digital computer, instructions, programming systems, assembly languages, high-level languages summary	3
2	**Number systems** Binary, Octal, Decimal, Hexadecimal numbers, addition, subtraction, mu ltiplcation, division, negative numbers, use of complements to represent negative numbers, complements in other numbering system, BCD numbers.	7
3	**Boolean algebra and Mapping Methods**	8

	Fundamental concepts of Boolean algebra, AND, OR, NOT, NAND, NOR gates, logical expressions, basic laws of Boolean algebra, simplification of expression, De Morgan's Theorem, sum of product, product of sum, K-maps to simplify expression (two-variable, three-variable, fourvariable), logical circuits using logical gates.	
4	**Digital integrated circuits** Introduction, Latch, Flip-Flop, register, multiplexer, De-multiplexer, Decoder, Encoder.	6
5	**Modern Computer Organization** Introduction, user and computer, computer organization, main memory, CPU operation, Interrupt concept, bus concept, booting sequence.	5
6	**CPU Architecture and instruction set** Introduction, CISC and RISC, Instruction set design, addressing modes, data representation, and binary data.	6

Reference Books:

1. Digital Computer Fundamentals (Sixth Edition) Thomas Bartee, McGraw-Hill
2. Computer Architecture and organization by B Govindrajalu (TMH)
3. Advanced microprocessor and interfacing by Badri Ram
4. Digital logic and computer design by M Moris Mano

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Data and File Structure

Semester 3

CODE: 13030301

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	2	5	4	30	50	70	-	150

Objectives: -The course improves the Data structure logical ability. To introduce various techniques for representation of the data in the real world. To teach concept of protection and management of data.

Prerequisites:-Computer Programming & utilization

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Introduction:** Data management concept, Data types,Perfomance analysis, Time & Space Complexity, Asymptotic notations Types of Data Structure-Linear and non Linear	5
2	**Linear Data Structure:** Array: Representation of arrays, Applications of arrays, sparse matrix and its representation Stack: Stack-Definitions & Concepts, Operations On Stacks, Applications of Stacks, Polish Expression, Reverse Polish Expression, Queue: Representation Of Queue, Operations On Queue, Circular Queue, Priority Queue, Array representation of Priority Queue, Double Ended Queue, Applications of Queue Linked List: Singly Linked List, Doubly Linked list, Circular linked list ,Linked implementation of Stack, Linked implementation of	10

	Queue, Applications of linked list	
3	**NONLINEAR DATA STRUCTURE :** Tree-Definitions and Concepts, Representation of binary tree, Binary tree traversal (Inorder, postorder, preorder), Threaded binary tree, Binary search trees, Applications Of TreesSome balanced tree mechanism, eg. AVL trees, Graph-Matrix Representation Of Graphs, Elementary Graph operations,(Breadth First Search, Depth First Search, Spanning Trees, Shortest path	11
4	**HASHING :** Hashing: The symbol table, Hashing Functions, Collision Resolution Techniques	7
5	**Sorting & Searching:** Sorting – Bubble Sort, Selection Sort, Quick Sort, Merge Sort Searching – Sequential Search and binary search	5

Learning Outcomes:-

*After learning the course the students should be able:

1. Differentiate primitive and non-primitive structures
2. Design and apply appropriate data structures for solving computing problems.
3. Apply sorting and searching algorithms to the small application

Teaching & Learning Methodology:-

The challenge that teaching and learning data structure presents, has encouraged the design and implementation of various new and innovative data structure teaching methods. The presented methods aim to improve the students' success rates by increasing their motivation and encouraging the greater self-engagement, not only in assignments provided within a course, but also in further exploration of the programming challenges outside the assignments' boundaries.

Books Recommended:-

1. An Introduction to Data Structures with Applications. by Jean-Paul Tremblay & Paul G. Sorenson Publisher-Tata McGraw Hill.
2. Data Structures using C & C++ -By Ten Baum Publisher – Prenctice-Hall International.
3. Fundamentals of Computer Algorithms by Horowitz, Sahni,Galgotia Pub. 2001 ed.
4. Fundamentals of Data Structures in C++-By SartajSahani.

E-Resources:-

1, https://www.tutorialspoint.com/data_structures_algorithms/index.htm

2, https://www.studytonight.com/data-structures/

Practical List:-

Sr. No.	Practical
1	Introduction to structures & pointers in C.
2	Stack operations Write a program to perform PUSH, POP, PEEP& CHANGE operations on Stack.
3	Queue Operations Write a program to implement insertion & deletion in a queue
4	Circular Queue Operations Write a program to implement insertion & deletion in a circular queue
5	Write a program for linked list insertion, deletion & copy
6	Write a program to perform Selection sort
7	Write a program to perform Selection sort
8	Write a program to sort the given number using bubble sort
9	Write a program to perform Merge sort
10	Write a program to perform Quick sort
11	Write a program to perform Sequential and binary search

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Relational Database Management System

Semester 3

CODE: 13030302

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	2	5	4	30	50	70	-	150

Objectives: - This course introduces students to information of data, working of related data to gain knowledge. Students also will design the real life application

Prerequisites:- (1) Elementary knowledge about computers including some experience using UNIX or Windows.
(2) Computer Programming & Utilization
(3) Knowledge about data structures and algorithms, corresponding to the basic course on Data Structures and Algorithms.

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Introduction:** • Data Vs. Information • Introduction of the Database and the DBMS • Role, Advantage and Disadvantages of DBMS • Types of Database	04
2	**Distributed Database Management Systems:** • Evolution of DDBMS • Distributed Processing and Distributed Database • DDBMS Advantages and Disadvantages • Characteristics of DDBMS	02

	• Components of DDBMS	
3	**Database Systems:** • The Database System Environment • DBMS Functions • The Relational Model • The E-R Model	04
4	**The Relational Database Model:** • A logical view of Data • Keys • Integrity Rules • Concept of Functional Dependency • Relational Set Operators • The Data Dictionary and The System Catalog • Relationship within the Relational Database	10
5	**The Entity Relationship Model:** • Entities • Attributes • Relationships • Connectivity and Cardinality • Existence Dependence • Relationship Strength • Weak Entities • Relationship Participation • Relationship Degree • Recursive Relationship • Composite Entities	08
6	**Normalization of Database Tables:** • The need of Normalization • The Normalization process	10

Learning Outcomes:-

After learning the course the students should be able:

1. Evaluate business information problem and find the requirements of a problem in terms of data.
2. Understand the uses the database schema and need for normalization.
3. Design the database schema with the use of appropriate data types for storage of data in database.
4. Use different types of physical implementation of database 5. Use database for concurrent use.
5. Backup data from database.

Teaching & Learning Methodology:-

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increasing their motivation and encouraging the greater self-engagement, not only in assignments provided within a course, but also in further exploration of the programming challenges outside the assignments' boundaries.

Books Recommended:-

1. An introduction to Database Systems, C J Date, Addition-Wesley.
2, C Programming: Test Your Skills, 1/e by Ashok Kamthane
3, Database System Concepts, Abraham Silberschatz, Henry F. Korth & S. Sudar shan, McGraw-Hill.
4, Understanding SQL by Martin Gruber, BPB
5, SQL -PL/SQL by Ivan bayross

E-Resources:-

1, https://en.wikipedia.org/wiki/Database_management_system
2, https://searchdatamanagement.techtarget.com/resources/Database
3, https://searchsqlserver.techtarget.com/.../database-management-system

Practical List:-

1. Overview of DBMS.
2. To study commands of DDL, DML, DTL and DCL.
3. To study different operations, date – function and conversion functions.
4. To study different types of string functions.
5. To study different types of function & operators like group by clause, having clause, etc.
6. To design Entity Relation Model.
7. To study sub-queries.

Paul

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Operating System

3rd Semester

CODE: 13030303

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	2	5	4	30	50	70	-	150

Objectives:- As a core subject of Computer Engineering/Information Technology, this course enables to understand importance of Operating System, its functionalities to manage resources of Computer and Peripherals, program development and its execution. Student will be made aware of Process Management, Memory Management, File Management and I/O Management in detail, which will be useful to them for Large Application Development in engineering field with emphasis given to Linux type of Open Source Operating System.

Prerequisites: - Data structures(stack, queue, linked list, tree, graph), hashing, File structures, Any structured Programming Language (like C)

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Introduction:** Introduction: Basics of Operating Systems: Definition – Generations of Operating systems – Types of Operating Systems, OS Service, System Calls, OS structure: Layered, Monolithic, Microkernel Operating Systems – Concept of Virtual Machine.	7
2	**Process Management Processes:** Definition , Process Relationship , Process states , Process State transitions , Process Control Block ,Context switching – Threads – Concept of multithreads , Benefits of threads – Types of threads Process Scheduling: Definition , Scheduling objectives ,Types of Schedulers ,Scheduling criteria : CPU utilization,	8

	Throughput, Turnaround Time, Waiting Time, Response Time (Definition only) , Scheduling algorithms : Pre emptive and Non , pre emptive , FCFS – SJF – RR , Multiprocessor scheduling : Types , Performance evaluation of the scheduling.	
3	**Inter process Communication-** Race Conditions, Critical Section, Mutual Exclusion, Hardware Solution, Strict Alternation, Peterson's Solution, The Producer Consumer Problem, Semaphores, Event Counters, Monitors, Message Passing, Classical IPC Problems: Reader's & Writer Problem, Dinning Philosopher Problem Scheduling, Scheduling Algorithms.	8
4	**Deadlocks:** Definition, Deadlock characteristics , Deadlock Prevention , Deadlock Avoidance :banker's algorithm, Deadlock detection and Recovery	5
5	**Memory Management:** Basic Memory Management, Definition, Logical and Physical address map, Memory allocation: Contiguous Memory allocation – Fixed and variable partition – Internal and External fragmentation and Compaction, Paging : Principle of operation – Page allocation – Hardware support for paging –Protection and sharing – Disadvantages of paging. **Virtual Memory:** Basics of Virtual Memory – Hardware and control structures – Locality of reference, Page fault , Working Set , Dirty page/Dirty bit – Demand paging (Concepts only) – Page Replacement policies : Optimal (OPT) , First in First Out (FIFO), Second Chance (SC), Not recently used (NRU) and Least Recently used (LRU)	8
6	**Unix/Linux Operating System** Development Of Unix/Linux, Role & Function Of Kernel, System Calls, Elementary Linux command & Shell Programming, Directory Structure, System Administration Case study: Linux, Windows Operating System	3

Learning Outcomes:-

After learning the course the students should be able to:

- ✓ Understand various generations of Operating System and functions of Operating System.
- ✓ Understand the concept of program, process and thread and Analyze various CPU Scheduling Algorithms and compare their performance.
- ✓ Solve Inter Process Communication problems using Mathematical Equations by various methods. Compare various Memory Management Schemes especially Paging and Segmentation in Operating System. Also apply various Page Replacement Techniques. Understand File Systems in Operating System like UNIX/Linux and Windows.
- ✓ Understand Input Output Management and use of Device Driver and Secondary Storage (Disk) Mechanism.
- ✓ Write shell scripts in Linux/UNIX environment.

Teaching & Learning Methodology:-

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Books Recommended:-

1. Operating System Concepts (8th Edition) by Silberschatz, Peter B. Galvin and Greg Gagne, WileyIndian Edition (2010).
2. Modern Operating Systems (Third Edition) by Andrew S Tanenbaum, Prentice Hall India (2008).
3. Principles of Operating Systems by Naresh chauhan, Oxford Press (2014).
4. Operating Systems by D.M. Dhamdhere, Tata McGraw Hill 2nd edition.
5. Operating Systems (5th Ed) – Internals and Design Principles by William Stallings, Prentice Hall India, 2000
6. UNIX Concepts and Applications(4th Edition)– by Sumitabha Das, Tata McGraw Hill.
7. Unix Shell Programming – by Yashwant Kanetkar, BPB publications.

List of Open Source Software/learning website: -

www.nptel.ac.in

Practical List:-Practical
1. Study of Basic commands of Linux/UNIX.
2. Study of Advance commands and filters of Linux/UNIX.
3. Write a shell script to generate marksheet of a student. Take 3 subjects, calculate and display total marks, percentage and Class obtained by the student.
4. Write a shell script to find factorial of given number n.
5. Write a shell script which will accept a number b and display first n prime numbers as output.
6. Write a shell script which will generate first n fibonnacci numbers like: 1, 1, 2, 3, 5, 13,...
7. Write a menu driven shell script which will print the following menu and execute the given task.
8. MENU
9. Display calendar of current month
10. Display today's date and time
11. Display usernames those are currently logged in the system
12. Display your name at given x, y position
13. Display your terminal number Exit
14. Write a shell script to read n numbers as command arguments and sort them in descending order.
15. Write a shell script to display all executable files, directories and zero sized files from current directory.
16. Write a shell script to check entered string is palindrome or not.
17. Shell programming using filters (including grep, egrep, fgrep)
18. Study of Unix Shell and Environment Variables.
19. Write a shell script to validate the entered date. (eg. Date format is : dd-mm-yyyy).
20. Write an awk program using function, which convert each word in a given text into capital.

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Object Oriented Programming – I

Semester 3

CODE: 13030304

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	4	7	5	30	50	70	-	150

Objectives: - This course provides in-depth coverage of object-oriented programming principles and techniques using C++. Topics include classes, overloading, data abstraction, information hiding, encapsulation, inheritance, polymorphism, file processing, templates, exceptions, container classes, and low-level language features. The course briefly covers the mapping of UML design to C++ implementation and object-oriented considerations for software design and reuse. Perform object oriented programming to develop solutions to problems demonstrating

Prerequisites: - To familiarize the trainee with basic concepts of computer programming and developer tools. To present the syntax and semantics of the "C++" language as well as data types offered by the language. To allow the trainee to write their own programs using standard language infrastructure regardless of the hardware or software platform.

Major Equipment:

- Latest Desktop PCs with any C++ compiler
- Open source software dev C++
-

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Concepts of OOPC:**	4

	Introduction OOP, Procedural Vs. Object Oriented Programming, Principles of OOP, Benefits and applications of OOP.	
2	**C++ Basics:** Overview, Program structure, namespace, identifiers, variables, constants, enum, operators, typecasting, control structures.	6
3	**C++ Function:** Simple functions, Call and Return by reference, Inline functions, Macro Vs. Inline functions, Overloading of functions, default arguments, friend functions, virtual functions.	6
4	**Object and Classes:** Basics of object and class in C++, Private and public members, static data and function members, constructors and their types, destructors, operator overloading, type conversion.	7
5	**Inheritance:** Concept of Inheritance, types of inheritance: single, multiple, multilevel, hierarchical, hybrid, protected members, overriding, virtual base class.	7
6	**Polymorphism:** Pointers in C++, Pointes and Objects, this pointer, virtual and pure virtual functions, Implementing polymorphism.	6

Learning Outcomes:-

* On successful completion of the course, the student will:
* Describe the important concept of OOPC like object and class
* Describe the important concept of OOPC like Encapsulation, inheritance, & polymorphism
* Write the simple C++ programs using the variables, operators, control structures, function
* Write the simple object oriented programs in C++ using objects and classes.
* Use advance features like exception to make programs supporting reusability
* Use standard template library for faster development.
* Develop the applications using object oriented programming with C++.
* Design, develop, execute, debug and validate programs in OOP environment.

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, not only in assignments provided within a course, but also in further exploration of the C++ programming challenges outside the assignments' boundaries.

Parth

Megh.

Books Recommended:-

1) Object Oriented Design by Rumbaugh (Pearson publication)
2) Object-oriented programming in Turbo C++ By Robert Lafore, Galgotia Publication.
3) Object-oriented programming with C++ by E.Balagurusamy, 2nd Edition, TMH.
4) C++ Programming, Black Book, Steven Holzner, dreamtech
5) Object Oriented Programming with ANSI and Turbo C++, Ashok Kamthane, Pearson

E-Resources:-

1) C++ Fundamentals: http://www.oupinheonline.com
2) C++ Tutorials: http://www.tutorialspoint.com/cplusplus/cpp_overview.htm
3) Video tutorials of C++: http://nptel.iitm.ac.in/syllabus/syllabus.php?subjectId=106101006
4) Learn C++ Programming: http://www.learncpp.com
5) Complete C++: http://www.cplusplus.com

Practical List:-

Sr. No.	Practical
1	1. Write C++ program to accept two numbers and display its product. 2. Write a program to accept the length and breadth of rectangle from the user. Calculate and display the area and perimeter. 3. Write a program to accept one int type data and one float type data. Multiply the two numbers and display the result. 4. Develop minimum 5 programs using control structures (for, while, do.....While,) 5. Write a program to print Fibonacci series of N numbers.
2	1. Write a program to display a user entered number in words using Switch...Case. 2. Write a program to add two numbers using function. 3. Develop minimum 2 programs using arrays I. Write a program to accept 'n' integers from users into an array and display them one in each line. II. Write a program to accept and display string
3	1. Develop programs using reference variable, scope resolution operator, simple manipulators, and number data type. 2. Write a program to swap two numbers using function. Pass the values to be swapped to this function using call by- value method. 3. Write a program using function with argument to swap the value of a pair of integers using call by reference. 4. Write a program to store and display the name, runs, scored and wickets taken of a cricket player using structure.

4	1.Write a program to find area of circle using object oriented programming such that the class circle must have three members functions namely: I. Read () to accept the radius from the user. II. Compute () for calculating the area. III. Display() for displaying the result 2. Write a program to find area of circle using object oriented programming such that the class circle must have three inline functions namely: I. Read () to accept the radius from the user. II. Compute () for calculating the area. III. Display() for displaying the result 3. Write a program that uses a class where the member functions are defined inside a class. 4. Write a program that uses a class where the member functions are defined outside a class 5. Write a program to demonstrate the use of zero argument and parameterized constructors. 6. Write a program to demonstrate the use of dynamic constructor. 7. Develop programs using various types of constructors and destructor.
5	1.Develop programs using : I. Single inheritance II. Multilevel inheritance III. multiple inheritance 2. Define minimum 5 different classes such as student, distance, shape, employee, feet, time, data etc. with data member & member functions. Also develop programs to test those classes functionality.
6	1. Develop Programs using array of objects and static member functions. 2. Write a program to demonstrate the use of static data members. 3. Write a program to demonstrate the use of const data members.
7	1. Write a program to demonstrate the overloading of increment and decrement operators. 2. Write a program to demonstrate the overloading of binary arithmetic operators. 3. Write a program to demonstrate the overloading of memory management operators.
8	1. Write a program to add two complex numbers using operator overloaded by a friend function. 2. Write a program to demonstrate function overriding. 3. Write a program to demonstrate dynamic binding using virtual function. 4. Write a program to demonstrate pure virtual function. 5. Write a program to demonstrate the use of "this" pointer.
9	1. Write a program to write and read a string from/to file.

Megh. Paul

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Software Engineering

Semester 3

CODE : 13030305

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	2	5	4	30	50	70	-	150

Objectives:

It Deliver an opportunity to students where they can deal with real life problems and learn an individual as well as teamwork approach for software development.

Prerequisites:-None

Course outline:-

Sr.No.	Course Contents	Number of Hours
1	**Software process Models and lifecycle:** Software Product, Product, Software Processes, Evolving Role of Software, Software Engineering: A Study of different Software Process Models, The Linear Sequential Model, The Prototyping Model, The RAD Model, Evolutionary Process Models, Process, Product and Process, Object Oriented Software Engineering	4
2	**Project Management Concepts & Project Metrics:** The Management Spectrum, People, Product, Process, Project, The W5HH Principle, Metrics in the Process and Project Domains (FP & LOC), Software Measurement, Metrics for Project and Software Quality	5

3	**Software Project Planning, Scheduling and Tracking:** Project Planning Objectives, Software Project Estimation using COCOMO Model, Software Scope and Resources, Empirical Estimation Models, Basic Concepts and Relationship Between People and Effort, Defining a Task Set for the Software Project, Selecting Software Engineering Tasks, Defining a Task Network and Scheduling, Earned Value Analysis	4
4	**Software Requirements Specification:** Requirement Gathering and Analysis, Software Requirement Specification(SRS),Formal requirements specification and verification - axiomatic and algebraic specifications	3
5	**Analysis Modeling, Software Design Concepts and Principles:** The Elements of the Analysis Model, Data Modeling, Functional Modeling and Information Flow, Behavioral Modeling and Structured Analysis, Software Design and Software Engineering, The Design Process, Design Principles, Design Concepts, Modular Design, Design Heuristics for Effective Modularity, The Design Model ,Design Documentation, Object Modeling using UML, Software Architecture and Data Design, Architectural Styles	4
6	**User Interface Design, Component Level Design:** User Interface Design, Task Analysis and Modeling, Interface Design Activities and Implementation Tools, Design Evaluation, Structured Programming and Comparison of Design Notation	5
7	**Risk Analysis & Management:** Reactive versus Proactive Risk Strategies, Software Risks (Risk Identification, Risk Projection, Risk Refinement, Risk Mitigation)	3
8	**Coding, Software Testing Techniques & Software Testing Strategies:** Software Testing Fundamentals and Test Case Design, White-Box Testing and Black-Box Testing, ISO/IEC/IEEE Software Testing standards, Testing for Specialized Environments, Unit Testing, Integration and Validation Testing, Software Documentation and Debugging Techniques	3
9	**Software Quality Assurance and Configuration Management** - Quality Concepts and Software Quality Assurance, Quality Planning and Control, Software Reviews (Formal Technical Reviews), Software Reliability and Fault Tolerance, The SCM Process Identification of Objects in the Software Configuration,Six Sigma, Version Control and Change Control	4
10	**Emerging and advanced topics in Software Engineering:** Security Engineering, Agile Methods, Client Server Software Engineering, Aspect Oriented Software Development, Software Engineering Aspects of Programming Languages, Re-engineering, Web Engineering	3

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Learning Outcomes:-

After completion of the course students will be able to

1. Prepare SRS (Software Requirement Specification) document and SPMP (Software Project Management Plan) document.
2. Apply the concept of Functional Oriented and Object Oriented Approach for Software Design.
3. Recognize how to ensure the quality of software product, different quality standards and software review techniques.
4. Apply various testing techniques and also upgrade it using advanced Software Engineering

Teaching & Learning Methodology:-

For teaching this subject power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work

Books Recommended:-

1. Roger S. Pressman, Software Engineering: A practitioner's approach, McGraw Hill.
2. Rajib Mall, Fundamentals of Software Engineering, Prentice Hall India.
3. Pankaj Jalote, An integrated approach to Software Engineering by Springer.
4. Ian Sommerville, Software Engineering, Addision and Wesley.

E-Resources:-

1) Software:-Rational Rose, Microsoft Visio, Enterprise resource planning
2) Project Management Tools
3) SCM Tools
4) SQA Tools
5) Analysis and Design Tools
6) User Interface Development Tools
7) Testing Tools
8) Client/Server Tools
9) Reengineering Tool

List of Experiments:

Prepare following document form below mentioned projects:

1.	DFD (Data Flow Diagrams)
2.	E-R Diagram
3.	Use-Case Diagram
4.	Activity Diagram
5.	Class Diagram
6.	Sequence Diagram
7.	State Diagram

8.	Implementation
9.	Test case design
10.	Program Testing
Case Study:-	
1) Student college management System	
2) Library Information System	
3) Railway/Flight Reservation system	
4) Online Banking System	
5) Hospital Management System	
6) ATM(Automatic Teller machine)	

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Object Oriented Programming - II

Semester 4

CODE: 13030401

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
4	-	4	8	6	30	50	70	-	150

Objectives: - To understand the concept of object oriented programming. This course Provide fundamental knowledge of the various aspects of java programming and enables students to appreciate recent development in the area of programming.

Prerequisites: - Object oriented concepts

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Basics of JAVA:** Features of Java, Byte Code and Java Virtual Machine, JDK, Data types, Operator, Control Statements – if , else, nested if, if-else ladders, Switch, while, do-while, for, for-each, break, continue.,	03
2	**Array and String:** Single and Multidimensional Array, String class, String Buffer class, Operations on string, Command line argument, Use of Wrapper Class.	04
3	**Classes, Objects and Methods:** Class, Object, Object reference, Constructor, Constructor Overloading, Method Overloading, Recursion, Passing and Returning object form Method, new operator, this and static keyword, finalize() method, Access control, modifiers, Nested class, Inner class, Anonymous inner class ,Abstract class.	06

4	**Inheritance and Interfaces:** Use of Inheritance, Inheriting Data members and Methods, constructor in inheritance ,method overriding, super keyword ,Final keyword, Creation and Implementation of an interface , instanceof operator, Interface inheritance, Dynamic method dispatch ,Comparison between Abstract Class and interface	06
5	**Package:** Use of Package, CLASSPATH, Import statement, Static import, Access control	04
6	**Exception Handling:** Exception and Error, Use of try, catch, throw, throws and finally, Built in Exception, Custom exception, Throwable Class	05
7	**Multithreaded Programming:** Use of Multithread programming, Thread class and Runnable interface , Thread priority, Thread synchronization , Thread communication, Deadlock	05
8	**IO Programming:** Introduction to Stream, Byte Stream, Character stream, Readers and Writers, File Class, File InputStream, File Output Stream, InputStreamReader, OutputStreamWriter, FileReader, FileWriter,Buffer Reader	05
9	**Collection Classes :** List, Abstract List, Array List, Linked List, Enumeration, Vector, Properties, Introduction to Java.util package.	05
10	**Networking with java.net:** InetAddress class ,Socket class, Datagram Socket class, Datagram Packet class	05

Learning Outcomes:-

After successful completion of the course students should be able to:

1. Understand object oriented programming concepts and implement in java.
2. Compare building blocks of OOPs language, inheritance, package and interfaces.
3. Identify exception handling methods.
4. Implement multithreading in object oriented programs.

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

Books Recommended:-

1. Java Fundamentals A comprehensive Introduction By Herbert Schildt, Dale Skrien, McGraw Hill Education.
2. Programming with Java A Primer – E.Balagurusamy,,Mc Graw hill Education.
3. The Complete Reference, Java 2 (Fourth Edition),Herbert Schild, - TMH.
4. Programming with Java, M. P. Bhave S.A. Patekar, Pearson.
5. Introduction to Java Programming 7th ed., Y. Daniel Liang, Pearson.

E-Resources:-

1. Java Development Kit: http://www.oracle.com/technetwork/java/javase/downloads/index.html
2. http://docs.oracle.com/javase/specs/jls/se7/html/index.html
3. http://docs.oracle.com/javase/tutorial/java/index.html
4. http://www.javatpoint.com/
5. http://www.tutorialspoint.com/java/
6. http://www.learnjavaonline.org/
7. http://www.c4learn.com/javaprogramming/
8. http://www.learn-java-tutorial.com/

Practical List:-

Sr. No.	Practical
1.	Display greatest number from three numbers.
2.	To check given number is prime or not.
3.	To reverse the given number.
4.	Display Fibonacci series.
5.	To print given pattern on screen. 1 2 3 4 3 2 1 1 2 3 3 2 1 1 2 2 1 1 1
6.	To search an element from an array.
7.	Sort the array in ascending order.

8.	Multiplication of 3X3 matrices.
9.	Create a class Calculator with arithmetic functions such as addition, subtraction, multiplication, and division.
10.	Create a class Time with hours, minutes, and seconds as member variables and calculate sum of two Time objects.
11.	Create a class which can perform following tasks using method overloading a) Addition of two float values b) Addition of two arrays. c) Addition of two Strings
12.	Write an OOP to demonstrate use of following functions of String class 1) getChars() 2) equals() 3) equalsIgnoreCase() 4) startsWith() 5) endsWith() 6) subString()
13.	Write an OOP to demonstrate use of following functions of StringBuffer class 1) deleteCharAt() 2) insert()
14.	Write an OOP to sort list of strings in alphabetical order.
15.	To catch Arithmetic Exception such as division by zero
16.	To catch multiple exceptions such as ArrayIndexOutOfBoundsException , NumberFormatException, NullPointerException.
17.	Write an OOP To throw your own exception
18.	Write an OOP for copying character from one file to another.
19.	Write an OOP for writing bytes to file
20.	Write an OOP for reading bytes from a file
21.	Write an OOP for copying bytes from one file to another.
22.	Write an OOP for reading and writing primitive datatype.
23.	Write an OOP for reading and writing using a random access file.

Mem. Paul

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

OPEN SOURCE TECHNOLOGY

Semester 4

CODE : 13030402

Teaching & Evaluation 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:

This course covers the basic introduction about HTML, CSS, JAVASCRIPT and brief of LAMP (Linux, Apache, MySQL, PHP) to design static as well as Dynamic web pages. We can use Windows Operating system instead of Linux.

Prerequisites: LAMP is an Open Source Web Development platform that uses Linux as an operating system, Apache as web server , MySQL as a Relational Database Management System and PHP as a Object Oriented Scripting Language. This subject covers the wide range of web technologies both client side and server side to provide the exposure to the students to develop Rich Internet Applications using them.

Course outline:-

Sr.No.	Course Contents	Number of Hours
1	**INTRODUCTION** :Concept Of Internet, Introduction of HTML, XHTML, CSS and JavaScript.	6
2	**XML**:Introduction to XML, uses of XML, simple XML, XML key components, DTD and Schemas, Well formed, using XML with application.XML, XSL and XSLT. Introduction to XSL, XML transformed simple example, XSL elements, transforming with XSLT	6
3	**INTRODUCTION OF PHP** : History of PHP, Apache Web Server, MySQL and Open Source,Relationship between Apache, MySQL and PHP (AMP Module),PHP configuration in IIS, Apache Web server	6
4	**BASICS OF PHP:** PHP structure and Syntax, Creating the PHP pages, rules of PHP syntax, Integrating HTML with PHP, Constants, Variables : static and global variable, Conditional Structure & Looping, PHP Operators, Arrays, foreach constructs, User defined function (argument function, Variable function, Return Function, default argument, variable length argument).	7
5	**INTRODUCTION TO MYSQL :** MySQL structure and syntax, Types of MySQL tables and storages engines, MySQL commands, Integration of PHP with MySQL, Connection to the MySQL server, Working with PHP and arrays of data, Referencing two tables , Joining two tables	7
6	**WORKING WITH DATABASE :** Basic command with PHP examples, Connection to server, creating database, selecting a database, listing database, listing table ,names creating a table, inserting data, altering tables, queries, deleting database, deleting data and tables, PHP myadmin and database bugs.	7

Learning Outcomes:-

After successful completion of this course, student will be able to

- Understand the basic structure of web designing technology
- Apply the concepts of web technology in designing static and dynamic web pages
- Design interactive web pages incorporating validation techniques
- We can save the data into database and get data when necessary.

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Teaching & Learning Methodology:-

For teaching this subject we use notepad or notepad++ or dream viewer or net beans software, Apache Server to store, process and deliver Web pages to clients.

Books Recommended:-

1Developing Web Applications, Ralph Moseley and M. T. Savaliya, Wiley-India
2. Web Technologies, Black Book, dreamtech Press
3. HTML 5, Black Book, dreamtech Press
4. Web Design, Joel Sklar, Cengage Learning
5. Internet and World Wide Web How to program, P.J. Deitel & H.M. Deitel, Pearson

E-Resources:-

Browsers like IE, Mozila,

FireFox etc - Server software XAMPP/WAMP/LAMP

www.apachefriends.org

www.w3.org

www.w3schools.com

Practical List:-

Sr. No.	Practical's
1	Creating the PHP page.
2	Programs using arrays and control and loop structures
3	Testing different PHP functions and user define function
4	Creating forms using buttons, textboxes and other form elements. Use ($_POST and $_GET to retrieve data.)
5	Passing hidden information to the form processing script via hidden form controls and a URL query string.
6	Creating forms with sessions and cookies
7	Allowing the user to upload their own images
8	View the data contained in the My SQL database.
9	Connect to the database from your website.
10	Revision of all practicals.

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Object Oriented Web Technology

Semester 4

CODE: 13030403

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	2	5	4	30	50	70	-	150

Objectives: -

The course builds upon the procedural and object-oriented programming logic tools from earlier courses. This course covers C# development using Visual Studio .NET and focuses on C# syntax, logic constructs, application development using windows forms, and the object-oriented nature of the language. Through the experience of creating these programs and methods the student will learn the fundamentals of C# programming to solve problems in various domains.

Prerequisites: -

1. Readings in the course text
2. Exams on all covered chapters in the course text
3. Lab projects
4. Regular and prompt attendance
5. Class Participation and daily work

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Introduction :** • What is .NET? • What is the CLR? • The FCL • Primitive Types • Namespaces • Statements and Expressions • Operators	06

2	**Classes and Objects:** • Constructors • Reference Types • Object Oriented Programming • Access Modifiers • Abstract Classes • Virtual Members • Static Classes • Debugging and Error Handling	04
3	**ADO.NET:** • Benefits of ADO.NET • ADO.NET compared to classic ADO • Datasets • Managed Providers • Data Binding: Introducing Data Source Controls • Reading and Write Data Using the Sql Data Source Control	04
4	**Windows Forms and Controls in details:** • The Windows Forms Model • Creating Windows Forms Windows Forms Properties and Events • Windows Form Controls, • Menus -Dialogs -ToolTips	04
5	**Visual Inheritance in C#.NET:** • Apply Inheritance techniques to Forms • Creating Base Forms • Programming Derived Forms	04
6	**Mastering Windows Forms:** • Printing - Handling Multiple Events • GDI+ • Creating Windows Forms Controls	04
7	**Themes and Master Pages:** • Creating a Consistent Web Site, • Themes - Master Pages • Displaying Data with the GridView Control Introducing the GridView Control • Filter Data in the GridView Control • Allow Users to Select from a DropDownList in the Grid • Add a Hyperlink to the Grid • Deleting a Row and Handling Errors	06
8	**Managing State:** • Preserving State in Web Applications and Page-Level State • Using Cookies to Preserve State • ASP.NET Session State • Storing Objects in Session State • Configuring Session State • Setting Up an Out-of-Process State Server	06

Prof. Patel

	• Storing Session State in SQL Server • Using Cookieless Session IDs • Application State Using the DataList and Repeater Controls • Overview of List-Bound Controls • Creating a Repeater Control and DataList Control	

Learning Outcomes:-

Knowledge Outcomes:

1. Articulate the basic syntax and features of the C# programming language
2. Define C# constructs which implement the three basic control structures
3. Define arithmetic, relational, and logical operators
4. Describe object-oriented (OO) concepts related to classes and objects
5. Describe the concepts behind sound user interface design
6. Describe the concepts behind variables, constants, and calculations

Skill Outcomes:

1. Demonstrate the ability to create Object-Oriented (OO) application programs
2. Demonstrate the ability to create appropriate classes and objects
3. Demonstrate the ability to create windows-based applications
4. Demonstrate the ability to create user interfaces including but not limited to various boxes, buttons, menus, dialog boxes

Teaching & Learning Methodology:-

Lectures, analysis of business practice examples, discussions, presentations of students' papers and case studies, exercises - students' individual and group work

Books Recommended:-

1. Christian Nagel, Professional C# .Net, Wrox Publication
2. Matthew Macdonald and Robert Standefer, ASP.NET Complete Reference, TMH
3. Vijay Mukhi, C# The Basics, BPB Publications

E-Resources:-

1. http://www.tarleton.edu/cis/studentresources.html
2. http://online.tarleton.edu/fac_dev/applications/student_blackboard/index.htm

Practical List:-

Sr. No.	Practical
1	Write a program to check whether empty query string is entered in Asp .net
2	Write a program to change color of Label text control programmatically in Asp .Net
3	Write a program to Enable-Disable Textbox and change width of TextBox programmatically in Asp .Net
4	Write a program to increase and decrease font size programmatically.

5	Write C# code to display the asterisk pattern as shown below: ***** ***** ***** ***** *****
6	Write C# code to prompt a user to input his/her name and country name and then the output will be shown as an example below: Hello Ram from country India!
7	Write C# code to do the following - Convert binary to decimal - Convert decimal to hexadecimal - Convert decimal to binary - Convert decimal to octa
8	Write C# code to convert infix notation to postfix notation.
9	Write a C# code to convert digits to words
10	Write a C# code to Convert following currency conversion. Rupees to dollar, frank, euro.
11	Write a C# code to Perform Celsius to Fahrenheit Conversion and Fahrenheit to Celsius conversion.
12	Write ASP.Net program to Store Objects in Session State and Storing Session State in SQL Server.

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Data Communication and Network

Semester 4

CODE: 13030404

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	2	5	4	30	50	70	-	150

Objectives:

The aims of this module are:

- To introduce the basics of data communications and computer networks.
- To examine and understand network protocols and architectures.
- To educate the student in modern networking technologies.

Prerequisites:-

Student must have a working knowledge of fundamental of procedure oriented language(c) and data structure. For some practical aspects of the course, a working knowledge of wire shark software.

Course outline:-

Sr.No.	Course Contents	Number of Hours
1	**INTRODUCTION TO DATA COMMUNICATION AND NETWORKING:** Uses of Computer Networks, Network Hardware, Network Software Internet Reference Models (OSI and TCP/IP)	05

2	**PHYSICAL LAYER:** Basis for Data Communication, Guided Transmission Media , Wireless Transmission Medium, Circuit Switching and Telephone Network, High Speed Digital Access	08
3	**DATA LINK LAYER:** Data Link Layer Design Issues, Error Detection and Correction, Data Link Control and Protocols, Example Data Link Protocol	07
4	**MEDIUM ACCESS LAYER:** Channel Allocation Problem, Multiple Access, CSMA, CSMA/CD, CSMA/CA	06
5	**LOCAL AREA NETWORK:** Ethernet, Fast Ethernet, Gigabit Ethernet, Wireless LAN, Bluetooth, Connecting Devices(Bridge, Hub, Switch, Router, Gateway)	06
6	**NETWORK LAYER:** Network layer design issues, Routing Algorithms (Optimality Principle, Static routing Algorithms, Shortest Path, Flooding, Dynamic routing algorithms, Dynamic Routing algorithms, Distance Vector, Link State Routing).	06

Learning Outcomes:-

Learning outcomes are a required element of the syllabus. They are statements about what students will know and be able to do with what they know upon successful completion of the course. These statements are further defined as observable and measurable - meaning that student progress on learning outcomes can and is assessed in the course.

Learning outcomes benefit faculty because they form a solid foundation for course organization and planning. Well constructed learning outcomes make the selection and design of assignments and assessments more focused. They also assist with keeping focus on the things faculty most value in the course.

Learning outcomes benefit students by providing specific learning targets to pursue. They can also help students better understand faculty actions and choices in the course.

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Teaching & Learning Methodology:-

The challenge that teaching and learning computer networking presents, has encouraged implementation of various new and computer network connections. Aim to improve the students' success rates by increasing their motivation and encouraging the greater self-engagement, not only in assignments provided within a course, but also in further exploration of the networking challenges outside the assignments' boundaries.

Books Recommended:-

1. Data Communication & Networking, Forouzen, Tata McGraw Hill
2. Andrew S. Tanenbaum (Fifth Edition)

E-Resources:-

1) https://en.wikipedia.org/wiki/List_of_network_protocols_(OSI_model)
2) https://www.webopedia.com/TERM/C/CSMA_CD.html
3) **https://www.studytonight.com/computer-networks/osi-model-datalink-layer**
4) https://turbofuture.com/misc/Data-Communication

Practical List:-

Sr. No.	Practical's
1	Study practical of OSI reference model.
2	Study practical of TCP/IP model.
3	Preparing LAN Cable using RJ45.
4	Preparing of Network cables.
5	Establishment of LAN Connection.
6	Troubleshooting of network.
7	Study practical of switch, Hub, Router, Gateway, Bridge.
8	Study of Wireshark packet tracer.
9	Prepare a demo Network using concept of Subnetting.

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Data Center Management

Semester 4

CODE: 13030405

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	2	5	4	30	50	70	-	150

Objectives: - Data Centre Management is well organized and thoughtfully prepared. The Subject is demanding and requires high level of self-discipline and persistence. In return, it offers deep insights in leadership, and inspires students to develop their leadership capabilities. It has been designed for the data centre industry and is great value for emerging leaders and their organizations.

Prerequisites: - Operating System and Computer Network

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	Basic Introduction of Data center Architecture, Requirement, Required Physical Area for Equipment and Unoccupied Space	06
2	Required power to run all the devices, Required cooling and HVAC Required weight, Network Bandwidth	05
3	Budget Constraints, Selecting a Geographic Location Safety from Natural hazards and manmade disaster	05
4	Data Center design and planning and cabling	04
5	Data Center Maintenance monitoring, Physical and logical security	05
6	Data center Consolidation, Reasons for data center Consolidation, Consolidation opportunity, Server consolidation, Storage Consolidation, Network Consolidation, Service Consolidation, Process Consolidation, Staff Consolidation, Data Consolidation phases	04

7	Data center servers, Sever Capacity Planning System Management Best Practices, Server Cluster Best Practices, Data Storage Best Practices.	05
8	Best Practices for System Administration, System Administration Work Automation,	04

Learning Outcomes:-

After successful completion of the course students should be able to:
1. Manage Server Systems and Data Centers Infrastructure Management.
2. Utilize the Storage, Bandwidth, Efficiency of systems and other resources for Data centre.
3. Monitoring the Networks and Resources.
4. Create ability to manage and maintain Server.

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

Books Recommended:-

1. Administering Data Centers: Servers, Storage and Voice over IP, Kailash Jayaswal
2. Data center fundamentals, Mauricio Arregoces, Maurizio Portol
3. Enterprise Data Center: Design and Methodology by Rob Snevely

E-Resources:-

1. Software: VMware
2. Nagios, Ganglia, Untangle,
3. https://www.techopedia.com/definition/29712/data-center-design

Practical List:-

Sr. No.	Practical
1	Installation of any server.
2	Manage workgroup and Create domain using Active Directory
3	Create user, Groups and Organization Unit
4	Create and apply policy on different group and OU
5	Concept of structure Cabling in network based environment
6	Setup VMware workstation and manage resources
7	Manage and maintain ESXI server
8	Monitoring the cluster using Open source (Nagios/Ganglia) tools.
9	Resource allocation to clients from server
10	Case study to design a datacenter as per requirement

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Object Oriented Programming – III

Semester : 5th

CODE: 13030501

Teaching and Examination Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Theory	Tutorial	Pr	Total		Theory	Practical	Theory	Practical	
3	-	2	5	4	30	-	70	50	150

Contents:

Sr.	Topic	Weightage	Teaching Hrs.
1	**Introduction to Python**: The Python programming language, What is a program?, What is debugging?, The first program. **Variables, expressions and statements** Values and types, Variables, Variable names and keywords, Statements, Operators and operands, Expressions, Order of operations, Comments, Debugging.	10%	5
2	**Operators**: Modulus operator, Boolean expressions, Logical operators, Conditional execution, Alternative execution, Chained conditionals, Nested conditionals	10%	5
3	**User Defined Function and Introduction to Packages**: **Functions:** Function calls, Type conversion functions, Math functions, Composition, Adding new functions, Definitions and uses, Parameters and arguments, Variables and parameters are local, Fruitful functions and void functions, Why functions?. Recursion Function **Introduction to Packages:** Usage of Packages, Installation of Packages, brief introduction to NUMPY Package	20%	9

4	**Python Data Structure – I**: **Strings** A string is a sequence, Len, Traversal with a for loop, String slices, Strings are immutable, Searching, Looping and counting, String methods, The in operator, String comparison, Debugging. **List** ListA list as a sequence, Lists are mutable, Traversing a list, List operations, List slices, List methods, Map, Filter and reduce, Deleting elements, Lists and strings, Objects and values, Aliasing, List arguments.	25%	12
5	**Python Data Structure – II**: **Tuples, Set, Dictionary** **Tuples:** Python Tuples, Accessing values in Tuples, update and delete tuples Basic tuples operation, Built in Tuples Function, List Vs Tuples. **Set:** Defining set, create and accessing values in a set, set Methods, Frozenset Dictionary: What is python Dictionary, Creating a Dictionary, Adding elements to a Dictionary, Accessing and removing an elements from Dictionary, Dictionary Methods	25%	12
6	**File Operations**: Need of a file. Opening, closing and read/write operations in file.	10%	5

***Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

Reference Books:

1. Think Python, How to Think Like a Computer Scientist (TextBook) Allen Downey; Green Tea Press Needham, Massachusetts.
2. Beginning programming with Python for Dummies John Paul Mueller; John Wiley & Sons

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Object Oriented Analysis and Desgin

Semester 5

CODE: 13030502

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
4	-	2	6	5	30		70	50	150

Course outline:-

Learning Outcome:		
After learning the course the students should be able to: • After successful completion of this course, student will be able to demonstrate the importance of modelling in the software development life cycle. • Become familiar with the Unified modelling Language. • Understand the object-oriented approach to analysing and designing systems and software solutions. Employ the Unified modelling Language notations to create effective and efficient system designs. • Understand the difference between writing programs for the software and doing analysis and design. • Problem formulation and decomposition (analysis) and solution building (design) will be covered.		
Theory syllabus		
Unit	Content	Hrs
1	**Introduction to OOAD and UML:** Overview of Software Development Life Cycle (Waterfall Model), Introduction to Object Oriented analysis and design, overview of model with types and UML, UML structure:building blocks and architecture, Overview of static and dynamic UML diagrams **Forward & Reverse Engineering:** Introduction to Forward & Reverse Engineering using UML	
2	**Use case Model:** Introduction to use case diagram, Elements of use case diagram with notations: association/uses, include, extend, generalization	

3	**Class & Object Model:** Basics of object oriented concepts, Introduction to class and object diagram, Identify the elements based on noun phrase method, Elements of class diagram with notations: object, class, link, association, multiplicity, link attributes, association end names, association classes, qualified association, association ends, N-ray association, aggregation and composition, generalization, abstract class	
4	**Sequence & Collaboration Model :** Introduction to Sequence & Collaboration diagram, Elements, Elements of sequence diagram Collaboration diagram with notations: object, messages, activation, lifeline, destroyingobjects, guard condition	
5	**State Model:** Introduction to State Diagram, Event ,Change Event, Signal Event, Call Event, Time Event , States, Transition & Conditions, Transition, Guard Condition, Action, State Diagrams, One shot 08 State Diagram, Creating State Diagram ,State Diagram Behaviour, Activity, Do-activity, Entry Activity, Exit Activity, Nested State Diagram, Nested States, Signal Generalization, Concurrency	
6	**Activity and Swim lane Model:** Introduction to Activity and Swim lane diagram, Elements, Elements of Activityand Swim lane diagram with notations: initial state or start point, activity or action state, action flow, decisionsand branching, guard condition, Synchronization (fork and join), time event, merge event, swim lanes, final state or end point	
7	**Component and Deployment Model:** Introduction to Component and deployment Diagram, Elements ofComponent and deployment Diagram	

8	**Forward & Reverse Engineering:** Introduction to Forward & Reverse Engineering using UML	

Practical List

- Draw activity diagram, class diagram, sequence diagram, use case diagram, object diagram using EA
- Write a program based on Reflection
- Demonstrate a program based on Delegation
- Demonstrate a program based on Design Patterns
- Program on factory pattern
- Demonstrate a program based on Up casting and Down casting
- Demonstrate a program based on Object Serialization/Deserialization

Text Books

1	Object Oriented Modelling and Design with UML: by J. Rambaugh, et al., Second Edition Pearson

Reference Books

1	Magnifying object-oriented analysis and design by ArpitaPatil and Netra, PHI
2	2 UML 2 and the Unified Process: Practical Object-Oriented Analysis and Design by Jim Arlow / IlaNeustadt
3	The UML Users guide by Grady Booch, J. Rambaugh, Ivar Jacobson, Pearson Education
4	Object Oriented System Development by Ali Bahrami, McGraw Hill

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Android Programming

Semester 5

CODE: 13030504

Type of Course: BCA

Prerequisite: Basic Knowledge of Core Java and Object Oriented Concepts.

Rationale: Introduce with mobile market and mobile application development.

Teaching and Examination Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Theory	Tutorial	Pr	Total		Theory	Practical	Theory	Practical	
3	-	2	5	4	30	-	70	50	150

Contents:

Sr.	Topic	Weightage	Teaching Hrs.
1	**Introduction to mobile computing & Mobile Development**: Introduction to MC, Applications, Limitations and architecture. Cellular overview, Cellular networks, Mobile IP, History of mobile software development. The open handset alliance, The android platform, android SDK, Building a simple application.	15%	7
2	**Android Application Design Essentials**: Anatomy of an android applications, Android terminologies, Application context, Activities, services, Intents, Receiving and broadcasting intents, Android manifest file and its common settings using intent filter, Permissions, Managing application resources in a hierarchy, Working with different types of resources.	20%	10
3	**Android User Interface Design Essentials**: User interface screen elements, Designing user interfaces with layouts, drawing and working with Using android networking APIs, Using android web APIs.	20%	10

4	**Database Connectivity Using SQLite**: Using android data and storage APIs, Managing data using SQLite, Sharing data between applications with content providers.	25%	12
5	**Working with Common API**: Using Android Networking APIs Using Android Web APIs Using Android Telephony APIs, Notification.	18%	8
6	**Publishing your Application**:	2%	1

***Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

Reference Books:

1. Android Wireless Application Development (TextBook)
   Lauren Darcey and Shane Conder; Pearson Education; First Edition
2. Professional Android 2 Application
   Development Reto Meier; Wiley India Pvt
   Ltd,2011
3. Beginning Android
   Mark L Murphy,; Wiley India Pvt Ltd.(2009)
4. Pro Android
   Sayed Y Hashimi and Satya Komatineni; Wiley India Pvt Ltd.(2009)

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Cyber Security

CODE : 13030601

BCA : 6th Semester

Teaching and Examination Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	2	5	4	30		70	50	150

Content:

Sr. No.	Topics	Weightage %
1	**Systems Vulnerability Scanning** Overview of vulnerability scanning, Open Port / Service Identification, Banner / Version Check, Traffic Probe, Vulnerability Probe, Vulnerability Examples, OpenVAS, Metasploit. Networks Vulnerability Scanning - Netcat, Socat, understanding Port and Services tools - Datapipe, Fpipe, WinRelay, Network Reconnaissance – Nmap, THC-Amap and System tools. Network Sniffers and Injection tools – Tcpdump and Windump, Wireshark, Ettercap, Hping Kismet	25
2	**Network Defense tools** Firewalls and Packet Filters: Firewall Basics, Packet Filter Vs Firewall, How a Firewall Protects a Network, Packet Characteristic to Filter, Stateless Vs Stateful Firewalls, Network Address Translation (NAT) and Port Forwarding, the basic of Virtual Private Networks, Linux Firewall, Windows Firewall, Snort: Introduction Detection System	25
3	**Web Application Tools** Scanning for web vulnerabilities tools: Nikto, W3af, HTTP utilities - Curl, OpenSSL and Stunnel, Application Inspection tools – Zed Attack Proxy, Sqlmap. DVWA, Webgoat, Password Cracking and Brute-Force Tools – John the Ripper, L0htcrack, Pwdump, HTC-Hydra	25
4	**Introduction to Cyber Crime and law** Cyber Crimes, Types of Cybercrime, Hacking, Attack vectors, Cyberspace and Criminal Behavior, Clarification of Terms, Traditional Problems Associated with Computer Crime, Introduction to Incident Response, Digital Forensics, Computer Language, Network Language, Realms of the Cyber world, A Brief History of the Internet, Recognizing and Defining Computer Crime, Contemporary Crimes, Computers as Targets, Contaminants and Destruction of Data, Indian IT ACT 2000.	10
5	**Introduction to Cyber Crime Investigation** Firewalls and Packet Filters, password Cracking, Keyloggers and Spyware, Virus and Warms, Trojan and backdoors, Steganography, DOS and DDOS attack, SQL injection, Buffer Overflow, Attack on wireless Networks	15

Reference Books:

1. Anti-Hacker Tool Kit (Indian Edition) by Mike Shema, Publication Mc Graw Hill.
2. Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives by Nina Godbole and Sunit Belpure, Publication Wiley

Course Outcome:
After learning the course the students should be able to: student should understand cyber-attack, types of cybercrimes, cyber laws and also how to protect them self and ultimately society from such attacks

List of Experiments:

1. TCP scanning using NMAP
2. Port scanning using NMAP
3. TCP / UDP connectivity using Netcat
4. Network vulnerability using OpenVAS
5. Web application testing using DVWA
6. Manual SQL injection using DVWA
7. XSS using DVWA
8. Automated SQL injection with SqlMap

Design based Problems (DP)/Open Ended Problem:

Paul

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Cloud Computing

Semester 6

CODE: 13030602

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	2	5	4	30		70	50	150

Learning Outcomes:

- After learning the course the students should be able to
- Understand the computing paradigm and cloud computing
- Understand the architecture of cloud computing
- Understand and use the service models and deployments
- Work on any real cloud service
- Understand the service management and security of cloud

Course outline:-

Sr.No.	Course Contents	Lectures (Hours)
1	**Introduction** Overview of computing paradigms, Recent trends in computing, evolution of cloud computing, Overview of cloud computing, Cloud computing-Concepts, properties, characteristics, Role of open standards.	5
2	**CLOUD COMPUTING ARCHITECTURE** Cloud computing architecture, Cloud service delivery models	8

	(XAAS), Cloud Deployment models.	
3	**INFRASTRUCTURE AS A SERVICE** Introduction, Hypervisors, Resource virtualization, Examples, How to implement IAAS, IAAS implementation using OpenStack	5
4	**PLATFORM AS A SERVICE** Introduction, Cloud Platform and Management, Examples, Containers, Application Stagin, How to implement PAAS.	6
5	**SOFTWARE AS A SERVICE** Introduction, Web services, Web 2.0, Web OS, Examples, How to implement SAAS.	6
6	**CLOUD SECURITY** Infrastructure security, Data Security, Storage Identity and Access Management, Access Control, Trust and Reputation, Authentication in Cloud computing.	6
7	**SERVICE MANAGEMENT IN CLOUD** Service Orchestration -Cloud computing and Service Management, licensing of software, Service Level Agreements (SLAs), Billing & Accounting, Comparing scaling hardware, economics of scaling, managing data. Cloud performance, Existing project experience	5

Practical Content

- Understanding single core and multi core Architecture
- Understanding Computer Network fundamentals and Designing LANs
- Implementation of Infrastructure as a service(IaaS) using Hypervisors
- Implementation of private cloud platform using openstack cloud
- Working with IaaS of Public cloud platforms
- Implementation of Platform as a service(PaaS) in private cloud environment
- Implementation Platform as a service(PaaS) in public cloud environment
- Implementation Software as a service(SaaS) in private cloud environment
- Implementing Software as a service(SaaS) in public cloud environment
- Implementation of Storage as a service(StaaS)

Reference Books:

1. Barrie Sosinsky: "Cloud Computing Bible", Wiley-India, 2010
2. Rajkumar Buyya, James Broberg, Andrzej M. Goscinski: "Cloud Computing: Principles and Paradigms",Wiley, 2011
3. Nikos Antonopoulos, Lee Gillam: "Cloud Computing: Principles, Systems and Applications", Springer,2012
4. Ronald L. Krutz, Russell Dean Vines: "Cloud Security: A Comprehensive Guide to Secure CloudComputing", Wiley-India, 2010

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Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Data Warehousing and Data Mining

Semester 6

CODE: 13030605

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	2	5	4	30		70	50	150

LEARNING OBJECTIVES:

The educational Objectives of this Course are:

- To Introduce various Data Mining Applications in real world scenario
- To be learning more about various mining tools for analysis and decision making
- Applying efficient mining methods to solve engineering problems
- Learning concepts of Business Intelligence in solutions, organizational changes, products, technologies andmethods to organize key data to improve performance and profit.

Course outline:-

Sr. No	Topic	Lecture Hours	Weightage ()%
1	**Data Warehousing fundamentals** • Introduction • A Multi-Dimensional Data Model • Data Warehouse Architecture • Data Warehouse Implementation • From Data Warehouse to Data Mining to Business Intelligence	8	13

2	**Data Pre-processing** • Data Cleaning • Data Integration and Transformation • Data Reduction • Data Discretization and Concept Hierarchy Generation	7	10
3	**Data Extraction, Transformation and Loading (ETL)** • Extracting the Data • Transforming the Data • Loading the Data into a DW System • ETL Using Export Import • Challenges for ETL • ETL Tools • Difference between ETL and BI Tools	8	13
4	**Introduction to Business Intelligence** • Introduction • A Data Framework For BI Structured Vs. Semi-Structured Data Framework Architecture For Structured Data Architecture For Semi-Structured Data • BI as a Product, Process, Solution and Tools • Factor driving Business Intelligence • Role of Data, Information and Knowledge in Data Warehouse, Data Mining and Decision Support System • Difference between BI and other related technologies. • Utilization and benefits of BI in Organization. • Obstacles to BI • Business Intelligence User Tools • Research issues in BI	10	15
5	**Mining Frequent Patterns, Associations, and Correlations** • **Basic Concepts and a Road Map** • **Efficient and Scalable Frequent Item set Mining Methods** • **Mining Various Kinds of Association Rules** • **Constraint based Association Mining**	7	10

6	Classification and Prediction • The fundamentals of classification systems • Issues regarding Classification and prediction • Differences between classification, recommendation, and clustering • Applications of classification • Classification methods: Decision tree, Bayesian Classification, Rule based, CART Neural Network CBR Rough set Approach Fuzzy Logic Genetic Algorithms • Prediction methods: • The fundamentals of Prediction • Linear and nonlinear regression • Accuracy and Error Measures • Accuracy of Classifier	8	13

Practical Content

Reference Books:

1. Data Mining concepts and Techniques by Jiawei Han, Micheline Kamber – Elsevier.
2. M. Kantardzic, "Data mining: Concepts, models, methods and algorithms, John Wiley &Sons Inc.
3. Business Intelligence by Rajiv Sabherwal, Irma Becerra-Fernandez, Wiley Publications, John Wiley & Sons, Inc.

LIST OF EXPERIMENTS:

Sr. No.	Practical Aim
1	Data Preprocessing Techniques in Standard Tool like Excel Miner/Mat Lab
2	Perform ETL on any standard dataset (Export – Import, Data Pump etc.)
3	Generating different types of graphs on different types of data.
4	Implement and simulate different classification algorithm on standard dataset
5	Implement and simulate different clustering algorithm on standard dataset
6	Future prediction on Data mining Tool
7	Computing association rule with TANAGRA and WEKA
8	Building decision tree with TANAGRA and WEKA. Error rate estimation using a Cross validation.
9	Generate intelligent report for enterprise data using BI tools
10	A Survey paper on latest research in Data Ming and Business Intelligence

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

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			• 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 a health educati sessions
Newbor n 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 clinical performance Assessment each skill w check lists Evaluation case study observation study

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			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.

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Internship Obstetrical Nursing

Clinical Training Duration - 5 weeks

Area	Duration (in weeks)	Objective	Skills	Assignment	Assess Meth
Labour ward Neonatal intensive care unit / NICU Antenatal OPD / Ward	2 1 2	Provide comprehensive care to mothers and neonates	Integrated Practice	Completion of other essential requirements Case book recordings	Assess clinica perfor with r scale Comp of cas book record

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Community Health Nursing – II

Placement - Fourth Year

Time - Theory - 90 Hours
Practical - 135 Hours

Course Description-This course is designed for students to practice Community Health Nursing for the individual, family and groups at both urban and rural settings by using concept and Principles of Health and Community Health Nursing.

Unit	Time (Hrs)	Learning Objectives	Content	Teaching Learning Activities	Assessment Methods
I	4	Define Concepts, scope, principles and historical developme nt of Community Health and Community Health Nursing	**Introduction :** * Definition, concept and scope of Community Health and Community Health Nursing * Historical development of o Community Health o Community Health Nursing - Pre - independence - Post - independence	* Lecture discussion	- Essay type - Short answers
II	6	Describe health plans, policies, various health committees and health problems in India	**Health planning and policies and problems :** • National Health planning in India – 5 year plans • Various committees and commissions on health and family welfare - o Central Council for Health and Family Welfare (CCH and FW) o National Health Policies (1983, 2002) o National Population policy • Health problems in India	* Lecture discussion * Panel discussion	- Essay type - Short answers
III	15	Describe the system of delivery of Community Health Services in Rural and Urban areas	**Delivery of Community Health Services :** Planning, Budgeting and material management of SCs, PHC and CHC Rural - Organization, staffing and functions of Rural Health Services provided by Govt. at - o Village o Sub-centre o Primary Health Centre o Community Health Centre /	* Lecture discussion * Visits to various health delivery systems * Supervised field practice * Panel discussion	- Essay type - Short answers

		List the functions of various levels and their staffing pattern Explain the components of health services Describe alternative system of health promotion and health maintenance Describe the chain of referral system	Sub divisional o Hospitals – District, State & Central Level Urban - Organisation, staffing and functions of urban health services provided by Govt. at - o Slums o Dispensaries o Maternal and Child Health Centres o Special clinics o Hospitals - Corporation / Municipality / Board Components of Health Services - o Environmental sanitation o Health Education o Vital statistics o MCH – Antenatal, Natal, Postnatal, MTP act, Female Foeticide Act, Child Adaptation Act. o Family welfare o National Health programmes o School Health Services o Occupational Health o Defence services o Institutional services Systems of medicine and health care - o Allopathy o Indian system of medicine and Homeopathy o Alternative health care systems like yoga, meditation, social and spiritual healing, etc Referral system		
IV	25	Describe Community Health Nursing approaches and concepts Describe the roles and responsibility of Community	**Community Health Nursing approaches, concepts and roles and responsibilities of Nursing Personnel :** Approaches - o Nursing Theories and Nursing process o Epidemiological approach o Problem solving approach o Evidence based approach o Empowering people to care for themselves Concepts of Primary Health Care -	* Lecture discussion * Demonstration * Practice session * Supervised field practice * Participation in camps * Group Project	- Essay t - Short answers

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		Health Nursing Personnel	○ Equitable distribution ○ Community participation ○ Focus on prevention ○ Use of appropriate technology ○ Multi-sectoral approach Roles and responsibilities of Community Health Nursing personnel in - ○ Family Health services ○ Information education communication (IEC) ○ Management information system (MIS) - Maintenance of records and reports ○ Training and supervision of various categories of health workers ○ National Health programmes ○ Environmental sanitation ○ Maternal and Child Health and Family Welfare ○ Treatment of minor ailments ○ School Health services ○ Occupational Health ○ Organization of clinics, camps - types, preparation, planning, conduct and evaluation ○ Waste management in the centre, clinics, etc. Home visit - concept, principles, process techniques - bag technique, home visit Qualities of community health nurse Job description of community Health Nursing personnel		
V	15	Describe and appreciate the activities of community health nurse in assisting individuals	**Assisting individuals and groups to promote and maintain their health :** Empowerment for self care of individuals, families and groups in - **A. Assessment of self and family** ○ Monitoring growth and development - - Mile stones - Weight measurement	* Lecture discussion * Demonstration * Practice session * Supervised field practice * Individual / group/family/	- Essay type - Short answers

		and groups to promote and maintain their health	- Social development ○ Temperature and Blood pressure monitoring ○ Menstrual cycle ○ Breast Self Examination and testicles ○ Warning signs of various diseases ○ Tests - Urine for sugar and albumin, blood sugar **B. Seek health services for -** ○ Routine check - up ○ Immunization ○ Counselling ○ Diagnosis ○ Treatment ○ Follow up **C. Maintenance of health records for self and family** **D. Continue medical care and follow up in community for various diseases and disabilities** **E Carry - out therapeutic procedures as prescribed / required for self and family** **F. Waste Management -** Collection and disposal of waste at home and community **G. Sensitize and handle social issues affecting health and development for self and family -** • Women Empowerment • Women and child abuse • Abuse of elders • Female Foeticide • Commercial sex workers • Food adulteration • Substance abuse **H. Utilize community resources for self and family -** ○ Trauma services ○ Old age homes ○ Orphanage ○ Homes for physically and	community health education	

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			mentally challenged individuals o Homes for destitute		
VI	20	Describe national health and family welfare programmes and role of a nurse Describe the various health schemes in India	**National health and family welfare programmes and the role of a nurse :** 1) National ARI programme 2) Revised National Tuberculosis Control Programme (RNTCP) 3) National Anti - Malaria programme 4) National Filaria control programme 5) National Guinea Worm Eradication programme 6) National Leprosy eradication programme 7) National AIDS control programme 8) STD control programme 9) National programme for control of blindness 10) Iodine deficiency disorder programme 11) Expanded programme on immunization 12) National Family Welfare Programme - RCH Programme - historical development, organization, administration, research, constraints 13) National water supply and sanitation programme 14) Minimum Need programme 15) National Diabetics control programme 16) Polio Eradication - Pulse Polio Programme 17) National Cancer Control Programme 18) Yaws Eradication Programme 19) National Nutritional Anemia Prophylaxis programme 20) Twenty point programme 21) ICDS programme 22) Mid-day meal applied nutritional programme 23) National mental health programme Health Schemes – ESI, CGHS, Health insurance	* Lecture discussion * Participation in National Health Programmes * Field visits	- Essay type - Short answers
VII	5	Explain the	**Health Agencies**	* Lecture	- Essay type

		roles and functions of various national and internationa l health agencies	**International** – WHO, UNFPA, UNDP, World Bank, FAO, UNICEF, DANIDA, European Commission (EC), Red Cross, USAID, UNESCO, Colombo Plan, ILO, CARE etc. **National** – Indian Red Cross, Indian Council for Child Welfare, Family Planning Association of India (FPAI), Tuberculosis Association of India, Hindu Kusht Nivaran Sangh, Central Social Welfare Board, All India women's conference, Blind Association of India etc.	discussion * Field Visits	- Short answers

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Management of Nursing Services and Education

Placement : Fourth Year

Time : Theory - 90 Hours

Course Description: This course is designed to enable students to acquire understanding of management of clinical and community health nursing services, nursing educational programmes. This is also designed to enable students to acquire understanding of the professional responsibilities, prospects and contribution to the growth of the profession.

Unit	Time (Hrs)		Learning Objectives	Content	Teaching Learning Activities	Assessment Methods
	Th.	Pr.				
I	4		Explain the principles and functions of managemen t	**Introduction to management in nursing :** * Definition, concepts and theories * Functions of management * Principles of Management * Role of Nurse as a manager	* Lecture Discussion * Explain using organization chart	- Short answers
II	5		Describe the elements and process of managemen t	**Management Process :** * Planning; mission, philosophy, objectives, operational plan * Staffing: Philosophy, staffing study, norms, activities, patient classification systems, scheduling * Human resource management: recruiting, selecting, deployment, retaining, promoting, super-superannuation, etc. * Budgeting: concept, principles, types, cost benefit analysis, audit * Material management: equipment and supplies * Directing process (Leading) * Controlling: Quality management * Program Evaluation Review Technique (PERT) , Bench marking, Activity Plan (Gantt Chart),	* Lecture Discussion * Simulated Exercises * Case studies	- Short answers - Essay type
III	8	20	Describe the Manageme nt of nursing services in the hospital	**Management of nursing services in the hospital and Community :** * Planning - o Hospital and patient care units including ward management	* Lecture Discussion * Demonstration * Simulated Exercises	- Short answers - Essay type - Assessment of problem solving

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			and community	○ Emergency and disaster management * Human resource management - ○ Recruiting, selecting, deployment, retaining, promoting, superannuation, etc. ○ Categories of nursing personnel including job description of all levels ○ Patient /population classification systems ○ Patients/population assignment and Nursing care responsibilities ○ Staff development and welfare * Budgeting - proposal, projecting requirements for staff, equipments and supplies for - ○ Hospital and patient care units ○ Emergency and disaster management * Material Management: procurement, inventory control, auditing and maintenance in - ○ Hospital and patient care units ○ Emergency and disaster management * Directing and leading - delegation, participatory management - ○ Assignments, rotations, delegations ○ Supervision & guidance ○ Implement standards, policies, procedures and practices ○ Staff development and welfare ○ Maintenance of discipline * Controlling / Evaluation - ○ Nursing Rounds/visits, Nursing protocols,	* Case studies * Supervised practice in ward-writing indents, preparing duty roaster, ward supervision * Assignment on duties and responsibilities of ward sister * Writing report	exercise. - Assessment of the assignment - Performance evaluation by ward sister with rating scale

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				Manuals o Quality Assurance - Model, documentation o Records and reports *Performance appraisal		
IV	5		Describe the concepts, theories and techniques of Organizational behaviour and human relations	**Organizational behaviour and human relations :** * Concepts and theories of organizational behaviours * Review of Channels of communication * Leadership styles * Review of Motivation - concepts and theories * Group dynamics * Techniques of - o Communication o Interpersonal relationships o Human relations * Public relations in context of nursing * Relations with professional associations and employee unions and Collective bargaining	* Lecture Discussion * Role plays * Group games * Self assessment * Case discussion * Practice Session	- Short answers - Essay type - Assessment of problem solving
V	5	5	Participate in planning and organizing In-Service Education Program	**In -Service education :** * Nature & scope of in-service education program * Organization of in-service education * Principles of adult learning * Planning for in-service education program, techniques, methods and evaluation of staff education program. * Preparation of report	* Lecture Discussion * Plan and conduct an educational session for in-service nursing personnel	- Short answers - Objective type - Assess the planning & conduct of the educational session
VI	10		Describe management of Nursing education institutions	**Management of nursing educational institutions :** * Establishment of Nursing educational institution - INC norms and guidelines * Co-ordination with - o Regulatory bodies o Accreditation o Affiliation - Philosophy/objectives - Organization o Structure o Committees - Physical facilities o College/School	* Lecture Discussion * Role plays * Counselling session * Group Exercises	- Short answers - Essay type

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				○ Hostel - Students ▯ Selection ▯ Admission ▯ Guidance and Counselling ▯ Maintaining discipline - Faculty and staff ○ Selection ○ Recruitment ○ Job description ○ Placement ○ Performance appraisal ○ Development and welfare • Budgeting • Equipments and supplies: audio visual equipments, laboratory equipment, books, journals, etc. • Curriculum: Planning, implementation and evaluation • Clinical facilities • Transport facilities • Institutional Records and reports – Administrative, faculty, staff and students.		
VII	10		Describe the ethical and legal responsibilities of a professional nurse. Explain the nursing practice standards	**Nursing as a Profession :** * Nursing as a profession ○ Philosophy - nursing practice ○ Aims and objectives ○ Characteristics of a professional nurse ○ Regulatory bodies - INC, SNC Acts - Constitution, functions ○ Current trends and issues in Nursing * Professional ethics ○ Code of ethics - INC, ICN ○ Code of professional conduct - INC, ICN * Practice standards for Nursing - INC * Consumer protection Act * Legal aspects in Nursing	* Lecture Discussion * Case discussion * Panel discussion * Role plays * Critical incidents * Visit to INC/SNRCs	- Short answers - Assessment of critical incidents

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				○ Legal terms related to practice - registration and licensing ○ Laws related to Nursing practice, Breach and Penalties ○ Malpractice and negligence		
VIII	3		Explain the various opportunities for professional advancement	**Professional Advancement :** * Continuing education * Career opportunities * Collective bargaining * Membership with professional organization - National and International * Participation in research activities * Publications - Journals, newspapers, etc.	* Lecture Discussion * Review / Presentation of published articles * Group work on maintenance of bulletin board.	- Short answers

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Vaishali

Madhumaly

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	Recognize 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 reproductive 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

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			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

			• 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 management 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 management problems

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			• 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 Third stage - • 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 Fourth Stage		
V	5	Describe the physiology of puerperium Describe the management 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 management problems Assessment of skills with check list
VI	6	Describe the	**Assessment and management of normal neonates :**	Lecture Discussion	Essay type

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		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

			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

			▪ 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 anesthesias 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

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		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

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P.B. B.SC NURSING

SYLLABUS

AARIHANT INSTITUTE OF NURSING

BATCH : 2021-2023

SYLLABUS FOR POST BASIC B.Sc NURSING

Section - I

PREAMBLE

Nursing encompasses autonomous and collaborative care of individuals of all ages, families, groups and communities, sick or well and in all settings. Nursing includes the promotion of health, prevention of illness, and the care of ill, disabled and dying people. Advocacy, promotion of a safe environment, research, participation in shaping health policy and in patient and health systems management, and education are also key nursing roles.

The authority for the practice of nursing is based upon a social contract that delineates professional rights and responsibilities as well as mechanisms for public accountability. In almost all countries, nursing practice is defined and governed by law, and entrance to the profession is regulated at national or state level.

The aim of the nursing community worldwide is for its professionals to ensure quality care for all, while maintaining their credentials, code of ethics, standards, and competencies, and continuing their education. There are a number of educational paths to becoming a professional nurse, which vary greatly worldwide, but all involve extensive study of nursing theory and practice and training in clinical skills.

Nurses care for individuals who are healthy and ill, of all ages and cultural backgrounds, and who have physical, emotional, psychological, intellectual, social, and spiritual needs. The profession combines physical science, social science, nursing theory, and technology in caring for those individuals.

The role of the nurse is evolving, as the mode of delivery of health care services has undergone major changes both locally and internationally in the past decades. In line with international trends, we are developing a health care system that provides lifelong holistic care, promotes health, enhances the quality of life and enables human development. The availability of qualified and competent health care professional is the key to the delivery of quality health care services. As nurses play a pivotal role in the promotion, maintenance and restoration of health, we need to develop competent nurses who are able to take up extended and expanded roles in the delivery of primary, secondary and tertiary care. Thus, apart from the roles of a caregiver, the nurse needs to develop competence to take up the roles of health promoter, educator, counselor, care coordinator, case manager, researcher as well as that the students acquires the essential competence that enables them to fulfill these roles competently and ethically.

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Philosophy

We believe the philosophy of Indian nursing council:

Health is a state of well-being that enables a person to lead a psychologically, socially and economically productive life. Health is not a privilege but a right of all the people. Individuals, families and communities have a responsibility towards maintaining their health.

Nursing contributes to the health services in a vital and significant way in the health care delivery system. It recognizes national health goals and is committed to participate in the implementation of National Health policies and programmes. It aims at identifying health needs of the people, planning and providing quality care in collaboration with other health professionals and community groups.

Scope of nursing practice encompasses provision of promotive, preventive, curative and rehabilitative aspects of care to people across their life span in wide variety of health care settings. Practice of nursing is based upon application of basic concepts and principles derived from the physical, biological, behavioral sciences.

Nursing is based on values of caring, and aims to help individuals to attain independence in self-care. It necessitates development of compassion and understanding of human behavior among its practitioners to provide care with respect and dignity and protect the rights of individuals & groups. Undergraduate nursing program at the post basic level is a broad based education within an academic framework, which builds upon the skills and competencies acquired at the diploma level. It is specifically directed to the upgrading of critical thinking skills, competencies & standards required for practice of professional nursing and midwifery as envisaged in National Health Policy 2002.

The teachers have the responsibility to be role models and create learning environment that enables students to acquire inquiry driven, self directed learning and foster an attitude of life long learning. Under graduate nursing education program at the post basic level prepares its graduates to become exemplary citizen by adhering to code of ethics and professional conduct at all times in fulfilling personal, social and professional obligations so as to respond to national aspirations.

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Aims

The aim of the undergraduate nursing program at the post basic level is to upgrade the diploma (GNM) nurses to:

- assume responsibilities as professional, competent nurses and midwives at basic level in providing promotive, preventive, curative, and rehabilitative services.
- make independent decisions in nursing situations, protect the rights of and facilitate individuals and groups in pursuit of health, function in the hospital, community nursing services, and conduct research studies in the areas of nursing practice. They are also expected to assume the role of teacher, supervisor, and manager in clinical/public health settings.

Objectives

On completion of B.Sc. Nursing (Post-Basic) degree programme the graduates will be able to:

1. Assess health status, identify nursing needs, plan, implement and evaluate nursing care for patients/clients that contribute to health of individuals, families and communities.
2. Demonstrate competency in techniques of nursing based on concepts and principles from selected areas of nursing, physical, biological and behavioral sciences.
3. Participate as members of health team in the promotive, preventive, curative and restorative health care delivery system of the country.
4. Demonstrate skills in communication and interpersonal relationship.
5. Demonstrate leadership qualities and decision-making abilities in various situations.
6. Demonstrate skills in teaching to individuals and groups in community health settings.
7. Demonstrate managerial skills in community health settings.
8. Practice ethical values in their personal and professional life.
9. Participate in research activities and utilize research findings in improving nursing practice.
10. Recognize the need for continued learning for their personal and professional development.

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SUBJECT AND TEACHING SCHEDULE

COURSE OF STUDY

S.NO	SUBJECT	HOURS THEORY	HOURS PRACTICAL
	1 Year		
1	Nursing Foundation	45	-
2	Nutrition & dietetics	30	15
3	Biochemistry & Biophysics	60	-
4	Psychology	60	15
5	Maternal Nursing	60	240
6	Child Health Nursing	60	240
7	Microbiology	60	30
8	Medical & Surgical Nursing	90	270
9	English (Qualifying)	60	-
	Total	**525**	**810**
Note: Hindi /Local Language as per the need of institution			
	2nd Year		
10	Sociology	60	-
11	Community Health Nursing	60	240
12	Mental Health Nursing	60	240
13	Introduction to Nursing Education	60	75
14	Introduction to Nursing Administration	60	180
15	Introduction to Nursing Research & Statistics	45	120
16.	Environmental Science	50	-
	Total	**395**	**855**

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SCHEME OF EXAMINATION

Paper	Subject	Duration	Int. Asst	Ext. Asst	Total Marks
Theory	**1st Year**				
1	Nursing Foundation	2	15	35	50
2	Nutrition & Dietetics	2	15	35	50
3	Biochemistry &Biophysics	3	25	75	100
4	Psychology	3	25	75	100
5	Maternal Nursing	3	25	75	100
6	Child Health Nursing	3	25	75	100
7	Microbiology	3	25	75	100
8	Medical & Surgical Nursing	3	25	75	100
9	English (Qualifying)*	3	25	75	100
	Practical				
1	Medical & Surgical Nursing		50	50	100
2	Maternal Nursing		50	50	100
3	Child Health Nursing		50	50	100
	2nd Year				
10	Sociology	3	25	75	100
11	Community Health Nursing	3	25	75	100
12	Mental Health Nursing	3	25	75	100
13	Introduction To Nursing Education	3	25	75	100
14	Introduction To Nursing Administration	3	25	75	100
15	Introduction To Nursing Research& Statistics**	2	50	50	100
16.	Environmental science**	2	25	75	100
Practical					
1	Community Health Nursing	3	50	50	100
2	Mental Health Nursing	3	50	50	100

Note: * Qualifying Examination

** College Examination (not University Examination)

N.B:

1. Teaching of Anatomy, Physiology, Pharmacology and Pathology will be integrated with clinical subjects
2. A minimum of 80% Attendance in theory and Practical in each subject is essential for appearing in the examination.
3. 100% attendance in practical in each clinical area is essential before award of degree.
4. 50% of minimum marks in each theory and practical paper separately is required for passing.
5. A candidate has to secure minimum of 33% in qualifying subject for passing.

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

AARIHANT INSTITUTE OF NURSING

POST BASIC B.SC NURSING I YEAR

NURSING FOUNDATION

THEORY: 45hrs

COURSE DESCRIPTION:-

This course will help students to develop an understanding of the philosophy, objectives and responsibilities of nursing as a profession. The purpose of the course is toorient to the current concepts involved in the practice of nursing and developments in thenursing profession.

OBJECTIVES :-

At the end of the course, the students will:

1. Identify professional aspects of nursing
2. Explain theories of nursing
3. Identify ethical aspects of nursing profession
4. Utilise steps of nursing process
5. Identify the role of the nurse in various levels of health services
6. Appreciate the significance or quality assurance in nursing.
7. Explain current trends in health and nursing

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UNIT NO	HOURS	Learning Objective	COURSE CONTENTS	Teaching learning Activities	Assessment Method
Unit I	6 hrs	Explain concept & scope of nursing Describe values code of ethics & Professional conduct for nurses in india	**Development of Nursing as a profession** * Its philosophy * Objectives and responsibilities of a graduate nurse * Trends influencing nursing practice * Expanded role of the nurse * Development of nursing education in India and trends in nursing education * Professional organizations, career planning * Code of ethics & Professional conduct for nurse.	Lecture, discussion , chart, slides	Written Test; Objective and Essay Type.
Unit II	12 hrs	Describe the ethical legal issues in nursing Explain concept of health ,illness effect on the individual Explain developm ental concept ,needs & roles of individual	**Ethical, legal and other issues in nursing** * Concepts of health and illness, effects on the person * Stress and adaptation * Health care concept and nursing care concept * Developmental concept, needs, roles and problems of the development stages of individual –newborn, infant, toddler, pre-adolescent, adolescent, adulthood, middle-age, old age.	Lecture, discussion , charts, slides & Demonstr ations	Written Test; Objective and Essay Type.

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Unit III	5hrs	Explain the theory of nursing practice Describe met paradigm of nursing	**Theory of nursing practice** * Meta paradigm of nursing – characterized by four central concepts i.e. nurse, person (client/patient), health and environment.	Lecture, discussion , Demonstration Practice session Clinical Practice	Written Test; Objective and Essay Type.
Unit IV	10 hrs	Explain the concepts ,uses & steps of nursing process	**Nursing process.** * Assessment: Tools for assessment, methods, recording. * Planning: Techniques for planning care, types of care plans. * Implementation of care, recording. * Evaluation: Tools for evaluation, process of evaluation.	Lecture, discussion , Demonstration Practice session Clinical Practice	Written Test; Objective and Essay Type.
Unit V	4 hrs	Explain the value of quality assurance in nursing	**Quality assurance:** * nursing standards, nursing audit, total quality management. * Role of council and professional bodies in maintenance of standards.	Lecture, discussion , Demonstration ,charts ,slides .	Written Test; Objective and Essay Type.
Unit VI	4 hrs	Explain the current trends in health & nursing	**Primary health care concept:** * Community oriented nursing * Holistic nursing. Primary nursing * Family oriented nursing concept, Problem oriented nursing * Progressive patient care * Team nursing	Lecture, discussion .	Written Test; Objective and Essay Type.
Unit VII	4 hrs	Explain biomedical waste management	**Biomedical Waste Management**	Field Visit, lecture& discussion	Written Test; Objective and Essay Type.

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REFERENCES:

1. Kozier B, Erb, G & Oliver, R : Fundamentals of Nursing ;4th ed. California, Addison Wesley., 1991
2. Perry, A.G. & Potter, P.A.: Basic nursing essentials of practice; 5th ed. St. Louis,Mosby. 2003
3. Potter, P.A. & Perry, A.G.: Fundamentals of nursing; 5th ed. Mosby Harcott(India) Pvt. Ltd.
4. Beverly WitlerDugas : Introduction to patient care ; 4th ed., Saunders, 2002
5. White, Lois: Foundations of nursing caring for the whole person; U.S.A.
6. Delmer Thompson Learning,
7. Luckmann, J & Sorensen, K.C.: Basic nursing: a psychophysiologic approach; 3rd
8. ed., W. B. Saunders, 2002
9. Park, J.E. :Text book of preventive and social medicine ; 17th ed., Banarasidas
10. Bhanot, 2003

DISTRIBUTION OF TYPE OF QUESTION AND MARKS

FOR THE SUBJECT NURSING FOUNDATION

Question No.	Question description	Division of marks	Total marks
1.	**Total MCQs:- 5**	5 x 1	5
2.	**Long Answer Questions (LAQ) (Any1 out of 2)**	1 x 10	10
3.	**Short Notes (4 out of 6)** a) b) c) d) e) f)	4x5	20

Note :

1. MCQ : Each MCQ carries 1 mark.
2. Long Answer Questions : 2 questions will be given out of which , 1 have to be answered.
3. Short Notes : 6 questions will be given out of which, 4 have to be answered.

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NUTRITION AND DIETETICS

Placement :First Year **Time Allotted: Theory -30 hrs.**
Practical -25 hrs

COURSE DESCRIPTION

This course is designed to provide the students with a wide knowledge of dietetics in Indian setting, that the practice of teaching optimum and realistic dietary planning can become an integral part of nursing practice.

OBJECTIVES

At the end of the course, the student will

1. Explain the principles and practices of nutrition and dietetics.
2. Plan therapeutic diets in different settings.
3. Identify nutritional needs of different age groups and plan diet accordingly.
4. Prepare meals using different methods utilizing cookery rules.

UNIT NO	HOURS		Learning Objective	COURSE CONTENT	Teaching Learning Activities	Assessment
	T	P				
I	8Hrs		Explain the principles of nutrition & dietetics	**Introduction to nutrition and dietetics.** * Balanced diet, factors on which it depends. * Factors to be considered in planning. * Guides available for planning. * Food hygiene, preparation and preservation * Review of nutrients –micro and macro.	Lecture & Discussion Explain Using chart Panel Discussion	Written Test; Objective and Essay Type.
II	8Hrs	8	Describe & plan various therapeuti c diet for different conditions	**Introduction to diet therapy** * Routine hospital diets * Therapeutic diet under each unit i.e. cardiovascular diseaded, Gastronitestinal diseases, Renal disorders, endocrine and metabolic disorders, allergy, infectionsand fevers, pre and post operative stage, deficiency diseases and malnutrition, overweight and underweight.	Lecture & Discussion Explain Using chart	Written Test; Objective and Essay Type.

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III	8Hrs	7	Describe and plan feeding of infant & children	**Infant and child nutrition** * Feeding of normal infants: factors to be considered in planning, nutritional requirements. * Feeding of premature infants: factors to be considered in planning, nutritional requirements. * Supplementary feeding of infants: Advantage and method of introduction. * Weaning, effects on mother and child * Psychology of infant and child feeding. * Feed the sick child. Diet in diseases of infancy and childhood. * Deficiency states – malnutrition and under nutrition. * Feeding pre-school child: nutritional needs, factors to be considered in planning diets. Problems in feeding. * School lunch programme: Advantages, Need in India.	Lecture & Discussio n Explain with slide film show Demonstr ation of assessmen t of nutritional charts	Written Test; Objective and Essay Type.
IV	6Hrs		Describe various communit y nutrition programm e Describe nutritional needs & diet plan for different age groups	**Community Nutrition:** Need for community nutrition programme. * Nutritional needs for special groups: infant, child, adolescent, pregnant woman,lactating mother and old people. * Substitutes for non-vegetarian foods. * Selection of cheap and nutritious foods. Nutrition education- needs and methods. * Methods of assessing nutritional status of individual/group/community. * Current nutritional problems and national programmes.	Lecture & Discussio n Explain with slide film show Demonstr ation of assessmen t of nutritional charts	Written Test; Objective and Essay Type.

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PRACTICUM

I. Methods of cooking and cookery rules.

1. Simple preparation of beverages, soups, cereals and pulses, eggs, vegetables, meat.

2. Menu Plans.

II. Preparation of supplementary food for infants.

1. Food for toddlers.

2. Low cost nutritious dishes for vulnerable groups.

3. Dietary case study of patient on special diet and planning of low cost dietary instructions for home adaptations.

4. Planning of therapeutic diets.

REFERENCES:

1) Clinical dietetics and Nutrition, Antia 4th ed.

2) Nutritive value of Indian foods, Gopalan, 1st ed.

3) Krause's Food, Nutrition & diet Therapy, Mahan, 11th ed.

4) Nutrition & diet therapy, Williams

5) Clinical Dietetics & Nutrition, Philip.

DISTRIBUTION OF TYPE OF QUESTION AND MARKS

FOR THE SUBJECT NUTRITION AND DIETETICS

Question No.	Question description	Division of marks	Total marks
1.	Total MCQs:- 5	5 x 1	5
2.	Long Answer Questions (LAQ) (Any1 out of 2)	1 x 10	10
3.	Short Notes (4 out of 6) a) b) c) d) e) f)	4x5	20

Note :

1. MCQ : Each MCQ carries 1 mark.
2. Long Answer Questions : 2 questions will be given out of which , 1 have to be answered.
3. Short Notes : 6 questions will be given out of which, 4 have to be answered.

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BIOCHEMISTRY AND BIOPHYSICS

Placement: First Year

Time Allotted:

Section A (Biochemistry) – Theory 30 hrs.

Section B (Biophysics) - Theory 30 hrs.

Practical - 30 hrs

COURSE DESCRIPTION:

This course introduces the basic principles of biochemistry and biophysics related to nursing.

OBJECTIVES:

At the end of the course, the student will

1. Identify the basic principles of biochemistry and biophysics.
2. Synthesize the knowledge of these principles in various nursing situations.

Section A: (Biochemistry)

THEORY : -30 Hrs

UNIT NO	HOURS	Learning Objective	COURSE CONTENTS	Teaching learning Activities	Assessment Method
I	2Hrs	Describe basic principles of biochemistry Describe the structure & functions of cell	**Introduction :** Importance of biochemistry in nursing * Study of cell and its various components.	Lecture, discussion, ,charts, slides Demonstration use of microscope	Written Test; Objective and Essay Type.
II	2Hrs	Describe the water & electrolyte balance of human body	**Water and Electrolytes:** Water sources, property and functions in human body. * Water and fluid balance. * Electrolytes of human body, functions, sources.	Lecture, discussion, Charts Slides Explain using charts, graph	Written Test; Objective and Essay Type.

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III	5Hrs	Explain the mechanism of enzymes	**Enzymes** * Mechanism of action * Factors affecting enzyme activity * Diagnostic applications * Precautions for handling specimens for enzyme estimation * Digestion and absorption of carbohydrates, proteins and fats * Various factors influencing the digestion and absorption, malabsorption syndrome.	Lecture, discussion Slides Demonstra tion in laboratory	Written Test; Objective and Essay Type.
IV	5Hrs	Explain catabolism of carbohydrate s Explain the storage and utilization of fats & glucose in the body	**Carbohydrates:** Catabolism of carbohydrates for energy purposes * Mitrochondrial oxidation and oxidation phosphorylation. * Fats of glucose in the body. Storage of glucose in the body, glycogenesis, glycogenolysis and neoglucogenesis, blood glucose and its regulation. * Glucose tolerance test, hyperglycemia, hypoglycemia, glycemia.	Lecture, discussion Charts Slides Demonstra tion of laboratory tests	Written Test; Objective and Essay Type.
V	5Hrs	Explain the metabolism of amino acids & proteins	**Protein :** Amino acids, hormones. * Essential amino acids. Biosynthesis of protein in the cells * Role of nucleic acid in protein synthesis. * Nitrogenous constituents of urine, blood, their origin –urea cycle, uric acid formation, gout. * Plasma proteins and their functions.	Lecture, discussion Charts Slides Demonstra tion of laboratory tests	Written Test; Objective and Essay Type.

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VI	6Hrs	Explain the metabolism of fat,importac e lipids & their functions	**Fat:** Biosynthesis of fats and storage of fats in the body. * Role of liver in fat metabolishm * Biological importance of important lipids and their functions * Cholesterol and lipoprotein * Sources, occurrence and distribution * Blood level and metabolism * Ketone bodies and utilization. * Inter- relationships in metabolism and cellular control of metabolic processes.	Lecture, discussion, explain using charts,grap h	Written Test; Objective and Essay Type.

Section B: (Biophysics)

THEORY : -30 Hrs

UNIT NO	HOURS	Learning Objective	COURSE CONTENTS	Teaching learning Activities	Assessment Method
I	2Hrs	Basic principles of biophysics	Introduction :Concepts of unit and measurements. * Fundamental and derived units. * Units of length, weight, mass, time.	Lecture, discussion, chart slides	Written Test; Objective and Essay Type.
II	2Hrs	Describe the vector & scalar motion	Vector and scalar motion, speed, velocity and acceleration.	Lecture, & discussion	Written Test; Objective and Essay Type.
III	3Hrs	Describe the gravity & v its application in nursing	Gravity: Specific gravity, centre of gravity, principles of gravity. * Effect of gravitational forces on human body. * Application of principles of gravity in nursing.	Lecture, discussion, chart slides experiments	Written Test; Objective and Essay Type.
IV	3Hrs	Describe the force ,work	Force, work, Energy: Their units of measurement.	Lecture, discussion,	Written Test; Objective and

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		& energy ,its principle & application in nursing	* Type and transformation of energy, forces of the body, static forces. * Principles of machines, friction and body mechanics. * Simple mechanics – lever and body mechanics, pulley and traction, incline plane, screw. * Application of these principles in nursing.	charts, slides experiments	Essay Type.
V	3Hrs	Describe the heat ,its principle& application in nursing	Heat: Nature, measurement, transfer of heat * Effects of heat on matter * Relative humidity, specific heat * Temperature scales * Regulation of body temperature * Use of heat for sterilization * Application of these principles in nursing	Lecture, discussion Demonstration	Written Test; Objective and Essay Type.
VI	3Hrs	Describe the light ,its principle & applications in nursing	Light: Laws of reflection * Focusing elements of the eye, defective vision and its correction, use of lenses. * Relationship between energy, frequency and wavelength of light * Biological effects of light. * Use of light in therapy. * Application of these principles in Nursing.	Lecture, discussion Demonstration, carts slides	Written Test; Objective and Essay Type.
VII	3Hrs	Describe the pressure ,its principle & applications in nursing	Pressures: Atmospheric pressure, hydrostatic pressure, osmotic pressure. Measurements of pressures in the body * Arterial and venous blood pressures * Ocular pressure * Intracranial pressure * Applications of these principles in nursing.	Lecture, discussion demonstration charts ,slides	Written Test; Objective and Essay Type.

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VIII	2Hrs	Describe the sound ,its principle & applications in nursing	Sound: Frequency, Velocity and intensity * Vocalization and hearing * Use of ultrasound. Noise pollution and its prevention * Application of these principles in nursing.	Lecture, discussion	Written Test: Objective and Essay Type.
IX	5Hrs	Describe the electricity & applications in human body	Electricity and Electromagnetism: Nature of electricity. Voltage, current, resistance and their units. * Flow of electricity in solids, electrolytes, gases and vacuum. * Electricity and human body. * ECG, EEG,EMG, ECT * Pace makers and defibrillation * Magnetism and electricity. * M.R.I Scanning, CAT Scan	Lecture, discussion, demonstration Supervised clinical practice	Written Test: Objective and Essay Type.
X	2Hrs	Describe the atomic energy. its structure, use & applications in nursing	Atomic Energy: Structure of Atom, Isotopes and Isobars. * Radioactivity: Use of radioactive isotopes. * Radiation protection units and limits, instruments used for detection of lionising radiation. X-rays.	Lecture, discussion charts	Written Test: Objective and Essay Type.
XI	2Hrs	Describe the principle of electronic & its applications in nursing	Principles of Electronics: Common electronic equipments used in patient care.	Lecture, discussion Supervised clinical practice	Written Test: Objective and Essay Type

Practicum:

Experiments and Tests should be demonstrated wherever applicable.

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1. Flitter, H.H.(1989): An introduction to physics in nursing; 7th edition Delhi, All India Traveller Book seller. (Original American ed. Pub. by C.V.Mosby, St.Louis).
2. Sackheim, S.M.(1962): Practical Physics for nurses; 2nd ed. Philadelphia, W.B. Saunders Co.
3. Stearns, H.O.(1962): Fundamentals of physics and Applications; 2nd ed. New York, Macmillan Co.
4. 4) T.N.A.I. (1966): Physics and Chemistry; Laboratory Manual for Student Nurses; 3rd ed. New Delhi, T.N.A.I.
5. Waters, M.(1958): Elementary physics for Nurses; 6th ed London, Faber and fabor.
6. KIGOUR, O.F.G.(1978): An Introduction to the physical aspects of Nursing Sciences; 3rd ed. London, William Heinemann Medical Books Ltd.
7. Nordmark, M.t and Rahweder, A.W.(1959): Science Principles in Nursing; Philadelphia, J.B. Lippincott.

DISTRIBUTION OF TYPE OF QUESTION AND MARKS FOR THE SUBJECT BIOCHEMISTRY AND BIOPHYSICS

Question No	Question description	Division of marks	Total marks
1	Total MCQ's 15 Biochemistry 1- 7 Biophysics 11-15	7x 1=7 5 x 1=5	15
	SECTION - A Biochemistry (30 marks)		
2	Long Answer Questions (LAQ's) (any 1 out of 2)	1 x 10	10
3	Short Notes (Any 4 out 6) a) b) c) d) e) f)	4 x 5	20
	SECTION – B (BIOPHYSICS- 30 marks)		
4	Long Answer Questions (LAQ's) (any 1 out of 2)	1 x 10	10
5	Short Notes (Any 4 out 6) a) b) c) d) e) f)	4 x 5	20

Note :

1. MCQ : Each MCQ carries 1 mark.
2. Long Answer Questions :2 questions will be given out of which, 1 has to be answered in Biochemistry& Biophysics separately.
3. Short Notes :6 questions will be given out of which,4 have to be answered in Biochemistry& Biophysics separately.

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PSYCHOLOGY

Placement :First Year

Time Allotted: Theory -60 hrs.
Practical- 15 hrs

COURSE DESCRIPTION

This course is designed to reorient and widen the student's knowledge of fundamentals of psychology. The student is offered an opportunity to apply the theoretical concepts in the clinical setting and thereby understand the psychodynamics of patient behaviour. This course would also help the student to develop and insight into her own behaviour.

OBJECTIVES

At the end of the course, the student will

1. Apply psychological principles while performing nursing duties.
2. Distinguish the psychological processes during health and sickness.
3. Analyze own behaviour patterns.
4. Tabulate the psychological needs of the patients for planning nursing care.
5. Participate in psychometric assessment of the client.

UNIT NO	HOURS		Learning Objective	COURSE CONTENTS	Teaching learning Activities	Assessment Method
	T	P				
I	3Hrs		Describe the scope & methods of psychology	* Introduction: Definition of psychology, scope and methods of psychology. * Relationship with other subjects.	Lecture & Discussion	Written Test; Objective and Essay Type
II	6Hrs	5	Describe the sensation,attenson& distinguish between normal & abnormal Simple experiments Perception measuring thresholds Reaction time	* Sensation, Attention and perception: Definitions * Sensory processes: Normal and abnormal * Attention and distraction: Contributory factors * Characteristics of perception, perception: Normal and abnormal	Lecture & Discussion	Written Test; Objective and Essay Type

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III	6Hrs		Describe motivation, its nature Describe Frustration and conflicts	* Motivation: Definition and nature of motivation * Biological and social motives * Frustration and conflicts * Self-actualization	Lecture & Discussion	Written Test; Objective and Essay Type
IV	5Hrs		Describe emotions & its application in sickness	* Emotions: Definition of emotions, expression and perception * Emotions in sickness	Lecture & Discussion	Written Test; Objective and Essay Type
V	7Hrs		Explain the concept of personality & its influence n behavior.	* Personality : Definition , constituents of personality * Personality in sickness and nursing	Lecture & Discussion	Written Test; Objective and Essay Type
VI	5Hrs		Describe psychological needs of various ages during their life cycle	* Psychological aspects of nursing * Behaviour and sickness. Psychological needs of Child and adolescents Adult Aged Attendants * Chronically ill individual	Lecture & Discussion Case Discussion	Written Test; Objective and Essay Type
VII	4Hrs		Describe significance of individual differences & its implications in nursing	* Individual differences * Significance of individual differences. * Heredity and environment * Role of individual differences both in health and sickness. * Implications of individual differences in nursing.	Lecture & Discussion Demonstration Practical sessions	Written Test; Objective and Essay Type
VIII	6Hrs		Describe intelligence & abilities during sickness	* Intelligence and Abilities: Definition * Intelligence and abilities during sickness * Measurement of intelligence and abilities.	Lecture & Discussion Demonstration	Assessment of Practice Written Test; Objective and Essay Type
IX	5Hrs		Describe leaning & laws of learning during health & sickness	* Learning: Definition, conditions of learning * Laws of learning * Learning during health and sickness.	Lecture & Discussion Demonstration	Assessment of Practice Written Test; Objective and Essay Type

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X	5Hrs		Describe memory & forgetting Describe its application during health & sickness	* Memory and forgetting: Definition and nature of memory * Memory during health and sickness. * Forgetting during health and sickness	Lecture & Discussion Demonstration	Written Test; Objective and Essay Type
XI	5Hrs		Describe attitude & role of attitudes in health & sickness	* Attitudes: Definition, Development and modification * Role of attitudes in health and sickness.	Lecture & Discussion	Written Test; Objective and Essay Type
XII	3Hrs		Describe the characteristics of mentally healthy person Explain ego, defense mechanism	* Concept of mental hygiene and mental health * Characteristics of a mentally healthy person. * Defense mechanisms.	Lecture & Discussion	Written Test; Objective and Essay Type

PRACTICUM

1. 1.Simple experiments of(i) perception (ii) measuring thresholds (iii) reaction time.
2. Administration of psychological tests
3. Observation and recording data: (i) field observation (ii) interview (iii) case study (iv)self –rating.

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1. Bhatia, B.D. and Craig, M: Elements of psychology and mental hygiene for nurses; Chennai : Orient Longman Pvt. Ltd
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3. Hurlock, E. : Developmental psychology ; Singapore :Tata McGraw Hill Book Co.,
4. McGhee, A: Psychology as applied to nursing ; London : Churchill Livingstone
5. Morgan, C.T. and King, R.A.: Introduction to psychology ; Singapore : McGraw Hill Book Co.,

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DISTRIBUTION OF TYPE OF QUESTION AND MARKS

FOR THE SUBJECT PSYCHOLOGY

Question No.	Question description	Division of marks	Total marks
1.	**Total MCQs:- 15**	15 x 1	15
2.	**Long Answer Questions (LAQ)** (Any2 out of 3)	2 x 10	20
3.	**Short Notes (8 out of 10)** a) b) c) d) e) f) g) h) i) j)	8x5	40

Note :

1. MCQ : Each MCQ carries 1 mark.
2. Long Answer Questions : 3 questions will be given out of it 2 have to be answered.
3. Short Notes : 10 questions will be given out of it 8 have to be answered.

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MICROBIOLOGY

PLACEMENT: FIRST YEAR

TIME ALLOTTED: Theory -60 hrs

Practical 30 hrs

COURSE DESCRIPTION

This course reorients the students to the fundamentals of Microbiology and its various sub-divisions. It provides opportunities to gain skill in handling and use of microscope for identifying various micro-organisms. It also provides opportunities for safe handling of materials containing harmful bacteria and methods of destroying microorganisms.

OBJECTIVES

At the end of the course, the student will

1. Identify common disease producing micro-organisms.
2. Explain the basic principles of microbiology and their significance in health and disease.
3. Demonstrate skill in handling specimens.
4. Explain various methods of dis-infection and sterilization.
5. Identify the role of the nurse in hospital infection control system.

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UNIT NO	HOURS		Learning Objective	COURSE CONTENTS	Teaching learning Activities	Assessment Method
	T	P				
I	5	5	Describe the structure, classification morphology & motility of microbes	* Structure and classification of microbes * Morphological types * Size and form of bacteria * Motility. * Classification of Micro-orgnisms. **Practical:** * Use and care of microscope. * Common examination :Smear, blood, mouldes, yeasts.	Lecture, discussion Demonstration	Written Test; Objective and Essay Type.
II	5	5	Identify common disease producing micro-organisms Describe & discuss different laboratory methods to diagnose bacterial diseases	* Identification of Micro-organisms * Discussion of laboratory methods * Diagnosis of bacterial diseases. **Practical:** * Staining techniques-gram staining, acid fast staining. * Hanging drop preparation.	Lecture, discussion Demonstration	Written Test; Objective and Essay Type.

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III	5	5	Describe the growth & nutrition of microbes	* Growth and Nutrition of Microbes * Temperature * Moisture * Blood **Practical:** * Preparation of Media and culture techniques. * Collection, handling and transportation of various specimens.	Lecture, discussion Demonstration	Written Test; Objective and Essay Type.
IV	10	2	Describe the methods of infection control Identify the different disease producing micro-organisms	* Destruction of Micro-organisms. * Sterilization and disinfection * Chemotherapy and antibiotics * Effects of heat and cold * Hospital infection control procedure and role of nurses. **Practical:** Sterilization methods – physical, chemical and mechanical0	Lecture, discussion Demonstrations	Written Test; Objective and Essay Type.

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V	12	4	Describe the different diseases producing microorganiss	* Disease producing micro-organisms * Gram positive bacilli * Tuberculosis and Leprosy * Anaerobes * Cocci * Spirochaete * Rickettsiae **Practical:** Identification and study of the following bacteria: Streptococci, pneumococci and Staphylococci, Corynebacteria, Spirochetes and gonococci. Enteric bacteria. Posting in infection control department.	Lecture, discussion, Demonstrations Clinical practice	Written Test; Objective and Essay Type.
VI	5		Describe pathogenic fungi, dermatophytes&mycotic infections & its laboratory diagnosis	* Pathogenic Fungi * Dermatophytes * Systemic mycotic infection * Laboratory diagnosis of mycotic infection	Lecture, discussion, Demonstrations Clinical practice	Written Test; Objective and Essay Type.

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VII	8	5	Explain the concept of immunity & hypersensitivity & immunization in diseases	* Immunity * Immunity and hypersensitivity –Skin test * Antigen and antibody reaction * Immunization in disease. **Practical:** Demonstration of serological methods	Lecture, discussion Clinical practice	Written Test; Objective and Essay Type.
VIII	8	4	Describe parasites & vectors, protozoal infections, helminthes & its diagnosis & disease transmission	* Parasites and vectors. * Characteristics and classification of parasites * Protozoal infection including amoebiasis * Helminthes infection * Diagnosis of parasitic infection * Vectors and diseases transmitted by them. **Practical:** Identification of Parasites and Vectors.	Lecture, discussion Clinical practice	Written Test; Objective and Essay Type.
IX	5		Describe & classify different viruses Explain the causes of diseases by viruses & there control	* Viruses. * Classification and general character of viruses * Diseases caused by viruses in man and animal and their control.	Lecture, discussion Clinical practice	Written Test; Objective and Essay Type.

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X	5		Explain food born infections & food poisoning	* Micro-organisms transmitted through food. * Food poisoning. Food borne infections.	Lecture, discussion Clinical practice	Written Test; Objective and Essay Type.

Practicum

Each student will practice in the laboratory as indicated in each unit of the courses outline. While giving nursing care in the wards they will practice collection and processing of specimens, prevention and control of hospital infections, sterilization, immunization, chemotherapy and maintenance of personal and environmental hygiene. Observation visit to incinerator, Posting in CSSD and infection control department.

REFERENCES

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2) Chakravarti: Textbook of Microbiology

3) Chattergey K.D.: Text book of Parasitology

4) Panikar: Textbook of Parasitology

5) Konemen: Textbook of Medical Microbiology

6) Marion E. Wilson: Microbiology in Nursing Practice.

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DISTRIBUTION OF TYPE OF QUESTIONS AND MARKS FOR THE MICROBIOLOGY

Type of Question	No of Question	Marks for each Question	Total
MCQ	15	1	15
Long Answer Questions	2	10	20
Short Notes	8	5	40
			75

Note:

1. MCQ's : EACH MCQ's Carries One Mark
2. Long Answer Questions : 3 Questions will be given out of it 2 has to be answered
3. Short Notes : 10 Questions will be given out of it 8 has to be answered.

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MATERNAL NURSING

Placement :First Year **Time Allotted :Theory -60 hrs**

Practical - 240 hrs

COURSE DESCRIPTION

This course is designed to widen the student's knowledge of obstetrics during pregnancy, labour and puerperium. It also helps to acquire knowledge and develop skill in rendering optimum nursing care to a child bearing mother in a hospital or community and help in the management of common gynecological problems.

OBJECTIVES

At end of the course, the student will

1. Describe the physiology of pregnancy, labour and puerperium.
2. Manage normal pregnancy, labour and puerperium.
3. Explain the physiology of lactation and advice on management of breast feeding.
4. Be skilled in providing pre and post operative nursing care in obstetric conditions.
5. Identify and manage high risk pregnancy including appropriate referrals.
6. Propagate the concept and motivate acceptance of family planning methods.
7. Teach, guide and supervise auxiliary midwifery personnel.

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UNIT NO	HOURS	Learning Objective	COURSE CONTENT	TEACHING LEARNING ACTIVITIES	ASSESSMENT
I	5hrs	Describe the concept of maternal nursing Explain the magnitude of maternal morbidity & mortality rates Describe the legislations related to maternity benefits ,MTP act & family planning	* Introduction and historical review * Planned parenthood * Maternal morbidity and mortality rates * Legislations related to maternity benefits, MTP acts, incentives for family planning etc.,	Lecture & Discussion Assessment of skills with check list	Written Test; Objective and Essay Type.
II	6hrs	Describe the anatomy &physlogy of female reproductive system Explain foetal development	* Review of the anatomy and physiology of female reproductive system. * Female pelvis(normal and contracted) * Review of foetal development.	Lecture & Discussion Explain using models Chart sides Specimen record book	Written Test; Objective and Essay Type
III	8hrs	Describe the physiology & management of pregnancy, labour&puerperiu Perform neonatal resuscitation Recognse& manage common neonatal problems	* Physiology and management of pregnany, labour and puerperium * Signs and symptoms and diagnosis of pregnancy * Antenatal care * Pregnant women with HIV/AIDS * Management of common gynaecological problems.	Lecture & Discussion Demonstration Charts slides Assessment of skills with check list	Written Test; Objective and Essay Type.

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IV	6hrs	Describe essential newborn care Describe the management of high risk newborn	* The New born baby * Care of the baby at birth including resuscitation * Essential Newborn Care * Feeding * Jaundice and infection * Small and large for date babies * Intensive care of the new born * Trauma and haemorrhage.	Lecture & Discussion Demonstration Charts slides Assessment of skills with check list	Written Test; Objective and Essay Type. Assessment of skills with check list Assessment of patient management
V	5hrs	Describe management of abnormal pregnancy labour&puerperiu Identify & manage high risk pregnancy &puerperium	* Management of abnormal pregnancy, labour and puerperium * Abortion, ectopic pregnancy and vesicular mole. * Pregnancy induced hypertension, gestational diabetes, anaemia, heart disease. * Urinary infections, Antepartum hemorrhage * Abnormal labour (malposition and malpresentation) * Uterine inertia * Disorders or puerperium * Management of engorged breast, cracked nipples, breast abscess and mastitis	Lecture & Discussion Demonstration Charts slides Assessment of skills with check list	Written Test; Objective and Essay Type.

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			* Pueperal sepsis * Post partum haemorrhage * Inversion and prolapse of uterus, obstetrical emergencies * Obstetrical operations i.e. forceps, vacuum, episiotomy, caesarean section.		
VI	10hrs	Explain effect of drugs during pregnancy , labour&puerperium o mother &baby	* Drugs in obstetrics * Effects of drugs during pregnancy, labour and puerperium on mother and baby.	Lecture & Discussion **Drug book**	Written Test; Objective and Essay Type.
VII	3hrs	Explain the concept f national family welfare programs for women & national family welfare program	* National Welfare programmes for women * National Family welfare programme * Infertile family * Problems associated with unwated pregnancy * Unwed mothers.	Lecture & Discussion Chart slides	Written Test; Objective and Essay Type.

PRACTICUM

1. The students will

a. Be posted in antenatal clinic, antenatal ward, labour room, postnatal ward, maternity OT, MTP room.

b. Visit welfare agencies for women and write observation report.

c. Follow nursing process in providing care to 3-6 patients.

d. Write at least two nursing care studies and do a presentation

e. Give at least one planned health teaching to a group of mothers.

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2. Practice following nursing procedures.

a. Antenatal and post natal examination, per vaginal exam.

b. Conduct normal delivery, stitching of episiotomy, (For male candidates minimum conduct of 5 deliveries)

c. Motivation of family for adopting family planning methods.

d. Motivate family for planned parenthood.

e. Assist in various diagnostic and therapeutic procedures including IUD insertion and removal.

REFERENCES

1. Myles Text Book of Midwives ,Eds; Diane M. Fraser and Margaret A. Cooper 14th Ed , Churchill Livingstone.
2. D.C. Dutta Text Book of Obstetrics including Perinatology and Contraception 6th Edition , 2004 New Central Book Agency.
3. Hawkins and Bourne ,Shaws Textbook of Gynaecology, Eds; V.G Padubidri and Shirish N Daftary, 13th ed, Reed ElseiverIndia.
4. S SRatnam, K BhaskerRao and S Arulkumaran, Obstetrics and Gynaecology for Postgraduates ,Vol 1 and Vol 2, Orient Longman Ltd 1994
5. lower milk, perry, Bobak:"Maternity and women's Health Care" 6th ed.; 1997. C.V Mosby.
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DISTRIBUTION OF TYPE OF QUESTION AND MARKS

FOR THE SUBJECT MATERNAL NURSING

Question No.	Question description	Division of marks	Total marks
1.	**Total MCQs:- 15**	15 x 1	15
2.	**Long Answer Questions (LAQ)** (Any2 out of 3)	2 x 10	20
3.	**Short Notes (8 out of 10)** a) b) c) d) e) f) g) h) i) j)	8x5	40

Note :

1. MCQ : Each MCQ carries 1 mark.
2. Long Answer Questions : 3 questions will be given out of which , 2 have to be answered.
3. Short Notes : 10 questions will be given out of which, 8 have to be answered.

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CHILD HEALTH NURSING

Placement :First Year **Time Allotted :Theory -60 hrs**

Practical - 240 hrs

COURSE DESCRIPTION

This course is aimed at developing an understanding of the modern approach to child care, the common health problems of children and neonates in health and sickness.

OBJECTIVES

At the end of the course, the student will

1. Explain the modern concept of child care and the principles of child health nursing.
2. Describe the normal growth and development of children at different ages.
3. Manage sick as well as healthy neonates and children.
4. Identity various aspects of preventive pediatric nursing and apply them in providing nursing care to children in hospital and community.

UNIT NO	HOURS	Learning Objective	COURSE CONTENT	Teaching Learning Methods	Evaluation
I	8Hrs	Describe the historical development philosophy & principles in nursing	Introduction *'Modern concept of child care * Internationally accepted rights of the child * National policy and legislations in relation to child health and welfare. * National programmes related to child health and welfare. * Changing trends in hospital care, preventive, promotive and curative aspects ofchild health. * Child morbidity and mortality rates. * Differences between an adult and child. * Hospital environment for a sick	Lecture, discussion, Demonstration of common pediatric procedure Assessment of skills with checklist	Written Test; Objective and Essay Type.

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			child. * The role of a paediatric nursing in caring for a hospitalized child * Principles of pre and post operative care of infants and children. * Paediatric nursing procedures.		
II	12Hrs	Describe the normal growth & development f children at different ages Identify the needs of children at different ages & provide parental guidance	The healthy child * Growth and development form birth to adolescence * The needs of normal children through the stages of development and parental guidance. * Nutritional needs of children and infants breast-feeding, supplementary/artificialfeeding and weaning. * Accidents, causes and prevention * Value of play and selection of play material * Preventive immunization.	Lecture, discussion, Demonstrations Developmental study of infant and children Observation on study of normal and sick child	Written Test; Objective and Essay Type.
III	4Hrs	Provide care to normal & low birth baby Perform neonatal resuscitation recognize and manage common neonatal problems	Nursing care of a neonate * Nursing care of a normal newborn * Neonatal resuscitation * Nursing management of a low birth weight baby. * Nursing management of common neonatal disorders. * Organization of neonatal unit. Prevention of infections in the nursery.	Lecture, discussion, Demonstrations Workshop on neonatal resuscitation Demonstration Practice Assessment of skills with check list	Written Test; Objective and Essay Type.
IV	32Hrs	Provide nursing care in common childhood diseases Identify measures to prevent common childhood	Nursing management in common childhood diseases * Nutritional disorders and infections * Respiratory disorders and infections * Gastrointestinal infections, infestations and congenital disorders. * Cardio vascular problem-congenital defects and rheumatic	Lecture, discussion, Demonstrations Practice sesson Clinical practice	Written Test; Objective and Essay Type.

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		diseases including immunization	fever. * Genito-urinary disorder – Nephrotic syndrome, wilms' tumor, infection andcongenital disorders. * Neurological infections and disorders-convulsions, epilepsy, meningitis,hydrocephalus, spinabifida. * Hematological disorders – aAnemias thalassemia, ITP, Leukemia,hemophilia. * Endocrine disorders – Juvenile diabetes mellitus. * Orthopedic disorders –club feet, hip dislocation and fracture. * Disorders of skin, eye and ears. * Common communicable diseases in children, their identification, nursingmanagement in hospital and home and prevention. * Paediatric emergencies – poisoning, foreign bodies, haemorrage, burns and drowning.		
V	4Hrs	Manage the child with behavioral & social problem	Management of behaviour disorders in children. * Management of challenged children: * Mentally challenged * Physically challenged * Socially challenged	Lecture, discussion, Demonstrations Field visit to the child guidance clinics, school for mentally physically & socially challenged	Written Test; Objective and Essay Type.

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PRACTICUM

The student will:-

1. Be posted in paediatric medical and surgical ward, OPD in hospital, health centre and neonatal unit.
2. Visit a centre for handicapped children and child welfare centre and write observation report.
3. Write an observation study of normal children of various age groups in home/nursery school/ crèche.
4. Follow nursing process in providing care to 3-6 children.
5. Write at least two nursing care studies and do a presentation.
6. Give two planned health teachings, one in hospital and one in OPD/health centre.
7. Practice the following nursing procedures:
    - Taking pediatric history.
    - Physical assessment of children.
    - Baby bath.
    - Feeding
    - Restraining
    - Calculation of dosage of drugs and administration of medications and injections.
    - Collection of specimens.
    - Enema, bowel wash, colostomy irrigation.
    - Steam and Oxygen inhalation
    - Preparation to assist with diagnostic tests and operations.
    - Examination/Assessment of a newborn
    - Neonatal resuscitation
    - Care of a baby in incubator and on ventilator
    - Photo therapy
    - Assist in exchange transfusion and other therapeutic procedures.

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1. Marlow Dorothy and Redding. Text book of Peadiatric Nursing.6th editionHartcourt India Ltd, New Delhi, 2001.
2. Wong Dona et al. Whaley and Wongs Nursing care of Infants and children. 6th edition. Mosby Company, Philadelphia, 2000.
3. Black G Florence and Wright. Essential of Paediatric Nursing.JB Lippincott & Co. Philadelphia.
4. Parthasarathy et al. IAP Text book of Peadiatrics. 1st edition Jaypee Brothers, New Delhi-2000.
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6. Vishwanathan and Desai. Achar's Text book of Paediatrics.3rd edition Orient Langman.Chennai, 1999.

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DISTRIBUTION OF TYPE OF QUESTION AND MARKS

FOR THE SUBJECT CHILD HEALTH NURSING

Question No.	Question description	Division of marks	Total marks
1.	**Total MCQs:- 15**	15 x 1	15
2.	**Long Answer Questions (LAQ)** (Any2 out of 3)	2 x 10	20
3.	**Short Notes (8 out of 10)** a) b) c) d) e) f) g) h) i) j)	8x5	40

Note :

1. MCQ : Each MCQ carries 1 mark.
2. Long Answer Questions : 3 questions will be given out of which , 2 have to be answered.
3. Short Notes : 10 questions will be given out of which, 8 have to be answered.

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MEDICAL SURGICAL NURSING

Placement: First Year **Time Allotted:Theory – 90 hrs**

Practical - 270 hrs

COURSE DESCRIPTION

The purpose of this course is to widen the student's knowledge and develop proficiency in caring for patients with medical surgical problems. This course includes review of relevant anatomy and physiology, pathophysiology in medical-surgical disorders and the nursing management of these conditions.

OBJECTIVES

At the end of the course, the student will

1. Explain relevant Anatomy and Physiology of various systems of the body.
2. Explain pathyophysiology of various disorders.
3. Explain the actions, side effects and nursing implications in administering drugs for various disorders.
4. Discuss the recent advancement in the treatment and care of patients with medical surgical conditions.
5. Develop skill in giving comprehensive nursing care to patients following the steps of nursing process.
6. Assist the patients and their families in identigying and meeting their own health Needs.
7. Appreciate the role of the nurse in the medical surgical health team.

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UNIT NO	HOURS	Learning Objective	COURSE CONTENT	Teaching Learning Methods	Evaluation
I	4Hrs	Explain the roles of a nurse in patient care	* Introduction to medical surgical nursing. * Review of concepts of comprehensive nursing care in medical surgical conditions. * Nurse, patient and his/her family. * Functions of nurse in the outpatient department. * Intensive care unit.	Lecture, discussion charts, graphs, models, films and slides	Written Test; Objective and Essay Type.
II	10Hrs	Describe the common signs & symptoms of patents suffering with minor illness	* Nursing management of patient with specific problems. * Fluid and electrolyte imbalance. * Dyspnea and cough, respiratory obstruction * Fever * Shock * Unconsciousness * Pain Acute illness * Incontinence	Lecture, discussion charts, graphs, models, films and slides Demonstrations Practice sessions Case discussion Seminar	Written Test; Objective and Essay Type.
III	8Hrs	Describe the etiology ,pathophysiology clinical manifestations ,diagnostic measures and nursing management of	Nursing management of patient with neurological and neurosurgical conditions. Review of anatomy and physiology of the	Lecture, discussion, Demonstrations Case discussion/seminar	Written Test; Objective and Essay Type.

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		patients with neurological disorders		nervous system. Pathophysiology, diagnostic procedures and management of: * Cerebro-vascular accident. * Cranial, spinal and peripheral neuropathies. * Head-ache and intractable pain * Epilepsy * Infectious and inflammatory diseases and trauma of the nervous system. * Common disorders of the system. * Recent advances in diagnostic and treatment modalities. * Drugs used in these disorders. * Tumors of brain and spinal cord, congenital malformations, degenerative diseases.	Health education Supervised clnical practice Drug book presentation	
IV	8Hrs	Describe the etiology ,pathophysiology clinical manifestations ,diagnostic measures and nursing management of patients with adults including elderly with		Nursing management of patient with cardiovascular problems. Review of relevant anatomy and physiology of cardio vascular system. Pathophysiology, diagnostic procedures and	Lecture, discussion, Demonstrations Case discussion/seminar Health education Supervised clnical practice	Written Test; Objective and Essay Type.

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		disorders of blood and cardiovascular problems	management of * Ischemic heart diseases. * Cardiac arrhythmias. * Congestive heart failure. * Rheumatic and other valvular heart diseases. * Endocarditis, cardiomyopathies, congenital heart, diseases, hypertension, heart block. * Cardiac emergencies: cardiac arrest, acute pulmonary oedema, cardiac temponade, cardiogenic shock, aneurysms and peripherovascular disorders, recent advancement in cardiology.	Drug book presentation	
V	6Hrs	Describe the etiology ,pathophysiology clinical manifestations ,diagnostic measures and nursing management of patients with adult including elderly with disorder of respiratory system common medical surgical	Nursing management of patient with respiratory problems. Review of anatomy and physiology of respiratory system, pathophysiology, diagnostic procedures and management of upper respiratory tract infections. * Bronchitis * Asthma	Lecture, discussion, Demonstrations Chart graphs films and slides Case discussion/seminar Health education Supervised clinical practice Drug book presentation	Written Test; Objective and Essay Type.

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		nursing procedures	* Emphysema, empyema, Atelectasis, COPD * Bronchiectasis * Pneumonia * Pulmonary tuberculosis * Lung abscess * Pleural effusion * Tumours and Cysts * Chest injuries * Respiratory arrest and insufficiency * Pulmonary embolism * Drugs used in the management of these patients. * Special respiratory therapies.	Exposure to procedure -x-ray -MRI -Endoscopy	
VI	5Hrs	Describe the etiology ,pathophysiology clinical manifestations ,diagnostic measures and nursing management of patients with adult including elderly with disorder of genitourinary system	Nursing management of patient with genitor-urinary problems. Review of anatomy and physiology of the genitor-urinary system * Nephritis * Renal Calculus * Acute renal failure * Chronic renal failure * End stage renal disease Special procedures, dialysis, renal transplant	Lecture, discussion, Demonstrations Case discussion/seminar Health education Supervised clnical practice Drug book presentation	Written Test; Objective and Essay Type.

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			Drugs used in management of these patients Congenital disorders, urinary infections.Benign prostate hypertrophy.		
VII	5Hrs	Describe the etiology ,pathophysiology clinical manifestations ,diagnostic measures and nursing management of patients with adult including elderly with disorder of digestive system	Nursing management of patients with problems of the digestive systems. Review of anatomy and physiology of gastrointestinal system and accessory organs. Pathophysiology, diagnostic procedures and management of * G.I.Bleeding * Peptic ulcer * Infections * Acute abdomen * Colitis, diarrhea, dysentery and mal-absorption syndrome. * Cholecystitis * Hepatitis, hepatic coma and cirrhosis of liver. * Portal hypertension * Pancreatitits * Tumors, hernias, fistulas, fissures, hemorrhoids. Drugs used in the management of these patients.	Lecture, discussion, Demonstrations Explain using charts, graphs models, films and slides Case discussion/seminar Health education Supervised clinical practice Drug book presentation	Written Test: Objective and Essay Type.

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VIII	10Hrs	Describe the etiology ,pathophysiology clinical manifestations ,diagnostic measures and nursing management of patients with adult including elderly with disorder of endocrine system	Nursing management of patients with endocrine problems Review of anatomy and physiology and patho-physiology of patients with * Thyroid disorders * Diabetes mellitus * Diabetes insipidus * Adrenal tumour * Pituitary disorders * Diagnostic procedures Nursing management of patient with above problems. Drugs used in endocrine problems.	Lecture, discussion, Demonstrations Explain using charts, graphs models, films and slides Case discussion/seminar Practice sessions Health education Supervised clinical practice Drug book presentation	Written Test; Objective and Essay Type.
IX	5Hrs	Describe the etiology ,pathophysiology clinical manifestations ,diagnostic measures and nursing management of patients with adult including elderly with disorder of musculo skeletal system	Nursing management of patients with musculoskeletal problems. Review of anatomy and physiology and pathophysiology * Arthritis, osteomyelitis, bursitis, * Fractures, dislocation and trauma * Prolapsed disc * Osteomalacia and osteoporosis	Lecture, discussion, Demonstrations Explain using charts, graphs models, films and slides Case discussion/seminar Health education Supervised clinical practice Drug book presentation	

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			* Tumor * Amputation Diagnositc procedures Nursing management of patients with above problems. Prosthesis and rehabilitation. Transplant and replacement surgeries.		
X	3Hrs	Describe the etiology ,pathophysiolo gy clinical manifestations ,diagnostic measures and nursing management of patients with adult including elderly with disorder of patients with oncology	* Nursing management of patients with disorders of female reproductive tract. * Disorder of menstruation * Infections of the genital tract * Beningn and malignant tumors of the genital tract * R.V.F., V.V.F * Climateric changes and associated problems.	Lecture, discussion, Demonstrations Explain using charts, graphs models, films and slides Case discussion/semin ar Health education Supervised clinical practice Drug book presentation	Written Test; Objective and Essay Type.
XI	5Hrs	Describe the etiology ,pathophysiolo gy clinical manifestations ,diagnostic measures and nursing management of patients with burns reconstructive and cosmetic surgery	* Nursing management of patients with oncological disorders. * Types of neoplasms and related pathophysiology * Diagnostic procedures * Modalities of treatment and nurse's role	Lecture, discussion, Demonstrations Explain using charts, graphs models, films and slides Case discussion/semin ar Health education	Written Test; Objective and Essay Type.

II	4	Discuss Teaching learning process	**Teaching learning process** * Nature and characteristics of learning * Principles and maxims of teaching * Formulating objectives * Lesson planning.	Chalkboard • Transparency • Power Point • Charts	➢ Assignments ➢ Unit tests, ➢ Essay type ➢ Short Answers ➢ Objectives ➢ Type
III	10	Enlist various types of Methods of teaching	**Methods of teaching** * Teaching methods * Lecture * Discussion * Demonstration * Group discussion * Project * Role play * Panel discussion * Symposium * Seminar * Field trip * Workshop * Exhibition * Programmed instruction * Computer assisted learning * Clinical teaching methods: * Case methods * Case presentation * Nursing rounds and reports * Bedside clinic * Conference(individual and group) * Recording of interaction process	• Chalkboard • Transparency • Power Point • Charts	➢ Assignments ➢ Unit tests, ➢ Essay type ➢ Short Answers ➢ Objectives ➢ Type

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IV	10	Explain the Educational media	**Educational media** * The communication process: factors affecting communication * Purposes and types of audio-visual aids * Graphics aid: Chalk-board, charts, graphs, posters, flash cards, flannel graph/khadigraph, bulletin, cartoon. * Three dimensional aids: Objects, specimen, models, puppets. * Printed aids: pamphlets and leaflets * Projected aids: slides, films and televisions, VCR,VCP,Overhead projector, camera, microscope. * Audio – Aids: Tape-recorder, public address system, computer	• Chalkboard • Transparency • Power Point • Charts	➢ Assignments ➢ Unit tests, ➢ Essay type ➢ Short Answers ➢ Objectives ➢ Type
V	10	Discuss the Methods of assessment	**Methods of assessment** * Purpose and scope of evaluation and assessment * Critieria for selection of assessment techniques and methods * Assessment of knowledge: essay type Question, SAQ(Short Answer Questions) * MCQ(multiple choice Questions) * Assessment of skills: Observation, check list. Practical examination, Viva, objective structured clinical examination. * Assessment of attitude: Attitude scale.	• Chalkboard • Transparency • Power Point • Charts	➢ Assignments ➢ Unit tests, ➢ Essay type ➢ Short Answers ➢ Objectives ➢ Type

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VI	10	Discuss the Management of school of Nursing	**Management of school of Nursing** * Planning of school of nursing, organization * Recruitment of teaching staff, budget, facilities for the school, student selection and admission procedure, administrative planning for students, welfare services for students, maintenance of school records, preparation of annual reports. INC guidelines for school of nursing	• Chalkboard • Transparency • Power Point • Charts	➢ Assignments ➢ Unit tests. ➢ Essay type ➢ Short Answers ➢ Objectives ➢ Type
VII	8	Discuss Guidance and counseling.	**Guidance and counseling definition** * Basic principles of guidance and counseling * Organisation of guidance and counseling services * Counselling process * Managing disciplinary problems * Management of crisis	• Chalkboard • Transparency • Power Point • Charts	➢ Assignments ➢ Unit tests. ➢ Essay type ➢ Short Answers ➢ Objectives ➢ Type
VIII	6	Discuss In-service education.	**In-service education** * Introduction to nature scope of in-service education programme * Principles of adult learning * Planning for in- sevice progamme * Techniques, and methods of staff education programme * Evaluation of in-service programme.	• Chalkboard • Transparency • Power Point • Charts	➢ Assignments ➢ Unit tests. ➢ Essay type ➢ Short Answers ➢ Objectives ➢ Type

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PRACTICUM

Each student should:

- *Conduct five planned teaching using different methods and media*
- *Prepare different types of teaching aids*
- *Plan, organize and conduct inservice education programme.*
- *Conduct at least one counseling session*
- *Prepare rotation plans.*

References :

1. *Bhatia, Kamala & Bhatia B.D.: The Principles and Methods of Teaching: Delhi, Doaba House, 1977.*
2. *Neeraja, Nursing Education, New Delhi, Jaypee Brother, 2004.*
3. *Safaya, Raghunath&Shaida, B.D. Educational Theory & Practice, Delhi, Dhanpat Row & Sons, 1974.*
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DISTRIBUTION OF TYPE OF QUESTION AND MARKS

FOR THE SUBJECT INTRODUCTION TO NURSING EDUCATION

Question No.	Question description	Division of marks	Total marks
1.	**Total MCQs:- 15**	15 x 1	15
2.	**Long Answer Questions (LAQ)** (Any2 out of 3)	2 x 10	20
3.	**Short Notes (8 out of 10)** a) b) c) d) e) f) g) h) i) j)	8x5	40

Note :

1. MCQ : Each MCQ carries 1 mark.
2. Long Answer Questions : 3 questions will be given out of it 2 have to be answered.
3. Short Notes : 10 questions will be given out of it 8 have to be answered.

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INTRODUCTION TO NURSING SERVICE ADMINSTRATION

Placement : Second year Time **Allotted: Theory -60 hrs**

Practical -180 hrs

COURSE CONTENTS

This course is designed to give an opportunity to the student to gain an understinading of the principles of administration and its application to nursing service. It is also intended to assist the students to develop an understanding of professional leadership need.

OBJECTIVES

At the end of the course, the student will

1. Identify the principles of administration
2. Describe the principles and techniques of supervision
3. Explain the principles and methods of personnel management
4. Explain the principles of budgeting
5. Organise and manage a nursing unit effectively
6. Identity dynamics of organizational behaviour, styles and functions of effective leadership.

UNIT NO	HOURS	Learning Objective	COURSE CONTENT	TEACHING LEARNING ACTIVITIES	ASSESSMENT
I	2	Discuss the Meaning of education, aims, function and principles. Philosophy of education	**Principles and practice of Administration** * Significance, elements and principles of administration, * Organization of hospital – Definition ,Aims, functions and classifications, health team. * Policies of hospital, different departments with special emphasis to department of	• Chalkboard • Transparency • Power Point • Charts	➢ Assignments ➢ Unit tests, ➢ Essay type ➢ Short Answers ➢ Objectives ➢ Type

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IV	10	Explain the Educational media	**Supervision** * Principles of supervision, nature and objectives * Tools and techniques of supervision * Evaluation * Nursing audit * Staff development – orientation program * Skill training * Leadership development * Problem solving process.	• Chalkboard • Transparency • Power Point • Charts	➢ Assignments ➢ Unit tests, ➢ Essay type ➢ Short Answers ➢ Objectives ➢ Type
V	10	Discuss the Methods of assessment	Material management * Pinciples of material management * Quality control * Inventory, care of equipment, safekeeping * Role of nursing personnel in material management.	• Chalkboard • Transparency • Power Point • Charts	➢ Assignments ➢ Unit tests. ➢ Essay type ➢ Short Answers ➢ Objectives Type
VI	10	Discuss the Management of school of Nursing	**Financial Management** * Budgeting – Principles of budgeting, audit.	• Chalkboard • Transparency • Power Point • Charts	➢ Assignments ➢ Unit tests. ➢ Essay type ➢ Short Answers ➢ Objectives ➢ Type
VII	8	Discuss Guidance and counseling.	**Organizational behaviour** * Group dynamic and human relation, organizational communication (hospital information system) * Public relations, leadership styles and functions * Methods of reporting * Maintaining records and reports	• Chalkboard • Transparency • Power Point • Charts	➢ Assignments ➢ Unit tests. ➢ Essay type ➢ Short Answers ➢ Objectives ➢ Type

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PRACTICUM

Observe the functioning of nursing administration at various level *i.e. institution,* department, unit.

Each student will practice ward management under supervision.

Student will prepare rotation plan of the staff, write reports, give verbal report of the ward and assist in maintaining the inventory of the nursing unit.

Visit to private and government hospital and write observation reports.

References :

1. TNAI. Nursing Administration and Management, 1st edn, Academic Press: New Delhi, 2000.
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3. Pai, Pragna. Effective Hospital Management, 1st edn, The National Book Depot: Mumbai, 2002.
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7. Park K. Park's Textbook of Preventive and Social Medicine, 17th edn, M/S BanarsidasBhanot Publishers: Jabalpur, 2003.
8. Russels, C S. Management & Leadership for Nurse Managers, 3rd edn, Jones Bartlett Publishers: London, 2002.

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DISTRIBUTION OF TYPE OF QUESTION AND MARKS

FOR THE SUBJECT

INTRODUCTION TO NURSING ADMINISTRATION

Question No.	Question description	Division of marks	Total marks
1.	Total MCQs:- 15	15 x 1	15
2.	Long Answer Questions (LAQ) (Any2 out of 3)	2 x 10	20
3.	Short Notes (8 out of 10) a) b) c) d) e) f) g) h) i) j)	8x5	40

Note :

1. MCQ : Each MCQ carries 1 mark.

2. Long Answer Questions : 3 questions will be given out of which , 2 have to be answered.

3. Short Notes : 10 questions will be given out of which, 8 have to be answered.

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INTRODUCTION TO NURSING RESEARCH AND STATISTICS

Placement :Second Year Time **Allotted: Theory -45 hrs**

Practical -120 hrs

COURSE DESCRIPTION

The course is designed to assist the students to develop an understanding of basic concepts of research and statistics, use the findings of nursing research in nursing practice, apply the knowledge in conducting projects(s) and solve problems related to nursing using scientific method.

OBJECTIVES

At the end of the course, the students will:-

1. Define the terms and concepts of nursing research
2. Identify needs and scope of nursing research
3. Identify and define a research problem
4. Locate and list sources of literature for a specific study
5. Describe different research approaches, methods of data collection and sampling techniques with a special reference to survey method.
6. Develop tool for data collection
7. Enumerate steps of data analysis and present data summary in tabular form.
8. Use descriptive and co-relational statistics in data analysis
9. Conduct a group research project.

UNIT NO	HOURS	Learning Objective	COURSE CONTENT	TEACHING LEARNING ACTIVITIES	ASSESSMENT
1	4	Defines the research definition	**A.INTRODUCTION TO RESEARCH METHODOLOGY** * Steps of scientific methods. * Definition of research * Need for nursing research * Characteristics of good research. Research process.	• Chalkboard • Transparency	➢ Assignments ➢ Unit tests, ➢ Objectives ➢ Type

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II	4	Discuss the Definition or research terms and Review of literature.	* Statement of purpose and objectives * Definition or research terms * Review of literature.	• Transparency • Power Point	➤ Short Answers ➤ Objectives ➤ Type
III	4	Discuss Research approaches	Research approaches:- historical, survey and experimental	• Chalkboard • Transparency • Power Point	➤ Essay type ➤ Short Answers ➤ Objectives ➤ Type
IV	4	Enlist various Sampling techniques and methods of data collection	**Sampling techniques and methods of data collection.** * Sampling * Instruments-Questionnarie. Interview * Observation schedule, records, measurements * Reliability and validity or instruments.	• Chalkboard • Transparency	➤ Assignments ➤ Objectives ➤ Type
V	4	Explain the Analysis of Data	**Analysis of Data:** Tabulation * Classification and summarization * Presentation * Interpretation of data	• Chalkboard • Transparency • Power Point Charts	➤ Assignments ➤ Unit tests. ➤ Essay type ➤ Short Answers
VI	4	Discuss the Communication of research findings	**Communication of research findings** * Writing Report: * Organizing materials for writing * Format of the report * Use of computers	• Chalkboard • Transparency	➤ Assignments ➤ Unit tests. ➤ Objectives Type
VII	8	Discuss the Measures of central tendency	**B.INTRODUCTION TO STATISTICS** * Descriptive Statistics. * Frequency Distribution –Types of measure – frequencies, class	• Chalkboard • Transparency	➤ Assignments ➤ Unit tests. ➤ Essay type

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			interval, graphic methods of describing frequency. * Measures of central tendency – Mode, Median and mean. * Measures of variability : Range, standard deviation * Introduction to normal probability.	• Power Point Charts	➢ Short Answers ➢ Objectives ➢ Type
VIII	4	Discuss Correlation .	**Correlation** * Computation by rank difference methods * Uses of correlation co-efficient	• Chalkboard • Transparency	➢ Assignments ➢ Objectives Type
IX	4	Discuss Biostatistics	**Biostatistics:** Crude rates and standardized rates, ratio and estimation of the trends.	• Chalkboard • Transparency • Power Point	➢ Assignments ➢ Unit tests, ➢ Essay type
X	6	Explain the Introduction to computers in nursing	**Introduction to computers in nursing** * Introduction to computers and disk-operating system. * Introduction to word processing * Introduction to data base * Windows applications, word, excel, power point, multimedia. * Use of statistical packages. * Introduction to internet & use of electronic mail * Computer aided teaching and testing.	• Chalkboard • Transparency • Power Point	➢ Assignments ➢ Unit tests, ➢ Essay type

PRACTICUM

Students will conduct research project in small groups in selected areas of nursing and submit a report(Group studies may include studying of existing health practices, improved practices of nursing (procedures) health records, patient records and survey on nursing literature)

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4. Dorothy Y B & Marie TH, Fundamentals of research in Nursing, 3rd ed. Jones & Bartlett Publishers, Boston, 2003.
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7. American Psychological Association publication manual. 2001.
8. Mahajan Methods in Bio statistics.
9. Treece E.W. &Treece JW: Elements of Research in Nursing, 3rd ed The CV Mosby Company St. Louis 1986.

DISTRIBUTION OF TYPE OF QUESTION AND MARKS FOR THE SUBJECT INTRODUCTION TO NURSING RESEARCH AND STATISTICS

Question No.	Question description	Division of marks	Total marks
1.	**Total MCQs:- 10**	**10 x 1**	**10**
2.	**Long Answer Questions (LAQ)** (Any 2 out of 3)	2 x 10	20
3.	**Short Notes (4 out of 6)** a) b) c) d) e) f)	4x5	20

Note :

1. MCQ : Each MCQ carries 1 mark.
2. Long Answer Questions : 3 questions will be given out of which , 2 have to be answered in Nursing Research.
3. Short Notes : 6 questions will be given out of which, 4 have to be answered.

Principal
Aarihant Institute of Nursing
Rajpur Kalol Gandhinagar.

CENTRAL COUNCIL OF INDIAN MEDICINE
NEW DELHI

SYLLABUS OF AYURVEDACHARYA (BAMS) COURSE

INDEX

3RD PROFESSIONAL

AGADTANTRA, VYAVAHAR-AYURVED EVUM VIDHIVAIDYAK

(TOXICOLOGY, FORENSIC MEDICINE AND MEDICAL JURISPRUDENCE)

Theory One Paper – 100 Marks
Practical/Viva voce -50 Marks
Theory -200 hrs
Practical - 100 hrs

Part- A **50 Marks**

1 Derivation, definition of Visha and Agadatantra. Scope of Agadatantra. Visha Utpatti, Visha Prabhava, Visha Pranaharana Kriya, Visha Guna, Visha Gati, Visha Vega Visha Sankata, Shanka Visha.

2 Definition of toxicology, Definition of poison, suicidal and homicidal poisons, classification of poisons, their action and route of administration, absorption, excretion, metabolism, diagnosis and general principles of treatment, duties of a medical practitioner in case of suspected poisoning.

3 Origin and Classification of Visha:-Its sources, Difference between Visha, Madya and Oja guna, Visha Upadrava and Visha Mukta Lakshana.

4 Tests for detection of Visha, and Modern Toxicological Techniques of detection of poisons
Visha Data Lakshana, Visha Peeta Lakshana, Signs and symptoms of Visha afflicted organs and personal effects. (Poisoning with Anjana, Lepa paduka, Abharana etc.

5 Introduction to Environmental Toxicology- Samuhika Vishaprayoga- effect of chemical and nuclear warfare.

6 Vishopakrama described by Charak**,** General principles of Management of poisoning.

7 Manifestation of poisoning due to poisons of plant origin their fatal Dose, fatal period, management of poisoning, post mortem appearance and its medico legal importance.
Visha and Upavisha- Arka, Snuhi, Langali, Karaveera, Gunja, Ahiphena, Dhattura, Bhallataka, Vatsanabha, Kupeelu, Jayapala, Bhanga & Tobacco, Parthenium hysteriphorus, Chitraka, Eranda, Digitalis and Cerebra Odallam.

8 Garavisha, Dooshivisha, Viruddhahara. Food adulteration and poisoning–classification, diagnosis, management and contemporary significance.

9 Jangama Visha – Detailed study of Sarpa, Keeta, Loota, Vrischika, Mooshika, Alarka – Visha; Lakshana, Bheda, Chikitsa and their Sadhyasadhyata (contemporary and classical views).

10 Introduction to poisoning due to Acids, Alkalis, metals, Non-metals, Asphyxiants and others, their Fatal Dose, Fatal period, Manifestation, management, medico legal importance and postmortem appearance of poisoning due to:

a) Acid and Alkalis– Sulphuric acid, Hydrochloric acid, Nitric acid, Hydrocyanic acid, Oxalic acid, Carbolic acid, Formic acid, alkalis in general.
b) Asphyxiants – Carbon monoxide, Carbon dioxide, Hydrogen sulphid**e**
c) Nonmetallic poisons – Phosphorous, Iodine
Metallic poisoning – Arsenic, Mercury, Lead, Copper, Zinc, Tin.
d) Others - Petroleum – Kerosene Organo phosphorus compounds -Aluminum

phosphate, Organo Chlorinated Compounds, Household poisons.

11 Madya and Madatyaya. Alcohol poisoning (Ethanol and Methanol).

12 *Introduction to Narcotic drugs and Psychotropic substances Act 1985.*

Part –B **50 Marks**

1. Definition of Vyavahara Ayurveda (Forensic medicine) and Vidhivaidyaka (Medical jurisprudence), concise history of Vyavahara Ayurveda (Forensic medicine) and Vidhivaidyaka (Medical jurisprudence). Introduction to Indian Penal Code, Indian Evidence Act and Criminal Procedure Code.

2. Legal Procedures:- Inquest, Evidence, Witness, Courts and their powers.

3. Personal identity and its Medico legal aspects, forensic odontology, Introduction to Forensic Serology and DNA profiling.

4. Death and its Medico Legal Aspects, Medico Legal autopsy and *exhumation.*

5. Injuries and thermal injuries, their medico Legal aspects, general introduction of weapons.

6. Dowry deaths (Domestic Violence), their Medico Legal importance and laws in relation to it.

7. Asphyxial deaths and its Medico Legal importance.

8. Medico Legal importance of Pregnancy, Delivery; Impotence & Sterility, Abortion, Infanticide, battered baby. Virginity, Artificial Insemination, Legitimacy.

9. Sexual offences, and their Medico Legal aspects. Sexual perversions.

10. Introduction to Forensic psychiatry.

11. Introduction to forensic laboratory.

12. Ethics as in classical Texts. Types of Vaidya, Pranabhisara and Rogabhisara Vaidya, Qualities of Vaidya, Responsibilities of Vaidya, Chaturvidha Vaidyavrutti, Duties of Vaidya to his patient, Vaidya Sadvrittam, Apujya Vaidya, Code of conduct.

13. Laws in relation to Medical practitioners: Indian Medicine Central Council Act.

14. Maintenance of medical record.

15. Physician's responsibility in criminal matters, Professional negligence, Civil negligence, Criminal negligence, Medico Legal aspects of Acquired Immune Deficiency Syndrome, Rights of an unborn child, Medical Termination of Pregnancy Act Transplantation of human organs Bill 1994, Pre Natal Diagnostic Testing Act, Malingering of feigned diseases, International Code of Medical Ethics for Doctors. Clinical establishment Act.

Consumer Protection Act 1986.

PRACTICAL

Practical Training

1. Post Mortem examination
2. Evidence in the court
3. Demonstrations in the Forensic & Toxicology museum
   (Toxic & Anti toxic substances, medico legal specimens & Charts)
4. Clinical postings
5. Library Hours for compilation

Distribution of Practical Marks

1. Post Mortem examination and Court posting – Case Record	10 Marks
2. Practical/Clinical Record Book	10 Marks
3. Identification (spotting)	10 Marks
4. Viva – voce	20 Marks
Total	**50 Marks**

Reference Books

1. Topics related to Agada Tantra from Charak Samhita, Sushrut Samhita, Ashtanga Hridaya, Ashtanga Samgraha, Kasyapa Samhitha, Yogaratnakara, Bhavaprakasha and Madhava Nidana.	
2. Vidhivaidyaka (Vyavahar Ayurveda Vijnan)	Dr.Charuchandra Pathak
3. Medical Jurisprudence and Toxicology	Modi
4. Basavarajeeyam	Edited by Vd.Govardhan
5. Agada Tantra	Sh. Ramanath Dwivedi
6. Text book of Agada Tantra	Edited by Dr Huparikar, Dr.Joglekar
7. Agadatantra ki Pathyapustaka	Edited By Dr Huparikar, Dr.Joglekar
8. Agad Tantra	Dr. Shekher Namboodri
9. Vishachikitsa (Ayurveda Toxicology English Translation)	Vaidya Balakrishnan Nair, Kerala
10. Medical Ethics and Medical Laws in India	Dr. H.S. Mehta
11. Toxicology Ayurvedic Perspective	VPSV Ayurveda college Kottakkal
12. Kautilya Arthashastra (English)	Prof. Kangle
13. Kautilya Arthashastra (Hindi)	Dr. Raghunath Singh
14. Vyavahar Ayurveda	Dr.Ayodhya Prasad Achal
15. Vyavahar Ayurveda Vigyanam	Dr.Indramohan Jha (Sachchan)
16. Textbook of Forensic Medicine and Toxicology	Dr. V.V.Pillay
17. Forensic Medicine	Dr. B. Umadathan
18. Relevant Acts	Govt. of India
19. Relevant topics from Manu Smriti	

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3.2 SWASTHAVRITTA

Theory- Two papers - 100 marks each
Practical / Viva voce -100 marks
Lectures –200 Hrs
Practicals and demonstration – 100 Hrs

Paper-I

PART A- VAIYAKTIKA SWASTHAVRITTA 50 marks

Introduction

Definition of swastha & swasthya and swasthavritta. Arogya lakshana, swasthavritta prayojanam, WHO definition of health.
Dimensions of health-Physical, Mental, Social.
Concept of wellbeing- objective, subjective, standard of living, quality of life.

Dinacharya

1. Definition of Dinacharya
2. Aims and importance of dinachary
3. Brahma Muhurta evam Utthana
4. Usha Jalapana
5. Sharirachinta
6. Malatyaga
7. Mukha prakshalan
8. Dantadhavana and preparation of Ayurvedic tooth powder and paste
9. Jihvanirlekhanavidhi
10. Anjana
11. Pratimarsha Nasya
12. Gandusha and Kavala
13. Tambulasevana
14. Dhoomapana
15. Abhyanga
16. Udvartana
17. Utsadana
18. Vyayama
19. Chankramana
20. Snana
21. Anulepana
22. Vastra dharana
23. Danda dharana
24. Padatra dharana
25. Chatra dharana
26. Ushnisha dharana
27. Ratnabharana dharana
28. Madhyahna charya
29. Cosmetic effect of Dinacharya procedures

Rathricharya

1. Sandhya charya
2. Rathri bhojana vidhi
3. Shayanavidhi according to Bhavamishra

Ritucharya

1. Importance of ritucharya
2. Ritu presentation as per different acharyas
3. Adana kala & visarga kala
4. Sanchaya-Prakopa-Prashamana of Dosha according to ritu
5. Doshashodhana in Ritu Charya
6. Relation of Agni bala and Ritu
7. Pathya and Apathya Ahara and Vihara in different ritus
8. a) Ritusandhi
   b) Yamadamsthra
   c) Rituharitaki
   d) Rituviparyaya

Sadvritta

Description of Sadvritta and Achara Rasayana their role in Prevention and control of diseases.

Trayopastambha

i)Ahara- Nirukti, Swarupa, Pramukhatva, Ahara dravya Vargikaranam, Aharavidhividhana, Dwadashashana pravicharana, Ashtaharvidhiviseshayatanani, Pathyahara, Apathyahara, Samashana, Adhyashana, Vishamashana, Ahara dushparinama & tajjanya vyadhaya, Santarpanajanya evam Apatarpanajanya vyadhi, Viruddhahara and its effects, Shadrasabhojanasya mahatwam.

Dietetic standards, Proximate principles of Food, Nutritional requirements, Sources and deficiency diseases of Protein, Carbohydrate, Fat, Vitamins and Minerals.
Concept of balanced diet in Ayurveda, Nitya sevaneeya dravya, Balanced diet for different sections of people in the society, Social aspects of nutrition.
Aharavarga - Dhanya varga(Cereals and millets), Shaka and Harita varga (Leafy and Non leafy vegatables), Kanda varga (roots and tubers), Phala varga (Fruits), Taila varga(Fats and Oils), Ikshu varga & Madhya varga(Alcoholic Beverages), Dugdha varga (Milk and Milk products), Masala and vyanjana dravyas (Spices & Condiments), Kritanna varga(Prepared Food), Mamsa varga (Meat types).

Food hygiene

Milk hygiene-Milk composition, Source of infection (for Milk), Milk borne diseases, Clean and Safe milk, Pasteurization of milk.
Meat hygiene-Meat inspection, Slaughter house, Freshness of fish and egg. Fruits and Vegetables hygiene
Sanitation of eating places, Preservation of food, Food handlers, Food borne diseases, Food fortification, and Food adulteration, Food toxicants, Properties of Vegetarian and Non- vegetarian diet, Effects of spices and condiments
Consumption of Alcohol and its effects on personal and social health. Effects of pathya-apathya in life style disorders-Diabetes, Hypertension, Obesity and Coronary heart Disease.

ii) Nidra- Nirukti and Utpatti, Types , Nidra – Swasthya sambandha, Properties of Yukta Nidra, Effects of Ratri Jagarana, Diwaswapna, Anidra, Atinidra, Ahara and Vihara causing disturbed sleep , Ahara and Vihara Causing sound sleep.
Duration of sleep according to age, Sleep in healthy and diseased persons.

iii) Brahmacharya – Brahmacharya and Abrahmacharya, Importance of Bharmacharya and Abrahmacharya, Vyavaya sambandhi niyama, Effects of Ativyavaya. Methods of Virya Raksha, Suratashpriha(Libido) through Vajikarana, Viryanasa phala.

Roganutpadaniya- Concept of Vega- Adharaniya Vega and Dharaneeya Vega, Diseases due to vegadharana and their chikitsa, sharir shodhan.

Rasayana for Swastha-Nirukti, paribhasha(definition), classification and examples

Ashta nindita purusha

Menstrual hygiene

Part B (YOGA AND NISARGOPACHARA) 50 marks

YOGA

Introduction

Yoga shabda utpatti, definitions, Different schools of Yoga – Rajayoga, Hathayoga, Mantrayoga, Layayoga, Jnanayoga, Karmayoga, Bhaktiyoga.
Yoga prayojana
Ayurveda yoga sambandha, swasthya rakshane yogasya mahatvam
Yogabhyasa pratibhandhaka & siddhikara bhavas as per Hathayoga.
Mitahara and Pathyapathyani during Yogabhyasa.

Panchakosha Theory

Astanga yoga
Yama, Niyama
Asana and its importance
Standing Postures
Ardhakatichakrasana, Padahastasana, Ardhachakrasana, Trikonasana.
Sitting postures
Swasthika, Gomukhasana, Padmasana, Vajrasana, Bhadrasana, Shashankasana, Ushtrasana, Pashchimottanasana, Suptavajrasana, ardhamatsyendrasana, Siddhasana.
Supine Postures
Pavanamuktasana, Sarvangasana, Matsyasana, Halasana, Chakrasana, Shavasana,Setubandhasana.
Prone postures
Bhujangasana, Shalbhasana, Dhanurasana, Makarasana.
Suryanamaskara – procedure and benefits.

Pranayama
Benefits of pranayama, time of practice, avara-pravara-madhyama lakshana, yukta-ayukta lakshana
Nadishudhi Pranayama .
Kumbhakabheda – suryabhedana, ujjayi, sheetali, Sitkari, Bhastrika, Bhramari Murcha, Plavini.
Nadishudhilakshana

Shatkarma

Dhauti, Basti, Neti, Trataka, Nauli, Kapalabhati

Bandhas and Mudras

Shad chakras, Ida-pingala-sushumna nadis.

Pratyahara, Dharana, Dhyana, Samadhi

Description of Yoga in Ayurveda
Moksha and Muktatma lakshana and upaya, Naishthiki chikitsa, Satyabuddhi, Tatvasmriti, Ashta Aishwarya, Ashta siddhis.

NISARGOPACHARA (Prakritika chikitsa)

Definition, history, aims and objectives
Theories as per Western school of Naturopathy
Indian school – Panchabhutopasana
Relation of Ayurveda and Naturopathy
Importance of Naturopathy in present era.
Jalachikitsa(hydrotherapy) – Hot water treatment, Cold water treatment, foot and arm bath, Spinal bath, hip bath, abdominal wet pack, Steam bath, enema and whirl pool bath.
Mrittika chikitsa (Mud therapy)
Types of soil, doctrine of mud selection, mud bath.
Suryakirana sevana (sun bath - heliotherapy)
Mardana (Massage) – different methods and effects.
Diet types – Soothing, Elimininative, Constructive,Positive and negative diet, Acidic and alkaline diet
Upavasa chikitsa(Fasting therapy) – Importance, types, therapeutic effects of fasting.
Visrama chikitsa upayoga

PAPER II – SAMAJIKA SWASTHAVRITTA

Part A **50 marks**

Janapadodhwamsa
Causes, Manifestations and control measures, importance of Panchakarma and Rasayana.

Vayu (Air)
Vayu guna according to sushruta samhita, Properties of Vayu as per different directions, Vayu shudhi prakara – Ayurvedic aspect.
Composition of air.
Air of occupied room- Thermal discomfort and comfort zone, indices of thermal comfort.
Air pollution – health and social aspects, Prevention and control of air pollution ,Global warming.
Ventilation and its types.
Mountain air & High altitude – Health problems

Jala (Ayurvedic and modern aspects)
Importance of water , safe and wholesome water, water requirements, properties, types and sources of water,water pollution and health hazards, Methods of water purification.

Hardness of Water.
Examination,Tests and analysis of water.
Rain water harvesting and water recycling

Bhumi and nivasa sthana(Land and housing)
Types of soil,soil & health, Land pollution, Bhumi shodhana, Nivasa yogya bhoomi, Social goals of housing, Housing standards, Mahanasa (Kitchen) standards, Rural housing, Housing and health, Overcrowding.

Prakasha(lighting)
Requirement of good lighting,natural lighting, artificial lighting, biological effects of lighting.

Dhwani pradooshana(Noise pollution) -Noise, Sources, effects,& control
Vikirana(Radiation)- sources, effects and control

Apadravya Nirmulana (Disposal of solid waste)
Different types of solid waste
Storage and collection of refuse
Methods of disposal of solid waste (Rural & urban)
Bio-medical waste management

Malanishkasana Vyavastha (Excreta Disposal)
Methods for Unsewered area and Sewered area
Latrines for camps, fairs and festivals
Disposal of dead body – Burial, Burning, Electric cremation.
Meteorology (Ritu evam Vatavarana jnanam)
Definition of weather and climate,factors influencing weather and climate.
Disaster management
Definition, natural and man-made disasters,epidemiologic surveillance and disease control.
Occupational Health
Occupational Hazards, Occupational Diseases, Prevention of Occupational Diseases, Health & precautionary measures, ESI Act, Indian factories Act.
Offensive Trades- Effects on health and precautionary measures .

School health services
Health problems of school children, aspects of school health service, duties of school medical officers, Maintenance of healthy environment

Epidemiology
Concept of Epidemiology, Dynamics of disease transmission, concept of diseases, concept of causation, Epidemiological triad, natural history of disease, concept of control, concept of prevention, Risks factor, modes of intervention, incidence and prevalence. Susceptible host, host defenses, Immunizing Agents, Disease prevention and control,investigation of epidemic.
Disinfection – definition, types.
Ayurvedic concept of Vyadhikshamatva and sankramaka rogas.

Epidemiology of communicable Diseases
Chicken Pox, Measles, Diphtheria, Pertussis, Mumps, Tuberculosis, SARS, Influenza, Pneumonia, Cholera, Polio, Viral Hepatitis , Typhoid, Leptospirosis, Dengue Fever, Chikungunia, Malaria, Filariasis , Leprosy, Rabies , Tetanus, Emerging and re-emerging diseases

Kuprasangaja vyadhi (STDs)

AIDS, Syphilis, Gonorrhoea, Chanchroid

Non-communicable disease epidemiology
Diabetes, Obesity, Hypertension, Coronary Heart Diseases, Rheumatic Heart Disease, Cancer

Chikitsalaya Bhavana (Hospital Building)

Part B **50marks**

Prathamika swasthya samrakshana(Primary Health Care)
Definition, principle, elements,levels of health care.
Structure at village, sub centre, PHC,CHC, Rural hospital levels.
Health insurance, Private agencies, Voluntary health agencies, NGOs and AYUSH sector.
Role of Ayurveda in Primary Health Care.

Parivara kalyana Yojana (Family welfare Programmes)– Demography, demographic cycle, life expectancy.
Family planning, methods of family planning.

Matru sishu kalyana Yojana – MCH programme
Ante natal, intra natal, post natal, neo natal care. Child health problems and indicators of MCH care.

Preventive geriatrics-Problems of elderly,prevention and control measures.

World Health Organisation-Objectives,structure and functions.
International health agencies-United Nations agencies,Health work of bilateral agencies.

Alma Ata declaration
National Health Policy
Health statistics- Definition, Sources, uses Data collection, Classification, Presentation.
Vital statistics-Morbidity rates,Mortality rates ,Fertility rates.
Health survey

Swasthya prashasana(Health Administration) – Health administration at Central including AYUSH, state, district, village levels.

National health programmes
Tuberculosis(RNTCP), Leprosy(NLEP), AIDS (NACP), Blindness (NPCB), Polio(PPI),Diabetes (NDCP), Cancer (NCCP) , Guinea worm, Vector born disease control programme, NRHM, all the upcoming national health programmes, RCH programme, Universal Immunization Programme.

National Nutritional Programmes - IDD, Vitamin A prophylaxis, Mid day meal, anemia control programmes.

PRACTICALS

Demonstration of Dinacharya procedures- anjana, nasya, kavala, gandoosha dhoomapana, abhyanga, udvarttana.

Parichaya of aharadravya, immunization agents, disinfectants and family planning devices

Practical demonstrations of Asanas mentioned in the syllabus
Pranayama (Suryabhedana, Ujjayi, Shitali, Sitkari, Bhastrika, Bhramari and Nadishuddhi) and Shad karmas(Jala dhauti, Jalaneti, Sutraneti, Trataka, Kapalabhati).

Preparing and delivering of a health educational talk on health related issues.
A short compilation on any topic on environmental health.

Educational Visits
Observe the functioning of the Milk Dairy,Water purification unit, Sewage treatment unit,MCH/Family welfare centre,Leprosy hospital and industraial unit.
Visit to Primary Health Centre for knowledge of actual implementation of National health programmes including knowledge of rural health.
Visit of rural Ayurvedic dispensary.
Visit to naturopathy centre to observe naturopathic treatment modalities.

Health survey- Minimum 5 families of rural and urban areas.
There should be 3 case sheets for Yoga Naturopathy & pathya apathya together and 3 case sheets for communicable diseases.
Proformas for Case sheets/practical records/survey/Dinacharya projects etc should be prepared by the respective universities.

Practical and Viva Voce examination

Marks distribution	**100 marks**
1. Vaiyaktika Swasthavritta	20
2. Samajik swasthavritta	20
3. Demonstration of Yoga	10
4. Naturopathy	10
5. Journal and compilation work	10
6. Viva voce	30

Reference Books:

Relevant portions of Charaka, Sushruta, Vagbhata, Sarngadhara, Bhavaprakasha, Yogaratnakara, Madhavanidana and Bhelasamhita.

Swasthavritta Samucchaya - Pandit Rajeshwar dutt Shastri
Swasthya Vigyan - Dr. Bhaskar Govind Ghanekar
Swasthya Vigyan - Dr. Mukund swarup Varma
Swasthavritta - Vaidya Sakad
Swasthavritta - Dr. Ranade and Dr. Firke

Ayurveda Hitopadesh - Vaidya Ranjit Rai Desai
Yoga and Ayurved - Acharya Rajkumar Jain
Swasthavritta vigyan - Dr. Ramharsha Singh
Swasthavrittam - Dr.Brahmanand Tripathi
Swasthavrittam - Dr. Shivkumar Gaud
Ayurvediya Swasthavritta - Vaidya Jalukar Shastri
Patanjala yogasutra - Patanjali Maharshi
Hathayogapradipika - Swatmaram Yogendra
Gheranda samhita - Gherand Muni
Yoga Paddhati - Bharatiya Prakritik Chikitsa Parishad
Yogik Chikitsa - Shri. Kedar Nath Gupta
Sachitra Yogasan darshika - Dr. Indramohan Jha
Yoga deepika - Shri. B.K.S. Iyengar
Light on Yoga - Shri. B.K.S. Iyengar
Light on Pranayama - Shri. B.K.S. Iyengar
Yoga and yoga chikitsa - Dr. Ramharsha Singh
Foundations of Contemporary Yoga - Dr. Ramharsha Singh
Yoga Sidhant evam Sadhana - Harikrishna Shastri datar
Prakritik chikitsa Vidhi - Sharan Prasad
Prakritik chikitsa vigyan - Verma
Preventive and Social Medicine - J. Park
Preventive and Social Medicine - Baride and kulkarni
Janasankhya Shiksha Sidhanta Evam upadesya - Dr. Nirmal Sahani
Health Administration in India - S.C.Seel
Health and family welfare - T.L.Devaraj
Positive Health - L.P. Gupta
Biogenic Secrets of food in Ayurveda - L.P.Gupta
Smriti granthon mein nihit Swasthaprakara samagri - Dr. Smt. Nigam Sharma
Dr. Reddy's comprehensive guide to Swasthavritta - Dr.P.sudhakar Reddy
Nutritive value of Indian foods - ICMR
Yoga and Nisargopachar - Vd. Prama Joshi
Prachin Vangmay mein prakritic chikitsa - swami Anant Bharati, CCRYN
Swasthavritta - Vd Yashwant Patil and Vd. Vhawal
Food and nutrition - Swaminathan
Organology and sensology in yoga -Prashant S Iyengar
Yoga-A game for Women -Geeta S Iyengar

Yoga-A game for Women(hindi translation)-Madhu Pandey

3.3 PRASUTI TANTRA & STRIROGA

Marks 200 (100marks each paper)
Practical-100 marks
HOURS Theory-200 Hrs
Practical-100 Hrs

PAPER-1 PRASUTI TANTRA

PART-A

INTRODUCTION TO SUBJECT

STRI SHARIRAVIJNAN

Etymological origin of the word Stri. Artava vaha and Stanyavaha strotamsi. Tryavarta yoni Stri Vishishta,Peshi Marmani.

Anatomy of female reproductive system.(External and internal genital organs) Soft & Bony Pelvis and its obstetrical importance.

DESIRABLE (non detail)

Vayobhedena Stri sangnya

RAJO VIGYANA

Description of Raja, Artava and Prathama Rajo Darshana, Rajasvala Charya. Ritumati Lakshana, Ritumaticharya, Ritukala

Menarche, Menstrual cycle and their regulation by endocrine glands,

Ovulation –Importance in conception

DESIRABLE (non detail)

Concept of Stri Sukra

GARBHA VIGYANA

a) Garbhasya paribhasha, Garbhadhanavidhi, Garbhavakranti, Garbha Sambhava samagri, Garbhakara bhava, Panchabhautikatwa of Garbha, Masanumasika Vridhi of Garbha, Garbha Poshana , Garbhasayasthe Garbhasthiti

   Foetal attitude, lie, position, presentation

b) Apara, GarbhaNabhinadi, Jarayu, Ulba

Formation, Development, Function of Placenta, Umbilical cord, Amniotic fluid

Foetal membranes -Abnormalities of Placenta

DESIRABLE (non detail)

Garbhalingotpatti, Garbhasya Avayavotpatti, Garbha Varnotpatti, Garbha Vikriti

GARBHINI VIGYANA

a) Lakshana of Sadhyograhita Garbha, Lakshana of Vyakta Garbha, Pumsavana vidhi

Diagnosis of Pregnancy

b) Garbhini vyavastha: Garbhini Paricharya, Garbha Upaghatakara Bhava, Dauhrida

Ante Natal care-Examination, Investigation and Management

c) Garbha Vyapada: Nidana, Samprapthy and Chikitsa Garbhasrava and Garbhapata-

Garbha shosha-Upavishtaka, Nagodara, Upashushka, Leena garbha,

Antarmrita garbha, Raktagulma, Bahugarbhatha

d) Abortions, Rh-incompatability-

Causes, clinical features, complications and management.

Gestational trophablastic neoplasias, Ectopic pregnancy, IUGR, Intrauterine foetal death, Multiple pregnancy

GARBHINI VYAPAD

a) Hrillasa, Chardi, Aruchi,Atisara, Vibandha, Arsa, Udavarta, Sotha, Parikarthika, Vaivarnya, Kandu, Kikkisa, Pandu, and Kamala, makkala
b) Common ailments of Pregnancy-High Risk Pregnancy, Emesis gravid arum, Gestational Anemia, Gestational Hypertension, Gestational Diabetes, Toxemias of Pregnancy, Jaundice, AIDS,

Ante Partum Hemorrhage causes, clinical features complications and Management

PART B

PRASAVA VIGYANA

a) Prasava Paribhasha,Prasavahetu,Prasavkaala, Sutikagaranirmana, Sangrahaniya Dravyani, Sutikagara praveshavidhi.

b) Prasavavastha; Prajayani/ Upasthita Prasava/ Asannaprasava lakshana, Aavi. Prasavaparicharya, Jatamatraparicharya

c) Normal Labour:-Definition of Labour, Physiology & Mechanism of Labour, Monitoring of Labour and management, Pictogram, Episiotomy, care and resuscitation of newborn.

PRASAVA VYAPAD

a) Garbhasanga, Yonisamvarana, Aparasanga, Mudagarbha-defenition, Nidana, Types & Management

b) Induction and augmentation of labour,Cervical dystocia,Cephalopelvic disproportion, Prolonged labour, Preterm labour, Post term labour, foetal distress, Assisted Labour, Caesarian

c) Retention of Placenta, PPH - causes, clinical features and management, Genital tract Injuries during labour

DESIRABLE (non detail)
Uterine Inversion, Amniotic Fluid Embolism, Garbhasthithi parivarthan(Version), Forceps Delivery, Ventouse Delivery.

SUTIKA VIGYANA

a) Sutika Paribhasha, Sutika Kaal, Sutika paricharya. Changes during sootika avastha(Sareerika&Manasika)

Normal and abnormal Puerperium and its Management

b) Sutika Roga – Number of Sutika Roga, Sutika Jwara, Shotha and Makkala.

c) Stanyavijnan- Sthanyadushti, Sthanyakshaya,Sthanyavridhi -their causes, clinical features and treatment

d) Emergency care in obstetrics

DESIRABLE(non detail)Stana stanya –Pareeksha,Stanya sampat.

PART-2 STRI ROGA

PART-A

ARTAVA VYAPAD

a) Artava-kshaya vridhi, Ashtartavadushti lakshana chikitsa
Asrigdara lakshana samprapti Chikitsa

b) Menstrual disorders-Amenorrhoea, hypomenorrhoea, Oligomenorrhoea, Dysmenorrhoea, Abnormal uterine Bleeding

YONI VYAPAD
Sankhya, Nidana, Lakshana, Upadrava evam Chikitsa

Endometriosis, Fibroid uterus, Genital Prolapses, Retroverted Uterus, Pelvic infections, Cervical erosion, Pelvic Inflammatory Diseases

VANDHYATWA – Prakar, Nidana, Chikitsa
Infertility – Causes, Types, Investigations and Management.

Yoni Kanda, Yoni Arsa, Granthi, Arbud,

Pelvic Infections including Sexually Transmitted Infections, HIV, AIDS, Preventive measures.

MENOPAUSE-changes during menopause ,menopause syndrome, management.

DESIRABLE (non detail)
Congenital malformations of female genital tract.
Sukra vijnan –kshaya,vridhi, dushti hetu lakshana and chikitsa
Benign and Malignant tumours of Genital Tract

PART-B

STANA ROGA

a) Stanakeela- nidana lakshana chikitsa, Stanagranthi, Stanavidradhi, Stanashoph Mastitis, Breast abscess, Galactocele -Etiopathology, clinicalfeatures, diagnosis, prognosis and complications

b) Sthanik Chikitsa
Snehana, Swedana, Uttarabasti, Pichu, Varti, Lepana, Dhupana, Dhavana, Dahana, Ksharakarma -. Practical knowledge of all these procedures along with indications, complications and management.

Shastra Karma

Surgical procedures their Indications, Contraindications of cauterization of cervix, cervical dilatation and curettage, female surgical sterilization

Knowledge of indication and procedure of PAP smear. Endometrial biopsy and interpretation of the reports

Stri roga Sambandhita Pramukha Aushadhyai, Prasuti & Stri Roga Chikitsa Upayogi
Yantra Shastra Parichaya and Vyadhivinischaya Upaya (Investigative and Diagnostic Aids)

Garbhanirodhaka Upaya.

Parivar Niyojana, Reproductive and Child Health Care, AIDS/HIV control Programme, MCH, PNDT Act, MTP Act, and importance of current National Programme

Knowledge of important Commonly used Ayurvedic and Allopathic drugs used in Prasutitantra and Streeroga. Pharmacotherapuetics of allopathic drugs in obstetrics and Gynaecology

Record keeping,ethical and medicolegal issues in Streeroga and prasutitantra

DESIRABLE (non detail)
Laproscopy, hysteroscopy, hysterosalphingography, USG, X-RAY, Colposcopy, Cervical Biopsy. Granthi evum Granthi nirharan samanyajnan (Myomectomy, hysterectomy)

CLINICAL TRAINING-OBSTETRIC SKILLS

To perform independently

1. History taking and examination of antenatal and gynaecological cases

2. Diagnosis of Pregnancy, assessing of gestational period, to diagnose onset of labour

3. To monitor labour progress, able to plot Partogram

4. Observation of 10 labours

5. To diagnose abnormalities of labour and decide about the referral of the patient

6. Able to provide first aid for obstetric emergencies

7. Recognition of post partum complications

8. Councelling and promoting of breast feeding

9. Record 5 antenatal cases, 5 intrapatum and 5 post partum cases

To observe/assist-D&C, D&E, Caesarean section, Repair operations, Resuscitation of new born.

GYNAECOLOGICAL SKILLS -To perform independently

1.History taking and examination of gynaecological cases

2.Recording 10 gynaecological cases, 5 gynaecological procedures

3.Taking vaginal smear, high vaginal swab

4. Practical knowledge of sthanika chikitsa

5. Observation and practical knowledge of minor gynaecological procedures

6.Observation of Surgical procedures

7. Identification, uses., Demonstration of surgical instruments

8. Observation of Method of sterilization, MTP, Surgical procedures Hystrectomy, Oopherctomy

DISTRIBUTION OF PRACTICAL MARKS

1. Case taking-2cases –one Gynec,one obstetric- 30marks

2. Instruments ,Drugs, &Models- 20 marks
3. General Viva- 40 marks
4. Record -2-(one Prasuti, one streerog)- 10 marks
Total **100 marks**

3.4. Kaumarbhritya (Ayurvedic Pediatrics)

Theory One Paper – 100 Marks
Practical Viva Voce - 50 Marks

Paper I **100 Marks**

Kaumarbhritya Parichaya Evum Balaka Paricharya
(Introduction to Ayurvedic Pediatrics and Child Care)

Part A **50 Marks**

1. General introduction and scope of Kaumarbhritya (Ayurvedic Pediatrics), Definitions and terminologies used in Kaumarbhritya.
2. Scientific contribution of Kashyapa Samhita in Kaumarbhritya.
3. Vayobheda (Classification of age): Garbha, Bala, Kumara; Kshirada, Kshirannada & Annada etc. and modern classification of childhood period.
4. Prana Pratyagamanam (Neonatal Resuscitation): Methodology; complications and their management (Ayurvedic and modern view). Assessment of gestational age.
5. Navajata Shishu Paricharya (Neonatal Care): Care of the Jatmatra (Newly born child) and the Sadyojata, Care of the Samaya-purvajata Shishu (Preterm), Purnakalika Shishu (Full term), and Samaya-Paschatjata Shishu (Post term neonate), Nabhinala Chhedana (Cutting of umbilical cord), Complications of improper cutting of umbilical cord and its treatment, Rakshoghna Karma (Protective measures- Ayurvedic and modern view).
6. Navajata Shishu Parikshana (Examination of newborn): Ayu-Parikshana, Modern approach to Neonatal Examination
7. Navajat Shishu Poshana (infant feeding): Specific feeding schedule as per Ayurvedic texts and modern concept; Stanya-Sampat (Properties of normal breast milk) Stanyotpatti (Physiology of lactation), Stanya Sangathana (Composition of breast milk), Stanya Parikshana (Examination of breast milk), Stanya-Piyusha (Colostrum); Stanya-Pana-Vidhi (Techniques of breast feeding), Stanyakshaya-Stanyanasha (Inadequate production and absence of breast milk), Dhatri (wet nurse)- Stanyabhave dugdh Vyavastha (alternative feeding in the absence of breast milk), Various other milk feeding methods.
8. Stanyadosha (Vitiation of Breast milk), Stanya Shodhana (Purification of breast milk), Stanya Janana and Vardhanopakrama (Methods to enhance breast milk formation).
9. Garbha Vridhi Vikasa Krama: Samanya Parichaya (brief monthwise development of

fetus), Milestones of development during infancy and childhood including concepts of various Samskaras.

10. Poshana (Nutrition): Normal requirements of nutrients and common food sources.
11. Dantotpatti evum Danta Raksha Vidhi (Dentition and dental care): Danta-sampat (Characteristics of healthy teeth), Danta Nisheka evum Dantodbheda (Eruption of teeth), Dantodbhedjanya Vikara (Dentition disorders).
12. Vyadhikshamatva: General concepts of Bala (Immunity) and methods of Bala Vriddhi.
13. Prashan & Lehana: Indications, contra-indications, different drugs used in lehana
14. Knowledge of National Programs related to Child Health Care: Reproductive and Child Health (RCH) Program, Community Child Health Programs, Nutritional Programs, National Immunization Program and other programs incorporated by Govt. of India from time to time

Part B **50 Marks**

Samanya Chikitsa Siddhanta and Balaroga
(General Principles of Treatment and Management of Pediatric Disorders)

1. Bala Pariksha-vidhi Evam Shishu Vedana Parigyan (Examination of sick child and Diagnostic methods-Ayurvedic and modern). Samanya Chikitsa Siddhanta (General principles of treatment in children).
2. General Aushadhl Matra Nirdharana - for Ayurvedic and modern drugs preparations (drug doses according to age, weight and drug contents)
3. Specific therapeutic panchakarma procedures in children with special emphases on snehan, swedan and basti.
4. Prasava Kaleena Abhighata (Birth injuries): Shwasavrodha (Asphyxia neonatorum), Ulvaka, Upashirshaka (Caput Succidanum and Cephalohaematoma), Facial Paralysis, Erb's Paralysis, Bhagna (fractures).
5. Brief description of Sahajavyadhi (Congenital disorders): Sahaja Hridaya Vikara (Congenital Cardiac Disorders) Jalashirshaka (Hydrocephalus), Khandaoushtha (cleft lip), Khanda-Talu (cleft palate) Sanniruddha Guda (Anal stricture / imperforated anus), Pada Vikriti (Talipes equanovarus and valgus), Spina bifida, Meningocele, Meningomyelocele.
6. Brief knowledge of genetic disorders): Down syndrome, Turner Syndrome, Muscular dystrophy, Sickle-Cell Anemia, Thalassaemia, Sahaja Madhumeha (Juvenile diabetes).
7. Prasavottara Vyadhi (Neonatal disorders): Navajata Kamala (Neonatal Jaundice), Navajata Netrabhishyanda (Neonatal conjunctivitis), Nabhiroga (Umbilical disorders), Navajatshishu-raktavishmayata (Neonatal Septicemia)
8. Dushta Stanyapanajanya Vyadhi (Disorders due to Vitiated Milk): Lactose intolerance, Kshiralasaka, Kukunaka, Ahiputana (Napkin Rashes)
9. Kuposhanajanya Vyadhi (Nutritional disorders): Karshya, Phakka, Balashosha and Parigarbhika (Protein Energy Malnutrition), Vitamin and Micro-nutrient deficiency

disorders, Hyper-vitaminosis, failure to thrive.

10. Aupasargika Vyadhi (Infectious Diseases): Karnamula Shotha (Mumps), Romantika (Measles), Rubella, Masurika (Chicken Pox), Rohini (Diphtheria), Kukkura-Kasa (Whooping Cough), Dhanurvata (Tetanus), Krimiroga (Worm Infestations), Antrika Jwara (Typhoid), Mastisakavarnashotha (Meningitis), AIDS, Dengue, Malaria, Rajayakshma (Tuberculosis), Jivanujanya Yakrit Shotha (Hepatitis)

1. Srotas Vikara:
   a) Pranavaha Srotas: Pratishyaya (common cold), Kasa (Cough), Shwasa (Respiratory distress syndrome), Tamaka Shwasa (Bronchial Asthma), Utphuliika, Swasanaka Jwara (Pneumonia/Pneumonitis,Bronchiolitis), Gala shotha (Pharyngitis, Laryngitis), Talukantaka(Tonsillitis)
   b) Annavaha_ Srotas: Ajirna (Indigestion), Atisara (Diarrhoea), Chhardi (Vomiting), Vibandha (Constipation), Mukhapaka (Stomatitis), Gudapaka (Proctitis), Parikartika (Anal fissure), Udarshula (Infantile Colic), Pravahika (Dysentry), Gudabhransa (Rectal Prolapse). Ama and its disorders like Ama vata jwara (Rheumatic fever).
   c) Rasavaha Srotas: Jwara (Fever), Pandu (Anemia), Mridbhakshanajanya Pandu (Anemia associated with clay eating/Pica).
   d) Raktavaha Srotas: Kamala (Jaundice), Raktapitta (Haemorrhagic disorders), Yakritodara (Hepatomegaly).and Pieehodara (Spleenomegaly)
   e) Mamsa-Medovaha Srotas: Apachi (Lymphadenitis), Galaganda (Goitre), Gandamala (Cervical Lymphadenopathy).
   f) Mutravaha Srotas: Shopha in Vrikka (Glomerulonephritis and Nephrotic syndrome)
2. Anya Bala Vikara (Miscellaneous Pediatric Disorders), Apasmara (Epilepsy), Akshepa (Convulsions), Nirudhaprakasha (Phimosis), Cerebral palsy.
3. Behavioral Disorders of Children, their management and counseling: Breath holding spell, Shayyamutra (Bed wetting), Pica, Unmada, Autism, ADHD (Attention Deficit and Hyperactive Disorders), Jadatwa (Mental retardation).
4. Pran raksha vidhi (Life saving measures in children): Principles of management of Shock and Anaphylaxis, Poisoning, Foreign body in respiratory tract, Status epilepticus, Hemorrhage, Acute Renal Failure, Febrile Convulsion, Status Asthmaticus, Fluid and Electrolyte Management.
5. Balagraha: General description, classification, clinical features and management.

PRACTICAL

Content of Practical / demonstration

1. Clinical training of above mentioned disorders of children.
2. Exposure to -
   a) Navajata Shishu Paricharya (Care of the newborn)
   b) Pranapratyagamana Vidhi (Resuscitation procedure of new born)
   c) Vaccination
   d) Panchakarma Vidhi (Panchakarma procedures) especially Snehan, Swedana, Basti.
3. Knowledge of various equipments such as phototherapy unit, overhead radiant

warmer, resuscitation equipments, Panchakarma equipments and their application

4. Knowledge of IV fluid administration, blood sampling
5. Anthropometry measurements and their interpretation
6. Various Ayurvedic & modern Procedures and investigations in pediatric practice

Distribution of Marks

Clinical work: Pediatric and neonatal case records [1.0 case sheets of each]	10 Marks
Patient Examination	20 Marks
Spotting	05 Marks
Viva – voce	15 Marks
Total	**50 Marks**

Reference Books

1. Kashyapa Samhita Complete Hindi translation by Satyapal Vidhyalankara English translation by Prof. Premvati Tiwari
2. Principles & practice of Pediatrics in Ayurveda: Dr. CHS Shastry
3. Child Health Care in Ayurveda: Prof. Abhimanyu Kumar
4. Ayurvedic Concepts of human Embryology: Prof. Abhimanyu Kumar
5. Kaumarbhritya by Prof. D.N. Mishra
6. Kaumarbhritya Ke Antargata Balgraho Ka Kramika Evam Vaigyanika Adhyana by Prof. Chanchal Sharma
7. Notes on Kaumarbhritya-by Dr. Dinesh K S
8. Pran - Pratyagannanann-by Dr. B.M. Singh
9. Ayurveda Dwara Matra Evam Shishu Paricharya by Dr. KS Patel,V.K.Kori & Raigopal
10. Kaumarbhritya related references from Charaka Samhita, Sushruta Samhita Vagbhata etc.
11. Clinical Methods in Paediatrics by Meharban Singh
12. Pediatrics Emergencies by Meharban Singh
13. Essential Pediatrics 0,P. Ghai
14. Text Book of Pediatrics Nelson
15. Care of New Born by Meharban Singh
16. Panchakarma in Pediatrics Dr. Yogita Srivas

3.5. CHARAK SAMHITA- UTTARARDHA

(Uttarardha: Chikitsa – Kalpa - Siddhi Sthana)

Theory- One Paper – 100 Marks

The marks of theory examination are distributed as follows:

1. Chikitsa sthana 60 Marks
2. Kalpa sthana 15 Marks
3. Siddhi sthana 25 Marks

Reference Books

1. Charak Samhita -Chakrapani Tika (Sanskrit Commentary)
2. Charak Samhita (Hindi Commentary) Vd. Jayadev Vidyalankar or Vd. Atridev Vidyalankar or Prof. Gorakh Nath Chaturvedi & Kashinath Shastri or Dr. Brahmanand Tripathy or Dr. Ravidutta Tripathy
3. Charak Samhita (English Commentary): Dr. Ram Karan Sharma & Vd. Bhagwan Dash or Acharya Priyavrata Sharma.

Principal
Aarihant Ayurvedic Medical College and Research Institute

Aarihant Ayurvedic Medical College and Research Institute
Bhoyan Rathod, Ghandhinagar

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF CHEMISTRY

Fundamentals of Organic Chemistry
CODE : 253020301

B.Sc.3rdSemester

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 Chemistry

Prerequisites:-

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**[A] Carbohydrates:** Introduction, classification of carbohydrates, osazone formation, epimerization, step up and step down reactions of monosaccharides, simple structures of glucose and fructose, Fischer's proof of configuration of D-glucose. **[B] Amino acid :** Introduction of amino acid, Classification and properties of amino acids, Zwitter ion , Isoelectric point, Strecker's and Gabreil pthalimide synthesis of amino acids.	14
2	**[A] Electrophilic aromatic Substitution:** Introduction, effect of substituent groups, determination of orientation and relative reactivity,classification of substituent groups, electrophilic substitution (ES) reactions.	14

	(Nitration,Sulfonation, Halogenation, Friedel Craft alkylation and acylation), Orientation in mono and disubstituted benzene.	
3	**[A] Heterocyclic Compounds** Introduction, structure of Pyrrole, Furan and Thiophene, Paal Knorr synthesis and electrophilic substitution of Pyrrole, Furan and Thiophene, reactivity and orientation of electrophilic substitution reactions (ESR) in five membered heterocycles (Pyrrole, Furan and Thiophene) Structure of Pyridine, Electrophilic and Nucleophilic substitution reactions of pyridine. Basicity of pyridine.	14
4	**Chemical Reactivity and Molecular Structure: (Acid- Base Properties)** Acid-Bases, scale of acidity-basicity, Resonance effect, Hybridization, Inductive effect and electronic effects, steric effect and hydrogen bonding, Lewis acid and bases,	14

Learning Outcomes:-

At the end of the course the student would have sufficient knowledge of Biochemistry

Teaching & Learning Methodology:-

- Use of audiovisual aids.
- Student interaction, group discussion, seminar, quizzes, assignment, brain storming session.

Books Recommended:

1. Robert Thornot Morrison and Robert Neilson Boyd, ***"Organic Chemistry"***, Prentice Hall of India Pvt Ltd, New Delhi, Sixth Edition, 1992.
2. Bhupinder Mehta, Manju Mehta, ***"Organic Chemistry"***, Prentice Hall of India Pvt Ltd, New Delhi, 2005.
3. James B Hedrickson Donald J. Cram and George S. Hammond, ***"Organic Chemistry",*** Mc-Graw-Hill Kogakusha,Ltd., Third Edition.
4. Arun Bahl, B. S. Bahl, ***"Advance Organic Chemistry"***, S. Chand & Company Ltd., New Delhi, First Edition, 2003.
5. I. L. Finar, ***"Organic Chemistry"***, Pearson Education Pet Ltd, New Delhi, First Edition, 2002.
6. G. Marc Loudon, ***"Organic Chemistry"***, Oxford University Press, Forth Indian edition, 2010.
7. P.S.Kalsi, ***"Text book of Organic Chemistry"*,** MacMillan of India Pvt. Ltd., 1999.
8. P.L. Soni and H.M. Chawala, ***"Text book of Organic Chemistry",*** Sultan Chand & Sons

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF CHEMISTRY

Fundamentals of Analytical Chemistry
CODE : 253020302

B.Sc.3rdSemester

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 Chemistry

Prerequisites:-

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**[A] Basic concepts of Qualitative and Quantitative Analysis** Introduction, Solubility product principle, Common ion effect, Separation of cations of each groups and separation of anions (acid radicals), Introduction of volumetric titration based on normality and morality of the solution, Conditions for volumetric analysis and types of titrimetric analysis. **[B] Redox titration:** Theory of redox titration, study of redox titration by electrochemical potential method, Ways of locating the end point for redox titration	8 6
2	**Acid Base Titration**: Theory of acid-base titration, Ways of locating the end point of an acid-base titration, Titration of strong acid with strong base, Titration of weak acid with strong base, Titration of weak base with strong	14

	acid, Titration of weak base with weak acid, Factors determining the exact form of a pH curve.	
3	**Complexometric Titrations** : Theory of complexometric titration involving EDTA, Study of EDTA complex formation taking disodium salt of EDTA and effect of pH, Ways of locating the end point, Estimation of calcium and magnesium by complexometric titration by EDTA [B] Precipitation Titration [6 marks] Titration curves, Feasibility, Indicators, Mohr, Volhard and Fajans' Methods, Factors affecting solubility **Precipitation Titration** Titration curves, Feasibility, Indicators, Mohr, Volhard and Fajans' Methods, Factors affecting solubility	8 6
4	**Precipitation Gravimetric** [14 marks] Introduction, Precipitation, Digestion, Filtration, Washing of the precipitate, Drying and/or incineration of the precipitate, Weighing, Specific and selective precipitation, Organic precipitants, Masking or sequestering agent, Problems involved in precipitation gravimetry.	14

Learning Outcomes:-

At the end of the course the student would have sufficient knowledge of Biochemistry

Teaching & Learning Methodology:-

- Use of audiovisual aids.
- Student interaction, group discussion, seminar, quizzes, assignment, brain storming session.

Books Recommended:

1. Dhruba Charan Dash, "Analytical Chemistry", PHI Learning Pvt. Ltd., New Delhi, 2011.
2. R.A.Day, A.L.Underwood, "Quantitative Analysis", Prentice-Hall of India Pvt.Ltd., New Delhi, 2004. (Sixth edition)
3. Gary D. Christian, "Analytical Chemistry", John Wiely & Sons, INC, New York, 1994. (Fifth edition) 4. Douglas A. Skoog, Donald M. West, F.James Holler, "Analytical Chemistry An Introduction", Saunders College Publishing, Harcourt Brace College Publishers, Philadelphia, 1994. (Sixth edition)
4. Y.Anjaneyulu, K.Chandrasekhar, Valli Manickam, "A Textbook of Analytical Chemistry", Pharma Book Syndicate, Hyderabad, India, 2006.

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

SEMESTER-III

DEPARTMENT OF CHEMISTRY

CHEMISTRY PRACTICAL

(CODE : 253020303)

[A] ORGANIC MIXTURE

Organic Spotting and Estimation Organic spotting minimum eight compounds
Acids: Salicylic acid, Cinnamic acid, Anthranilic acid, Sulfanilic acid
Phenols: p-Nitrophenol, Beta-Naphthol
Bases: m and p – Nitroanilines, p-Toludine
Neutral : Solids:- Acetanilide, Glucose Liquids:- Acetophenone, Carbon tetrachloride (CCl4), Methylacetate

[B] ANALYTICAL CHEMISTRY:

1. Nitrite by back titration.
2. Hardness of Water , Ca & Mg (Total Hardness) by EDTA
3. Estimation of MgCl2 and Eriochrome Black – T (Back Titration)
4. estimation of calcium Gluconate (displacement titration)
5. Estimation of ferrous sulphate (redox titration)
6. Estimation of copper sulphate (redox titration)
7. Ba as BaSO4(gravimetric analysis)
8. Estimation of NaCl by mohr's and volhard method.

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF BIOTECHNOLOGY

Cellular Biology
Subject Code :253010301
B.Sc. Semester -3

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 Biotechnology
- To provide students basic knowledge of cell biology
- Students will understand how these cellular components are used to generate and utilize energy in cells.
- Explain how DNA allows for the passage of genetic information between generations.
- Compare the structure of prokaryotic and eukaryotic genetic information storage molecules.

Prerequisites:-

- Student Must have studied 2years B.Sc. with microbiology/Biotechnology as a major subject and knowledge of basic microbiology.

Course outline:-

Unit No.	Course Contents	Teaching Hours
1.	**Structure of cell:** • Chemistry and Ultra structure of cellwall, • Membrane, • Flagella and Cilia organells • Mitochondria, • Chloroplast, • Golgi bodies, • peroxysome, • Endoplasmic reticulum, • Ribosome, • Nature of Cytosol, • Cytoskeleton structures, • Cellular diversity at structural and compositional levels among Prokaryotes, Archeobacteria and Eukaryotes (Plant, Animal and Fungi)	**10**
2.	**Cellular Metabolism:** • Oxidation-Reduction, • Energy and carbons source utilization, Electron transport chain and ATP generation, • Metabolism: Anabolism, Catabolism, Respiration, Passive transport, Facilitated diffusion, Group translocation, • Enzymes: Properties, • Mechanism of catalysis, • Allosteric controls	**10**
3.	**Cell Division:** • Cell division, Phases, Mitosis, Growth and tumour, • Cell cycle, Senescence and Apoptosis	**10**
4.	**Cell Expression:** • Central dogma of life, • Concept of gene, Transcription, Translation and Expression, Operon model, Coordination of Metabolism at enzyme Activity and Synthesis levels, • Cell Communication: Single molecules, Receptors, junction, Plasmodesmata and cell signalling	**10**
		40

Learning Outcomes:

- At the end of the course the student would have basic knowledge of Applications of Biotechnology
- The student can make predictions about natural phenomena occurring during the cell cycle.
- The student can describe the events that occur in the cell cycle.
- The student is able to construct an explanation, using visual representations or narratives, as to how DNA in chromosomes is transmitted to the next generation via mitosis, or meiosis followed by fertilization.
- The student is able to represent the connection between meiosis and increased genetic diversity necessary for evolution.
- The student is able to evaluate evidence provided by data sets to support the claim that heritable information is passed from one generation to another generation through mitosis, or meiosis followed by fertilization.

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

- Dr.A.C Deb. *Fundamentals of Biochemistry*
- U Satyanaryan. *Biochemistry*

- Verma, P. S., & Agrawal, V. K. (2006). *Cell Biology, Genetics, Molecular Biology, Evolution & Ecology (1 ed.). S .Chand and company Ltd.*
- Lodish sixth edition. *Molecular Cell Biology*
- Thomas D. Pollard *Cell biology*

- Luby-Phelps K. *The physical chemistry of cytoplasm and its influence on cell function*

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MICROBIOLOGY

MICROBIAL PHYSIOLOGY
Subject Code: 253040301
B.Sc. Semester -3

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 Biochemistry and Metabolism.
- The purpose of the course is to give students an introduction of bacterial nutrition, uptakes of solutes, their growth requirements and growth measurements.
- To provide an understanding of energy production and regulation in cells, fundamentals of enzymology, etc.

Prerequisites

Student must have studied first year (FY) of B.Sc. with Microbiology as a major subject and knowledge of basic biology.

Course outline

Unit No.	Course Contents	Teaching hours
1	**Biomolecules** • Chemical structure, properties, classification and Biological significance of Biomolecules: ➢ Carbohydrates ➢ Protein ➢ Lipids ➢ Nucleic acids	**10**
2	**Enzymes** • General introduction: Physical &Chemical properties • Structure of enzymes: Prosthetic group, Apo-enzyme, coenzyme, cofactors. • Localization of enzymes: Extra cellular and intra cellular • Nomenclature and classification of enzymes, IUB system of enzyme classification • Enzyme action: active site of enzymes • Mechanism of Enzyme action • Factors affecting on enzyme activity • Inhibition of enzyme activity: Competitive and Non competitive	**10**
3	**Microbial Nutrition and Introduction to Metabolism** • Types of Culture Media • Modes of Nutrition Uptake: Entry of nutrients in cell, Passive diffusion, facilitated diffusion and active transport • Classification of bacteria on the basis of growth supporting environmental factors such as oxygen, temperature, pH, osmotic pressure, salt and hydrostatic pressure • Introduction to microbial metabolism: Anabolism, catabolism, primary and secondary metabolism • Role of reducing power, precursor metabolites and energy rich compounds in cell metabolism	**10**
4	**Microbial growth** • Methods of reproduction in bacteria and new cell formation • Growth: Introduction to growth rate, generation time ➢ Criteria for growth measurement: Cell mass and Cell number, methods of their measurement ➢ Normal growth curve of bacteria ➢ Continuous growth and synchronous growth. • Chemotherapeutic agents as growth inhibitors: ➢ Principles of chemotherapy ➢ General mode of action of various chemotherapeutic agents: Sulfonamides, Antibiotics (penicillin, streptomycin, polymyxin)	**10**
		40

Learning Outcomes

- The students will be able to apply the knowledge of the physiology of microbes to understands concepts of various fields like research fields, fermentation industries, food industries, etc.

- Student should be able to understand basic concepts of culture media, modes of nutrition uptake, classification of bacteria based on physiological properties, physical and chemical properties of enzymes, mechanism of enzyme action, methods of reproduction in bacteria, growth and their measurements and chemotherapeutic agents, classification of biomolecules, anabolism, catabolism, primary and secondary metabolism, role of reducing power.

- 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

1. PelczarJr, M J, Chan E C S, Krieg N R, (1986) Microbiology, 5thedn, McGraw-Hill Book company, NY
2. IngrahamJ L, and Ingraham, C L, (2000) Introduction to Microbiology, 2nd edition, Brooks/Cole, Singapore
3. Black J G, (2002) Microbiology: Principles and Explorations, 5thedn, John Wiley and Sons, Inc. NY.
4. Atlas R M, (1977), Principles of Microbiology2nd Edition, Wm. C. Brown Publ. Iowa USA

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF BIOTECHNOLOGY

MOLECULAR BIOLOGY-I
Subject Code: 253010302
B.SC. Semester -3

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 molecular genetics of prokaryotes.
- The purpose of the course is to give students to introduction of replication, transcription, and translation in prokaryotes.
- To provide an understanding of DNA damage and repair system and also get idea about transposons and its applications.
- At the end of the course the students would have basic fundamentals of biotechnology.

Prerequisites

Student must have basic knowledge of molecular biology.

Course outline

Unit No.	Course Contents	Teaching hours
1.	**Prokaryotic Replication:** • Definition, property and features of prokaryotic DNA. • Unidirectional, bidirectional. • Initiation, elongation and termination of replication. • Closed clamp and rolling model. • DNA damage and repair system.	**10**
2.	**Prokaryotic Transcription:** • Definition. • Concept of gene, promoter. • Initiation, Elongation, termination and anti-termination of transcription. • Post transcription modification. • Operon concept-Lac and Trp operon.	10
3.	**Prokaryotic Translation:** • Genetic code • Wobble Hypothesis An overview of translation in prokaryotes. Initiation, elongation and termination of translation. • Post-translation modification	10
4.	**Restriction Modification system:** • Introduction, • Restriction enzymes, types, nomenclature, properties and examples (Eco RI, Bam HI, SmaI)	10
		40

Learning Outcomes

- The students will be able to apply the knowledge of the molecular biology to understand the concept of various fields like research fields, Gene manipulation, Genetic engineering, etc.

- Student should be able to understand basic concepts of Replication, Transcription, Translation, and restriction modification system in prokaryotes, DNA damage and repair mechanisms.

- 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

- Prescott, Harley, and Klein's Microbiology, J. M. Willey, L. M. Sherwood, C. J. Woolverton, 7 th Edition (2008), McGraw Hill Higher Education- USA
- Principles of Microbiology, R. M. Atlas, 2nd Edition (Indian Edition) (2015), McGraw Hill Education (India) Private Limited –New Delhi.


SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF PHYSICS

PHYSICS -301

Subject Code: 253050301

B.Sc. Semester 3

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 electronics, crystalline state, modern physics and wave optics. 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 Mathematics and fundamentals of Physics.

Course outline

Sr. No.	Course Contents	Teaching Hours
1	**Electronics**: **Basic characteristics of the Transistor**: Basic Transistor amplifier, Two diode analogy for a transistor, Transistor input characteristics, Transistor collector characteristics, collector cut off current I_{CEO}, Forward current transfer ratio CE , Permissible operating area of a transistor CE, The basic common base amplifier, CB, Forward current transfer ratio CB, relation between and β, collector cut off current I_{CBO}, physical explanation of CB and CE amplifying action, reduction of CE leakage current to I_{CO}, common collector amplifier, identifying the transistor leads	10
2	**The common emitter amplifier:** Graphical analysis of CE class A amplifier, input and output resistance, effect of adding a class A amplifier, conversion efficiency of class A amplifier with a direct coupled resistive load, phase relationship in CE amplifier, input waveform consideration, comparison of basic transistor amplifier **Solid state electronics Devices:** zener diode, zener diode specification, the voltage regulator circuit, design of a voltage regulator circuit, effect of supply voltage variation, zener break down mechanism, the tunnel diode, application of tunnel diode ,the silicon controlled rectifier, the Uni junction transistor	12
3	**Modern Physics and Elementary Quantum mechanics** **A.** Historical origins of quantum theory, Difficulties with Classical : models, optical spectra Black body radiation, Frank- Hertz experiment, Stationary states of atoms. The correspondence principle, Bohr atom, Spectroscopic series, Quantisation of the orbits. The Elliptic Orbits, Particle in a box, rigid rotator, Harmonic oscillator, Short coming of an old quantum theory, Compton effect, particle diffraction, Wave packets and Einstein De Broglie relation **B.** The Schrodinger equation and stationary states, a free particle in one dimension, Generalization to three dimensions, Operator correspondence And the Schrodinger equation for a particle subjected to force, Physical Interpretation of wave function, Normalization, Non normalizable wave functions and box normalization, conservation of probability.	12
4	**Wave Optics** **A. Diffraction of Light (Fresnel class) :** Frensnel's half period zones, zone plate, difference between interference & diffraction, Fresnel & Fraunhofer diffraction. **B. Fraunhofer class :** Fraunhofer diffraction at two slits, diffraction at N slits, Plane diffraction grating, Dispersive power of grating, Grating at oblique incidence.	12

	C. Resolving power of optical Instrument : Resolving power, Rayleigh's criterion of resolution, resolving power of telescope, relation between magnifying power & the resolving power of telescope, Resolving power of a plane diffraction grating, difference between resolving power & dispersive power of grating, comparison of prism & grating spectra.	

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

- Introduction to Solid State Physics (7th Edition) by C. Kittle, Wiley (India)
- Electronics Devices and Circuits By Allen Mottershed , PHI

- Electronic Principles (7th Edition) by Albert Malvino & David J. Bates, TMcGHill Pub.
- Electronic Devices and Circuits by Sanjeev Gupta, Dhanpatrai & Sons
- Quantum Mechanics by Powel and Crasemann, Addison and Wesley
- Concept of Modern Physics, Arthur Beiser, TMH Edition
- A textbook of Quantum Mechanics, P.M. Mathews, K. Vankatesan
- Optics & atomic physics by Singh, Agrawal
- Optics by Ajay Ghatak, Tata McGraw Hill 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 National Geographics.
- http://www.sciencefairadventure.com/

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF PHYSICS

PHYSICS -302

Subject Code: 253050302

B.Sc. Semester 3

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: -

Physics students will:

- Develop a solid grasp of core concepts and applications of fourier series, classical mechanics, nuclear physics and dielectrics. 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:-Engineering physics majors must have a basic understanding of fundamental physics and mathematics.

Course outline

Sr. No.	Course Contents	Teaching Hours
1	**Dielectrics** Polarization, Types of polarization, Types of dielectric materials, Laws of electrostatics field in presence of dielectrics, Energy of the field in the presence of a dielectric, Boundary conditions, Gaseous non polar dielectrics, Gaseous polar dielectrics, Non- polar liquids, Solid Dielectrics-Electrets, Electric Field, Stresses, Claussis-Mossotti equation	10
2	**Magnetostatics** : Types of magnetic materials, (diamagnetic, paramagnetic & ferromagnetic), Magnetic effects, The magnetic field, force on a current, Biot Savart law, The laws of magnetostatics, the magnetic potentials, Magnetic dipole in non-uniform magnetic field, Magnetic vector potential due to a small current loop, Magnetic media, Magnetisation, Magnetic field vector, Magnetic susceptibility & permeability, Boundary conditions, Uniformly magnetized sphere in external magnetic field, A comparison of static electric & magnetic fields	10
3	**Classical Mechanics**: **Motion in a Central force field**: General features of the motion, Motion in an inverse square law force field, Equation of the orbit, Kepler's laws of planetary motion **Collision of particles :** Elastic & inelastic scattering, Elastic Scattering Laboratory & Centre of mass system, Kinematics of elastic scattering in the laboratory system, inelastic scattering, cross-section, The Rutherford formula **Moving Co-ordinate System :** Rotating co-ordinate system, The Coriolis force, Motion on the earth, Effect of Coriolis force on freely falling particles	12
4	**Nuclear Physics:** **A.** Physical tools: Introduction, Interaction between particles & Matter, brief survey, Detectors for Nuclear particles (i) Proportional counter (ii) The Geiger counter (iii) Scintillation counter (iv) Solid state or semi-conductor detectors (v) Cloud & Bubble chambers (vi) Spark chamber; Particle Accelerators : Need for an accelerator of charged particles, (i) Van de Graff Generator (ii) The cyclotron (iii) Synchrotron (iv) The Betatron; Beta ray spectrometer **B.** Nuclear magnetic resonance (NMR), Introduction, The technique of NMR, Some experiments with NMR.	12

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

- Mathematical Methods in Physical Sciences by Mary L. Boas (John Willey & Sons)
- Mathematical Physics by H.K. Das, S. Chand Publishing Co
- Classical mechanics by R.G. Takewale & P.S. Puranik, Tata McGraw Hill
- Nuclear physics, An introduction by S. B. Patel, New Age International (P) Ltd
- Nuclear Physics by D.C. Tayal, Himalaya Publishing House
- Electromagnetics by B. B. Laud, Willey Eastern Limited
- Introduction to Electrodynamics by D. J. Griffith (3 edition), PHI learning

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 National Geographics.
- http://www.sciencefairadventure.com/

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MATHEMATICS

Linear algebra
Subject Code: 253030301
B.Sc. Semester -3

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	-	-	-	-	30	--	70	-	100

Objectives

- The aim of this subject is to present the important ideas in Linear equation using multiple method to student whose principal interest lie outside the field of mathematics.
- It is a subject which provide a vital arena where students can see the interaction of mathematics and machine computation.
- Student will demonstrate competence with the basic ideas of linear algebra and Partial derivatives including concept of linear system,basis , span , vector space ,different type of solving series including Taylor's series, Fourier series .

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 Linear algebra and their properties .

Sr. No.	Course Contents	Teaching hours
1	**Unit: I** Definition and examples of vector space,subspaces,Necessary and sufficient condition to be a subspace,span of a set , Examples of subspaces, intersection, addition and direct sum of subspace , Intersection , addition and direct sum of subspaces.	10
2	**Unit: II** Finite Linear Combination, Linear dependence and linearly independence and their properties (with proof).Examples regarding Linear Dependence and independence .Dimension and Basis of a vector space , Dimensional Theorem.	8
3	**Unit: III** Linear Transformation : Defination and Examples , Range and kernal of a linear map and results regarding them . Rank and Nullity of a linear map , Rank - nullity Theorem , Examples for verification of Rank - Nullity Theorem . Inverse of a Linear map , Consequences of Rank-Nullity Theorem.	14
4	**Unit: IV** Matrix associated with a Linear map , Linear map associated with a Matrix . Linear operation in $\mu_{m,n}$, Only introduction of L(U,V) and I somorphism between L(U,V) and $\mu_{m,n}$, Dimension theorem for $\mu_{m,n}$,and L(U,V). Rank-Nullity of Matrices and verification of the Rank - Nullity Theorem for Matrices.	10

Learning Outcomes

After Successfully Completion of the Course the student will be ….

- Solve system of linear equation using multiple methods including Gaussian elimination and matrix inversion.
- Determine if the system is consistent and find its general solution .
- Row reduce a matrix to reduce echelon form.
- Determine a subspace of a vector space , null space , and a column space.
- Find the dimension of subspace spanned by the given vectors. .
- Understand the partial derivative and solve different order of partial derivatives .
- Understand different type of series and method to solve that series.
- Know about the Convergent and Divergent of the Series .

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. Linear Algebra by K.Hoffman and R. KunzaA text book of Modern Abstract Algebra by Shanti Narayan, S.Chand& Co., New Delhi.
2. Basic Linear Algebra with Mat lab by S.K.Jain, A.Gunawardena & P.B. Bhattacharya.
3. Linear algebra by I.N Herstein.
4. Differential Calculus by Shanti Narayan, S.Chand & co., New Delhi.
5. Differential Calculus by Gorakhprasad, Pothishala Pvt. Ltd., Allahabad.
6. Real Analysis by R.R. Goldberg, Oxford and I.B.H. Publishing Co. Pvt. Ltd.
7. Mathematical Analysis by S.C. Malik, Wiley, Eastern Ltd., New Delhi.
8. Linear Algebra by V Krishnamurthy , V P Mainra , J L Arora.

E-Resources

- SWAYAM PORTEL/ NPTEL- online courses on mathematical and quantum mechanics. https://swayam.gov.in/ and https://nptel.ac.in/
- https://users.math.msu.edu/users/gnagy/teaching/la.pdf
- https://www.coursehero.com/file/43045203/MTH309-lecture-1pdf/
- https://www.studocu.com/en-ca/document/memorial-university-of-newfoundland/linear-algebra-i/other/section-12-chapter-1-systems-of-linear-equations/698998/view

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MATHEMATICS

NUMERICAL ANALYSIS

Subject Code: 253030302

B.Sc. Semester -3

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 Midterm examination and end examination Conducted by university.

Teaching Scheme				Credits	Evaluation Scheme				
Th	Tu	P	Total		Internal		External		Total
					Th	Pr	Th	Pr	
4	-	-	-	-	30	--	70	-	100

Objectives :-

- The aim of this subject is to present the important ideas in Numerical Analysis using multiple methods to student whose principal interest lie outside the field of mathematics.
- It is a subject which provides a vital arena where students can see the interaction of mathematics and machine computation.
- Student will demonstrate competence with the basic ideas of numerical analysis and including concept of numerical analysis like solution to numerical, algebraic transcendental equations, finite differences, interpolation formula, numerical differentiation and integration, numerical solution to ordinary differential equations .

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 designed for undergraduate and graduate students working on scientific, engineering, statistics, and mathematics majors This course serves as an introduction to numerical methods used to applied mathematics problems, with applications across the spectrum of disciplines.

Sr. No.	Course Contents	Teaching hours
1	**Unit: I** Solutions to numerical, algebraic and transcendental equations, Bisection Method, Newton's Iteration method, method of false Position, Rate of convergence of Newton- Rapson method.	10
2	**Unit: II** **Interpolation:** Finite differences, Forward, central and backward differences, Differences of a polynomial, Gregory Newton's forward and backward forward formula, Gauss forward and backward formula, Bessel's Formula, Stirling formula. Lagrange's Everett's formula (without proof).	12
3	**Unit: III** **Interpolation with unequal Interval : properties of divided differences,** Newton's divided difference formula , Inverse interpolation , Lagrange's interpolation formula , Numerical differentiation and Integration , derivatives using Newton's forward and Backward difference formula, Maximum and minimum values of a tabulated function. Trapezoidal rule, Simpson's (1/3) rd and (3/8) th rules.	12
4	**Unit: IV** **Numerical solution of ordinary differential equation:-** Taylor's series Method for simultaneous first order differential equations, Taylor's series Method for higher order differential equations , Euler's Method, modified Euler's method, Runge-kutta's method, Higher order Runge –Kutta Methods Runge-Kutta's methods for simultaneous first order equation, Runge-kutta's methods for second order equation, Picard	10

	method.	

Learning Outcomes:-

After Successfully Completion of the Course the student will be ….

- Derive Numerical methods for various mathematical operation and tasks, such as interpolations, differentiations, integration, the solution of linear and nonlinear equations, and the solution of linear and nonlinear equation, and the solution of differential equations.
- Analyse and evaluate the accuracy of common numerical methods.
- Derive numerical methods for various mathematical operations and tasks , such as interpolation, differentiations, integrations , the solution of linear and nonlinear equations..

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. S.S.Sastry, Introductory methods of Numerical analysis, Prentice hall of India, 1990.
2. Numerical Analysis by G. Shankar Rao.
3. Numerical Analysis, B.S.Grawal.
4. Numerical methods by Dr. P. kandasamy.
5. Introduction of Numerical analysis by Josef Stoer and Roland Bulirsch.
6. Analysis of Numerical Methods by Isaacson and Herbert Keller.

E-Resources

- SWAYAM PORTEL/ NPTEL- online courses on mathematical and quantum mechanics https://swayam.gov.in/ andhttps://nptel.ac.in/
- cims.nyu.edu/~cfgranda/pages/OBDA_fall17/notes…
- www.sxccal.edu/mathematics-lecture-notes


SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
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Kalol, Gandhinagar

SWARNIM STARTUP & INNOVATION UNIVERSITY (SSIU)

SWARNIM SCIENCE COLLEGE

PHYSICS

B.Sc. Semester 3

Practical List

Sr. No.	Practical Name
1	Study of Y-by Koening's method
2	Study of Resolving power of telescope.
3	Flatness of plate by Newton‟s ring.
4	Study of Numerical method of oscillatory motion.
5	Resolving power of telescope.
6	Wavelength of light using Hartmann formula.
7	Figure of Merit of a mirror galvanometer.
8	C1/C2 by Desauty's method
9	Zener diode as a voltage regulator
10	h-parameters of CE transistor.
11	Uni Junction Transistor
12	Load line and determination of Q point for BJT.
13	Absorption coefficient of liquid using photocell
14	Study of electron diffraction pattern
15	Resonance pendulum
16	Fourier Analysis
17	L by Maxwell‟s bridge
18	Liquid Lens

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MICROBIOLOGY
Soil & Water Microbiology
CODE: 253040302
B.Sc. 3rd Sem

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 properties of soil its physicochemical characteristics, micro flora present in soil. What kind of interactions take place in soil.
- Student will learn about the importance of microorganism and its co-relation of soil & microbes.
- How the biogeochemical cycles run in the nature i.e rotation of various elements like nitrogen, sulfur, carbon, iron and phosphorus.
- Importance of soil fertility.
- To provide the importance of drinking water, how to check whether the water is potable or not, get to know different test like SPC,MPN, PA Test about qualitative and quantitative analysis of drinking water
- To provide the information of properties and types of waste water, what can be sources of the waste water.
- The purpose of the course is to provide the knowledge about the importance of treatment of waste water, how it can be treated by different methods and then disposed off in the environment.

Prerequisites

Student Must have studied S.Y B.Sc. with Microbiology as a major subject and knowledge of basic biology

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Microbiology of soil** • Physicochemical characteristic of soil: Soil as culture media and Soil micro flora • Methods of soil micro flora: • Direct microscopic methods, Agar plate technique, Enrichment culture technique, Buried slide technique and soil respiration technique • Microbial soil interactions: (A) Neutral, Positive and Negative associations (B) Interaction between plant roots and micro organisms (i) Rhizosphere and its significance (ii) Mycorrhiza	**8**
2	**Microorganisms as Biogeochemical agents:** • Biogeochemical transformations in soil: Mineralization and immobilization of elements • Rotation of elements in nature: (A) Nitrogen cycle (B) Sulfur cycle(C) Carbon Cycle (D) Iron cycle (E) Phosphorus Cycle) • Soil fertility: Biofertilizers	**10**
3	**Microbiology of drinking water:** • Natural waters: Sources of contamination • Microbial indicators of fecal pollution (A) Coliforms as indicator (B) Methods for differentiation: IMViC test and Elevated temperature test (C) Microbial indicators other than coliforms • Nuisance organisms in water: Slime forming bacteria, Iron and Sulphur bacteria and Algae • Water borne diseases • Bacteriological examination of drinking water: (A) Sampling (B) Quantitative analysis: Total viable count, Membrane filter technique (C) Qualitative substrate test, P-A (Presence Absence test) • Purification of drinking water.	**8**
4	**Microbiology of Wastewater:** • Type of wastewater: Chemical and Microbiological characteristics of waste water • BOD ,COD, TOD as indicators of untreated waste water, Pollution problems due to disposal of untreated waste. • Methods of wastewater treatment: (A)Primary treatment and secondary treatment: Principles and role of microorganisms in: Septic tank, Imhoff tank, trickling filters, activated sludge process and oxidation ponds. (B) Advanced treatment and Final treatment (C) Solid waste processing: Anaerobic sludge digestion and composting	**10**

Learning Outcomes:-

At the end of the course the student would have sufficient knowledge of Soil and Water Microbiology such as

- The students will learn about the properties of soil, nature of soil, types of soil present in the environment.
- Students get knowledge about how the microbes present in the soil interact with soil and help in increasing the soil fertility.
- This study will help them to know about the biogeochemical cycles running in nature how the elements are maintained in the environment and also how organism interact.
- The students will be able to understand the importance of drinking water, types of contaminants present in the water. With the help of practical also get to know about the how quality of water can be tested for its portability.
- The study will help in learning the quality, types, properties of waste water and also why waste water should be treated. Also learn about various methods like BOD, COD, TOC, TOD for treatment of waste water.

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:

1. PelczarJr, M J, Chan E C S, Krieg N R, (1986) Microbiology, 5th edn, McGraw-Hill Book Company,NY.
2. Alexander M, (1977), Soil Microbiology, 2nd Edition Krieger Publ. Co. Melbourne, FL
3. Atlas R M, (1977), Principles of Microbiology 2nd Edition, Wm. C. Brown Publ. Iowa USA

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MICROBIOLOGY

BACTERIAL DIVERSITY

Subject Code: 253040401
B.Sc. Semester -4

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 Microbial diversity of Archea bacteria and Eubacteria.
- The purpose of the course is to give students to introduction and basic knowledge of bacterial and archaeal diversity.
- To provide an understanding of different genera of eubacteria.

Prerequisites

Student must have studied First year (FY) of B.Sc. with Microbiology as a major subject and knowledge of basic biology.

Course outline

Unit No.	Course Contents	Teaching hours
1	**Archea bacteria** • Introduction and phylogeny • General properties ➢ Cell wall and cell membrane ➢ Chromosome ➢ Ribosome • Salient features of: ➢ Methanogens ➢ Halophiles ➢ Thermophillic S^0 metabolizers	**10**
2	**Eubacteria-I** • Photosynthetic bacteria: General properties ➢ Oxygenic photosynthetic bacteria ➢ An-oxygenic photosynthetic bacteria • Chemolithotrophic bacteria ➢ Nitrifying bacteria ➢ Colorless Sulphur bacteria ➢ Iron, Hydrogen and Magnetotactic bacteria	**10**
3	**Eubacteria II** • Gram negative spiral and curved rods: ➢ Spirocheatales ➢ Spiral bacteria ➢ Curved rods • Gram negative aerobic rods and cocci: ➢ Pseudomonadaceae ➢ Neisseriaceae • Gram-negative anaerobic and facultative rods and cocci: ➢ Enterobacteriaceae ➢ Vibrionaceae ➢ Veillonellaceae • Obligatory Parasites: ➢ Rickettsiaceae ➢ Chlamydiaceae ➢ Mollicutes	**10**
4	**Eubacteria III** • Gram positive rods and cocci ➢ Micrococcaceae ➢ Deinococcaceae ➢ Other genera: Streptococcus, Leuconostoc, Peptococcus ➢ Endospore formers ➢ Non spore forming Rods • Gram positive irregular rods	**10**

	➢ Nonfilamentous rods ➢ Aerobic curved rods ➢ Nocardioforms • Filamentous bacteria with complex morphology • Bacteria with unusual morphology ➢ Prosthecate budding/nonbudding bacteria ➢ Nonprosthecate budding/nonbudding bacteria ➢ Sheathed bacteria ➢ Gliding fruiting/nonfruiting bacteria	
TOTAL		**40**

Learning Outcomes

- The students will be able to apply the knowledge of bacterial diversity to understand concepts of various fields like research fields, fermentation industries, food industries, culture collection centers etc. to identification of organism or strains.

- Student should be able to understand basic concepts of Archea bacteria, phylogeny, general features of methanogens; halophiles; Thermophiles. Students also should be able to get knowledge of morphological, cellular, physiological, metabolic and ecological diversity of selected genera of eubacteria.

- 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 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

1. Atlas R M, (2015), *Principles of Microbiology* 2nd Edition, McGraw Hill education, Mumbai
2. Garrity George M, Noel R Krieg et al (2011) *Bergey's Manual of Systematic Bacteriology* (Vol. I to IV) 2ndedition, Editors James T Staley and Aidan C Parte Springer
3. PelczarJr, M J, Chan E C S, Krieg N R, (1986) *Microbiology*, 5thedn, McGraw-Hill Book company, NY

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF BIOTECHNOLOGY

BIOINSTRUMENTATION

Subject Code: 253010402

B.Sc. 4th 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 studied 2years B.Sc. with microbiology/Biotechnology as a major subject and knowledge of basic microbiology.

Course outline

Unit. No.	Course Contents	Teaching hours
1	**COLORIMETERY AND SPECTROPHOTOMETRY** • Principle, Instrumentation Method and Application of UV-Visible Spectroscopy, • Atomic Absorption Spectroscopy • Flame Photometry • Nephlometery, Infra-Red Spectroscopy • Mass Spectroscopy for Protein Characterization & Identification.	10
2	**ELECTROPHORESIS AND CENTRIFUGATION** **Electrophoresis** • Principle, Support Media • Types and application. Separation of protein and nucleic acids (PAGE, SDS-PAGE, Agarose and IEF) **Centrifugation** • Basic Principles of Sedimentation, types and Applications of Density Gradient Centrifugation (Rate Zonal andIsopycnic), Ultracentrifugation (Introduction and Applications)	10
3	**CHROMATOGRAPHY** • Introduction, Definition and Types of Chromatography, • General Principles Underlying Chromatographic techniques, • Paper chromatography and Thin Layer Chromatography, • Adsorption, chromatography, Ion Exchange Chromatography, • Gas Liquid Chromatography • HPLC, Affinity CHROMATOGRAPHY	10
4	**Bioinformatics** • Definition. Branches of Bioinformatics. • Aim of Bioinformatics. • Scope of Bioinformatics. **Databases** • Types of Databases Primary, secondary ,tertiary and composite databases. • Database retrieval system. **Bioinformatics basic tools** • Blast, sequence alignment, protein structure analysis. NCBI,EBI	10
		40

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,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).
- R. F. Boyer, Modern experimental biochemistry (Benjamin Cummings, San Francisco, 3rd ed., 2000).
- J. R. Lakowicz, Principles of fluorescen

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF CHEMISTRY

Fundamentals of Inorganic Chemistry
CODE : 253020401
B.Sc. 4th 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 Chemistry

Prerequisites:-

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Wave –Mechanics:** Basic postulates of quantum mechanics (Postulates 1,2,3 and 4); Operators: their addition, subtraction and multiplication; Commutators; Particle in a box (One dimensional); Zero potential energy; Characteristics of the wave functions; Electron in a ring.	14
2	**Coordination Compounds:** Application of valence bond theory to some complexes; Shortcoming of valance bond theory; Crystal Field Theory; Orientation of d-orbitals and Crystal Field Splitting of Energy levels; Crystal Field Splitting in Octahedral complexes; Crystal Field Stabilization Energy (CFSE); Crystal Field Splitting in Tetrahedral Complexes; Crystal Field Splitting in Tetragonal and square Planar Complexes; Magnetic Properties of Metal Complexes and Crystal Field Theory; Factors	14

	influences the magnitude of Crystal Field Splitting; Color of Transition Metal Complexes; Crystal Field Effects on Ionic Radii; Crystal Field Effects on Lattice Energies; Jahn- Teller Effect.	
3	**Chemical Bonding** : Molecular orbital Theory; LCAO Molecular Orbital Theory; Energy Level Diagram for Molecular Orbitals; Mixing of Orbitals; Filling up of Molecular Orbitals; Electronic Configuration of Heteronuclear Diatomic molecules (CO, NO, HF, HCl); Molecular orbitals of Polyatomic Species (BeH2, CO2 , NH3)(Excluding Walsh diagram); M.O. Theory of [Co (NH3)6] 3+ and [CoF6] 3-; Molecular orbital or Band Theory for metals.	14
4	**Non Aqueous Solvents:** Introduction; Classification of Solvents; General Properties of Ionising Solvents (a) Liquid Ammonia (NH3): Physical Properties, Auto-ionization , Acid-Base reactions, Ammonia as a proton – acceptor, Precipitation reactions, Complex formation reaction, Ammonolysis reactions, Reactions of Metal-Ammonia solution, Reduction –Oxidation (Redox) reactions; Advantages and disadvantages of using liquid Ammonia as a solvent. (b) Liquid SO2: Physical Properties, solubility of Inorganic materials and Organic Compounds, Electrolytic conductance behavior of solutions, Acid-Base reactions, Solvolysis, Precipitation reactions, Complex formation reactions, Reduction –Oxidation (Redox) reactions (c) Liquid HF: Physical Properties, Solvent effect, Amphoteric behavior, Precipitation reactions, Reduction –Oxidation (Redox) reactions, Solutions of Compounds of Biological Interest.	14

Learning Outcomes:-

At the end of the course the student would have sufficient knowledge of Biochemistry

Teaching & Learning Methodology:-

- Use of audiovisual aids.
- Student interaction, group discussion, seminar, quizzes, assignment, brain storming session.

Books Recommended:

1. Gurdeep Raj, "Advanced Inorganic Chemistry", Goel Publishing House, Meerut, Volume –I, 24th Revised Edition,1998.
2. R.D. Madan, "Modern Inorganic Chemistry', S. Chand & Co. Ltd., New Delhi, 2nd Edition, 2006.
3. J.D. Lee, "Concise Inorganic Chemistry", Wiley India Publication, 5th Edition, 1996, Reprint 2011. 4. W.V. Malik, G.D. Tuli, R.D. Madan, "Selected Topics in Inorganic Chemistry", S.Chand & Co. Ltd., New Delhi, 7th Edition, 2007.

4. A.K. Chandra, “Introductory Quantum Chemistry”, Tata- McGraw Hill Pub. Co. Ltd., New Delhi, 4th Edition.

5. Puri, Sharma, Kalia, “Principles of Inorganic Chemistry”, Milestone Publishers & Distributors, New Delhi, 3rd Edition, 2006.

6. R.K.Prasad, “Quantum chemistry”, New Age International (P) Ltd., Publishers, 4th Edition, 2010. 8. Peter Atkins, Tina Overton, Jonathan Rourke, Mark Weller, Fraser Armstrong, “Shriver & Atkins’ Inorganic Chemistry”, Oxford University Press, 2011.

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF CHEMISTRY

Fundamentals of Physical Chemistry
CODE : 253020402
B.Sc. 4th 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 Chemistry

Prerequisites:-

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**(A) Thermodynamics** Physical significance of entropy; Entropy change during phase change - solid to liquid and liquid to vapor; Entropy of mixing of ideal gases; Entropy change in reversible and irreversible process; Work and free energy functions; Helmoltz function and variation of free energy change with temperature and pressure; Gibbs Helmoltz equation, derivation. **(B) Chemical Kinetics** Theories of reaction rates: Collision theory of bimolecular gaseous reactions and Activated Complex theory of bimolecular reactions; Effects of temperature on	8 6

	reaction rates; Derivation of Arrhenius equation.	
2	**(A) Electrochemistry** Transport number; Determination of transport numbers by moving boundary method; Conductometric titrations: Principle and advantages; Titration of Strong acid against strong base (HCl vs NaOH); Titration of Weak acid against strong base (CH3COOHvs NaOH); Titration of Strong acid against weak base (HCl vs NH4OH); Titration of very weak acid against strong base (H3BO3 vs NaOH); Titration of mixture of acids against strong base (HCl + CH3COOH vs NaOH); Activity and activity coefficient;Ionic strength. **(B) Phase Rule** Theoretical derivation of phase rule; One component system : water system and sulphur system; Condensed phase rule; Silver – lead (Ag-Pb) system;	14
3	**(A) Adsorption** Definition of terms, Types of adsorption (physical, chemical and their difference), Types of adsorption isotherms (5 types), Derivation of Freundlich adsorption isotherm, Derivation of Langmuir adsorption isotherm, Applications of adsorption **(B) Catalysis** Characteristic of catalysis, Homogenous and heterogeneous catalysis, Enzyme catalysed reaction and derivation mechanism, Marten reaction.	8 6
4	**Polymer Chemistry** Definition: Monomer, Polymer, Polymerization, Classification of Polymers; Chain polymerization:Free radical and Ionic polymerization [cationic and anionic], Coordination polymerization, Step polymerization: Polycondensation and Polyaddition and Ring Opening Polymerization. **(B) Colloids** Colloidal Systems; Preparation of Colloidal Solutions; General Properties of Colloidal Systems; Properties of hydrophobic Colloidal Systems	14

Learning Outcomes:-

At the end of the course the student would have sufficient knowledge of Biochemistry

Teaching & Learning Methodology:-

- Use of audiovisual aids.
- Student interaction, group discussion, seminar, quizzes, assignment, brain storming session.

Books Recommended:

1. Robert Thornot Morrison and Robert Neilson Boyd, ***"Organic Chemistry"***, Prentice Hall.

of India Pvt Ltd, New Delhi, Sixth Edition, 1992.
2. Bhupinder Mehta, Manju Mehta, ***"Organic Chemistry"***, Prentice Hall of India Pvt Ltd, New Delhi, 2005.
3. James B Hedrickson Donald J. Cram and George S. Hammond, ***"Organic Chemistry",*** Mc-Graw-Hill Kogakusha,Ltd., Third Edition.
4. Arun Bahl, B. S. Bahl, ***"Advance Organic Chemistry"***, S. Chand & Company Ltd., New Delhi, First Edition, 2003.
5. I. L. Finar, ***"Organic Chemistry"***, Pearson Education Pet Ltd, New Delhi, First Edition, 2002.
6. G. Marc Loudon, ***"Organic Chemistry"***, Oxford University Press, Forth Indian edition, 2010.
7. P.S.Kalsi, ***"Text book of Organic Chemistry"*****,** MacMillan of India Pvt. Ltd., 1999.
8. P.L. Soni and H.M. Chawala, ***"Text book of Organic Chemistry",*** Sultan Chand & Sons Publication, New Delhi, 26th Edition, 1995.

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

SEMESTER-IV

DEPARTMENT OF CHEMISTRY

CHEMISTRY PRACTICAl

(CODE : 253020403)

[A] Inorganic Mixture:

- Semi micro method of analysis of inorganic mixture containing four radicals (excluding phosphate, arsenite, arsenate and borate) Minimum eight mixtures should be performed. Mixture may be partly soluble in water and soluble in acid.

[B] Physical Experiment

1. .Determination of Viscosity by Ostwald Viscometer of different liquid.
2. To Mesure the Concentration of Water:Methanol by Mesuring the Viscosity
3. To find out the order of Reaction of hydrolysis of Methyl Acetate(First Order Kinetics)
4. To Determine order of Reaction of Alkaline Hydrolysis of Ethyl Acetate(Second Order)
5. To Determine Adsorption Isotherm of Acetic Acid Solution by Activated Charcoal.
6. Conductometric titration.
    a. Strong acid - Strong base (HCl - NaOH)
    b. Weak acid - Strong base (CH3COOH - NaOH)
    c. Mixture of acids- Strong base (HCl+CH3COOH - NaOH)
7. To Determine Refractive Index of Different Liquids.

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MICROBIOLOGY

Food & Dairy Microbiology

CODE:253040402

B.Sc. 4th Sem

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: -

- This study will provide the information about the microflora present in food, food and milk borne infections. It will also describe about the food poisoning and also will study about the role of *Staphylococcus aureus*, *Clostridium botulinium* and *Salmonella* etc.
- Students will learn about the various sources of microbial spoilage of food and milk product, how to preserve the food & milk and methods of preservation.
- It will provide the information about how to use microbe as food and food products like various Indian fermented food, mushrooms, spirulina and yeasts.
- Students will get an idea how to grade the quality of food and milk samples using different methods like SPC, CFU, MPN, Acid-fast staining etc.

Prerequisites:-

- Student Must have studied F.Y Year B.Sc. with microbiology as a major subject and knowledge of basic biology.

- **Course outline:-**

Sr. No.	Course Contents	Number of Hours
1	**Microbes in food infection and poisoning:** • Food as a substrate for microorganism • Microbial flora of foods: fruits, vegetables, meat, eggs, biochemical, temperature and pathogenic types of milk • Factors affecting kinds and number of microorganisms: intrinsic and extrinsic • Food and Milk borne infections: Microorganism involved, source of infection, Incubation period and characteristics in brief: (A) Bacterial infection: *Salmonella sp*., *Shigella sp*., *E.col*i., *Vibrio sp*., *Campylobacter jejuni*, *Listeria monocytogenes*(B) Viral Infections: *Rotavirus*, Hepatitis A, Polio virus (C) Protozoal infections: *Entamoeba* • Food poisoning: (A) Role of *Staphylococcus aureus*, *Clostridium botulinium*, *Salmonella spp*. (B) Molds as poisoning agents: Role of Mushroom, *Aspergillus*, *Claviceps purpurea*, *Fusarium moniliformis*	**10**

2	**Microbial food spoilage and preservation:** • Microbial spoilage of food (A) Spoilage of milk and milk product, fruits, vegetables, eggs, meat (B) Spoilage of canned foods • Preservation of food and milk: (A) General principles (B) Preservation of food and Milk :(i) Use of aseptic handling (ii) High temperature: Pasteurization, Sterilization, canning (iii) Low temperature : Refrigeration and freezing (iv) Dehydration (v) Osmotic pressure (vi) Preservatives (vii) Radiations: Ionizing and non-ionizing radiation	**10**
3	**Microbes as food and food products:** • Fermented dairy products (A) Starter culture (B) Cheese: Types, curdling, processing, ripening (C) Other fermented dairy products: Yogurt, cultured buttermilk, acidophilus milk, Kefir and cultured sour milk (D) Introduction to probiotics, prebiotics and synbiotics • Indian fermented food products: Pickles, sauerkraut and bread • Microbes as food: Mushrooms, spirulina and yeasts.	**10**
4	**Methods in food microbiology:** • Biological methods: Generalized scheme for microbiological examination (A) Direct microscopic examination, colony forming units (CFU) (B) Most probable number (MPN) (C) Identification of specific group or species of microorganisms • Bacteriological analysis of milk (03) (A) Grading of milk: Methylene Blue Reduction test and Resazurin test (B) Determination of efficiency of pasteurization: Phosphatase test (C) Determination of MPN (D) Acid-fast staining • Microbiological analysis of mil (A) Microbial standards for food (B) FDA, BIS, Food safety and Standard Act of India (C) Food certification marks in India: ISI, Agmark,	**10**

	FPO, BIS, FSSAI	
		40

Learning Outcomes:-

- At the end of the course student will know about the microflora present in foods, different infections caused by food and milk. They will have an idea about the different sources of contamination and also diseases caused by different micro-organisms.
- Students will get an idea about how the food and milk are spoiled and methods for preservation and storage will be learned by them.
- This course will help in knowing the use of microbes as food and food products like Indian fermented foods, using of other sources as energy and food.
- Lastly students will have an idea about the different technology that can be used for monitoring the quality of food and milk.

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:

1. Pelczar Jr, M J, Chan E C S, Krieg N R, (1986), *Microbiology: An Application Based Approach*, 5th edn. McGraw-Hill Book Company, NY
2. Frazier W C and Westhoff D C (1988), *Food Microbiology*, 4th edn. McGraw-Hill Book Company, NY
3. Prescott L, Harley J P, and Klein D A, (2008), *Microbiology*, 7th edn. Wm C. Brown - McGraw Hill, Dubuque, IA.
4. Indian Standards: Food Hygiene-Microbiological Criteria-Principles for Establishment and Application
5. Fssai: Manual of methods of analysis of foods- food safety and standards authority of India, Ministry of health and family welfare, Government of India, New Delhi, 2015

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF BIOTECHNOLOGY

IMMUNOLOGY-I
Subject Code: 253010401
B.SC. Semester -4

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 immunology, immune system, immunity, antigen, Antibody, and its Interaction. Also detection technique of Ag-Ab.
- The purpose of the course is to introduce students to Introduction of immune system , types of the immunity, and antigen antibody interaction.
- To provide an understanding of the blood grouping technique, Ag-ab detection technique and various cells and organ of immune systems.

Prerequisites

Student Must have studied B.Sc. with Biotechnology as a major subject and knowledge of basic Principle of Immunology.

Course outline

Unit No.	Course Contents	Teaching hours
1.	**Immune System:** • Introduction to immune system. • Immune system: Hematopoiesis, Cells and organs of immune system (T cell, B cell, NK cells, APC)	**10**
2.	**Immunity and its types:** • Types of immunity: a) innate and acquired, b) active and passive, c) humoral and cell-mediated). • Immune response- primary and secondary.	**10**
3.	**Antigens and Antibodies:** • **Antigen**- Definition, properties and classification, epitopes and hapten. • **Antibody**- Definition, structure, type and function, blood group types, ABO and Rh system,	**10**
4.	**Antigen –Antibody Interaction:** • Introduction to antigen-antibody interaction. • Precipitation, Agglutination, Cross-reactivity. • Ag-Ab detection techniques: ELISA, RIA, Western blotting	**10**
		40

Learning Outcomes

- The students will be able to understand and apply antigen antibody techniques and easily understand the immune system in our body.
- Student should be able to understand basic concepts of Immune system, Types of Immunity, Ag-Ab detection techniques.
- 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 and laboratory experiments in a clear and concise manner that incorporates the conventions used by biotechnologists 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

- Prescott, Harley, and Klein's Microbiology, J. M. Willey, L. M. Sherwood, C. J. Woolverton, 7 th Edition (2008), McGraw Hill Higher Education- USA .
- Principles of Microbiology, R. M. Atlas, 2nd Edition (Indian Edition) (2015), McGraw Hill Education (India) Private Limited –New Delhi .
- Baker and Silverton's Introduction to Medical Laboratory Technology, Baker F J, Silverton R E, Pallister C J, 7th edition (1998), Butterworths-Heinemann, Oxford, UK


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 PHYSICS

PHYSICS -401

Subject Code: 253050401

B.Sc. Semester 4

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
4	-	-	-	4	30	-	70	-	100

Objectives: -

Physics students will:

- Develop a solid grasp of core concepts and applications of solid state physics, Heat & Thermodynamics, transistor circuits and atomic spectroscopy. 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

Knowledge of basics of Solid State Physics, thermodynamics and spectroscopy.

Course outline

Sr. No.	Course Contents	Teaching Hours
1	**Solid State Physics:** **A. Lattice Vibrations :** Harmonic crystals : the "Ball & strings" model; Normal modes of one dimensional monoatomic lattice, periodic boundary condition, concept of the first Brioullin zone, salient features of the dispersion curve; Normal modes of one dimensional diatomic lattice, salient features of the dispersion curves, optical and acoustical mode; Quantization of lattice vibrations-phonons; Measurement of phonon dispersion by inelestic neutron scattering. **B. Thermal properties:** Classical lattice heat capacity Quantum theory of lattice heat capacity, Einstein model, phonon density of states; Debye continuum model; Anharmonic effects, Thermal expansion, Gruneisen parameter; Phonon collision processes, Phonon thermal conductivity.	12
2	**Heat and Thermodynamics**: **Entropy:** Reversible part of the second law (clauis theorem), Entropy, Entropy of the ideal gas, TS diagram, Application of the Entropy principle. **Pure substances:** Volume expansitivity: Cubic Expansion coefficient, Compressibility. **Mathematical methods in thermodynamics:** Characteristics functions, Enthalpy, Helmholtz & Gibb's functions, two mathematical theorems, Maxwell's relations, Tds equations, Internal energy equations, Heat Energy equations, Heat capacity equations. **Open Systems:** Joule-Thomson expansion, Liquefication of gases by the Joule-Thomson expansion	12
3	**Transistor Circuits:** **Transistor Biasing:**Factors contributing to thermal stability, effect of temperature increase, stability factor S, common base stability, collector to base bias, disadvantage of collector to base bias, emitter bias, voltage divider bias with emitter bias, emitter bypass capacitor, summary of stabilization circuit, additional stability factors, bias compensation **Hybrid equivalent circuit for a transistor:** conversion of a transistor to a standard form, general Black box theory, Hybrid 'h' parameters, obtaing the hybrid h parameters, typical h parameter value, Amplifier equation, voltage and current gains taking into account Rg of source, depedance of amplifier characteristics on R_L and R_g, comparison of CB, CC and CE **Number system:** Binary number system, Binary to decimal conversion , decimal to binary conversion, Hexadecimal numbers, ASCII codes, The Excess 3 code, Gray code	12
4	**Atomic Spectroscopy:** Hydrogen atom spectrum, Orbital magnetic moment of hydrogen,	12

	Larmor precession, Stern-Garlach experiment, Electron spin, The vector atom model, Spin-orbit interaction and fine structure, Pauli's exclusion principle and electronic configuration, Total angular momentum in many electron atoms, L-S coupling, j-j coupling, Hund rules, Energy levels and transitions of Helium, Alkali spectra, Shielding of core electrons, Spectral terms of equivalent electrons, Normal Zeeman effect, experimental arrangement and theory, Anomalous Zeeman effect, Paschen-Bach effect, Stark effect, Characteristics X-ray spectrum, Moseley's law, Width of spectral lines.	

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 ones 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 Recommende

- Elements of Solid State Physics (2nd Edition) by J. P. Srivastava, PHI Learning
- Introduction to Solid State Physics (7th Edition) by C. Kittle, Wiley (India)
- Heat & Thermodynamics by Mark W. Zemansky and R.H. Dittman, McGraw Hill, Int. Edition (7th edition)
- Thermal Physics by A. B. Gupta, H. P. Roy (New central Publication)
- Electronics Devices and Circuits By Allen Mottershed , PHI
- Digital principle and Application By Malvino, Leach and Saha (6th edition)
- Fundamentals of Digital Circuits by A. Anandkumar, PHI (2nd Edition)
- Modern Physics by G. Aruldhas and P. Rajagopal, PHI Learning Pvt. Ltd
- Principles of Modern Physics by A.K. Saxena, Narosa Publishing House

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 National Geographics.
- http://www.sciencefairadventure.com/

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF PHYSICS

PHYSICS -402

Subject Code: 253050402

B.Sc. Semester 4

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

- Develop a solid grasp of core concepts and applications of sound & optics, statistical mechanics, theory of relativity and quantum mechanics. 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 Mathematics and fundamentals of relativity, quantum mechanics and quantum mechanics .

Course outline

Sr. No.	Course Contents	Teaching Hours
1	**Sound and Optics:** **Sound:** Architectural Acoustics, Sabine's formula, Reverberation time-theoretical treatment, Reverberation time of a live room, Reverberation time of a dead room, optimum reverberation time. **A. Polarization of light & double refraction :** Plane polarized light, pictorial representation of light vibrations, method to produce plane polarized light (only names), double refraction or birefringence, geometry of calcite crystal, Optical axis principal section & principal plane, Nicol prism, Parallel & Crossed Nicol prism, Huygen's theory of double refraction in uniaxial crystals, refractive indices for o-rays & e-rays, Polaroids. **B. Production & Analysis of Polarized light :** Introduction, superposition of two plane polarized waves having perpendicular vibrations, The elliptically & circularly polarized light, quarter wave plate, half wave plate, production of plane elliptically & circularly polarized light, detection of plane elliptically & circularly polarized light, systematic analysis of polarized light	12
2	**Statistical Mechanics**: **Macroscopic and microscopic states**: Macroscopic states, Microscopic states, Phase spaces, μ-space, Γ-space, Postulate of equal a priori probabilities, Ergodic hypothesis, Density distribution in phase space, Liouville's theorem, Principle of conservation of density in phase and principle of conservation of extension in phase, Condition for statistical equilibrium, **Statistical ensemble:** Microcanonical ensemble, Canonical ensemble, Mean value and fluctuations, Grand canonical ensemble, Fluctuations in the number of particles of a system in a grand canonical ensemble. **Some applications of Statistical mechanics:** Thermodynamics, Statistical interpretation of basic thermodynamic variables, Ideal gas, Gibbs paradox, the equipartition theorem	12
3	**Special theory of Relativity & Quantum Mechanics:** **Special Theory of Relativity:** The Michelson- Morley experiment, The special theory of relativity, The Gallelian Transformation, The Lorentz transformation, The Lorents Fitzerald Contraction, Time dilation, Relativity of mass, mass & energy, some relativistic formulas, velocity addition, Doppler Effect in light **Expectation values:** Ehrenfest's Theorem, Admissibility conditions on the wave functions, stationary states : The time dependent schrodinger equation, A particle in a square well potential, bound states in a square well (ε < 0) (a,b,c,d), The square well : Nonlocalized states (E > 0), square potential Barrier	12

4	**Quantum Mechanics:** **General Formalism of wave mechanics :** The schrodinger equation & the probability interpretation for an N- particle system, the fundamental postulates of wave mechanics. The adjoint of an operator & self adjointness. The Eigen value problem, Degeneracy, Eigen values & Eigen functions of self- adjoint operators, The Dirac delta function, observables: Completeness & normalization of Eigen functions, closure, physical interpretation of Eigen values, Eigen functions & Expansion coefficients, Momentum Eigen functions : Wave functions in momentum space. The uncertainty principle, states with minimum value for uncertainty product, Commuting observables, Removal of Degeneracy, Evolution of system with time, constants of the motion, Non- interacting & interacting systems, systems of identical particles.	12

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:

Books Recommended:

- A textbook on oscillations, waves & acoustics by M. Ghosh, D. Bhattacharya, S. Chand
- Publishers
- Optics & atomic physics by Singh, Agrawal (Pragati Prakashan, Meerat)
- Optics by Ajoy Ghatak, Tata McGraw Hill Ltd
- Fundamentals of Statistical Mechanics by B.B. Laud, New Age International Publishers
- Statistical Mechanics An Introduction by Evelyn Guha, Narosa Publications
- Concepts of Modern Physics by Arthur Beiser, McGraw Hill Pub. Co.
- A Textbook of Quantum mechanics by PM Mathews & K. Venkatesan, Tata McGrew Hill

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 National Geographics.
- http://www.sciencefairadventure.com/

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MATHEMATICS

ADVANCED CALCULUS

Subject Code: 253030401

B.Sc. Semester -4

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,Linear transformation,Gauss elimentary and matrix inversion concept .
- The aim of this subject is to present the important ideas in advanced calculus using multiple method to student whose principal interest lie outside the field of mathematics.
- 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 designed for undergraduate and graduate students working on Line integral and vector space. This course serves as an introduction to Line integral and vector used to applied mathematics problems. .

Sr. No.	Course Contents	Teaching hours
1	**Unit I** Line integral, Evaluation of line integrals, Double integral: Definition and Examples, Change of variables in double integral, Application of Double integral, triple integral ,polar coordinate, cylindrical coordinate ,spherical coordinate.	10
2	**Unit: II** Beta and Gamma Functions, Symmetrical properties of Beta gamma function ,Other form of Beta and Gamma Function, Relation between Beta and Gamma Function.	10
3	Unit: III Laplace Transform of Elementary Functions, Differentiation of Laplace Transform, Integration of Laplace Transform, Laplace Transform of Derivatives, Laplace Transform of Integration, Laplace Transform of Periodic Function, Inverse Laplace Transform, Convolution Theorem, Solution of Linear Ordinary Differential Equation.	12
4	**Unit: IV** Vector differentiation and Integral calculus:Vector point function and scalar point functions, vector differentiation, Laplace operator, Laplace equation, Gradient, divergence and curl. Line integral, Surface integral, Green's theorem, Stoke's theorem Divergence theorem of Gauss and its applications with Examples	12

Learning Outcomes

After Successfully Completion of the Course the student will be ….

- Student can learn to solve the Line integral,Double integral and triple integral.
- Solve multiple integrals, including area, centre of mass and inertial multiple integrals.
- Derive different type of function like Beta function ,Gamma function and different properties Beta and Gamma function.
- In this maths student understand partial differential equation and its application and related theorems.
- Student will understand line integral, surface integral and its application.
- Students learn the concept of Fourier series and Laplace Transforms

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. S.S.Sastry, Introductory methods of Numerical analysis, Prentice hall of India, 1990.
2. Numerical Analysis by G. Shankar Rao.
3. Numerical Analysis, B.S.Grawal.
4. Numerical methods by Dr. P. kandasamy.
5. Introduction of Numerical analysis by Josef Stoer and Roland Bulirsch.
6. Analysis of Numerical Methods by Isaacson and Herbert Keller.

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

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF MATHEMATICS

Algebra and Statistical mathematics

Subject Code: 253030401

B.Sc. Semester -4

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,Linear transformation,Gauss elimentary and matrix inversion concept .
- The aim of this subject is to present the important ideas in advanced calculus using multiple method to student whose principal interest lie outside the field of mathematics.
- 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 designed for undergraduate and graduate students working on Line integral and vector space. This course serves as an introduction to Line integral and vector used to applied mathematics problems. .

Sr. No.	Course Contents	Teaching hours
1	**Unit I** Inner product spaces, Cauchy-Schwartz inequality, Triangular inequality, Orthogonal vectors,Orthonormal vectors, Orthogonal sets and bases, Orthonormal bases , Gram- Schmidt process, Orthogonal Compliments, Orthogonal Projection, Least Squares Approximation.	10
2	**Unit: II** The space of linear transformations, composition of linear transformations, The Matrix of a Linear Transformation, Eigen basis and diagonalization of L.T., Effect of Change of Bases on Linear Operators, Similarity of Matrices.	10
3	Unit: III Measure of central tendancy: introduction and theory of Mean, Median, Mode. Problems based on Mean, Median, Mode. Other measures of central tendancy: Geometric Mean and Harmonic Mean. Problems based on Harmonic Mean and Geometric Mean. Measures of Dispersion, Characteristics of measures of dispersion, classification of measures of dispersion. Introduction and Problems Based on Range, Quartile deviation, and Mean Deviation.	12
4	**Unit: IV** Introduction to Probability, Relative frequency and axiomatic. Definitions of probability, Addition Rule and Conditional Probability, Multiplication Rule, total probability, Baye's Theorem and independence, probability mass, probability density and commutative distribution functions. Markov's inequality problems. Chebyshev's inequality problems, Discrete probability distribution, Binomial passion, Normal distribution.	12

Learning Outcomes

After Successfully Completion of the Course the student will be ….

- Student can learn to solve the Line integral,Double integral and triple integral.
- Solve multiple integrals, including area, centre of mass and inertial multiple integrals.
- Derive different type of function like Beta function ,Gamma function and different properties Beta and Gamma function.
- In this maths student understand partial differential equation and its application and related theorems.
- Student will understand line integral, surface integral and its application.
- Students learn the concept of Fourier series and Laplace Transforms

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. E.Kreyszing , Advanced Engineering Mathematics , Fifth edition , New Age International (P) Ltd., New Delhi , 1997.
2. B.S.Grewal,Higher Engineering Mathematics.

3. Mathematical Analysis by S.C. Malik, Wiley, Eastern Ltd., New Delhi

4. Mathematical Analysis by T.M. Apostol, Narosa Publishing House, New Delhi

5. A course of mathematical Analysis by Shanti Narayan , S.Chand & Co., New Delhi

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

SWARNIM STARTUP & INNOVATION UNIVERSITY (SSIU)

SWARNIM SCIENCE COLLEGE

DEPARTMENT OF PHYSICS

PHYSICS

B.Sc. Semester 4

Practical List

Sr. No.	Practical Name
1	Searl's goniometer
2	Study of Resolving power of telescope.
3	Flatness of plate by Newton‟s ring.
4	Diffraction by single slit.
5	Wavelength of light by Biprism.
6	Phonon dispersion relation of monoatomic lattice.
7	FET Characteristics.
8	C by ballistic galvanometer
9	Gray to binary code conversion
10	High Resistance by leakage method.
11	To study the variation of Ic & Vce with temperature in fixed bias circuit & collector to base bias circuit for CE configuration
12	To study the variation of Ic & Vce with temperature in fixed bias circuit & potential divider circuit for CE configuration Group.
13	Identification of elements in line spectra
14	Thevenin‟s maximum power theorem
15	Analysis of elliptical polarized light using photocell
16	Wavelength of light by Adser‟s A pattern
17	L by Anderson‟s bridge
18	Least Square Method

SWARNIM STARTUP & INNOVATION UNIVERSITY

Communication Skills – 1

CODE: 253000302

Sem 3

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
2	-	-	2		50	-	50	-	100

Objectives: -

- To develop employability Skills of the students
- To develop skills of data collection and interpretation skills
- To cultivate basic knowledge of grammar and also writing skills
- To develop reading habit of the inspirational non-fictions.

Prerequisites:-

- Being able to communicate effectively is the most important of all life skills; hence, students are expected to have good spirit for learning English as second language.

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	DEVELOPING EMPLOYABILITY SKILLS Drafting a job application letter- SWOT- Interviews- Interviewer- Interviewee- Types of interview questions- Types of interview: 1) Employment interview 2) Appraisal/ promotional interview 3) Telephonic interview	12
2	DATA COLLECTION AND INTERPRETATION SKILLS Primary and secondary sources of information- preparing questionnaires-Questionnaire on social and educational survey	8

3	BASIC WRITING SKILLS Sentence structure- use of phrases and clauses in sentences- Importance of proper punctuations- Précis writing	12
4	"Stay Hungry stay foolish" By Bansal Rashmi, West land, CIIIE, IIM Ahmedabad.	10
	Total hours:	42

Learning Outcomes: -

* Students will learn to write effective resume and job application

* They will learn primary and secondary data and also their interpretation.

* Students will learn basic grammar.

* Students will cultivate reading habit of inspirational non fiction.

Teaching & Learning Methodology:-

- Power point presentation
- 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.
- It includes audio video clips that can provide ample number of exercise to the students
- Face- to face oral communication to provide a platform where they can perform and practice well.

Books Recommended:

- Mujumadar, Arti and O.P.Jubeja
- Business communication: Techniques and Methods- Orient Blackswam: Hyderabad 2010
- Business Communication. Rai and Rai, Himalaya Publication.

E-Resources:

1. http://www.free-english-study.com/
2. http://www.english-online.org.uk/course.htm
3. http://www.english-online.org.uk/

Practical List:-

Sr. No.	Practical
	----------NA---- as per Teaching scheme

SWARNIM STARTUP & INNOVATION UNIVERSITY

Communication Skills -2

CODE: 253000402

B.sc sem 4

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
2	-	-	2		30	-	70	-	100

Objectives: -

- To enhance students' communicative and linguistic approach in English
- To provide icebreaking approach through LSRW skills and soft skills
- To learn ways to enhance overall communication skills

Prerequisites:-

- Being able to communicate effectively is the most important of all life skills; hence, students are expected to have good spirit for learning English as second language.

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Introduction to Communication Skills : LSRW** 1. Need for Effective communication 2. Importance of English as second language 3. Importance of Communication **Basics of Communication** 1. Definition & types of Communication, 2. Cycle of communication 3. Components of Verbal & Non-verbal communication	10

2	**Listening Skill** 1. Definition & Types of Listening 2. Barriers to effective listening 3. Techniques to be good listener Listening audio clips (practical exercise) **Reading Skill** 1. Reading techniques 2. Reading Strategies 3. Comprehensive reading Book review	**12**
3	**Writing Skill** 1. Effective Writing Skill 2. Paragraph writing 3. Precise writing 4. Business Letters 5. Technical Report Writing 6. Email writing	**12**
4	**Non- Verbal Communication** 1. Kinesics 2. Paralinguistic/ Paralanguage 3. Chronemics & Proxemics **Short Stories** ● The Selfish Giant by Oscar Wilde ● The Last Leaf by O'Henry	**8**
	Total hours:	**42**

Learning Outcomes: -

* Students will become master of four communication skills.

* They feel confident in speaking and writing English language.

* Students will be able to improve the language skills i.e. Listening Skill, Speaking Skill, Reading Skill, and Writing Skill (LSRW).

* To make them learn about life skills and soft skills.

Teaching & Learning Methodology:-

- Power point presentation
- 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.
- It includes audio video clips that can provide ample number of exercise to the students

- Face- to face oral communication to provide a platform where they can perform and practice well.

Books Recommended:

1. Lesikar R V, Flatley M E ,Rentz K and Pandey Business Communication: Making Connections in a Digital World 2009: New Delhi, Tata Mcgrow Hill
2. Raman Minakshi, Communication Skills, 2011: New Delhi, Oxford University Press.
3. Leech, Geoffrey and Jan Svartvik. A Communicative Grammar of English. New Delhi: Pearson, 2009.

E-Resources:

1. http://www.free-english-study.com/
2. http://www.english-online.org.uk/course.htm
3. http://www.english-online.org.uk/

Practical List:-

Sr. No.	Practical
	----------NA---- as per Teaching scheme

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF BIOTECHNOLOGY

Animal Tissue Culture and Pharmaceutical Biotechnology

CODE: 256010304

M.Sc 3rd SEM

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

Unit 1: Animal tissue culture

- Primary culture and established cell line cultures
- Equipment and material for animal cell technology
- Basic media and techniques of mammalian cell culture
- Manipulation and application of animal cell culture

Unit 2: Bioprocess economics and IPR

- Expenses for industrial materials, equipment, product recovery and effluent treatments
- Cost recovery due to waste usages and recycling
- IPR and patent process
- Benefits, problems and management of IPR
- International harmonization of patent law

➢ Patents of biotechnological process and their protection

➢ Indian scenario

Unit 3: Regulatory affairs

➢ Introduction to pharmacopoeia, good microbiological techniques and good laboratory practice (GLP)

➢ Basic principles of quality control (QA) and quality assurance (QC)

➢ Guidelines for QA and QC: raw materials, sterilization, media, stock cultures and products

➢ Validation study and toxicity testing

➢ Role of culture collection centre, public health laboratories and regulatory agencies

Unit 4: Biosafety and bioethics

➢ Biosafety guidelines

➢ Risk and risk assessment

➢ Biosafety levels, laboratory biosecurity concepts

➢ Introduction to drug design

➢ Pre-clinical and clinical trials

➢ Basics of bioethics principles, international codes and guidelines in India

➢ Ethics in post-genomic era

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF BIOTECHNOLOGY

ENZYMOLOGY

CODE: 256010302

M.Sc 3rd SEM

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 objectives of the paper is students will get about the protein structure, classification of enzymes, terminology, enzyme activity and purification of enzymes and strategy for separation and purification.
- The student will get idea about the enzyme kinetics and mechanism. What is significance of Km, Vmax and Kcat and importance of steady state equilibrium. Enzyme inhibition and its types. Thermal kinetics.
- To provide the mechanism and action of enzyme and its role of activators. Allosteric regulation and its mechanism.
- The study will help in understanding the what are isoenzymes and physiological significance role of different types of enzymes.

Course Outcome:

Unit	Description in Detail	Weightage (In Hours)
1	**Introduction**: Enzymology and historical developments in enzymology Protein Structure: Primary, secondary, tertiary and quaternary structure, techniques used in enzyme characterization Enzyme classification: IUB enzyme classification. Enzyme Activity: Principle and techniques of enzymatic analysis, factors affecting enzyme Activity, Extraction and Purification of enzyme: Objectives and strategy, separation techniques, test of purity.	08
2	**Enzyme Kinetics:** Bioenergetics and Catalysis Single substrate kinetics: Equilibrium and Steady state kinetics, significance of Km, Vmax & Kcat. Pre-steady state and Relaxation kinetics. Multisubstrate kinetics: General rate equation, compulsory order, random order and ping-pong mechanisms and their primary and secondary plots. Enzyme inhibition and its kinetics: Reversible and irreversible inhibition, competitive, noncompetitive and uncompetitive, mixed, partial, substrate and allosteric inhibition. Thermal kinetics: Effect of temperature on reaction rate, enzyme stability, Arrhenius equation and activation energy.	10
3	**Mechanism of Enzyme Action:** Enzyme activators, co-enzymes and co-factors in enzyme catalysis, Enzyme and substrate Specificity Investigation of active Centre, Factors affecting catalytic efficiency, Experimental approaches to determine enzyme mechanisms. Enzyme mechanisms: Lysozyme, Chymotrypsin, Carboxypeptidase, Restriction endonuclease, Aspartate trans carbomylase. Allosteric enzymes and sigmoidal	10

	kinetics: Protein ligand binding, Co-operativity, MWC & KNF models, Regulation of enzyme activity. Control of metabolic pathways.	
4	Isoenzymes and its physiological significance, Ribozymes and Abzymes Enzyme engineering: Chemical modification of enzymes: methods of modification of primary structure, catalytic and allosteric properties, use of group specific reagents. Enzyme Immobilization Enzymes in non conventional media, Enzymes sensors, Enzymes as analytical reagents.	08

Learning Outcomes:

- The students will be able to understand and deals with the biochemical nature and activity of enzymes and is a subject that has relevance to students from a wide range of disciplines.
- Student should be able to understand basic concepts of the present day scope and applications of enzymology.
- The course is designed to give students an understanding of procedures involved in purification of enzymes, enzymes assays and quantitative evaluation of the influencing parameters such as concentrations of substrate / enzyme, pH, temperature and effects of inhibitors on enzyme activity.
- This is a course where the topics to be studied include enzyme active sites / mechanisms of enzyme action; enzyme kinetics and regulation; Isozymes and their clinical significances /function relationship etc as tools for understanding functions of enzymes.

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:

1. *Enzymes: Biochemistry, Biotechnology, Clinical Chemistry 2nd Edition,* authored by Trevor Palmer and Philip Bonner Affiliated East-West Press Pvt. Ltd.
2. Textbook of biochemistry – Vasudevan Shreekumari
3. Biochemistry – Lehninger 6th edition
4. Fundamentals of Enzymologist: Nicholes C. Price and Lewis Stevens, Oxford Univ. Press.
5. Enzyme Structure and mechanism: Alan Fersht, Reading, USA.
6. The chemical kinetics of enzyme action: K. J. Laider and P. S. Bunting, Oxford University Press,London.
7. Enzymes: M. Dixon, E. C.Webb, CJR Thorne and K. F. Tipton, Longmans, London.
8. Biochemistry: Lubert Stryer

E-Resources

- https://www.feedspot.com/infiniterss.php?_src=feed_title&followfeedid=4812449&q=site:https%3A%2F%2Fwww.nature.com%2Fsubjects%2Fbiochemistry.rss
- https://www.sciencedaily.com/news/matter_energy/biochemistry/
- https://thebiochemistblog.com/
- https://www.longdom.org/microbial-biochemical-technology.html
- https://bmcbiochem.biomedcentral.com/
- https://www.slideshare.net/mohdsakharkar/enzyme-final

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF BIOTECHNOLOGY

MICROBIAL BIOTECHNOLOGY
Subject Code: 256010301
M.Sc. Semester -3

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 Microbial Biotechnology. It covers up general concept of microbial production and fermentation of various products.
- The purpose of the course is to give knowledge about production process of primary & secondary metabolites using fermentation technology and microorganisms.
- To provide an understanding of other microbial products such as microbial polysaccharides, beverages, polyhydroxyalkanoates, bio-surfactants and biotransformation of steroids.
- To understand the concepts of biomass production of microorganisms and its applications.

Prerequisites

Student must have studied First year (FY) of M.Sc. with Microbiology as a major subject and knowledge of basic biotechnology.

Course outline

Unit No.	Course Contents	Teaching hours
1	**Microbial production of primary metabolites** • Amino acids: Glutamic acid, Lysine • Enzymes: Proteases, Amylases • Organic acids: Citric acid, Acetic acid • Industrial Alcohol	**10**
2	**Microbial production of secondary metabolites** • Antibiotics: Penicillin, Streptomycin • Vitamins: B_{12}, B_2 • Ergot Alkaloids • Carotenoid pigments: β-carotene, lycopene	**10**
3	**Microbial production of other products & Biotransformation** • Microbial polysaccharides: Xanthan, Alginate and Dextran • Beverages: Beer, Wine • Polyhydroxyalkanoates: PHA and PHB • Biosurfactants • Steroid transformation	**10**
4	**Biomass production and applications** • Fungal biomass- baker's yeast and single cell oil • Mushroom cultivation • Use of Algal biomass. • Microbial production for food and feed	**10**
		40

Learning Outcomes

- The students will be able to apply the knowledge of the Microbial production to understands concepts of various fields like food and dairy industries, pharmaceutical industries, Fermentation industries, beverages industries, etc.

- Student should be able to understand basic concepts of various products like amino acids, enzymes, vitamins, organic acids, industrial alcohol, beer, wine, microbial polysaccharides, Biosurfactants as well as biotransformation of steroids. Students also apply knowledge of mushroom cultivation, fungal biomass production, algal biomass and other microbial production for food and feed.

- 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 Microbiologists, biotechnologist, researchers and scientists 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

1. A.N. Glazer and H. Nikaido. (2007) *Microbial Biotechnology. Fundamentals of Applied Microbiology.* (2nd edition)
2. E. M. T. El-Mansi, E. M. T. El-Mansi, C. F. A. Bryce, Arnold L. Demain, A.R. Allman (2006) *Fermentation Microbiology and Biotechnology* (2nd edition)
3. James.M. Jay, Martin J. Loessner, David. A. Golden (2005). *Modern Food Microbiology* 7th Edition (Food Science Texts Series)
4. Michael J. Waites, Neil L. Morgan, John S. Rockey, Gary Higton (2001). *Industrial Microbiology: An Introduction*

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF BIOTECHNOLOGY

r-DNA Technology
Subject Code: 256010303
M.SC. Semester -3

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 R-DNA technology (Recombinant DNA technology).
- The purpose of the course is to give student to introduction of Recombinant DNA technology and its cover up scope of genetic engineering, Cloning, Recombinant, and PCR.
- To provide an understanding of Scope of genetic engineering, concept & important of genetic engineering, chemical synthesis of gene cloning & expression vectors, and PCR techniques.

Prerequisites

Student must have studied M.Sc. with microbiology as a major subject and knowledge of basic microbiology/Life science.

Course outline

Sr. No.	Course Contents	Teaching hours
1.	Scope of Genetic Engineering, Concept and importance of Genetic Engineering; General strategies and Steps involved in gene cloning; Extraction and purification of DNA from bacteria, plant and animal cells; Restriction enzymes, DNA lipase and other enzymes involved in gene cloning; mRNA and cDNA preparation.	06
2.	Chemical synthesis of gene/DNA Cloning and expression vectors- Plasmids, _-bacteriophages, M-13 based vectors, Phagemids, Cosmids, YAC, BAC,HAC/MAC, etc. Expression of cloned gene in heterologous host Introduction of DNA into different host systems.	06
3.	Recombinant selection and screening Southern blotting & hybridization, Northern analysis, Western blot analysis, Agarose gel electrophoresis, Pulse Field Gel Electrophoresis, Rotating Gel. Electrophoresis (RGE), Mapping Regulatory Sequences by in vivo expression assay Mapping of Protein Binding Site by DNAse I Protection, Mobility Gel Shift Assay Protein Activity Assay – Yeast-one hybrid, Yeast-two hybrid and Yeast-three hybrid system. Phage display, Subtractive hybridization and cloning, HRT/HART, Chromosomal Walk. Characterization of Cloned genes .Restriction map,S1 mapping ,Denaturation mapping ,Heterogonous mapping DNA sequencing, Nucleic Acid Microarray, Metagenomics, Metabolism, gene therapy.	10
4	Polymerase chain reaction, Molecular markers Linkage mapping using meiotic recombination frequencies, Genomic mapping using radiation induced Chromosome rearrangement, Genomic mapping using DNA sequence polymorphism as genetic marker, In vitro Mutagenesis, Metagenomics, Metabolic engineering, Gene therapy Recombinant products- recombinant hormones ,recombinant DNA vaccines, Transgenic plants, Transgenic animals, Genetic Engineering Guidelines, Levels of Physical containment, Levels of Biological Containment, The Indian Guidelines.	10

Learning Outcomes

- The students will be able to understand the Knowledge of r-DNA technology to understand concept of various fields like research, gene manipulation, genetic engineering, gene cloning, fermentation industries, etc.

- Student should be able to understand basic concepts of recombination, methods of genetic engineering, screening methods, enzymes involved in r-DNA technology, DNA sequencing, vectors, gene markers, transgenic plants and animals as well as gene therapy.

- 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 microbiologists, biotechnologists, researchers and scientist 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

1. Genomes TA Brown 3rd Edition
2. Principles of Genetic Manipulation- Old & Primrose
3. Genetic Engineering – Rastogi & Pathak
4. Recombinant DNA technology by keya chaudhari

E-Resources

- https://www.slideshare.net/mobile/SECBIO/genetic-engineering-13933607
- https://www.slideshare.net/mobile/ImdadTakkar/artificial-gene-synthesis
- https://www.slideshare.net/mobile/FarazaJaved/pcr-76618045
- https://www.slideshare.net/mobile/fizz92fizzuo/vectors-49902617


SWARNIM SCIENCE COLLEGE, SSIU, KALOL, GANDHINAGAR
SSIU
BHOYAN RATHOD
Kalol, Gandhinagar

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCIENCE COLLEGE

DEPARTMENT OF BIOTECHNOLOGY
ENVIRONMENTAL BIOTECHNOLOGY
CODE: 256010402
M.Sc 4th SEM

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 knowledge about environment monitoring, its assessment using bio-indicators, biomarkers, biosensors and toxicity testing. Various environmental laws.
- Student will an get idea about bioremediation techniques, strategies involved in bioremediation. Phytoremediation, GMO and impact on bioremediation.
- To provide an idea about principles of biodegradation and mechanism of detoxification, biodegradation of various compounds like detergents, pesticide, lignin, hydrocarbon and dyes.
- Provide knowledge about Principles and mechanisms of biodeterioration, Methodology to assess biodeterioration, Prevention and control of biodeterioration, Biodeterioration of selected material.

Prerequisites

Student must have studied B.Sc with microbiology/Biotechnology as a major subject and knowledge of basic microbiology.

COURSE OUTLINE:

Unit	Description in Detail	Weightage
1	**Environmental problems and monitoring:** Environmental monitoring: environmental impacts and their assessments using bio-indicators, biomarkers, biosensors and toxicity testing, rDNA technology, Conservation strategies, Environmental laws and policies in India	06
2	**Bioremediation:** Bioremediation principles, Strategies and techniques of bioremediation: *in situ* and *ex situ,* Bioremediation of metals, Phytoremediation, GMOs and their impact on bioremediations	06
3	**Biodegradation:** Principles of biodegradation and mechanism of detoxification, Biodegradation of detergent, pesticide, lignin, hydrocarbon and dyes	10
4	**Biodeterioration:** Principles and mechanisms of biodeterioration, Methodology to assess biodeterioration, Prevention and control of biodeterioration, Biodeterioration of selected materials	10

Learning Outcomes

- To provide knowledge about environment monitoring, its assessment using bio-indicators, biomarkers, biosensors and toxicity testing. Various environmental laws.
- Student will an get idea about bioremediation techniques, strategies involved in bioremediation. Phytoremediation, GMO and impact on bioremediation.

- To provide an idea about principles of biodegradation and mechanism of detoxification, biodegradation of various compounds like detergents, pesticide, lignin, hydrocarbon and dyes.
- Provide knowledge about Principles and mechanisms of biodeterioration, Methodology to assess biodeterioration, Prevention and control of biodeterioration, Biodeterioration of selected material.
-

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

1. Biotechnology- U. Satyanarayana
2. Environmental engineering and management- S. K. Dhameja, Publ: Kataria & Sons
3. Textbook of Biotechnology- H.K.Das
4. Methods in Biotechnology- Hans-peter-schmauder
5. Environmental Biotechnology- B.C. Bhattacharyya and R. Banerjee
6. Environmental biotechnology- G. M. Evans and J. C. Furlong
7. Environmental biotechnology- A. Scragg, Oxford

E-Resources

1. https://www.slideshare.net/Omodhu/bioremediation-71688629
2. https://www.slideshare.net/vanithagopal/bioremediation-41934065
3. https://www.slideshare.net/halalarahman/phytoremediationppt
4. https://www.slideshare.net/Christa_belle/phytoremediation-43828173
5. https://www.slideshare.net/tanujanautiyal/environmental-biotechnology-50099488

(b) effect of climate

(c) comfort zone

(d) personal hygiene

(e) physical exercise

(f) sanitation of fair and festivals

(g) disinfection and sterilisation

(h) atmospheric pollution and purification of air

(i) air borne diseases

5. Water

(a) distribution of water; uses; impurities and purification

(b) standards of drinking water

(c) water borne diseases

(d) excreta disposal

(e) disposal of deceased.

(f) disposal of refuse.

(g) medical entomology- insecticides, disinfection, Insects in relation to disease, Insect control.

6. Occupational health

7. Preventive medicine in pediatrics and geriatrics

Fourth B.H.M.S

A. Theory:

1. Epidemiology

(a) Principles and methods of epidemiology

(b) Epidemiology of communicable diseases:

- General principles of prevention and control of communicable diseases;

(c) Communicable diseases: their description, mode of spread and method of prevention.

(d) Protozoan and helminthic infections- Life cycle of protozoa and helminthes, their prevention.

(e) Epidemiology of non-communicable diseases: general principles of prevention and control of non-communicable diseases

(f) Screening of diseases

2. Bio-statistics

(a) Need of biostatistics in medicine

(b) Elementary statistical methods

(c) Sample size calculation

(d) Sampling methods

(e) Test of significance

(f) Presentation of data

(g) Vital statistics

3. Demography and Family Planning; Population control; contraceptive practices; National Family Planning Programme.

4. Health education and health communication

5. Health care of community.

6. International Health

Principal
Arihant Homoeopathic
Medical College & R.I.
Bhoyan Rathod, Gandhinagar

1.2 Marks: Paper I-100; Paper II-100

1.3 Contents:

1.3.1 Paper-I: Gynaecology and homoeopathic therapeutics

1.3.2. Paper-II: Obstetrics, infant care and homoeopathic therapeutics

2. Practical including viva voce or oral:

2.1. Marks: 200

2.2. Distribution of marks;	Marks
2.2.1. One long case	30
2.2.2. Practical records, case records, journal	30
2.2.3. Identification of instruments, models and specimens	40
2.2.4. Viva voce (oral)	100
Total	200

COMMUNITY MEDICINE

Instructions:

I. (a) Physician's function is not limited merely prescribing homoeopathic medicines for curative purpose, but he has wider role to play in the community;

(b) He has to be well conversant with the national health problems of rural as well as urban areas, so that he can be assigned responsibilities to play an effective role not only in the field of curative but also preventive and social medicine including family planning.

II. This subject is of utmost importance and throughout the period of study attention of the student should be directed towards the importance of preventive medicine and the measures for the promotion of positive health.

III. (a) During teaching, focus should be laid on community medicine concept, man and society, aim and scope of preventive and social medicine, social causes of disease and social problems of the sick, relation of economic factors and environment in health and disease;

(b) Instructions in this course shall be given by lectures, practicals, seminars, group discussions, demonstration and field studies.

Third B.H.M.S

A. Theory:

1. Man and Medicine

2. Concept of health and disease in conventional medicine and homoeopathy

3. Nutrition and health

(a) Food and nutrition

(b) Food in relation to health and disease

(c) Balanced diet

(d) Nutritional deficiencies, and Nutritional survey

(e) Food Processing

(f) Pasteurisation of milk

(g) Adulteration of food

(h) Food Poisoning

4. Environment and health

(a) air, light and sunshine, radiation.

(b) effect of climate

(c) comfort zone

(d) personal hygiene

(e) physical exercise

(f) sanitation of fair and festivals

(g) disinfection and sterilisation

(h) atmospheric pollution and purification of air

(i) air borne diseases

5. Water

(a) distribution of water; uses; impurities and purification

(b) standards of drinking water

(c) water borne diseases

(d) excreta disposal

(e) disposal of deceased.

(f) disposal of refuse.

(g) medical entomology- insecticides, disinfection, Insects in relation to disease, Insect control.

6. Occupational health

7. Preventive medicine in pediatrics and geriatrics

Fourth B.H.M.S

A. Theory:

1. Epidemiology

(a) Principles and methods of epidemiology

(b) Epidemiology of communicable diseases:

- General principles of prevention and control of communicable diseases;

(c) Communicable diseases: their description, mode of spread and method of prevention.

(d) Protozoan and helminthic infections- Life cycle of protozoa and helminthes, their prevention.

(e) Epidemiology of non-communicable diseases: general principles of prevention and control of non-communicable diseases

(f) Screening of diseases

2. Bio-statistics

(a) Need of biostatistics in medicine

(b) Elementary statistical methods

(c) Sample size calculation

(d) Sampling methods

(e) Test of significance

(f) Presentation of data

(g) Vital statistics

3. Demography and Family Planning; Population control; contraceptive practices; National Family Planning Programme.

4. Health education and health communication

5. Health care of community.

6. International Health

7. Mental Health
8. Maternal and Child Health
9. School Health Services
10. National Health Programs of India including Rashtriya Bal Chikitsa Karyakram.
11. Hospital waste management
12. Disaster management
13. Study of aphorisms of organon of medicine and other homoeopathic literatures, relevant to above topics including prophylaxis.

B. Practicals:

1. Food additives; food fortification, food adulteration; food toxicants
2. Balanced diet
3. Survey of nutritional status of school children, pollution and Water purification
4. Medical entomology
5. Family planning and contraception
6. Demography
7. Disinfection
8. Insecticides

Field Visits

1. Milk dairy
2. Primary Health Centre
3. Infectious Diseases Hospital
4. Industrial unit
5. Sewage treatment plant
6. Water purification plant

Note:

1. For field visits, Annexure 'B' has to be kept in view.
2. Students are to maintain practical records or journals in support of above practical or field visits.
3. Reports of the above field visits are to be submitted by the students.
4. Each student has to maintain records of at least ten infectious diseases.

C. Examination:

There will be examination of the subject only in Fourth B.H.M.S (and not in III BHMS). Besides theory examination there shall be a practical or clinical examination including viva-voce as per following distribution of marks-

1. Theory:

1.1. Number of papers - 01

1.2. Marks: 100

2. Practical including viva voce oral:

2.1. Marks: 100

2.2. Distribution of marks;	Marks
2.2.1. Spotting	30
2.2.3. Journal or practical records (including field visit records)	20

2.2.4. Viva voce (oral)	50

Total	100

SURGERY

Instructions:

I (a) Homoeopathy as a science needs clear application on part of the physician to decide about the best course of action(s) required to restore the sick, to health;

(b) Knowledge about surgical disorders is required to be grasped so that the Homoeopathic Physician is able to:-

(1) Diagnose common surgical conditions.

(2) Institute homoeopathic medical treatment wherever possible.

(3) Organise Pre and Post-operative Homoeopathic medicinal care besides surgical intervention with the consent of the surgeon.

II For the above conceptual clarity and to achieve the aforesaid objectives, an effective co-ordination between the treating surgeons and homoeopathic physicians is required keeping in view the holistic care of the patients and it will also facilitate the physician in individualising the patient, necessary for homoeopathic treatment and management.

III The study shall start in Second B.H.MS and complete in Third B.H.M.S. and examination shall be conducted in Third B.H.MS.

IV (a) Following is a plan to achieve the above and it takes into account about the Second and Third year B.H.M.S syllabus and respective stage of development;

(b) Throughout the whole period of study, the attention of the students should be directed by the teachers of this subject to the importance of its preventive aspects.

V There shall be periodical inter-departmental seminars, to improve the academic knowledge, skill and efficiency of the students and the study shall include training on, –

(a) principles of surgery,

(b) fundamentals of examination of a patient with surgical problems

(c) use of common instruments for examination of a patient.

(d) physiotherapy measures.

(e) applied study of radio-diagnostics.

(f) knowledge of causation, manifestations, management and prognosis of surgical disorders.

(g) miasmatic background of surgical disorders, wherever applicable.

(h) bedside clinical procedures.

(i) correlation of applied aspects, with factors which can modify the course of illness, including application of medicinal and non-medicinal measures.

(j) role of homoeopathic treatment in pseudo-surgical and true surgical diseases.

Second B.H.M.S

A. Theory:

(a) General Surgery:-

1. Introduction to surgery and basic surgical principles.

2. Fluid, electrolytes and acid-base balance.

3. Haemorrhage, haemostasis and blood transfusion.

63.	Platinum metallicum
64.	Podophyllum
65.	Secale cornutum
66.	Selenium
67.	Sepia
68.	Staphysagria
69.	Stramonium
70.	Sulphuric acid

71.	Syphilinum
72.	Tabacum
73.	Taraxacum officinale
74.	Tarentula cubensis
75.	Terebinthina
76.	Theridion
77.	Thlaspi bursa pastoris
78.	Veratrum album

Group studies
Acid group
Carbon group
Kali group
Ophidia group
Mercurius group
Spider group

D. Practical or clinical:

(1) This will cover,–

(a) case taking of acute and chronic patients.

(b) case processing including selection of medicine, potency and repetition schedule

(2) Each student shall maintain a journal having record of ten case takings.

E. Examination:

1. Theory:

1. 1. Number of papers- 01

1. 2. Marks: 100

1. 3. Distribution of marks:

1.3.1. Topics of Second B.H.M.S. 50 Marks

1.3.2. Topics of Third B.H.M.S. 50 Marks

2. Practical including viva voce or oral:

2.1. Marks:100

2.2. Distribution of marks:	Marks
2.2.1. Case taking and case processing of one long case	30
2.2.2. Case taking of one short case	10
2.2.3.Maintenance of practical record or journal	10
2.2.4. Viva voce or oral	50
Total	100

Fourth B.H.M.S

In addition to the syllabus of First, Second and Third BHMS including the medicines taught as per the Appendices I and II, the following additional topics and medicines are included in the syllabus for the Fourth BHMS examination.

HOMOEOPATHIC MATERIA MEDICA

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63.	Platinum metallicum
64.	Podophyllum
65.	Secale cornutum
66.	Selenium
67.	Sepia
68.	Staphysagria
69.	Stramonium
70.	Sulphuric acid

71.	Syphilinum
72.	Tabacum
73.	Taraxacum officinale
74.	Tarentula cubensis
75.	Terebinthina
76.	Theridion
77.	Thlaspi bursa pastoris
78.	Veratrum album

Group studies
Acid group
Carbon group
Kali group
Ophidia group
Mercurius group
Spider group

D. Practical or clinical:

(1) This will cover,–

(a) case taking of acute and chronic patients.

(b) case processing including selection of medicine, potency and repetition schedule

(2) Each student shall maintain a journal having record of ten case takings.

E. Examination:

1. Theory:

1. 1. Number of papers- 01

1. 2. Marks: 100

1. 3. Distribution of marks:

1.3.1. Topics of Second B.H.M.S. 50 Marks

1.3.2. Topics of Third B.H.M.S. 50 Marks

2. Practical including viva voce or oral:

2.1. Marks:100

2.2. Distribution of marks:

	Marks
2.2.1. Case taking and case processing of one long case	30
2.2.2. Case taking of one short case	10
2.2.3.Maintenance of practical record or journal	10
2.2.4. Viva voce or oral	50
Total	100

Fourth B.H.M.S

In addition to the syllabus of First, Second and Third BHMS including the medicines taught as per the Appendices I and II, the following additional topics and medicines are included in the syllabus for the Fourth BHMS examination.

HOMOEOPATHIC MATERIA MEDICA

A. General topics of Homoeopathic materia medica – Sarcodes – definition and general indications.

B. Medicines indicated in Appendix-III shall be taught in relation to the medicines of Appendices-I and II for comparison wherever required.

APPENDIX-III

1	Abies canadensis	35	Sambucus nigra
2	Abies nigra	36	Squilla maritima
3	Carbo animalis	37	Baryta muriatica
4	Carbolic acid	38	Crataegus oxyacantha
5	Cundurango	39	Lithium carbonicum
6	Fluoricum acidum	40	Rauwolfia serpentina
7	Hydrastis canadensis	41	Caulophyllum
8	Raphanus sativus	42	Cocculus indicus
9	Magnesia carbonica	43	Crocus sativus
10	Magnesia muriatica	44	Helonias dioica
11	Anthracinum	45	Lillium tigrinum
12	Bacillinum	46	Sabina
13	Lac caninum	47	Trillium pendulum
14	Lac defloratum	48	Viburnum opulus
15	Lyssin	49	Cicuta virosa
16	Medorrhinum	50	Ranunculus bulbosus
17	Psorinum	51	Rhododendron chrysanthum
18	Pyrogenium	52	Clematis erecta
19	Vaccininum	53	Sabal serrulata
20	Variolinum	54	Sarsaparilla officinalis
21	Hydrocotyle asiatica	55	Coffea cruda
22	Mezereum	56	Glonoine
23	Radium bromatum	57	Melilotus
24	Urtica urens	58	Millefolium
25	Vinca minor	59	Sanguinaria canadensis
26	Abrotanum	60	Spigelia
27	Rheum palmatum	61	Veratrum viride
28	Sanicula aqua	62	Capsicum
29	Acalypha indica	63	Cedron
30	Corallium rubrum	64	Eupatorium perfoliatum
31	Lobelia inflata	65	Abroma augusta
32	Mephitis putorius	66	Calotropis gigantea
33	Rumex crispus	67	Carica papaya
34	Sabadilla officinalis	68	Cassia sophera

69	Ficus religiosa	104	Artemesia vulgaris
70	Jonosia asoca	105	Avena sativa
71	Justicia adhatoda	106	Blatta orientalis
72	Ocimum sanctum	107	Carcinosin
73	Syzigium jambolanum	108	Carduus marianus
74	Ratanhia peruviana	109	Ceanothus
75	Collinsonia canadensis	110	Chininum arsenicosum
76	Antimonium arsenicosum	111	Cholesterinum
77	Sticta pulmonaria	112	Coca erythroxylon
79	Asterias rubens	113	Diphtherinum
80	Iodium	114	Erigeron canadensis
81	Thyroidinum	115	Malandrinum
82	Argentum metallicum	116	Menyanthes
83	Cuprum metallicum	117	Onosmodium
84	Plumbum metallicum	118	Passiflora incarnata
85	Zincum metallicum	119	Ustilago maydis
86	Adonis vernalis	120	Stannum metallicum
87	Kalmia latifolia	121	Valeriana officinalis
88	Physostigma venenosum	122	X – ray
89	Mercurius corrosivus		
90	Mercurius cyanatus		
91	Mercurius dulcis		
92	Mercurius solubilis		
93	Mercurius sulphuricus		
94	Causticum		
95	Bacillus No. 7		
96	Dysentery co		
97	Gaertner		
98	Morgan pure		
99	Morgan gaertner		
100	Proteus bacillus		
101	Sycotic bacillus		
Additional medicines			
102	Aesculus hippocastanum		
103	Adrenalinum		

Sl. No.	Group studies
1	Baryta group
2	Calcarea group
3	Magnesia group
4	Natrum group
5	Compositae family
6	Ranunculacae family
7	Solonacae family

C. Practical or clinical:

Each student shall maintain a journal having record of ten acute and ten chronic case takings.

D. Examination:

1. Theory:

1. 1 Number of papers-02

2.1 Marks: 200

2.1.1 Distribution of marks:

2.1.2 Paper-I: Topics of First, Second and Third B.H.M.S.— 100 Marks

2.1.3 Paper-II:Topics of IV B.H.M.S.— 100 Marks

2. Practical including viva voce or oral:

2.1. Marks: 200

2.2. Distribution of marks;	Marks
2.2.1. Case taking and Case processing of one long case	60
2.2.2 Case taking of one short case	20
2.2.3 Maintenance of practical record or journal	20
2.2.4. Viva voce (oral)	100
Total	200

PATHOLOGY

Instructions:

I (a) Pathology and microbiology shall be taught in relation to the concept of miasms as evolved by Samuel Hahnemann and further developed by JT Kent, H.A. Robert, J.H. Allen and other stalwarts, with due reference to Koch's postulate, correlation with immunity, susceptibility and thereby emphasizing homoeopathic concept of evolution of disease and cure;

(b) Focus will be given on the following points, namely:-

(1) Pathology in relation with Homoeopathic Materia Medica.

(2) Correlation of miasms and pathology.

(3) Characteristic expressions of each miasm.

(4) Classification of symptoms and diseases according to pathology.

(5) Pathological findings of diseases; their interpretation, correlation and usage in the management of patients under homoeopathic treatment.

B. Practical or clinical:

Each student appearing for Third B.H.M.S examination shall maintain records of 20 cases (10 acute and 10 chronic cases).

C. Examination:

1. Theory:

1.1. Number of papers - 01

1.2. Marks: 100

1.3. Distribution of Marks:

1.3.1. Aphorisms 1 to 294 : 60 marks

1.3.2. Homoeopathic philosophy: 40 marks

2. Practical including viva voce or oral:

2.1. Marks: 100

2.2. Distribution of marks;

	Marks
2.2.1. Case taking and case processing	40
2.2.3. Maintenance of practical record or journal	10
2.2.4. Viva voce (oral)	50
Total	100

FOURTH B.H.M.S.

A. Theory:

In addition to the syllabus of First B.H.M.S, Second B.H.M.S and Third B.H.M.S, the following shall be covered, namely:–

1. Evolution of medical practice of the ancients (Prehistoric Medicine, Greek Medicine, Chinese medicine, Hindu medicine and Renaissance) and tracing the empirical, rationalistic and vitalistic thoughts.

2. Revision of Hahnemann's Organon of Medicine (Aphorisms 1-294) including footnotes (5th & 6th Editions translated by R.E. Dudgeon and W. Boericke).

3. Homoeopathic Philosophy:

Philosophy books of Stuart Close (Chapters- 1, 2, 4, 5, 6, 8, 17), J.T. Kent (Chapters - 18 to 22) and H.A. Roberts (Chapters- 1 to 5, 20, 22 to 33, 35), Richard Hughes (Chapters- 1 to 10) and C. Dunham (Chapters- 1 to 7).

4. Chronic Diseases:

4.1. Hahnemann's Theory of Chronic Diseases.

4.2. J.H. Allen's The Chronic Miasms – Psora and Pseudo-psora; Sycosis

(a) Emphasis should be given on the way in which each miasmatic state evolves and the characteristic expressions are manifested at various levels and attempt should be made to impart a clear understanding of Hahnemann's theory of chronic miasms.

(b) The characteristics of the miasms need to be explained in the light of knowledge acquired from different branches of medicine.

(c) Teacher should explain clearly therapeutic implications of theory of chronic miasms in practice and this will entail a comprehension of evolution of natural disease from miasmatic angle, and it shall be correlated with applied materia medica.

B. Practical or clinical:

(a) The students shall maintain practical records of patients treated in the out patient department and inpatient department of the attached hospital.

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B. Practical or clinical:

Each student appearing for Third B.H.M.S examination shall maintain records of 20 cases (10 acute and 10 chronic cases).

C. Examination:

1. Theory:

1.1. Number of papers - 01

1.2. Marks: 100

1.3. Distribution of Marks:

1.3.1. Aphorisms 1 to 294 : 60 marks

1.3.2. Homoeopathic philosophy: 40 marks

2. Practical including viva voce or oral:

2.1. Marks: 100

2.2. Distribution of marks;

	Marks
2.2.1. Case taking and case processing	40
2.2.3. Maintenance of practical record or journal	10
2.2.4. Viva voce (oral)	50
Total	100

FOURTH B.H.M.S.

A. Theory:

In addition to the syllabus of First B.H.M.S, Second B.H.M.S and Third B.H.M.S, the following shall be covered, namely:–

1. Evolution of medical practice of the ancients (Prehistoric Medicine, Greek Medicine, Chinese medicine, Hindu medicine and Renaissance) and tracing the empirical, rationalistic and vitalistic thoughts.

2. Revision of Hahnemann's Organon of Medicine (Aphorisms 1-294) including footnotes (5th & 6th Editions translated by R.E. Dudgeon and W. Boericke).

3. Homoeopathic Philosophy:

Philosophy books of Stuart Close (Chapters- 1, 2, 4, 5, 6, 8, 17), J.T. Kent (Chapters - 18 to 22) and H.A. Roberts (Chapters- 1 to 5, 20, 22 to 33, 35), Richard Hughes (Chapters- 1 to 10) and C. Dunham (Chapters- 1 to 7).

4. Chronic Diseases:

4.1. Hahnemann's Theory of Chronic Diseases.

4.2. J.H. Allen's The Chronic Miasms – Psora and Pseudo-psora; Sycosis

(a) Emphasis should be given on the way in which each miasmatic state evolves and the characteristic expressions are manifested at various levels and attempt should be made to impart a clear understanding of Hahnemann's theory of chronic miasms.

(b) The characteristics of the miasms need to be explained in the light of knowledge acquired from different branches of medicine.

(c) Teacher should explain clearly therapeutic implications of theory of chronic miasms in practice and this will entail a comprehension of evolution of natural disease from miasmatic angle, and it shall be correlated with applied materia medica.

B. Practical or clinical:

(a) The students shall maintain practical records of patients treated in the out patient department and inpatient department of the attached hospital.

(b) The following shall be stressed upon in the case records, namely:–

(1) receiving the case properly (case taking) without distortion of the of patient's expressions;

(2) nosological diagnosis;

(3) analysis and evaluation of the symptoms, miasmatic diagnosis and portraying the totality of symptoms;

(4) individualisation of the case for determination of the similimum, prognosis, general management including diet and necessary restrictions on mode of life of the individual patients;

(5) state of susceptibility to formulate comprehensive plan of treatment;.

(6) order of evaluation of the characteristic features of the case would become stepping stone for the repertorial totality;

(7) remedy selection and posology;

(8) second prescription.

Note: (1) Each student has to maintain records of twenty thoroughly worked out cases (ten chronic and ten acute cases).

(2) Each student shall present at least one case in the departmental symposium or seminar.

C. Examination:

1. Theory:

1.1 Number of papers - 02

1.2 Marks: Paper I: 100, Paper II: 100

1.3 Distribution of marks:

Paper I: Aphorisms 1-145:- 30 marks

Aphorisms 146-294:- 70 marks

Paper II: Chronic diseases – 50 marks

Homoeopathic philosophy – 50 marks

2. Practical including viva voce or oral:

2.1. Marks: 100

2.2. Distribution of marks;	Marks
2.2.1. Case taking and case processing of a long case	30
2.2.2. Case taking and case processing of a short case	10
2.2.3. Maintenance of practical record or journal	10
2.2.4. Viva Voce (oral)	50
Total	100

HOMOEOPATHIC PHARMACY

Instructions:

Instruction in Homoeopathic Pharmacy shall be so planned as to present ,–

(1) importance of homoeopathic pharmacy in relation to study of homoeopathic materia medica, organon of medicine and national economy as well as growth of homoeopathic pharmacy and research;

(2) originality and speciality of homoeopathic pharmacy and its relation to pharmacy of other recognised systems of medicine;

(3) the areas of teaching shall encompass the entire subject but stress shall be laid on the fundamental topics that form the basis of homoeopathy.

A. Theory:

I. General concepts and orientation:

(i) ENT	-10 marks
(ii) Ophthalmology	-10 marks
(iii) Dentistry	-05 marks
Section– 2: -Systemic Surgery	
Homoeoapthic Thereapeutics	25 marks
(i) ENT Homoeopathic Therapeutics	-10 marks
(ii) Ophthalmology Homoeopathic Therapeutics	-10 marks
(iii) Dentistry Homoeopathic Therapeutics	-05 marks

2. Practical including viva voce or oral:

2.1. Marks: 200

2.2. Distribution of marks;	Marks
2.2.1. One long case	40
2.2.2. Identification of instruments, X-rays	30
2.2.3. Practical records, case records or journal	30
2.2.4. Viva voce (oral)	100
Total	200

PRACTICE OF MEDICINE

Instructions: FINAL BHMS

I (a) Homoeopathy has a distinct approach to the concept of disease;

(b) it recognises an ailing individual by studying him as a whole rather than in terms of sick parts and emphasizes the study of the man, his state of health, state of Illness.

II The study of the above concept of individualisation is essential with the a following background so that the striking features which are characteristic to the individual become clear, in contrast to the common picture of the respective disease conditions, namely:–

(1) correlation of the disease conditions with basics of anatomy, physiology and, biochemistry and pathology.

(2) knowledge of causation, manifestations, diagnosis (including differential diagnosis), prognosis and management of diseases.

(3) application of knowledge of organon of medicine and homoeopathic philosophy in dealing with the disease conditions.

(4) comprehension of applied part.

(5) sound clinical training at bedside to be able to apply the knowledge and clinical skill accurately.

(6) adequate knowledge to ensure that rational investigations are utilised.

III (a) The emphasis shall be on study of man in respect of health, disposition, diathesis, disease, taking all predisposing and precipitating factors, i.e. fundamental cause, maintaining cause and exciting cause;

(b) Hahnemann's theory of chronic miasms provides us an evolutionary understanding of the chronic diseases: psora, sycosis, syphilis and acute manifestations of chronic diseases and evolution of the natural disease shall be comprehended in the light of theory of chronic miasms.

IV (a) The teaching shall include homoeopathic therapeutics or management in respect of all topics and clinical methods of examination of patient as a whole will be given due stress during the training;

(b) A thorough study of the above areas will enable a homoeopathic physician to comprehend the practical aspects of medicine;

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(i) ENT	-10 marks
(ii) Ophthalmology	-10 marks
(iii) Dentistry	-05 marks
Section– 2: -Systemic Surgery	
Homoeoapthic Thereapeutics	25 marks
(i) ENT Homoeopathic Therapeutics	-10 marks
(ii) Ophthalmology Homoeopathic Therapeutics	-10 marks
(iii) Dentistry Homoeopathic Therapeutics	-05 marks

2. Practical including viva voce or oral:

2.1. Marks: 200

2.2. Distribution of marks;	Marks
2.2.1. One long case	40
2.2.2. Identification of instruments, X-rays	30
2.2.3. Practical records, case records or journal	30
2.2.4. Viva voce (oral)	100
Total	200

PRACTICE OF MEDICINE

FINAL BHMS

Instructions:

I (a) Homoeopathy has a distinct approach to the concept of disease;

(b) it recognises an ailing individual by studying him as a whole rather than in terms of sick parts and emphasizes the study of the man, his state of health, state of Illness.

II The study of the above concept of individualisation is essential with the a following background so that the striking features which are characteristic to the individual become clear, in contrast to the common picture of the respective disease conditions, namely:–

(1) correlation of the disease conditions with basics of anatomy, physiology and, biochemistry and pathology.

(2) knowledge of causation, manifestations, diagnosis (including differential diagnosis), prognosis and management of diseases.

(3) application of knowledge of organon of medicine and homoeopathic philosophy in dealing with the disease conditions.

(4) comprehension of applied part.

(5) sound clinical training at bedside to be able to apply the knowledge and clinical skill accurately.

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III (a) The emphasis shall be on study of man in respect of health, disposition, diathesis, disease, taking all predisposing and precipitating factors, i.e. fundamental cause, maintaining cause and exciting cause;

(b) Hahnemann's theory of chronic miasms provides us an evolutionary understanding of the chronic diseases: psora, sycosis, syphilis and acute manifestations of chronic diseases and evolution of the natural disease shall be comprehended in the light of theory of chronic miasms.

IV (a) The teaching shall include homoeopathic therapeutics or management in respect of all topics and clinical methods of examination of patient as a whole will be given due stress during the training;

(b) A thorough study of the above areas will enable a homoeopathic physician to comprehend the practical aspects of medicine;

(c) He shall be trained as a sound clinician with adequate ability of differentiation, sharp observation and conceptual clarity about diseases by taking help of all latest diagnostic techniques, viz. X-ray, ultrasound, electrocardiogram, and commonly performed laboratory investigations;

(d) Rational assessment of prognosis and general management of different disease conditions are also to be focused.

V Study of subject. - The study of the subject will be done in two years in Third B.H.M.S and Fourth B.H.M.S, but examination shall be conducted at the end of Fourth B.H.M.S.

Third B.H.M.S

Theory:

1. Applied anatomy and applied physiology of the respective system as stated below.
2. Respiratory diseases.
3. Diseases of digestive system and peritoneum.
4. Diseases concerning liver, gall-bladder and pancreas.
5. Genetic Factors (co-relating diseases with the concept of chronic miasms).
6. Immunological factors in diseases with concept of susceptibility (including HIV, Hepatitis-B)
7. Disorders due to chemical and physical agents and to climatic and environmental factors.
8. Knowledge of clinical examination of respective systems.
9. Water and electrolyte balance – disorders of.

Fourth B.H.M.S

A. Theory:

1. Nutritional and metabolic diseases
2. Diseases of haemopoietic system.
3. Endocrinal diseases.
4. Infectious diseases.
5. Diseases of cardiovascular system.
6. Diseases of urogenital Tract.
7. Disease of CNS and peripheral nervous system.
8. Psychiatric disorders.
9. Diseases of locomotor system (connective tissue, bones and joints disorders)
10. Diseases of skin and sexually transmitted diseases.
11. Tropical diseases.
12. Paediatric disorders.
13. Geriatric disorders.
14. Applied anatomy and applied physiology of different organ and systems relating to specific diseases.
15. Knowledge of clinical examination of respective systems.

(a) General management and homoeopathic therapeutics for all the topics to be covered in Third B.H.M.S and Fourth B.H.M.S shall be taught simultaneously and the emphasis shall be on study of man in respect of health, disposition, diathesis, disease, taking all predisposing and precipitating factors, i.e. fundamental cause, maintaining cause and exciting cause.

(b) Study of therapeutics does not mean simply list of specifics for the clinical conditions but teaching of applied materia medica which shall be stressed upon.

Practical or clinical:

(a) Each candidate shall submit of twenty complete case records (ten in Third B.H.M.S and ten in Fourth B.H.M.S).

(b) The examination procedure will include one long case and one short case to be prepared. During clinical training, each student has to be given adequate exposure to,–

1. comprehensive case taking following Hahnemann's instructions;

2. physical examinations (general, systemic and regional);

3. laboratory investigations required for diagnosis of disease conditions;

4. differential diagnosis and provisional diagnosis and interpretation of Investigation reports;

5. selection of similimum and general management.

B. Examination:

1. Theory:

1.1. Number of papers - 02

1.2. Marks: Paper I-100; Paper II-100

1.3. Contents:

1.3.1 Paper-I: Topics of Third B.H.M.S with Homoeopathic Therapeutics

1.3.2. Paper-II: Topics of Fourth B.H.M.S with Homoeopathic Therapeutics

2. Practical including viva voce or oral:

2.1. Marks: 200

2.2. Distribution of marks;	Marks
2.2.1. One long case	20
2.2.2. One short case	20
2.2.3. Practical records, case records, journal	30
2.2.4. Identification of specimens (X-ray, E.C.G., etc.)	30
2.2.5. Viva voce (oral)	100
Total	200

Note: The case reports of the students carried out during the course shall also be considered for the oral examination.".

9. In the principal regulations, for regulation 7, the following regulation shall be substituted, namely:–

"7. First B.H.M.S examination.– (i) The student shall be admitted to the First B.H.M.S examination provided he has required attendance as per clause (iii) of regulation 13 to the satisfaction of the head of the college.

(ii) The First BHMS examination shall be held in the 12th month of admission.

(iii) The minimum number of hours for lecture, tutorial, demonstration or practical classes and seminars in the subjects shall be as under:-

Sl. No.	Subject	Theoretical lecture(in hours)	Practical or clinical or tutorial or seminars (in hours).
1.	Organon of Medicine with Homoeopathic Philosophy	35 (including 10 for logic)	
2.	Anatomy	200 (including 10 hours each for histology and embryology).	275 (including 30 on histology and embryology).
3.	Physiology	200 (including 50 hours for bio-chemistry)	275 hours (including 50 hours for Bio-chemistry).
4.	Pharmacy	100	70
5.	Homoeopathic Materia Medica	35	--

(iv) Full marks for each subject and the minimum number of marks required for passing the First B.H.M.S examination shall be as follows, namely:-

2.2. Distribution of marks;	Marks
2.2.1. Medico-legal aspect of 4 specimens	40
2.2.3. Journal or practical records	10
2.2.4. Viva voce (oral)	50
Total	100

REPERTORY

Instructions:

FINAL BHMS

I. (a) Repertorisation is not the end but the means to arrive at the simillimum with the help of materia medica, based on sound knowledge of Homoeopathic Philosophy;

(b) Homoeopathic materia medica is an encyclopedia of symptoms. No mind can memorize all the symptoms or all the drugs with their gradations;

(c) The repertory is an index and catalogue of the symptoms of the materia medica, neatly arranged in a practical or clinical form, with the relative gradation of drugs, which facilitates quick selection of indicated remedy and it may be difficult to practice Homoeopathy without the aid of repertories.

II. (a) Each repertory has been compiled on distinct philosophical base, which determines its structure;

(b) In order to explore and derive full advantage of each repertory, it is important to grasp thoroughly its conceptual base and construction and this will help student to learn scope, limitations and adaptability of each repertory.

Third B.H.M.S

A. Theory:

1. Repertory: Definition; Need; Scope and Limitations.
2. Classification of Repertories
3. Study of different Repertories (Kent, Boenninghausen, Boger-Boenninghausen):
   - (a) History
   - (b) Philosophical background
   - (c) Structure
   - (d) Concept of repertorisation
   - (e) Adaptability
   - (f) Scope
   - (g) Limitation(s)
4. Gradation of Remedies by different authors.
5. Methods and techniques of repertorisation. Steps of repertorisation.
6. Terms and language of repertories (Rubrics) cross references in other repertories and materia medica.
7. Conversion of symptoms into rubrics and repertorisation using different repertories.
8. Repertory – its relation with organon of medicine and materia medica.
9. Case taking and related topics:
   - (a) case taking.
   - (b) difficulties of case taking, particularly in a chronic case.
   - (c) types of symptoms, their understanding and importance.
   - (d) importance of pathology in disease diagnosis and individualisation in relation to study of repertory.
10. Case processing

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2.2. Distribution of marks;	Marks
2.2.1. Medico-legal aspect of 4 specimens	40
2.2.3. Journal or practical records	10
2.2.4. Viva voce (oral)	50
Total	100

REPERTORY

Instructions: FINAL BHMS

I. (a) Repertorisation is not the end but the means to arrive at the simillimum with the help of materia medica, based on sound knowledge of Homoeopathic Philosophy;

(b) Homoeopathic materia medica is an encyclopedia of symptoms. No mind can memorize all the symptoms or all the drugs with their gradations;

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II. (a) Each repertory has been compiled on distinct philosophical base, which determines its structure;

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Third B.H.M.S

A. Theory:

1. Repertory: Definition; Need; Scope and Limitations.
2. Classification of Repertories
3. Study of different Repertories (Kent, Boenninghausen, Boger-Boenninghausen):
   (a) History
   (b) Philosophical background
   (c) Structure
   (d) Concept of repertorisation
   (e) Adaptability
   (f) Scope
   (g) Limitation(s)
4. Gradation of Remedies by different authors.
5. Methods and techniques of repertorisation. Steps of repertorisation.
6. Terms and language of repertories (Rubrics) cross references in other repertories and materia medica.
7. Conversion of symptoms into rubrics and repertorisation using different repertories.
8. Repertory – its relation with organon of medicine and materia medica.
9. Case taking and related topics:
   (a) case taking.
   (b) difficulties of case taking, particularly in a chronic case.
   (c) types of symptoms, their understanding and importance.
   (d) importance of pathology in disease diagnosis and individualisation in relation to study of repertory.
10. Case processing

(a) analysis and evaluation of symptoms

(b) miasmatic assessment

(c) totality of symptoms or conceptual image of the patient

(d) repertorial totality

(e) selection of rubrics

(f) repertorial technique and results

(g) repertorial analysis

B. Practical or clinical:

1. Record of five cases each of surgery, gynaecology and obstetrics worked out by using Kent's repertory.

2. Rubrics hunting from Kent's & Boenninghausen's repertories.

Note: There will be no Examination in the subject in Third B.H.M.S.

Fourth B.H.M.S

A. Theory:

1. Comparative study of different repertories (like Kent's Repertory, Boenninghausen's Therapeutic Pocket Book and Boger- Boenninghausen's Charactetristic Repertories, A Synoptic Key to Materia Medica).

2. Card repertories and other mechanical aided repertories– History, Types and Use.

3. Concordance repertories (Gentry and Knerr)

4. Clinical Repertories (William Boericke etc.)

5. An introduction to modern thematic repertories- (Synthetic, Synthesis and Complete Repertory and Murphy's Repertory)

6. Regional repertories

7. Role of computers in repertorisation and different softwares.

B. Practical or clinical:

Students shall maintain the following records, namely:-

1. Five acute and five chronic cases (each of medicine, surgery and obstetrics and gynaecology) using Kent's Repertory.

2. Five cases (pertaining to medicine) using Boenninghausen's therapeutics pocket book.

3. Five cases (pertaining to medicine) using Boger-Boenninghausen's characteristics repertory.

4. Five cases to be cross checked on repertories using homoeopathic softwares.

C. Examination:

There will be examination of repertory only in Fourth B.H.M.S (not in III BHMS).

1. Theory:

1.1. Number of papers-01

1.2. Marks: 100

2. Practical including viva voce or oral:

2.1. Marks: 100

2.2. Distribution of marks:	Marks
2.2.1. One long case	30
2.2.2. One short case	10
2.2.3. Practical record or journal	10
2.2.4. Viva Voce (Oral)	50

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

ENGLISH FOR RESEARCH PAPER WRITING (AUDIT COURSE)

CODE: 26080101

M.TECH SEM-1

Teaching & Evaluation Scheme: -

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th		
2	0	0	2	0	50	0	0		

Course outcomes:

At the end of the course, the student will be able to:

1. Understand that how to improve your writing skills and level of readability
2. Learn about what to write in each section
3. Understand the skills needed when writing a Title
4. Ensure the good quality of paper at very first-time submission

Course outline: -

Sr. No.	Course Contents	Number of Hours
Unit-1	Planning and Preparation, Word Order, Breaking up long sentences, Structuring Paragraphs and Sentences, Being Concise and Removing Redundancy, Avoiding Ambiguity and Vagueness	04
Unit-2	Clarifying Who Did What, Highlighting Your Findings, Hedging and Criticizing, Paraphrasing and Plagiarism, Sections of a Paper, Abstracts. Introduction	04
Unit-3	Review of the Literature, Methods, Results, Discussion, Conclusions, The Final Check	04
Unit-4	Key skills are needed when writing a Title, key skills are needed when writing an Abstract, key skills are needed when writing an Introduction, skills needed when writing a	04

	Review of the Literature	
Unit-5	Skills are needed when writing the Methods, skills needed when writing the Results, skills are needed when writing the Discussion, skills are needed when writing the Conclusions	04
Unit-6	Useful phrases, how to ensure paper is as good as it could possibly be the first- time submission	04

Teaching & Learning Methodology: - Power Point presentation mostly preferred and in some topics chalk & duster is preferable.

Books Recommended:

1. Goldbort R (2006) Writing for Science, Yale University Press (available on Google Books)
2. Day R (2006) How to Write and Publish a Scientific Paper, Cambridge University Press
3. Highman N (1998), Handbook of Writing for the Mathematical Sciences, SIAM. Highman'sbook
4. Adrian Wallwork , English for Writing Research Papers, Springer New York Dordrecht Heidelberg London, 2011

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SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

RESEARCH METHODOLOGY AND IPR

CODE: 26080102

M.TECH SEM-1

Teaching & Evaluation Scheme: -

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
1	0	2	3	2	0	20	0	80	100

Objectives: -

The purpose of this subject is to orient the students to the scientific methodology of research and presenting their thesis. Research constitutes primarily of literature review, giving critical comments on the literature reviewed and identifying the gap, problem formulation, modelling in either an analytical or experimental set up, validating the model and solving the problem you set for yourself.At the end, student should be able to present and defend the solution he/she has found, in a simple and easy manner. Communicating the research outcomes, is an art wherein, you do not want to either undermine or over emphasise the content, within the short time limit given for such presentations. The balance of critical technicality and overall outcomes is the key to an effective presentation. The language, content and articulation should be such as to convey in a unified manner, the gist of your work.

Course outcomes:

At the end of the course the students should be able to:

1. Conduct a quality literature review and find the research gap.
2. Identify an original and relevant problem and identify methods to find its solution
3. Validate the model
4. Present and defend the solution obtained in an effective manner in written or spoken form.
5. Follow research ethics
6. Understand IPR protection for further research and better products

Course outline: -

Sr. No.	Course Contents	Number of Hours
Unit-1	**Starting Research:** Identify specific requirements for evaluation/review and what constitutes completion of your work. Identify key areas in your field. Determine the nature and extension of papers that you should read Find where the source is available. Establish proper methods for finding the relevant material from the source. Identify key areas in your field. Determine the nature and extension of papers that you should read. Learn to Critique existing knowledge and how to find the gap. Understand what should be the key aspects of your problem statement. Examples of effective and ineffective Titles. Identify problem and experimental/theoretical data for comparison with your model. Learn how to extrapolate/scale data for validation. Find what is acceptable level of error and justification thereof	
Unit-2	**Finding Good Literature:** Differentiate between journals, conferences, books, magazines and their quality. Understand how to establish their quality and authenticity. How to conduct effective searches. How to find relevant papers related to your area of research. How to capture critical information. Understand and identify the bias, theoretical position and evidence produced. Compare ideas and concepts from different papers.	
Unit-3	**Writing and Presenting your Work:** How to write Report, Paper, Developing a Research Proposal, Format of research proposal. Recognize the importance of emphasizing your point. Distinguish between your point and the evidence available Acknowledge the evidence. Know and follow the Process of reviewing and proof reading your work. Use feedback to improve your work. Identify the key message of your presentation. Understand the expectations and what will be the key review points. Understand the key components of an oral presentation Know the usual structure of a good presentation. Rehearse and time your presentation. Prepare to answer questions from the audience: Fundamental concepts should be spoken from memory as reviewer will be looking for evidence of your thorough understanding. Read more than the content you are presenting; keep sources ready on hand for reference.	

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

ADVANCED STRUCTURAL ANALYSIS

CODE: 26080103

M.TECH SEM-1

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	50	70	-	150

Objectives: -

In the present era of computerization, it has become necessary to recognize the theory of structures into a more systemic form that is valid for all types of structures and can be more easily programmed for a digital computer. Matrix method provides a comprehensive approach to the analysis of different structural systems and therefore offers a major advantage over many traditional methods. It is also suitable for digital computer. There are many structural problems involving complicated geometries, loadings and material properties for which mathematical solution involves ordinary or partial differential equations. Hence numerical methods such as the finite element method, finite difference method, boundary element method etc. may be used. Finite element method is such a versatile numerical method that can be used to solve any complex problem of structural mechanics. In light of above, the course on Advanced Structural Analysis provides the students a clear understanding of determining structural response of skeletal & continuum structure using matrix method and computer software.

Course outcome: -

After learning the course, the students should be able to:

1. Analyze skeleton structures using stiffness method,
2. Analyze skeleton structures having secondary effects using stiffness method,
3. Derive element properties and analyze structure using finite element method,
4. Solve realistic engineering problems through computational simulations using finite element code,

Course outline: -

Sr. No.	Course Contents	Number of Hours
Unit-1	**Stiffness Member Approach:** Principles of Virtual work, Basic concepts of flexibility and stiffness. Analysis of Continuous beam, Plane Truss, Plane Frame, Plane Grid including secondary effects such as Temperature changes, Pre-strains and end displacements. Introduction to Non-linearity in structure and non-linear analysis.	17
Unit-2	**Finite Element Method:** Principles of discretization, Element stiffness mass formulation based on direct, variational and weighted residual techniques. Computations of element properties for bar elements, beam elements, truss elements, constant strain triangle and quadrilateral elements using generalized coordinates. Computations of element properties for bar elements, beam elements, truss elements, constant strain triangle and quadrilateral elements using natural coordinates; Iso-parametric formulation. Axisymmetric solids.	22

Teaching & Learning Methodology: - Power Point presentation mostly preferred and in some topics chalk & duster is preferable.

Books Recommended:

1. Matrix Analysis of Framed Structure - Weaver W. and Gere J. M., CBS Publishers, Delhi.
2. Structural Analysis - Ghali & Nevelle, Spon Press, London.
3. Matrix Analysis of Structures - Aslam Kassimali, Cengage Learning, USA.
4. Elementary Matrix Analysis of Structures - H. Kardestuncer, Mc-Graw Hill, USA.
5. Matrix Analysis of Structures - Meghre & Deshmukh, Charotar Publication, Anand.
6. Computer Methods of Structural Analysis - Beaufait, Rowan, Hadley and Heckett
7. Linear Analysis of Frame works - Graves Smith
8. Computer Analysis of Structural Systems - Fleming J.F
9. A First Course in the Finite Element Method - D. L. Logan
10. Introduction to Finite Elements in Engineering - Chandrupatla, R.T. & Belegundu, A.D
11. Finite Element Analysis - S. S. Bhavikatti
12. Finite Element Method in Engineering - S.S.Rao
13. Finite Elements Methods - C.S.Krishnamurthy
14. Finite Element Method - Y. M. Desai, T. I. Eltho and A. H. Shah
15. Matrix Structural Analysis - McGuire, Gallagher, and Ziemian, John Wiley & Sons, Inc.
16. Finite Elements Procedures in Engineering analysis - Bathe, Wilson
17. Finite Element for Structural Analysis - Weaver & Johnston
18. The Finite Element Methods - Zienkiewicz
19. Finite Element Programming - Hinton & Owen

List of Experiments/ Tutorials:

Tutorial work shall consist of solution of at least five problems from each topic out of which at least half of problems shall be checked by use of standard software.

List of Open-Source Software/learning website:

Major Software: ---STAAD-Pro, SAP2000, ETABS, ABACUS, ANSYS

www.scilab.org/
http://nptel.ac.in/
http:// ocw.mit.edu/
https://ndl.iitkgp.ac.in/
www.mastan2.com/
www.scilab.org/
http://www.code-aster.org/forum2/ (For open source FEA program Code_Aster)
http://www.calculix.de (For open source FEA program Calculix)
http://www.openfoam.org (For open source FEA program OpenFOAM)

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SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

ADVANCED CONCRETE DESIGN OF STRUCTURES

CODE: 26080104

M.TECH SEM-1

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	50	70	-	150

Objectives: -

Reinforced cement concrete is one of the widely used construction material. With rapid development of infrastructure facilities, large number of special structures like bunker and silos, flat slabs, grid floors, shear walls, corbels, deep beams, water retaining structures etc. are being designed and constructed across the globe. The course on Advanced Concrete Design acquaints the structural engineering students to analyze and design such special structures as per Indian Standard code of practice.

Course outcome: -

After learning the course, the students should be able to:

1. Carry out load calculation, analysis, design and detailing of Slender Column, Corbel, Deep beams, flat slabs, water tanks, bunker and silos, Shear Walls as per relevant IS code of practice.,
2. Analysis and design of raft foundation, strip footing and pile caps,
3. Ensure serviceability criteria for reinforced concrete structural elements.

Course outline: -

Sr. No.	Course Contents	Number of Hours
Unit-1	Design philosophy, Loads and load combinations, Material Characteristics	02
Unit-2	Serviceability criteria: Deflection and crack width.	03
Unit-3	Design of slender columns	02
Unit-4	Strut-and- Tie Method, Design of Deep Beam and Corbel	04

Unit-5	Proportioning, analysis and design of flat slab by direct design method and detailing	04
Unit-6	Analysis and design of Grid floors by Rankine Grashoff Method, classical equivalent plate theory and IS:456 method.	05
Unit-7	Design of rafts, Strip footing and pile cap.	08
Unit-8	Design of Intz type shaft supported water tank	06
Unit-9	Design of Bunker and Silos	04
Unit-10	Design of Shear Walls, Compression Field Theory for Shear Design, Design against Torsion	04

Teaching & Learning Methodology: - Power Point presentation mostly preferred and in some topics chalk & duster is preferable.

List of Experiments/Tutorials:

At least two designs suitably selected from topics of the course. The report shall consist of full analytical treatment, design procedure, references and all necessary drawings in the form of neat dimensioned sketches.

Books Recommended:

1. Advanced Design of Concrete Structures – Krishana Raju N., Tata Mc-Graw Hill, Delhi.
2. Reinforced Concrete Design – Sinha S. N., Tata Mc-Graw Hill, Delhi.
3. Limit State Design of Reinforced Concrete – Jain A. K., Nemchand & Bros., Roorkee.
4. Advanced Reinforced Concrete, Varghese A. V., Prentice Hall of India.
5. Reinforced concrete, Vol - I and II – Shah H. J., Charotar Pub., Anand.
6. Design of Multi-storied Building (G+3) - Shah and Karve, Structure Pub., Pune.
7. Reinforced Concrete Design, Pillai S. U. and MenonD., Tata McGraw-Hill, 3rd Ed, 1999.
8. Reinforced Concrete Structures, Park R.and PaulayT., John Wiley & Sons, 1995.
9. Advanced Reinforced Concrete Design, Varghese P. C., Prentice Hall of India, New Delhi.
10. Unified Theory of Concrete Structures, Hsu T. T. C. and Mo Y. L., John Wiley & Sons, 2010.
11. IS Codes: IS:456, IS:875, IS:1893, IS:4326, IS:13920, IS: 3370, IS: 4995 (I & II), SP:16, SP:34.

List of Open-Source Software/learning website

http://nptel.ac.in/

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SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

DISASTER MANAGEMENT (AUDIT COURSE)

CODE: 26080105

M.TECH SEM-1

Teaching & Evaluation Scheme: -

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
2	0	0	2	0	50	0	0	-	50

Course outcomes:

At the end of the course, the student will be able to:

1. .learn to demonstrate a critical understanding of key concepts in disaster risk reduction and humanitarian response
2. critically evaluate disaster risk reduction and humanitarian response policy and practice from multiple perspectives.
3. develop an understanding of standards of humanitarian response and practical relevance in specific types of disasters and conflict situations
4. critically understand the strengths and weaknesses of disaster management approaches, planning and programming in different countries, particularly their home country or the countries they work in

Course outline: -

Sr. No.	Course Contents	Number of Hours
Unit-1	**Introduction:** Disaster: Definition, Factors and Significance; Difference Between Hazard and Disaster; Natural and Manmade Disasters: Difference, Nature, Types and Magnitude.	04
Unit-2	**Repercussions of Disasters and Hazards:** Economic Damage, Loss of Human and Animal Life, Destruction of Ecosystem. Natural Disasters: Earthquakes, Volcanisms, Cyclones, Tsunamis, Floods, Droughts and Famines, Landslides and Avalanches, Man-made disaster: Nuclear	04

	Reactor Meltdown, Industrial Accidents, Oil Slicks and Spills, Outbreaks of Disease and Epidemics, War and Conflicts	
Unit-3	**Disaster Prone Areas in India:** Study of Seismic Zones; Areas Prone to Floods and Droughts, Landslides and Avalanches; Areas Prone to Cyclonic and Coastal Hazards with Special Reference to Tsunami; Post-Disaster Diseases and Epidemics	04
Unit-4	**Disaster Preparedness and Management:** Preparedness: Monitoring of Phenomena Triggering a Disaster or Hazard; Evaluation of Risk: Application of Remote Sensing, Data from Meteorological and Other Agencies, Media Reports: Governmental and Community Preparedness	04
Unit-5	**Risk Assessment:** Disaster Risk: Concept and Elements, Disaster Risk Reduction, Global and National Disaster Risk Situation. Techniques Of Risk Assessment, Global Co-Operation in Risk Assessment and Warning, People's Participation in Risk Assessment. Strategies for Survival.	04
Unit-6	**Disaster Mitigation:** Meaning, Concept and Strategies of Disaster Mitigation, Emerging Trends in Mitigation. Structural Mitigation and Non-Structural Mitigation, Programs of Disaster Mitigation in India.	04

Teaching & Learning Methodology: - Power Point presentation mostly preferred and in some topics chalk & duster is preferable.

Books Recommended:

1. R. Nishith, Singh AK, "Disaster Management in India: Perspectives, issues and strategies" New Royal book Company
2. Sahni, Pardeep et.al. (Eds.), "Disaster Mitigation Experiences and Reflections", Prentice Hall of India, New Delhi.
3. Goel S. L., "Disaster Administration and Management Text and Case Studies", Deep &Deep Publication Pvt. Ltd., New Delhi.

Prof. Mansi Prajapati

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SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

ANALYTICAL AND NUMERICAL METHODS FOR STRUCTURAL ENGINEERING

CODE: 26080106

M.TECH SEM-1

Teaching & Evaluation 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: - To find solution of structural engineering problems, a mathematical model of the problem is formed and then its closed form or numerical solution is obtained using mathematics. Thus, the knowledge of application of various mathematical tools is essential for the solution of structural problems. The course on Analytical and Numerical Methods for Structural Engineering equips the students with the applications of numerical and statistical methods to solve problems related to structural engineering.

Prerequisites: - Knowledge of access to referred journals

Course outcome: - On completion of this module, the learner will be able to:

1. Solve algebraic equations,
2. Obtain numerical solution of ordinary and partial differential equations,
3. Apply integration method/s for structural analysis,
4. Carry out interpolations and curve fitting,
5. Obtain solution of Eigen value problems and Fourier series for structural analysis,
6. Apply iterative and transformation methods in structural engineering

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Course outline: -

Sr. No.	Course Contents	Number of Hours
Unit-1 Errors	Error analysis, types of errors, accuracy & precision, stability in numerical analysis	02
Unit-2 Interpolation and Curve Fitting	Empirical laws for curve fitting, general interpolation formulae.	06
Unit-3 Solution of Non-linear Algebraic and Transcendental Equations	Solution by graphical method, bisection method, Newton Raphson iterative method, Regula-Falsi method.	06
Unit-4 Elements of Matrix Algebra	Solution of systems of linear equations, Eigen value problems. Applications to Structural Dynamic problems, stress problems, buckling of columns	08
Unit-5 Numerical Differentiation & Integration	Solution of Ordinary and Partial Differential Equations, Euler's equation and other methods. Laplace equation - Properties of harmonic functions - Fourier transform methods for Laplace equation. Numerical Integration	10
Unit-6 Finite difference method	Finite difference technique, its applications to structural engineering problems.	06
Unit-7 Computer Algorithms	Numerical solutions for different structural problems.	04

Teaching & Learning Methodology: - Power Point presentation mostly preferred and in some topics chalk & duster is preferable.

Books Recommended:

1. Numerical methods in Engineering - Salvadori & Baron
2. Numerical methods – B S Grewal
3. Numerical Methods in Finite Element Analysis - Bathe & Wilson
4. Numerical methods for scientific and engineering computations – S R K Iyengar, R K Jain and Mahinder

Open Ended Problems:

Minimum 20 problems from above topics out of which half of the problems shall be also solved using self developed computer programs in any language

List of Open Source Software/learning website:

www.scilab.org/
http://nptel.ac.in/
http://ocw.mit.edu/

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SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

THEORY AND APPLICATIONS OF CEMENT COMPOSITES

CODE: 26080107

M.TECH SEM-1

Teaching & Evaluation 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: -

Concrete as one of the conventional composite material is invariably one of the most robust and versatile material. It performs extremely well under compression, however high strength concrete tends to be brittle. Concrete these days is modified in order to enhance its capacity for long term performance under harsh environmental & structural loads. Cement and concrete composites have made this possible. These composites comprise of binder or a matrix that binds together different types of fibers or fragments as per the requirements. The final product in form of composite is light, strong, flexible and more efficient in comparison to conventional composite i.e. concrete.

Prerequisites: -

Material Science, Concrete Technology, Mechanics of Structures

Course outcome: -

After learning the course the students should be able to:

1. Formulate constitutive behaviour of composite materials –Ferrocement & FiberReinforced Concrete - by understanding their strain- stress behaviour.
2. Classify the materials as per orthotropic and anisotropic behaviour.
3. Estimate strain constants using theories applicable to composite materials.
4. Analyse and design structural elements made of cement composites.

Course outline: -

Sr. No.	Course Contents	Number of Hours
Unit-1 Introduction	Genesis of composites, Classification and Characteristics of Composite Materials,Constituent materials and their properties •Stress-strain relations, Orthotropic & Anisotropic materials, Engineering Constants for Orthotropic Materials, Restrictions on Elastic Constants, Plane Stress Problem, Biaxial Strength, Theories for an Orthotropic Lamina • Advantages over conventional materials • Manufacturing process of composites	13
Unit-2 Cement composites	Advanced Cement Composites: Fiber-reinforced cementitious composites, high-strength cementitious composites, Polymers in concrete, shrinkage-compensating concrete, engineered cementitious composites	10
Unit-3 Mechanical Properties	Behaviour of cement composites in tension, compression, flexure, bond, post-cracking behavior, Fatigue, Impact, Durability & corrosion, Factors affecting mechanical properties	13
Unit-4 Application of cement composites	Fiber Reinforced Concrete, Ferrocement, Housing, Water storage, Boats & Miscellaneous structures	06

Teaching & Learning Methodology: - Power Point presentation mostly preferred and in some topics chalk & duster is preferable.

Books Recommended:

1. Mechanics of Composite Materials, Jones R. M,, 2nd Ed., Taylor and Francis,BSP Books, 1998.
2. Advanced Concrete Technology –Zongjin Li
3. Ferrocement – Theory and Applications, Pama R. P., IFIC, 1980.
4. New Concrete Materials, Swamy R.N., 1stEd., Blackie, Academic and Professional, Chapman & Hall, 1983.
5. Isaac M. Daniel and Orilshai - Engineering Mechanics of Composite Materials, OxfordUniversity Press, Second Edition, New Delhi.
6.Michael W. Hyer - Stress Analysis of Fiber-Reinforced Composite Materials,WCB/McGraw-Hill,Singapore.
7.Roman Solecki and R Jay Conant – Advanced Mechanics of Materials, OxfordUniversityPress,New York, Special Edition for sale in India.

List of Experiments:

1. Study the changes in the mechanical properties of Fiber reinforced concrete by varying % content of fibers
2. Investigation of the change in the mechanical properties of the Fiber reinforced concrete due to variation in geometry of fibers
3. Experimental study of Effect of size and aspect ratio of fibers on properties of concrete
4. Experimental investigation to study tensile properties of Normal and Fiber reinforced concrete
5. Experimental study on effect of addition of fibers on Pull-Off strength of concrete
6. Study of cracking pattern of reinforced beams made up of (i) Normal Concrete (ii) Fiber reinforced concrete (iii) Ferrocement wrap under bending.

Major Equipment: Compression Testing Machine

List of Open Source Software/learning website:

http://nptel.ac.in/

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SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

THEORY OF STRUCTURAL STABILITY

CODE: 26080108

M.TECH SEM-1

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	50	70	-	150

Objectives: -

Various loads are acting on structures. Behavior of structure under these loads is very important to understand. Stability is the prime importance for any structures. Therefore various design criteria for the design of structures need to be studied. Instability in any of the structural member leads to failure of the structures. Therefore instability in the individual members is required to be studied due to various structural actions. Instability of the frames to be studied as a whole at the end.

Prerequisite: Theory of Structures & Structural Analysis

Course outcome: -

After learning the course, the students should be able to:

1. Determine stability of columns and frames
2. Determine stability of beams and plates
3. Use stability criteria and concepts for analyzing discrete and continuous systems

Course outline: -

Sr. No.	Course Contents	Number of Hours
Unit-1 Fundamental Concepts & Criteria for Design of Structures	Concept of stability - Stability, Strength, and Stiffness, Classical Concept of Stability of Discrete and Continuous Systems, instability and bifurcation, different forms of structural instability, approaches of stability analysis, Linear and nonlinear behavior	06
Unit-2 Stability of Columns	Governing differential equation- Euler formulas for column – Eigenvalue problem; buckling modes and critical load; elastically restrained column, column with geometric imperfections, eccentrically loaded column, and large deflection analysis. Axial and Flexural Buckling, Lateral Bracing of Columns, Combined Axial, Flexural and Torsion Buckling.	08
Unit-3 Stability of Beams	Introduction lateral buckling of beams in pure bending; torsional buckling; combined flexural-torsional buckling.	06
Unit-4 Stability of Frames	Beam columns: Standard cases of beam columns, beam-columns with elastic restraints; effect of initial curvature Member Buckling versus Global Buckling, Slenderness Ratio of Frame Members, Buckling analysis of single-storey frames with sway and no-sway condition using stiffness method	10
Unit-5 Stability of Plates	Differential equation of plate buckling and boundary conditions, rectangular plates under uniaxial and biaxial compression; axial-flexural buckling; shear-flexural buckling, application of energy methods for calculation of buckling loads and modes.	08
Unit-6 Introduction to Inelastic Buckling	Introduction to Inelastic Buckling and Dynamic Stability.	04

Teaching & Learning Methodology: - Power Point presentation mostly preferred and in some topics chalk & duster is preferable.

Books Recommended:

1. Theory of elastic stability, Timoshenko and Gere, Tata Mc Graw Hill,1981
2. Principles of Structural Stability Theory, Alexander Chajes, Prentice Hall, New Jersey.
3. Structural Stability of columns and plates, Iyengar, N. G. R., Eastern west press Pvt. Ltd.
4. Chen, W.F. & Lui, E.M.: Structural Stability, Elsevier (1987).
5. Gambhir, M.L.: Stability Analysis and Design of Structures, Springer- Verlag (2004).
6. Strength of Metal Structures, Bleich F. Bucking, Tata McGraw Hill, New York

List of Experiments:

1. Study of effective length of columns with different end condition & determine buckling load
2. Study of Axial, Flexural & Torsional buckling in columns
3. Study of lateral torsional buckling of beams
4. Study of Structural stability of Beams, trusses & Frames

Major Equipment:

1. Model of column with different end condition
2. Model of beams for lateral torsional buckling
3. Model of columns for Axial, Flexural & Torsional buckling
4. Model of beams, frames & truss with different support condition

List of Open-Source Software/learning website:

Major Software: ---STAAD-Pro, SAP2000, ETABS, and ANSYS
http://nptel.ac.in/

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SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

THEORY OF THIN PLATES & SHELLS

CODE: 26080109

M.TECH SEM-1

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	50	70	-	150

Objectives: -

Plates and Shells have become important structural forms of modern infrastructures. Analysis of such structure requires rigorous mathematical treatment. It is essential to understand structural behavior and analysis of plates and shells for their safe design. The course on Plates and Shell equips the students with analysis methodology of plates and shell using analytical methods.

Prerequisite:

Mechanics of Solids, Structural Analysis and Engineering Mathematics

Course outcome: -

After learning the course, the students should be able to:

1. Use analytical methods for the solution of thin plates and shells.
2. Use analytical methods for the solution of shells.
3. Apply the numerical techniques and tools for the complex problems in thin plates.
4. Apply the numerical techniques and tools for the complex problems in shells.

Course outline: -

Sr. No.	Course Contents	Number of Hours
Unit-1 Introduction	Space Curves, Surfaces, Shell Co-ordinates, Strain Displacement Relations, Assumptions in Shell Theory, Displacement Field Approximations, Stress Resultants, Equation of Equilibrium using Principle of Virtual Work, Boundary Conditions.	04
Unit-2 Static Analysis of Plates	Governing Equation for a Rectangular Plate, Navier Solution for Simply- Supported Rectangular Plate under Various Loadings, Levy solution for Rectangular Plate with other Boundary Conditions	09
Unit-3 Circular Plates	Analysis under Axi- Symmetric Loading, Governing Differential Equation in Polar Co-ordinates. Approximate Methods of Analysis- Rayleigh-Ritz approach for Simple Cases in Rectangular Plates.	09
Unit-4 Static Analysis of Shells	Membrane Theory of Shells - Cylindrical, Conical and Spherical Shells	08
Unit-5 Shells of Revolution	Shells of Revolution With Bending Resistance - Cylindrical and Conical Shells, Application to Pipes and Pressure Vessels.	08
Unit-6 Thermal Stresses in Plate	Thermal Stresses in Plate/ Shell	04

Teaching & Learning Methodology: - Power Point presentation mostly preferred and in some topics chalk & duster is preferable.

Books Recommended:

1. Theory of Plates and Shells, Timoshenko S. and Krieger W., McGraw Hill.
2. Stresses in Plates and Shells, Ugural Ansel C., McGraw Hill.
3. Thin Elastic Shells, KrausH., John Wiley and Sons.
4. Theory of Plates, Chandrashekhara K., Universities Press.
5. Design and Construction of Concrete Shells, Ramaswamy G.S.

List of Experiments/Assignments:

Tutorial work shall consist of presentations / problems / preparation of learning material based on above topics. Apart from above assignments a group of students has to undertake one open ended design problem based on engineering application of Thin plates & shells.

List of Open-Source Software/learning website:

http://ocw.mit.edu/courses/mechanical-engineering/2-081j-plates-and-shells-spring-2007/

1. http://nptel.ac.in/courses/112101095/34
2. http://nptel.ac.in/courses/112101095/38

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SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

ADVANCED SOLID MECHANICS

CODE: 26080110

M.TECH SEM-1

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	50	70	-	150

Objectives: -

In this course, general theory available to study the response of solids to applied forces will be developed and will be used to study simple boundary value problems. In all the treatment would be three dimensional. The present course provides the student with the mathematical and physical principles of "Theory of Elasticity" and "Stability" with various solution strategies and their practical applications.

Prerequisite:

It is assumed that all students have a working familiarity with the basics of Mechanics of Solids and Structural Analysis along with mathematical differential equations.

Course outcome: -

After learning the course, the students should be able to:

1. Understanding the basic concepts and solve simple problems of elasticity and plasticity.
2. Solve the advanced practical problems related to the theory of elasticity, concepts of stress and strain, strain energy, and failure criteria.
3. Propose materials and structural elements to the analysis of complex structures.
4. Apply numerical methods to solve continuum problems.

Course outline: -

Sr. No.	Course Contents	Number of Hours
Unit-1 Introduction	Strain and Stress Fields, Constitutive Relations, Cartesian Tensors and Equations of Elasticity.	03
Unit-2 Stress Analysis	Body Force, Surface Force and Stress Vector, Stress at a Point, Normal and Shear Stress Components, Rectangular Stress Components, Stress Components on an Arbitrary Plane, Differential Equations of Equilibrium, Equilibrium Equations for Plane Stress State, Boundary Conditions. Application example based on these theories.	10
Unit-3 Strain Analysis	Change in Length of a Linear Element & Components, Rectangular Strain Components, Strain at a Point, Principal Axes of Strain and Principal Strains, Plane State of Strain, Compatibility Conditions. Application example based on these theories.	10
Unit-4 Equations of Elasticity	Equations of Equilibrium, Stress- Strain relations, Strain Displacement and Compatibility Relations, Boundary Value Problems. Application example based on these theories.	06
Unit-5 Two-Dimensional Problems of Elasticity	Plane Stress and Plane Strain Problems, Airy's stress Function, Two-Dimensional Problems in Polar Coordinates. Application example based on these theories.	06
Unit-6 Torsion of Prismatic Bars	Saint Venant's Method, Prandtl's Membrane Analogy, Torsion of Rectangular Bar, and Torsion of Thin Walled Tubes.	06

Teaching & Learning Methodology: - Power Point presentation mostly preferred and in some topics chalk & duster is preferable.

Books Recommended:

1. Theory of Elasticity, Timoshenko S. and Goodier J. N., McGraw Hill, 1961.
2. Elasticity, Saddm. H., Elsevier, 2005.
3. Engineering Solid Mechanics, Ragab A. R., Bayoumis E., CRC Press,1999.
4. Computational Elasticity, Ameenm., Narosa,2005.
5. Solid Mechanics, Kazimis. M. A., Tata McGraw Hill,1994.
6. Advanced Mechanics of Solids, Srinath L. S., Tata McGraw Hill, 2007.

List of Experiments/Assignments:

Tutorial work shall consist of presentations / problems / preparation of learning material based on above topics. Apart from above assignments a group of students has to undertake one open ended design problem based on engineering application of elasticity and analysis or stability and analysis.

List of Open-Source Software/learning website:

http://nptel.ac.in/
http://ocw.mit.edu/courses/civil-and-environmental-engineering/
http://www.brown.edu/Departments/Engineering/Courses/En175/notes.htm
http://www.ktubtechquestions.bid/2017/07/advanced-mechanics-of-solids-useful.html

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SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

STRUCTURAL OPTIMIZATION

CODE: 26080111

M.TECH SEM-1

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	50	70	-	150

Objectives: -

The basic requirement of structural design is safety and economy. Safety can be ensured by designing the structure by satisfying various standards of code of practice. There are many design solutions which satisfy codal provisions, out of which few gives economic solution. Thus the best solution using available resources can be achieved by using optimization techniques. The optimal design can be in terms of minimum cost, minimum weight or maximum performance or a combination of these. Thus, optimization techniques play an important role in structural design.

Course outcome: -

After learning the course, the students should be able to:

1. Understand optimization techniques,
2. Classify the optimization problems,
3. Derive response quantities corresponding to design variable,
4. Apply optimization techniques to trusses, beams and frames.

Course outline: -

Sr. No.	Course Contents	Number of Hours
Unit-1 Introduction	Basic theory and elements of optimization Terminology and definitions. Basic principles and procedure of optimization. Classical Methods of optimization: Trial and error method, Lagrangian Multiplier method and Kuhn-Tucker method with illustrative examples.	08
Unit-2 Linear Programing	Introduction, terminology, standard form of linear programming problem, geometrical interpretation, canonical form of equation graphical and algebraic methods of solving L.P. problems, Simplex method, illustrative examples.	08
Unit-3 Non Linear programming	Unconstrained methods of optimization on Direct search methods, Univariate search method, Hooke and Jeeves' method, Powell's method, Steepest Descent Methods, Davidon –Fletcher-Powell (DFP) method, illustrative examples.	10
Unit-4 Structural Applications	Optimum design using the plastic theory, Optimum design of planner structures using matrix force method and matrix displacement method.	12
Unit-5 Introduction to Specialized Optimization techniques	Integer programming, Dynamic programming, Geometric programming and Genetic Algorithms.	04

Teaching & Learning Methodology: - Power Point presentation mostly preferred and in some topics chalk & duster is preferable.

Books Recommended:

1. Rao S. S., Engineering Optimization – Theory and Practice, New Age International.
2. Majid K I, Optimum Design of Structures- NEWNES – BUTTERWORTHS, London.
3. Deb, K., Optimization for Engineering Design – Algorithms and examples, Prentice Hall.
4. Kirsch U., Optimum Structural Design, McGraw Hill.
5. Arora J S. Introduction to Optimum Design,.McGraw Hill

List of Experiments/Tutorials:

Minimum 05 problems from each topic should covered in the tutorial work out of which half of the problems shall be also solved using self developed computer programs or readymade software.

List of Open-Source Software/learning website:

http://nptel.ac.in/

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SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

DISASTER MANAGEMENT (AUDIT COURSE)

CODE: 26080105

M.TECH SEM-2

Teaching & Evaluation Scheme: -

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
2	0	0	2	0	50	0	0	-	50

Course outcomes:

At the end of the course, the student will be able to:

1. learn to demonstrate a critical understanding of key concepts in disaster risk reduction and humanitarian response
2. critically evaluate disaster risk reduction and humanitarian response policy and practice from multiple perspectives.
3. develop an understanding of standards of humanitarian response and practical relevance in specific types of disasters and conflict situations
4. critically understand the strengths and weaknesses of disaster management approaches, planning and programming in different countries, particularly their home country or the countries they work in

Course outline: -

Sr. No.	Course Contents	Number of Hours
Unit-1	**Introduction:** Disaster: Definition, Factors and Significance; Difference Between Hazard and Disaster; Natural and Manmade Disasters: Difference, Nature, Types and Magnitude.	04
Unit-2	**Repercussions of Disasters and Hazards:** Economic Damage, Loss of Human and Animal Life, Destruction of Ecosystem. Natural Disasters: Earthquakes, Volcanisms, Cyclones, Tsunamis, Floods, Droughts and Famines, Landslides and Avalanches, Man-made disaster: Nuclear	04

	Reactor Meltdown, Industrial Accidents, Oil Slicks and Spills, Outbreaks of Disease and Epidemics, War and Conflicts	
Unit-3	**Disaster Prone Areas in India:** Study of Seismic Zones; Areas Prone to Floods and Droughts, Landslides and Avalanches; Areas Prone to Cyclonic and Coastal Hazards with Special Reference to Tsunami; Post-Disaster Diseases and Epidemics	04
Unit-4	**Disaster Preparedness and Management:** Preparedness: Monitoring of Phenomena Triggering a Disaster or Hazard; Evaluation of Risk: Application of Remote Sensing, Data from Meteorological and Other Agencies, Media Reports: Governmental and Community Preparedness	04
Unit-5	**Risk Assessment:** Disaster Risk: Concept and Elements, Disaster Risk Reduction, Global and National Disaster Risk Situation. Techniques Of Risk Assessment, Global Co-Operation in Risk Assessment and Warning, People's Participation in Risk Assessment. Strategies for Survival.	04
Unit-6	**Disaster Mitigation:** Meaning, Concept and Strategies of Disaster Mitigation, Emerging Trends in Mitigation. Structural Mitigation and Non-Structural Mitigation, Programs of Disaster Mitigation in India.	04

Teaching & Learning Methodology: - Power Point presentation mostly preferred and in some topics chalk & duster is preferable.

Books Recommended:

1. R. Nishith, Singh AK, "Disaster Management in India: Perspectives, issues and strategies" New Royal book Company
2. Sahni, Pardeep et.al. (Eds.), "Disaster Mitigation Experiences and Reflections", Prentice Hall of India, New Delhi.
3. Goel S. L., "Disaster Administration and Management Text and Case Studies", Deep &Deep Publication Pvt. Ltd., New Delhi.

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SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

ADVANCED STEEL DESIGN

CODE: 26080201

M.TECH SEM-2

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	50	70	-	150

Objectives: -

This course examines advanced design concepts for structural steel applicable to various types of steel structures; the primary code source applies to building design, which is supplemented by a strong theoretical background in steel behavior applicable to non-typical structures.

Prerequisites: -

It is assumed that all students have a working familiarity with the elementary design of steel structural members.

Course outcome: -

On completion of this module, the learner will be able to:

1. Design steel structures/ components by different design processes.
2. Analyze and design beams and columns for stability and strength, and drift.
3. Design welded and bolted connections.
4. Apply unified code philosophy to steel building design
5. Apply plastic method for design of beams and frames.
6. Design & detail Industrial building, steel stacks & composite structures as per the IS code

Course outline: -

Sr. No.	Course Contents	Number of Hours
Unit-1 Properties of Steel	Mechanical Properties, Hysteresis, Ductility. Compactness and non-compactness, slenderness, residual stresses.	05
Unit-2 Plastic Behaviour of Structural Steel	Introduction, Plastic theory, Plastic hinge concept, Plastic collapse load, conditions of plastic analysis, Theorem of Plastic collapse, Methods of Plastic analysis	08
Unit-3 Design of Industrial Buildings	Introduction, selection of bay width, structural framing, purlins, girts and eave strut, plane trusses, Design of Gantry girders.	10
Unit-4 Design of cold formed sections	Advantages, stiffened and un stiffened elements, local buckling and post buckling strength, shear lag and flange curling, unusually wide flange section, short span sections, members subjected to axial tension, compression and bending. Design of beams and columns, Introduction to pre-engineered buildings using cold formed sections.	12
Unit-5 Design of Steel Stacks	Introduction, Proportioning of stack, Codal provisions, Loads on Stacks, Load combinations, Stresses in Self-supporting stacks, Design procedure for self-supporting stacks, Guyed steel stacks.	06
Unit-6 Design of composite structures	Composite Floor and Roof System Design, Composite beam, Open web steel joist / joist girder, Serviceability requirements.	06

Teaching & Learning Methodology: - Power Point presentation mostly preferred and in some topics chalk & duster is preferable.

Books Recommended:

1. N. Subramanian Design of Steel Structures: Theory and Practice, Oxford University.
2. V. L. Shah and Veena Gore, Limit State Design of Steel Structures IS : 800-2007, Structures.
3. S. S. Bhavikatti, Design of Steel Structures by Limit State Methods as Per IS 800-2007, I & K. International.
4. M. R. Shiyekar, Limit State Design in Structural Steel, PHI Learning.
5. S. K. Duggal, Limit State Design of Steel Structures, Tata McGraw Hill.
6. M. L. Gambhir, Fundamentals of Structural Steel Design, McGraw Hill Education.
7. IS Codes: IS: 800, IS: 875, SP: 6 and Steel Table.
8. Design of Steel Structures - Vol. II, Ramchandra. Standard Book House, Delhi.
9. Design of Steel Structures - Arya A. S., Ajmani J. L., Nemchand and Bros., Roorkee.
10. Plastic Methods of Structural Analysis, Neal B. G., Chapman and Hall London.

List of Experiments/Assignments:

Tutorial work shall consist of presentations / problems / preparation of learning material based on above topics. Apart from above assignments a group of students has to undertake one open ended design problem based on engineering application.

List of Open Source Software/learning website:

http://nptel.ac.in/

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SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

STRUCTURAL DYNAMICS

CODE: 26080202

M.TECH SEM-2

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	50	70	-	150

Objectives: -

Earthquake, wind, moving loads, traffic, blasting etc. impose time-dependent forces on the structure and thereby induces vibration in the structures. The analysis of structure under such time-dependent forces is carried using theory of structural dynamics. Therefore, understanding of structural dynamics is essential for safe design of Civil Engineering Structures.

Prerequisites: -

Engineering Mechanics, Structural Analysis and Engineering Mathematics

Course outcome: -

On completion of this module, the learner will be able to:

1. Analyze and Interpret dynamics response of single degree freedom system using fundamental theory and experiments
2. Analyze and Interpret dynamics response of Multi degree freedom system using fundamental theory and experiments
3. Differentiate the effects of various types of dynamic loads
4. Use structural engineering software for dynamic analysis
5. Perform & interpret the results of various experiments on models to understand structural behavior of symmetrical & un-symmetrical structures in plan & elevation

Course outline: -

Sr. No.	Course Contents	Number of Hours
Unit-1 Introduction	Objectives, Importance of vibration analysis, Nature of exciting forces, Basic terminology related to vibration – natural frequency, natural period, resonance etc, Dynamic degree of freedom, Assumption to reduce dynamic DoF, Mathematical modeling of dynamic systems.	03
Unit-2 Single Degree of Freedom System	Free and forced vibration with and without damping, Response to Harmonic Loading, Response to general dynamic loading using Duhamel's integral, Numerical solution of response using Newmark's method & Direct Integration, Concept of response spectrum.	13
Unit-3 Multiple Degree of Freedom System	Equation of motion of symmetrical and un-symmetrical structures in plan, Natural frequencies and mode shapes of vibrating system, Orthogonality of modes, Dynamic response by Modal Superposition Method, Response Spectrum Analysis, Missing mass correction Introduction to multiple degree of freedom system with distributed mass and loading, Generalized Single Degree of Freedom System	20
Unit-4 Special Topics in Structural Dynamics(Concepts only)	Dynamic effects of Wind loading, Moving loads, Vibrations caused by High Speed Traffic, Blasting and Pile driving, Foundations for industrial machinery, Base-isolation.	06

Teaching & Learning Methodology: - Power Point presentation mostly preferred and in some topics chalk & duster is preferable.

Books Recommended:

1. Structural Dynamics and Introduction to Earthquake Engineering, Chopra A. K.
2. Dynamics of Structures, Clough R. W. and Penzien J., Mc Graw Hill
3. Dynamics of Structures, Humar J. L., Prentice Hall
4. Structural Dynamics - Theory and Computation, Paz Mario, CBS Publication
5. Dynamics of Structures, Hart and Wong
6. Vibration of Structures - Application in Civil Engineering Design, Smith J. W., Chapman and Hall

List of Experiments:

1. Study of response of various SDoF systems with variable mass/stiffness (E,I & L)
2. Study of response of MDoF systems though mode shapes
3. Study of response of MDoF structural systems (Model) with vertical irregularity e.g soft storey (stiffness), mass etc
4. Study of response of SDoF / MDoF structural systems (Model) with plan irregularity e,g re-entrant corner, mass etc
5. Study of response of structural systems (Model) during pounding of structures
6. Study the response of above experiments through structural engineering software dealing with dynamic analysis
7. Minimum 15 problems from above topics

Major Equipment:

1. Shake table,
2. Data acquisition System with required sensors to measure response of structural system (Model)
3. Spring Mass Model - SDoF system
4. Mode Shape Model – MDoF System
5. Model of structure with plan irregularities
6. Model of structure with vertical irregularities
7. Model of structures to exhibit pounding
8. Structural engineering software

List of Open Source Software/learning website:

http://nptel.ac.in/
2. http://ocw.mit.edu/courses/civil-and-environmental-engineering/
3. opensees.berkeley.edu/
4. www.nicee.org
5. http://www.earthquakeinfo.org/
6. www.eeri.org/
7. www.earthquakeengineering.com/
8. www.curee.org
9. Non-lin software

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SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

STRUCTURAL DESIGN PROJECT

CODE: 26080203

M.TECH SEM-2

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
0	0	4	4	2	-	20	-	80	100

Objectives: -

The project work aims to develop the work practice in students to apply theoretical and Practical tools and techniques to solve real-life problems of industry. It is also aims to explore alternate structural forms and deriving cost effective solution for any project.

Prerequisites: -

Analysis and Design of Steel and Concrete structures, Concrete Technology

Course outcome: -

On completion of this module, the learner will be able to:

1. Use computational tool for modeling, analyzing & designing structures using relevant codes.
2. Prepare site visit reports.
3. Prepare detailed design report.
4. Prepare structural drawings which may be Good for construction.

Course outline: -

Sr. No.	Course Contents	Number of Hours
Unit-1	The project work has to be a design projects from the following; 1. Multistoried RC or steel structure 2. Industrial Structure 3. Water storage structures 4. Bulk storage structures 5. Concrete Bridges □ The project work is chosen/allotted individually on different topics. □ It is mandatory to design minimum two full projects (from concept to detailed design & drawing) from above topics along with cost estimation. □ Use of computational tools is essential. □ Work of each student shall be supervised by one or more faculty members of the department. The students may do their project work in the parent institute or some structural design organization as per requirement. □ Students are encouraged to take up industry problems in consultation with the respective supervisors. At the end of the term student has to present a report which consists of at least: □ Site visit reports of minimum three site visits, exploring the field aspects for various subjects □ Report must covers Design note, Modeling, Analysis and design with the latest IS codes and preparation of drawing in CAD software. □ For validation, calculation of at least one member in each category should be done manually and compared with software results. Computer results must be checked and compared with conventional methods.	56

Teaching & Learning Methodology: - Power Point presentation mostly preferred and in some topics chalk & duster is preferable.

Books Recommended:

1. Structural Design of Multi-storeyed Buildings, Varyani U. H., 2nd Ed., SouthAsian Publishers,New Delhi.
2. Structural Analysis and Design of Tall Buildings, Taranath B. S., Mc Graw Hill, 1988
3. Advanced Design of Concrete Structures – Krishana Raju N., Tata Mc-Graw Hill, Delhi
4. Design of Multi Storeyed Buildings, Vol. 1 & 2, CPWD Publications.
5. Tall Building Structures, Smith Byran S. and Coull Alex, Wiley India
6. High Rise Building Structures, Wolfgang Schueller, Wiley
7. Tall Building Structures on Elastic Subgrade and Research of Semi-Analytical method by Gong Yaoqing. Beijing: Tsinghua University
8. Tall Chimneys, Manohar S. N., Tata Mc Graw Hill Publishing Company, New Delhi
9. Advanced Reinforced Concrete, Varghese A. V., Prentice Hall of India.
10. Advanced Reinforced Concrete Design, Varghese P. C., Prentice Hall of India, New Delhi.
11. Unified Theory of Concrete Structures, Hsu T. T. C. and Mo Y. L., John Wiley & Sons, 2010.
12. IS Codes : IS:456, IS:875, IS:1893, IS:4326, IS:13920, IS: 3370, IS: 4995 (I & II), SP:16, SP:34, IS:800, IS:226, SP:6(1), SP:6(6)
13. Design of Steel Structures – N. Subrhamanyan, Oxford.
14. Steel Structure -Design and Behaviour, Salmon, C.G., and Johnson, J.E. Harper and Row
15. Design of Steel Structure - Duggal, Tata Mc Graw Hill.
16. Steel Structures, William McGuire, Prentice Hall, Inc., Englewood Cliffs, N.J.1986

List of Experiments/Tutorial:

At least two designs suitably selected from topics of the course. The report shall consist of full analytical treatment, design procedure, references and all necessary drawings in the form of neat dimensioned sketches.

List of Open Source Software/learning website:

1. http://nptel.ac.in/
2. MIT open source material

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SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

ENGLISH FOR RESEARCH PAPER WRITING (AUDIT COURSE)

CODE: 26080101

M.TECH SEM-2

Teaching & Evaluation Scheme: -

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Pr	
2	0	0	2	0	50	0	0	-	50

Course outcomes:

At the end of the course, the student will be able to:

1. Understand that how to improve your writing skills and level of readability
2. Learn about what to write in each section
3. Understand the skills needed when writing a Title
4. Ensure the good quality of paper at very first-time submission

Course outline: -

Sr. No.	Course Contents	Number of Hours
Unit-1	Planning and Preparation, Word Order, Breaking up long sentences, Structuring Paragraphs and Sentences, Being Concise and Removing Redundancy, Avoiding Ambiguity and Vagueness	04
Unit-2	Clarifying Who Did What, Highlighting Your Findings, Hedging and Criticizing, Paraphrasing and Plagiarism, Sections of a Paper, Abstracts. Introduction	04
Unit-3	Review of the Literature, Methods, Results, Discussion, Conclusions, The Final Check	04
Unit-4	Key skills are needed when writing a Title, key skills are needed when writing an Abstract, key skills are needed when writing an Introduction, skills needed when writing a	04

	Review of the Literature	
Unit-5	Skills are needed when writing the Methods, skills needed when writing the Results, skills are needed when writing the Discussion, skills are needed when writing the Conclusions	04
Unit-6	Useful phrases, how to ensure paper is as good as it could possibly be the first- time submission	04

Teaching & Learning Methodology: - Power Point presentation mostly preferred and in some topics chalk & duster is preferable.

Books Recommended:

1. Goldbort R (2006) Writing for Science, Yale University Press (available on Google Books)
2. Day R (2006) How to Write and Publish a Scientific Paper, Cambridge University Press
3. Highman N (1998), Handbook of Writing for the Mathematical Sciences, SIAM. Highman'sbook
4. Adrian Wallwork , English for Writing Research Papers, Springer New York Dordrecht Heidelberg London, 2011

Prof. Mami Prajapati

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SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

DESIGN OF FORMWORK

CODE: 26080204

M.TECH SEM-2

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	50	70	-	150

Objectives: -

To study the temporary structures that contractors have to build in order to construct the primary structure. This includes form work, scaffolding, support excavation systems, and equipment for hoisting materials, personnel, and erecting structures.

Prerequisites: -

Building Construction, Design of Structures

Course outcome: -

On completion of this module, the learner will be able to:

1. Design decking, form work and false work.
2. Apply the sequence of construction of civil Engineering structures
3. Apply the safety norms involved in the design of form work and false work
4. Use of right material for manufacturing false work and form work suiting specific requirements.

Course outline: -

Sr. No.	Course Contents	Number of Hours
Unit-1 Introduction	Formwork and false work, Temporary work systems, Construction planning and site constraints, Materials and construction of the common formwork and false work systems, Special and proprietary forms.	09
Unit-2 Formwork Design	Concrete pressure on forms, Design of timber and steel forms, Loading and moment of form work.	09
Unit-3 Design of Decks and False works	Types of beam, decking and column formwork, Design of decking, False work design, Effects of wind load, Foundation and soil on false work design	09
Unit-4 Special Forms	The use and applications of special forms	06
Unit-5 Formwork Failures	Causes and Case studies in Formwork Failure, Formwork Issues in Multi-Story Building Construction	05
Unit-6 Construction Sequence and Safety in use of Formwork	Sequence of construction, Safety use of formwork and false work.	04

Teaching & Learning Methodology: - Power Point presentation mostly preferred and in some topics chalk & duster is preferable.

Books Recommended:

1. Formwork for Concrete Structures, First Edition, McGraw Hill -2012, Kumar Neeraj Jha.
2. Formwork for Concrete Structures, McGraw- Hill, 2006, Robert L. Peurifoy and Garold D. Oberlender.
3. Formwork for concrete structures, McGraw Hill – 2011, Peurifoy, R.L. and Oberlender,G.D.
4. Technical Monograph for Formwork,2002, Indian Concrete Institute.
5. IS 14687: 1999, False work for Concrete Structures Guidelines, BIS.

List of Open Source Software/learning website:

http://nptel.ac.in/

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SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

DESIGN OF HIGH RISE STRUCTURES

CODE: 26080205

M.TECH SEM-2

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	50	70	-	150

Objectives: -

Due to urbanization and lack of land, it has become inevitable to construct high rise structures. This subject will make the students aware about the various structural systems for high rise structures and the suitability of each towards various varying parameters. Advanced method of analysis of such structures and modelling these structures in various software's with the pros and cons will be dealt in detail.

Prerequisites: -

Elementary design of steel and concrete structures and Concrete Technology

Course outcome: -

On completion of this module, the learner will be able to:

1. Analyze, design and detail Tall structures under different loading conditions by static and dynamic method of analysis.
2. Use of computational software for analysis and design of high rise structures.
3. Apply codal provisions for tall structures.
4. Choose & apply appropriate structural systems for different size & height of structure
5. Develop design basis report

Course outline: -

Sr. No.	Course Contents	Number of Hours
Unit-1 Design of transmission/ TV tower, Mast and trestles	Configuration, bracing system, analysis and design for vertical transverse and longitudinal loads.	08
Unit-2 Analysis and Design of RC and Steel Chimney	Analysis and Design of RC and Steel Chimney, Foundation design for varied soil strata.	08
Unit-3 Tall Buildings	**Introduction:** Why Tall Buildings, Factors affecting growth, Height and structural form. Design philosophy **Design Criteria:** Codal provisions for Loading, Sequential loading, Strength and Stability, Stiffness and drift limitations, Human Comfort criteria, Creep, Shrinkage and temperature effects, Fire. Foundation settlement and soil structure interaction. **Loading On Tall Structures :** a. Gravity loading:-Methods of live load reduction, Impact gravity loading, Construction loading. b. Wind loading: - Static loading, Dynamic loading. c. Earthquake loading:-Equivalent lateral force procedure, Modal analysis procedure. d. Combination of loading:-Working stress design, Limit Sate design; **Structural Form:** Braced frame structures, Rigid Frame structures, In filled-Frame structures, Flat plate- Flat slab structures, Shear wall structures, Wall frame structures, Framed tube structures, Suspended structures	08
Unit-4 Application of software in analysis and design	**Approaches to analysis:**-Preliminary analyses, Intermediate and final analysis, **Assumptions:-** Materials, Participating components, Floor slabs, Negligible stiffness, Negligible deformations, Cracking, High-Rise Behavior, **Modeling for Approximate analyses:-** Approximate Representation Bents, Approximate modeling of slabs, Modeling for continuum analyses, **Modeling for Accurate analyses:**-Plane frames, Plane shear walls, Three dimensional frame and wall structures, P-Delta effects, The assembled model; **Braced Frames:** Types of bracings, Behavior of bracings, Behavior of bracing bents, **Methods of analysis:**-member force analysis, Drift analysis, Worked example for calculating drift by approximate methods, use large scale bracing	08

Unit-5 Dynamic Analysis	**Dynamic Response to Wind Loading:-** Sensivity of structures wind forces, Dynamic structural response due to wind forces, Along wind response, Cross wind response, worked examples, **Dynamic response to Earthquake motions:-**Response of Tall buildings to ground accelerations, response spectrum analysis, Empirical relations for fundamental natural frequency, Structural damping ratios **Comfort criteria:** Human perception of building motion, Perception thresholds, Use of comfort criteria in design	10

Teaching & Learning Methodology: - Power Point presentation mostly preferred and in some topics chalk & duster is preferable.

Books Recommended:

1. Structural Design of Multi-storeyed Buildings, Varyani U. H., 2nd Ed., SouthAsian Publishers,New Delhi.
2.Structural Analysis and Design of Tall Buildings, Taranath B. S., Mc Graw Hill, 1988
3. Advanced Design of Concrete Structures – Krishana Raju N., Tata Mc-Graw Hill, Delhi
4. Design of Multi Storeyed Buildings, Vol. 1 & 2, CPWD Publications.
5. Tall Building Structures, Smith Byran S. and Coull Alex, Wiley India
6. High Rise Building Structures, Wolfgang Schueller, Wiley
7. Tall Building Structures on Elastic Subgrade and Research of Semi-Analytical method by Gong Yaoqing. Beijing: Tsinghua University
8. Tall Chimneys, Manohar S. N., Tata Mc Graw Hill Publishing Company, New Delhi
9. Advanced Reinforced Concrete, Varghese A. V., Prentice Hall of India.
10. Advanced Reinforced Concrete Design, Varghese P. C., Prentice Hall of India, New Delhi.
11. Unified Theory of Concrete Structures, Hsu T. T. C. and Mo Y. L., John Wiley & Sons, 2010.
12. IS Codes : IS:456, IS:875, IS:1893, IS:4326, IS:13920, IS: 3370, IS: 4995 (I & II), SP:16, SP:34.

List of Experiments/Tutorials:

At least two designs suitably selected from topics of the course. The report shall consist of full analytical treatment, design procedure, references and all necessary drawings in the form of neat dimensioned sketches.

List of Open Source Software/learning website:

http://nptel.ac.in/

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SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

DESIGN OF MASONRY STRUCTURES

CODE: 26080206

M.TECH SEM-2

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	50	70	-	150

Objectives: -

Masonry structure is one of the low cost structural form for low rise buildings up to G+3 storey and it is one of the major structural form used in rural India and to some extent in urban part too. Hence this subject will help in developing understanding of use of masonry in terms of materials, mechanical properties, behaviors under different types of loads, analysis & design methodology, testing, construction practices etc. for safe, stable and durable structure.

Prerequisites: -

Building Construction, Elementary Structural Design.

Course outcome: -

On completion of this module, the learner will be able to:

1. Distinguish from a wide range of materials for their suitability to arrive at feasible and optimal solutions for masonry constructions.
2. Apply knowledge of structural masonry for advanced research and construction procedures.
3. Justify the design of masonry buildings for sustainable development.
4. Check the stability of walls.

Course outline: -

Sr. No.	Course Contents	Number of Hours
Unit-1 Introduction	Historical Perspective, Masonry Materials, Masonry Design Approaches, Overview of Load Conditions, Compression Behavior of Masonry, Masonry Wall Configurations, Distribution of Lateral Forces.	06
Unit-2 Characteristics of masonry constituents	Types of masonry units such as stone, bricks, concrete blocks, clay blocks and stabilized mud blocks. Properties of masonry units like strength, modulus of elasticity and water absorption. Masonry mortars – Classification and properties of mortars, selection of mortars.	08
Unit-3 Strength of Masonry in Compression	Behavior of Masonry under compression, strength and elastic properties, factors influencing the compressive strength masonry, Effects of slenderness and eccentricity, water absorption, curing, ageing and workmanship on compressive strength. Prediction of strength of masonry in Indian context.	08
Unit-4 Shear and Flexure Behavior of Masonry	Bond between masonry unit and mortar, test methods for determining flexural and shear bond strengths, test procedures for evaluating flexural and shear strength, factors affecting bond strength, effect of bond strength on compressive strength, flexure and shear strength of masonry. Flexural strength of reinforced masonry members: In plane and Out-of-plane loading. Concept of Earthquake resistant masonry buildings.	10
Unit-5 Design of load bearing masonry buildings	Concept of basic compressive stress, Permissible compressive stress, reduction factors. Increase in permissible stresses for eccentric vertical and lateral loads, permissible tensile and shear stresses, Effective height of walls and columns, opening in walls, effective length, effective thickness, slenderness ratio, eccentricity, load dispersion, arching action, lintels; Wall carrying axial load, eccentric load with different eccentricity ratios, wall with openings, freestanding wall; Design of load bearing masonry for buildings up to 3 storeys using BIS codal provisions.	10

Teaching & Learning Methodology: - Power Point presentation mostly preferred and in some topics chalk & duster is preferable.

List of Experiments:

Designed & detailed at least one full load bearing masonry building. The report shall consist of full analytical treatment, design procedure, references and all necessary drawings in the form of neat dimensioned sketches.

List of Open Source Software/learning website:

http://nptel.ac.in/

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SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

STRUCTURAL HEALTH MONITORING AND RETROFITTING OF STRUCTURES

CODE: 26080207

M.TECH SEM-2

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	50	70	-	150

Objectives: -

Recent structural failures and the increased deterioration of the civil infrastructure, calls for the technology that can help to preserve structural integrity thereby assuring the public safety. Structural Health Monitoring (SHM) is one such technology that helps to assess the in-service performance of the structures located in earthquake zones or remote areas, using a variety of measurement techniques. SHM plays a predominant role in catering to the need of monitoring of innovative designs and materials & better management of existing structures. The proper diagnosis through SHM helps to suggest the most appropriate retrofitting techniques to localize damages at their first occurrence.

Prerequisites: -

Concrete technology, Analysis & Design of reinforced concrete structures, Repairs & rehabilitation of structures

Course outcome: -

On completion of this module, the learner will be able to:

1. Diagnose the distress and the cause of distress in the structure.
2. Detect the changes in the characteristics of the structure
3. Assess the remaining performance capacity
4. Choose & apply the appropriate repair and retrofitting techniques for damaged structures.

Course outline: -

Sr. No.	Course Contents	Number of Hours
Unit-1 Structural Assessment& Need for retrofitting	Introduction to health assessment of structures, structural damages & failures, Principles of structural assessment, Classification & levels of assessment, Current scenario of infrastructure through case studies	08
Unit-2 Introduction to SHM	Introduction to global infrastructure crisis, Definition & Motivation for SHM, SHM versus Non-destructive evaluation, Concept of smart materials & smart structures with SHM,SHM & biomimetics, System components & categories of SHM, Classification of SHM systems, Methodologies and monitoring principles, Local & global Techniques for SHM, Advantages of SHM	12
Unit-3 Monitoring techniques of SHM:	Static field testing: Behavior tests, Diagnostic tests, Proof tests, Sensors & sensing technology for Structural monitoring, Structural responses Dynamic Field Testing: Stress history tests, Ambient vibration tests, Dynamic Load Allowance tests, Pull back (anchored cable tests) Periodic Monitoring: Field testing, tests to determine changes in structure Continuous monitoring: Active & Passive Monitoring	12
Unit-4 Concept of repair & retrofitting of structures	Case studies of structural & foundation failure, performance problems, responsibility & accountability, causes of distress in structural members, design and material deficiencies, factors causing extensive deterioration. Retrofitting of structures: Fundamental of retrofitting, Flow of retrofitting process, Methods of retrofitting, Materials for retrofitting(conventional and smart materials), selection of retrofitting methods	10

Teaching & Learning Methodology: - Power Point presentation mostly preferred and in some topics chalk & duster is preferable.

Books Recommended:

1. Structural Health Monitoring, Daniel Balageas, Peter Fritzen, Alfredo Guemes, John Wiley & Sons, 2006.
2. Health Monitoring of Structural Materials and Components_Methods with Applications, Douglas E Adams, John Wiley and Sons, 2007.
3. Structural Health Monitoring and Intelligent Infrastructure, Vol1, J. P. Ou, H. Li and Z. D. Duan, Taylor and Francis Group, London, UK, 2006.
4. Structural Health Monitoring with Wafer Active Sensors, Victor Giurglutiu, Academic Press Inc, 2007.

List of Experiments:

1. To determine change in dynamic response of material due to damage : Steel
2. To determine change in dynamic response of material due to damage : Concrete
3. Damage detection using Acoustics/Ultrasonic wave propagation
4. Mapping of reinforcement details of given reinforced concrete element
5. Comparison of core test with destructive testing
6. Testing of rehabilitated beam – Flexure
7. Testing of rehabilitated beam – Shear
8. Testing of rehabilitated column

Major Equipment:

1. Vibration analyzer with sensors
2. Concrete Core cutter
3. Cover meter and rebar locator
4. USPV tester
5. Acoustic tester
6. Reinforced member casting facility
7. Load frame for testing elements

List of Open Source Software/learning website:

1. https://research.csiro.au/data61/structural-health-monitoring
2. https://beanair.com/conditioning-monitoring-system.html
3. https://www.hindawi.com/journals/ace/2010/724962/
4. https://www.ndt.net/events/NDTCanada2014/app/content/Slides/40_Tamutus.pdf
5. https://cpwd.gov.in/Units/FinalDraftHandbook_Apr2007.pdf

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SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

DESIGN OF BRIDGE STRUCTRES

CODE: 26080208

M.TECH SEM-2

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	50	70	-	150

Objectives: -

Bridge is an important infrastructure facility required for the passage of railways, road ways, and footpaths and even for carriage of fluids. Further, the constant increase in traffic loads associated with the economic growth in modern societies imparts large demands to build such structures. Therefore, the study of analysis and design of bridges is essential for the structural engineering students.

Prerequisites: -

Design of Structures

Course outcome: -

On completion of this module, the learner will be able to:

1. Analyze and design small to medium span of reinforced concrete slab culverts, T beam bridges as per IRC specifications,
2. 2Apply design principles of pre-stressed concrete T beam bridges, box girder bridges, balanced cantilever bridges.
3. Use of computational software for analysis & design of bridges
4. Choose & apply appropriate structural form for different span of bridges
5. Develop design basis report

Course outline: -

Sr. No.	Course Contents	Number of Hours
Unit-1	Components of bridges and Classification of Bridges, Investigations and planning, Choice of type of bridges	05
Unit-2	I.R.C. and other international specifications on live loads for road bridges, Various forces acting on bridges, Load distribution theories: Courbon's Method, Hendry Jaeger Method, Grillage analogy, Pigeaud's curves	07
Unit-3	Superstructure: General design considerations, Analysis and design of reinforced concrete slab culverts, Tee beam and slab bridges, Design of prestressed concrete T beam bridges, Box girder bridges, Balanced cantilever bridges	15
Unit-4	Substructure : Various parts of substructures, Various types of substructures, Loads acting on substructures, Design of pier and pier cap, Design of different types of foundation – Open, pile & well foundation	15
Unit-5	New era methodology/technology for design and construction of bridges, Seismic resistant design provisions, load test on bridges	03

Teaching & Learning Methodology: - Power Point presentation mostly preferred and in some topics chalk & duster is preferable.

Books Recommended:

1. Krishnaraju, N., "Design of Bridges" Oxford and IBH Publishing Co., Bombay, Calcutta, New Delhi, 1988
2. Ponnuswamy, S., "Bridge Engineering", Tata McGraw Hill, 1989
3. Taylor, F.W., Thomson, S.E., and Smulski E., "Reinforced Concrete Bridges", John Wiley and Sons, New York
4. Raina V.K. "Concrete Bridge Practice", Tata McGraw Hill Publishing Company, New Delhi, 1991.
5. M.J. Ryall, G.A.R Parke, J.E. Harding, "The Manual of Bridge Engineering", Thomas Telford Publishers.
6. R. Rajagopalan, "Bridge Superstructure", Tata McGraw- Hills Publishing Company Limited
7. Chen Wai-Fah, Duan Lian, Bridge Engineering Handbook - Fundamentals, CRC Press.
8. Chen Wai-Fah, Duan Lian, Bridge Engineering Handbook - Superstructure Design,CRC Press.
9. Chen Wai-Fah, Duan Lian, Bridge Engineering Handbook - Construction & Maintenance, CRC Press.
10. Chen Wai-Fah, Duan Lian, Bridge Engineering Handbook - Seismic Design, CRC Press.
11. Chung C. Fu, Wang Shuqing, Computational Analysis & Design of Bridge Structures, CRC Press.
12. IRC: 5, 6, 78, 112-2011

List of Experiments:

Analysis and design of at least one full design of RC bridge and one superstructure of PSC bridge with computation analysis & design, references and all necessary drawings in the form of neat dimensioned sketches

List of Open Source Software/learning website:

1. http://nptel.ac.in/

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SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

SOIL STRUCTURE INTERACTION

CODE: 26080209

M.TECH SEM-2

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	50	70	-	150

Objectives: -

To retain earth in an engineered way as per requirement and to determine soil response both under static and dynamic loadings is one of the major tasks for structural engineers. As soil is heterogeneous material, it is very difficult to retain it under different situation. Many theories are available to analyze and design such structures. To deal with any type foundation and earth retaining structure, the knowledge of its behavior on field is very important to take proper engineering decisions in practical situations

Prerequisites: -

Basic Structural Engineering, Soil Mechanics, Foundation Engineering

Course outcome: -

On completion of this module, the learner will be able to:

1. Apply various theories applicable to SSI and will have capacity to idealize soil response in order to analyze and design rigid and flexible foundation elements subjected to different loadings.
2. Calculate Contact pressure and settlement under shallow foundations, mat foundation, pile-raft foundation, settlement computation from constitutive laws.
3. Analyise retaining structures through various analytical and graphical approaches, and design supporting structures for excavations
4. Analyse sub-structural and super-structural element using various SSI tools based on hybrid models, discrete models and FEM approach and elastic theory approach.
5. Analyise vertical piles, laterally loaded piles and pile-raft system and foundations subjected to dynamic forces/seismic forces.

Course outline: -

Sr. No.	Course Contents	Number of Hours
Unit-1 Introduction to SSI	Introduction to SSI, Importance of SSI, Applications and Examples of SSI for geotechnical engineer, Effect of structure roughness / smoothness on soil behaviour.	03
Unit-2 SSI problems	General soil-structure interaction problems- Shallow foundation, Sheet piles, Mat/Raft foundation, pile raft foundation, etc., Contact pressure and soil-structure interaction for shallow foundation, Fixed/ Flexible base, Differential foundation settlement for high rise buildings, Pressure settlement prediction from constitutive laws.	11
Unit-3 SSI Models	Elastic continuum, Winkler's model, Multi parameter models, Hybrid models, Codal provisions, discrete models and finite element models	07
Unit-4 Seismic Soil-Structure Interaction	Dynamic response of soil, strain-compatibility, and damping characteristics of soil-structure. Machine foundation - soil interaction, Shake-table tests, SSI in time domain (dynamic stiffness and Green's functions).	08
Unit-5 Soil-Pile Behaviour	Introduction, axial and laterally loaded piles, load-displacement behaviour, Modified Ramberg Osgood Model, pile group, interaction effect in pile group, soil-pile modelling in FEM, Elastic continuum and elasto-plasticanalysis of piles and pile groups. Non-linear load-deflection response, Pile-raft system	08
Unit-6 SSI in Retaining Structures	Curved failure surfaces, their utility and analytical / graphical predictions from Mohr – Coulomb envelope and circle of stress, Earth pressure computations by friction circle method, Earth pressure on wall with limited / restrained deformations, Earth pressure on sheet piles, braced excavations, Design of supporting system for excavations.	05

Teaching & Learning Methodology: - Power Point presentation mostly preferred and in some topics chalk & duster is preferable.

Books Recommended:

1. Bowels, J.E., "Analytical and Computer methods in Foundation" McGraw Hill Book Co., New York.
2. Desai C.S. and Christian J.T., "Numerical Methods in Geotechnical Engineering" McGraw Hill Book Co. New York.
3. Soil Structure Interaction, the real behaviour of structures, Institution of Structural Engineers, 1989.
4. Elastic Analysis of Soil Foundation Interaction, Developments in Geotechnical Engg.vol-17, Elsevier Scientific Publishing Co.
5. Kameswara Rao, N.S.V., "Dynamics soil tests and applications", Wheeler Publishing, New Delhi, 2000
6. Selvadurai, A.P.S., "Elastic Analysis of Soil Foundation Interaction", Elsevier 1979
7. Hemsley, J.A, "Elastic Analysis of Raft Foundations", Thomas Telford, 1998
8. ACI 336. (1988), Suggested Analysis and Design Procedures for combined footings and Mats, American Concrete Institute, 1988.

List of Experiments/Tutorial:

Tutorial work shall consist of presentations / problems / preparation of learning material based on above topics. Apart from above assignments a group of students has to undertake one open ended design problem based on engineering application.

List of Open Source Software/learning website:

1. http://nptel.ac.in/
2. MIT open source material

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SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

INDUSTRIAL SAFETY

CODE: 26080301

M.TECH SEM-3

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	-	100

Objectives:

Safety is major issue in any industry; awareness about safety helps students from any major accidents, Different rules regulation of safety helps students apply it in industry for performance and productivity improvements. Knowledge of Maintenance, its type and application give better work environments and helps industry from major shutdown. Different maintenance tools and techniques for different situation and industry equipment's help students to apply it in real life industry problems.

Course outcomes:

At the end of the course, the student will be able to:

1. Understand Importance of Safety and Important related Acts.
2. Apply Maintenance techniques as per requirements and able to compare for with different technique for better performance.
3. Understand wear and corrosion, its causes and remedial actions for preventions.
4. Demonstrate fault tracing, its methods and application.

Course outline: -

Sr. No.	Course Contents	Number of Hours
Unit-1 Industrial safety	**Industrial safety:** Accident, causes, types, results and control, mechanical and electrical hazards. types, causes and preventive steps/procedure, describe salient points of factories act 1948 for health and safety, wash rooms, drinking water layouts, light, cleanliness, fire, guarding, pressure vessels, etc., Safety color codes. Fire prevention and firefighting, equipment and methods.	08

Unit-2 Fundamentals of maintenance engineering	**Fundamentals of maintenance engineering:** Definition and aim of maintenance engineering, Primary and secondary functions and responsibility of maintenance department, Types of maintenance, Types and applications of tools used for maintenance, Maintenance cost & its relation with replacement economy, Service life of equipment	08
Unit-3 Wear and Corrosion and their prevention	**Wear and Corrosion and their prevention:** Wear-types, causes, effects, wear reduction methods, lubricants-types and applications, Lubrication methods, general sketch, working and applications, i. Screw down grease cup, ii. Pressure grease gun, iii. Splash lubrication, iv. Gravity lubrication, v. Wick feed lubrication vi. Side feed lubrication, vii. Ring lubrication, Definition principle and factors affecting the corrosion. Types of corrosion, corrosion prevention methods	10
Unit-4 Fault tracing	**Fault tracing:** Fault tracing-concept and importance, decision tree concept, need and applications, sequence of fault-finding activities, show as decision tree, draw decision tree for problems in machine tools, hydraulic, pneumatic, automotive, thermal and electrical equipment's like, I. Any one machine tool, ii. Pump iii. Air compressor, iv. Internal combustion engine, v. Boiler, vi. Electrical motors, Types of faults in machine tools and their general causes	09
Unit-5 Periodic and preventive maintenance	**Periodic and preventive maintenance:** Periodic inspection-concept and need, degreasing, cleaning and repairing schemes, overhauling of mechanical components, overhauling of electrical motor, common troubles and remedies of electric motor, repair complexities and its use, definition, need, steps and advantages of preventive maintenance. Steps/procedure for periodic and preventive maintenance of: I. Machine tools, ii. Pumps, iii. Air compressors, iv. Diesel generating (DG) sets, Program and schedule of preventive maintenance of mechanical and electrical equipment, advantages of preventive maintenance. Repair cycle concept and importance	10

Teaching & Learning Methodology: - Power Point presentation mostly preferred and, in some topics chalk & duster is preferable.

Books Recommended:

1. Maintenance Engineering Handbook, Higgins & Morrow, Da Information Services
2. Maintenance Engineering, H. P. Garg, S. Chand and Company
3. Pump-hydraulic Compressors, Audels, Mcgrew Hill Publication
4. Foundation Engineering Handbook, Winterkorn, Hans, Chapman & Hall London

Prof. Mauni Prajapati

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SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

OPERATION RESEARCH

CODE: 26080302

M.TECH SEM-3

Teaching & Evaluation Scheme: -

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		
Th	Tu	P	Total		Th	Pr	Th	Pr	Total
3	0	0	3	3	30	0	70	-	100

Objectives:

Operation research techniques are useful for solving real life Industrial problem, Problems can be of Manufacturing, Service and supply related. Different techniques help for optimization of linear as well as non - linear type problem.

Course outcomes:

At the end of the course, the student will be able to:

1. Students should able to apply the Liner programming techniques to solve problems of real-life applications and carry out post optimality analysis.
2. Students should able to apply the concepts of non-linear programming and apply them for real life problems.
3. Students should able to obtain quantitative solutions in business decision making under conditions of certainty, risk and uncertainty.
4. Students should able to implement various scientific tools and models that are available in the subject to take decisions in a complex environment.

Course outline: -

Sr. No.	Course Contents	Number of Hours
Unit-1 Linear Programming Problems	**Linear Programming Problems:** Formulation of a LPP, - graphical solution, simplex method, duality in LPP, sensitivity analysis, Integer linear programming, revised simplex method, parametric linear programming, Dynamic programming under certainty, Dynamic programming approach for solving LPP.	12

Unit-2 Project Management, Inventory Control and Decision Making	**Project Management, Inventory Control and Decision Making:** CPM, PERT, Project time cost trade off, Resource allocation, Deterministic inventory control models, Probabilistic inventory control models, Decision making process, Decision making under uncertainty, Decision making under risk, Decision tree analysis, Theory of games, Pure strategies, Mix strategies, Solutions method games without saddle points.	10
Unit-3 Classical Optimization Methods	**Classical Optimization Methods:** Single variable optimization, Constrained and unconstrained multi-variable optimization, Direct substitution method, Lagrange's method of multipliers, Kuhn-Tucker conditions.	06
Unit-4 Non-linear Programming	**Non-linear Programming:** **Constrained Optimization Techniques:** Unimodal function, Unrestricted search, Exhaustive search, Dichotomous search, Interval halving method, Fibonacci method, Golden section method **Unconstrained Optimization Techniques:** Direct Search Methods: Random search methods, Grid search method, Univariate method. **Constrained Optimization Techniques:** Direct Methods: Random search method, Sequential linear programming	10
Unit-5 Evolutionary Algorithms	**Evolutionary Algorithms:** An overview of evolutionary algorithms, Simulated annealing algorithm, Genetic algorithm, Particle swarm optimization	04

Teaching & Learning Methodology: - Power Point presentation mostly preferred and in some topics chalk & duster is preferable.

Books Recommended:

1. J. K. Sharma, Operation Research, Theory and Application, Macmillan Publishers India Ltd,2013
2. H.A. Taha, Operations Research, An Introduction, PHI, 2008
3. S.S.Rao, Engineering Optimization Theory and Practice, New Age International (P) Ltd, Publishers.
4. H.M. Wagner, Principles of Operations Research, PHI, Delhi, 1982
5. Pannerselvam, Operations Research: Prentice Hall of India 2010
6. Harvey M Wagner, Principles of Operations Research: Prentice Hall of India 2010

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SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

COMPOSITE MATERIALS

CODE: 26080303

M.TECH SEM-3

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	-	100

Course outline: -

Sr. No.	Course Contents	Number of Hours
Unit-1 Introduction	Definition – Classification and characteristics of Composite materials. Advantages and application of composites. Functional requirements of reinforcement and matrix. Effect of reinforcement (size, shape, distribution, volume fraction) on overall composite Performance.	04
Unit-2 Reinforcements	Preparation-layup, curing, properties and applications of glass fibers, carbon fibers, Kevlar fibers and Boron fibers. Properties and applications of whiskers, particle Reinforcements. Mechanical Behavior of composites: Rule of mixtures, Inverse rule of mixtures. Isostrain and Isostress conditions.	04
Unit-3 Manufacturing of Metal Matrix Composites	Casting – Solid State diffusion technique, Cladding – Hot isostatic pressing. Properties and applications. Manufacturing of Ceramic Matrix Composites: Liquid Metal Infiltration – Liquid phase sintering. Manufacturing of Carbon – Carbon Composites: Knitting, Braiding, Weaving. Properties and applications.	05

Unit-4 Manufacturing of Polymer Matrix Composites	Preparation of Moulding compounds and prepregs – hand layup method – Autoclave method – Filament winding method – Compression moulding – Reaction injection moulding. Properties and applications.	05
Unit-5 Strength	Laminar Failure Criteria-strength ratio, maximum stress criteria, maximum strain criteria, interacting failure criteria, hygrothermal failure. Laminate first play failure-insight strength; Laminate strength-ply discount truncated maximum strain criterion; strength design using caplet plots; stress concentrations.	06

Teaching & Learning Methodology:

Power Point presentation mostly preferred and in some topics chalk & duster is preferable

Books Recommended:

1. Hand Book of Composite Materials-ed-Lubin.
2. Composite Materials – K.K.Chawla.
3. Composite Materials Science and Applications – Deborah D.L. Chung.
4. Composite Materials Design and Applications – Danial Gay, Suong V. Hoa, and Stephen W. Tasi.
5. Material Science and Technology – Vol 13 – Composites by R.W.Cahn – VCH, West Germany.
6. Materials Science and Engineering, An introduction. WD Callister, Jr., Adapted by R.Balasubramaniam, John Wiley & Sons, NY, Indian edition, 2007.

List of Open-Source Software/learning website:

1. NPTEL lecture series

Dr. M.N. Patel

Prof. Mansi Prajapati

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

DESIGN OF PRESTRESSED CONCRETE STRUCTURES

CODE: 26080304

M.TECH SEM-3

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	-	100

Objectives:

Prestressed concrete is one of the most reliable, durable and widely used construction materials in building and bridge projects around the world. It has made significant contributions to the construction industry, the precast manufacturing industry and the cement industry as a whole. It has led to an enormous array of structural applications, including buildings, bridges, foundations, parking garages, water towers, nuclear reactors, TV towers and offshore drilling platforms due to its distinct advantages. This subject covers basic principles and in-depth knowledge of designing prestressed concrete structures.

Prerequisite:

Mechanics of Solids and Design of Reinforced Concrete Structures and Concrete Technology

Course outcomes:

At the end of the course, the student will be able to:

1. Apply principle of prestressing, determination of losses, deflections and cable profile.
2. Analyze and design pre-tensioned and post-tensioned prestressed concrete beam with limit state design method.
3. Apply principles of prestressing to slab, column, beam-column, pipes & cylindrical water tank.
4. Apply prestressing techniques to composite structures like Prestressed concrete beam over cast-in-situ slab.
5. Apply design principles of partial prestressing, prestressing of few special structures like folded plates, cylindrical shell and poles.

Course outline: -

Sr. No.	Course Contents	Number of Hours
Unit-1 Introduction	**Introduction:** Principles of prestressing - types and systems of prestressing, need for High Strength materials, Loading stages, Determination of losses, deflection (short-long term), camber, cable layouts.	05
Unit-2 Statically determinate PSC beams	**Statically determinate PSC beams:** Analysis and design for ultimate and serviceability limit states for flexure, shear, bond and torsion, code provisions.	06
Unit-3 Transmission of prestress	**Transmission of prestress:** Prestress Transmission in pre-tensioned members; Anchorage zone stresses and design for post-tensioned members.	05
Unit-4 Statically indeterminate structures	**Statically indeterminate structures:** Analysis and design of continuous beams, choice of cable profile, linear transformation and concordance.	06
Unit-5 Design of structural elements	**Design of structural elements:** Analysis and design of various structural elements like slab, column, beam-column. Application in the design of prestressed pipes and prestressed concrete cylindrical water tanks.	10
Unit-6 Composite construction	**Composite construction:** Analysis and design of precast PSC beams and cast in-situ RC slab, creep and shrinkage effects. Partial prestressing - principles, analysis and design concepts, crack width calculations.	06

Teaching & Learning Methodology: - Power Point presentation mostly preferred and in some topics chalk & duster is preferable.

List of Experiments/Tutorials:

At least two designs suitably selected from topics and small design examples from each topic of the course. The report shall consist of full analytical treatment, design procedure, references and all necessary drawings in the form of neat dimensioned sketches.

Books Recommended:

1. Prestressed concrete - Krishna Raju
2. Design of Prestressed Concrete Structures - T.Y.Lin
3. Fundamentals of Prestressed Concrete - N.C.Sinha & S.K.Roy S.Chand & Co.,
4. Prestressed Concrete- Design and Construction – Leonhardt F., Wilhelm Ernst and Shon, Berlin
5. Prestressed Concrete - Freyssinet
6. Prestressed Concrete, - Evans, R.H. and Bennett, E.W., Chapman and Hall
7. Prestressed concrete - Rajgopalan
8. IS:1343-Code for Practice for Prestressed Concrete.
9. IS:3370-3: Code of Practice Concrete structures for the storage of liquids, Part 3: Prestressed concrete structures

Prof. Mansi Bajapati

Dr. M. N. Patel

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

EARTHQUAKE RESISTANT DESIGN OF STRUCTURES

CODE: 26080305

M.TECH SEM-3

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	-	100

Prerequisite:

Design of concrete structures, Structural Dynamics and Engineering Mathematics

Objectives:

Earthquake force is time-dependent force acting on the structure and thereby it induces vibration in the structures. Structures are designed as earthquake resistant structures which allow damage in the structures. Therefore, it is very challenging to design structures which remain safe during earthquake disaster. ERD of Structures becomes very important for the structural engineers to make them safe.

Course outcomes:

At the end of the course, the student will be able to:

1. Apply the concept of Earthquake Resistant Design & appraise the effect of structural & architectural irregularities of buildings.
2. Determine the lateral loads on SDOF & MDOF structural system subjected to earthquake.
3. Analyze RCC framed structures through Equivalent static force method - Response spectrum method for determining the lateral forces generated due to earthquake. Design & detailing of Multi-storey RC building using the available software.
4. Appraise the concepts of ductile detailing for various structural elements in RC structures.
5. Classify & describe various control systems & apply to framed structures.

Course outline: -

Sr. No.	Course Contents	Number of Hours
Unit-1 Earthquake Ground Motion	**Earthquake Ground Motion:** Engineering Seismology-Causes of earthquakes; seismic waves; magnitude, intensity and energy release, Seismic zoning map of India - Strong motion studies in India - Strong motion characteristics - Evaluation of seismic design parameters.	03
Unit-2 Concepts of earthquake resistant design & Effects of Irregularities in RC Structures	**Concepts of earthquake resistant design & Effects of Irregularities in RC Structures:** Earthquake Resistant Design Philosophy, Earthquake Proof v/s Earthquake Resistant Design, four virtues of good earthquake resistant structures (strength, stiffness, ductility and configuration), Earthquake resistant building architecture. Effect of various structural irregularities like improper Load Transfer Path, Floating Columns, Short Column, Soft Storey, Improper gap between adjacent structures (Pounding), Eccentric loading, Unsymmetrical plan/elevation, Setbacks and Improper Detailing of reinforcement on performance of RCC buildings during earthquakes, Effect of Masonry Infill Walls, Performance of buildings in past earthquakes, Identification of seismic damages & Lessons learnt from past earthquakes.	06
Unit-3 Lateral Load Distribution, Seismic analysis and modeling of RCC structures	**Lateral Load Distribution, Seismic analysis and modeling of RCC structures:** Rigid diaphragm effect, centers of mass and stiffness, lateral load distribution in torsionally coupled and uncoupled system. Lateral load resisting systems- moment resisting frame, building with shear wall system, building with dual system; Code based procedure for determination of design lateral loads - Seismic analysis procedure as per IS 1893 code - Equivalent static force method - Response spectrum method - Time history analysis - Advantages and disadvantages of these methods, Estimation of earthquake forces using equivalent static force method & response spectrum method as per IS:1893-2016, Calculation of design horizontal seismic base shear and story drift, Mathematical modeling of multi-storey RCC buildings with Infill walls.	10

Unit-4 Ductility considerations in earthquake resistant design of RCC buildings	**Ductility considerations in earthquake resistant design of RCC buildings:** Impact of ductility; Requirements for ductility; Assessment of ductility– Member/element ductility, Structural ductility; Factor affecting ductility; Ductility considerations as per IS 13920-2016, Design and detailing of typical flexural member, typical column, footing and beam-column joint as per IS13920-2016, Importance of Beam Column Joints.	06
Unit-5 Earthquake resistant design of RCC structures	**Earthquake resistant design of RCC structures:** Development of structural framing plan from architectural plan. Ductility considerations - Earthquake resistant design & detailing of multi-storey RCC buildings and shear walls based on Capacity Design Concept - IS 13920-2016, 3D modeling and analysis of RC Framed Building Structures under design load combinations including earthquake loads using standard commercial software such as STAAD Pro, SAP/ETABS etc. Post-processing of analysis results for design of structural Elements. Comparison with design output of the software.	10
Unit-6 Structural controls Passive Control Systems	**Structural controls:** Active & Passive Controls systems & their suitability. **Passive Control Systems:** Base isolation of structures; Considerations for seismic isolation; Basic elements of seismic isolation; seismic isolation design principle; Feasibility of seismic isolation; Seismic-isolation configurations Characteristics of Viscous Dampers, Visco-Elastic Dampers, Yielding Dampers, Tuned Mass Dampers, Tuned Liquid Dampers, Friction Pendulum Dampers, MR Dampers etc. & their suitability Concepts of Active, Semi-active & Hybrid Control Systems Application of controls in design of structures	08

Teaching & Learning Methodology: - Power Point presentation mostly preferred and in some topics chalk & duster is preferable.

Books Recommended:

1. B.C. Punmia, Ashok K. Jain and Arun K. Jain, "Reinforced Concrete Structures, Vol, 1", Laxmi Publications
2. M.L. Gambhir, "Fundamentals of Reinforced Concrete Design", Prentice Hall of India Private Limited.
3. P.C. Varghese, "Design of Reinforced Concrete Foundations", Prentice Hall of India Private Limited,
4. T. Paulay and M.J.N. Priestley, "Seismic Design of Reinforced Concrete and Masonry Buildings", John Wiley and Sons Inc.
5. P. Agarwal and M. Shrikhande, "Earthquake Resistant Design of Structures", Prentice-Hall of India Private Limited
6. S.K. Duggal, "Earthquake Resistant Design of Structures", Oxford University Press
7. IS 456:2000, Indian Standard Plain and Reinforced Concrete - Code of Practice, Bureau of Indian Standards, New Delhi.
8. IS 875 (Part 1 to 5): Indian Standard Code of Practice for Design Loads (Other than Earthquake) for Buildings and Structures & load combination
9. IS:1893-2016, Indian Standards Criteria for Earthquake Resistant Design of Structures, Bureau of Indian Standards, New Delhi.
10. IS:13920-2016, Indian Standard Code of Practice for Design & Ductile Detailing of Reinforced Concrete Structures subjected to Seismic Forces, Bureau of Indian Standards, New Delhi.

List of Open-Source Software/learning website:

1. http://www.cdeep.iitk.ac.in/nptel
2. http://www.nptel.iitm.ac.in
3. opensees.berkeley.edu/
4. www.nicee.org
5. http://www.earthquakeinfo.org/
6. www.eeri.org/
7. www.earthquakeengineering.com/
8. www.curee.org
9. Non-lin software

Dr. M. N. Patel

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SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

ADVANCED DESIGN OF FOUNDATIONS SYSTEMS

CODE: 26080306

M.TECH SEM-3

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	-	100

Prerequisite:

Soil Mechanics, Foundation Engineering and relevant IS codes

Objectives:

Foundation system is an important component of any civil engineering structure. The structural loads of buildings, bridges, towers, and other civil engineering works must be transmitted to the underlying natural soil or rock using a foundation system that is safe. Its proper selection will ultimately lead to serviceability, stability against various forces and economy of the project. The course on Analysis and Design of Foundation Systems provides the students necessary design knowledge with latest field practices and codal provisions. This will help them to analyze and design suitable foundation systems under different loads and soil conditions.

Course outcomes:

At the end of the course, the student will be able to:

1. Apply various design approaches, selection of proper foundation system as per sub-soil conditions based on codal provisions and theoretical practice followed.
2. Analyze and design rigid and flexible foundation systems using elastic theories based on numerical and analytical approaches through software including soil structure interaction effect.
3. Design temporary and permanent soil retaining structures, excavation supports, foundations in water bodies and high embankments.
4. Apply conceptual knowledge of special foundations such as batter piles, shell foundations and sheet pile walls for various applications such as resisting high lateral loads.

Course outline: -

Sr. No.	Course Contents	Number of Hours
Unit-1	Introduction to Limit State Design of reinforced concrete in foundations; Bearing capacity of Foundations, Settlement computations of various foundation types and their related IS Codal provisions.	04
Unit-2	Design of Shallow foundations: Structural design of reinforced concrete spread footings, rectangular, trapezoidal and strap beam;	08
Unit-3	Soil pressure for structural design; Conventional structural design of continuous footings, individual footings, combined footings and rafts of various types subjected to vertical and lateral loads and moments; Design of circular rafts;	08
Unit-4	Soil structure interaction and 'flexible' approach to the design of foundations; Winkler foundation	06
Unit-5	Structural design of piles including pile caps, under reamed piles, battered piles, piers and caissons;	09
Unit-6	Structural design of retaining walls; Cantilever and counter fort earth retaining walls with Structural and foundation stability computations	05
Unit-7	Sheet Pile Walls, Cantilever and Anchored sheet pile walls, Introduction to shell foundations;	02

Teaching & Learning Methodology:

Power Point presentation mostly preferred and in some topics chalk & duster is preferable.

List of Open-Source Software/learning website:

1. NPTEL lecture series
2. MIT open-source material

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Books Recommended:

1. Joseph E Bowles,"Foundation Analysis & Design", McGraw Hill, 1996
2. Shamsher Prakash et.al, Analysis and Design of Foundation and Retaining Structures, Sarita Prakashan
3. Nayak N.V., Foundation Manual for Practicing Engineers, Dhanpatrai Publications
4. Robert W Brown, Pratical Found. Engg. Handbook, McGraw Hill Pub,1996
5. Das B.N., Principles of Found Engg, 4th ed,PWS Pub.Co.,1999
6. S.P. Brahama, Foundation Engg, Tata McGraw Hill, 1985
7. Zeevert, Found.Engg for Difficult Sub Soil Condition, Van Nostrand Publin.,1975
8. Fang and Winterkorn, Found.Engg, Handbook, Van Nostrand Publn.,1975
9. H.J. Shah, Design of Reinforced Concrete Structures (Revised as per Limit State), Charotar Publishing House Pvt. Limited, 2012

Prof. Mansi Prajapati

Dr. M.N. Patel

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Introduction to Computer & Emerging Technologies

Semester 1

CODE: 13030101

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:-The objective of this course is introducing the fundamental in information technology. The course covers different aspects in information technology such as

- Basics of Data and Information.
- Acquisition of different types of information like numbers, text, multimedia etc.
- Issues of Data Storage and organization.
- Processing of different types of information.
- Emerging trend, societal impacts and applications of Information technology.

Prerequisites:-To familiarize the trainee with basic concepts of computer programming and developer tools. To present the syntax and semantics of the "C" language as well as data types offered by thelanguage. To allow the trainee to write their own programs using standard language infrastructureregardless of the hardware or software platform

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	Introducing Today's Technologies: Computers, Devices,	8

	and the Web Today's Technology o Computers o Mobile and Game Devices o Data and Information o The Web o Digital Security and Privacy o Programs and Apps o Operating Systems o Applications o Communications and Networks o Wired and Wireless Communications o Networks o Computers and Mobile Devices o Mobile Computers and Desktops o Servers o Supercomputers o Cloud Computing o Ports and Connections	
2	**Processors, Memory, Adapters and Buses** Inside the case : o Motherboard o Processors o Memory o Adapters o Buses **Digital Storage** o Storage o Hard Drives o Portable Flash Memory Storage	6
3	**Input and Output Devices** o Input Devices o Keyboards o Pointing Device o Touch Screens o o Scanners and Reading Devices o **Output Devices** o Displays o Printers o Other Output Devices	6
4	**Computer Codes** o Introduction to Computer Codes o Decimal System o Binary System o Hexadecimal System o Octal System o 4-bit BCD System	7

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	○ 8-bit BCD System ○ ASCII code ○ 16-bit Unicode	
5	**Conversion of Numbers (Includes fixed and fractional numbers)** ○ Non-Decimal to Decimal ○ Binary to Decimal ○ Decimal to Binary ○ Binary to Octal ○ Octal to Binary ○ Octal to Decimal ○ Decimal to Octal ○ Binary to Hexadecimal ○ Hexadecimal to Binary ○ Hexadecimal to Decimal ○ Decimal to Hexadecimal	7

Learning Outcomes:-

On the completion of the course students will be able to:

1) Know the fundamental terms associated with computers, mobile devices and new technologies.
2) Know different types of computers, mobile devices, memory and various input and output devices.
3) Understand the basic uses and applications of computer in business and society.
4) Get familiar with various computer codes

Teaching & Learning Methodology:-

During theory lectures foundations of information technology related concepts will be introduced to students. Emphasis will be given on acquisition, storage and processing of data to generate meaningful information. Students will be made familiar with applications related to information technology. Emerging trends and societal impacts of information technology will be discussed to students. Students will give practical exposure by demonstrating real information technology system.

Books Recommended:-

1. Discovering Computers 2016 (First Edition) Cengage Learning By Misty E. Vermaat; Susan L. Sebok; Steven M. Freund; Jennifer T. Campbell; Mark Frydenberg (Shelly Cashman Series)
2. Pearson India By M. Morris R. Mano
3. Fundamentals of Computer(First Edition- 2009) Publisher: McGraw-Hill by Balaguruswamy
4. Computer Fundamentals(First Edition-2010) Publisher: Pearson by Anita Goel

E-Resources:-

1. http://sct.emu.edu.tr/courses/it/index.php?id=itec103&page_type=file_directory&elemen t_id=2 [Information Technology fundamentals]
2. http://technology.ku.edu/software [Information Technology related applications]
3. http://www.managementstudyguide.com/emerging-trends-in-informationtechnology.htm [Emerging trends in Information Technology]

Practical List:-

Sr. No.	Practical
1	Run different commands of MS DOS – CD, DIR, COPY, REN, CLS, MD, CD, RD etc.
2	Study information of Internet connectivity components line, VSAT, Broadband
3	Study information of Internet connectivity components Modem, IP Sharer, Hub, and Switch.
4	Study different web Browsers- Internet Explorer, Fire fox, downloading of files
5	Connect the Internet; open any website of your choice and save the Webpages. Search any topic related to your syllabus using any search engine and download the relevant material.

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Programming in C

Semester 1

CODE: 13030102

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	0	4	7	7	30	50	70	-	150

Objectives:-Thecourse fully covers the basics of programming in the "C" programming language anddemonstrates fundamental programming techniques, customs.

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Introductionto Programming Languages:** • Introduction to Machine level language • Introduction to Assembly language • Introduction to Higher level language • Limitations and Features. • Classification of Computer Language- Procedural Language and Non Procedural Language	5
2	**Tools and Techniques of Problem Analysis** • Algorithm Development and Flow Chart • Numerous Examples in Algorithm Development and Flow Chart	4
3	**Getting Started With 'C' Language:** • Basic Structure of C	9

	• Executing C program • Character set & C Tokens • Identifiers & Keywords • DataTypes • Constants and Variables • Type Casting • o Comments	
4	**C Language Operators and Decision Making:** **Operators& Expression** • TypesofOperatorsandExpression • Precedence&Associativity **Console based I/O andrelated built-inI/Ofunction** • printf(),scanf(),getch(),getchar(),putchar() • Concept of HeaderFile and #include,#define **Decision Making Structure** • If • If-else • NestedIf-else • Switch	10
5	**Control Structure & Array:** **Loop ControlStructure** • While • Do-While • For • Nested loop **Other Statements** • break,continue,goto,exit **Array** • One,Two – Dimensional Arrays • Initializationand workingwith Array. • Introduction to MultidimensionalArrays.	10

Learning Outcomes:-

On the completion of the course students will be able to:

1. To create their own logic and implement using C Programming.

2. To understand how to use programming in day to day application

TEXT BOOK/S:

1. Introduction to C Programming

Publication : Oxford

By Reema Thareja

REFERENCE BOOKS:

1. Computer Fundamentals & Programming in C

Publication :Oxford

By Pradip Dey, Manas Ghosh

2. Programming in ANSIC (Fifth Edition 2011)

Publication :McGraw Hill

By Balagurusamy

WEB RESOURCES:

1. https://www.tutorialspoint.com/cprogramming/
2. http://www.javatpoint.com/c-programming-language-tutorial
3. https://www.programiz.com/c-programming
4. http://www.cprogramming.com/tutorial/c-tutorial.html
5. http://www.programmingsim

Practical List:-

Sr. No.	Practical's
1	Write a program to print "HELLO".
2	Write a program to display multiplication table.
3	Write a program to print +1/2+1/3+1/4+.....+1/N series.
4	Write a program to find sum of all integers greater than 100 & less than 200 and are divisible by 5.
5	Write a program to convert days into months and days
6	Write a program to print following patterns.

Megh. Parul

	<table><tr><td>* * * * * * * * * *</td><td>1 2 3 4 5 2 3 4 5 3 4 5 4 5 5</td></tr><tr><td>AAAAA BBBB CCC DD E</td><td>1 0 1 1 0 1 0 1 0 1</td></tr></table>
7	Write a program for factorial number.
8	Write a program to find sum of all integers greater than 100 & less than 200 and are divisible by 5.
9	Make a programs using If, If-else, If-else-if and Nested If statements.
10	Make a program using goto and break statement.
11	Write a programs using while loop and do-while loop.
12	Write a program to read array of integers and print it in reverse order

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Internet Web Designing I

Semester 1

CODE: 13030103

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Theory	Tutorial	Pr	Total		Theory	Practical	Theory	Practical	
3	0	4	7		30	50	70		150

Objectives: -To develop the skill about the basic and important terminology of Internet.To make the students able for web site design fundamentals using HTML scripting.

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Introduction to Internet:** Introduction to Internet • How does Internet works? • Internet addressing & DNS • Internet Vs Intranet • Switching: o Circuit switching o Packet switching o Message switching	

	• Different types of connections o Dial-UP connections o ISDN o ADSL o Leased Line Connections o Satellite Connections • Internet service provider • Computer Networks o Use of computer Networks o Network Devices o Network Types o Network Topologies • E-Mail o Introduction o E-mail System o E-mail Protocols o About E-mail addresses o Structure of E-mail Message o E-mail clients and server o Mailing list o E-mail security • World Wide Web o Introduction o Basic Elements • Search engines o Introduction o Criteria o Search Agent o About Popular search engines	
2	**Getting Started With HTML 5:** o New Structure o New Form Elements and Attributes	

	o Browser support • Defining HTML Markup • Basic structure of HTML Document o The <!DOCTYPE html> Element o The <HTML> Element o The <head> Element o The <title> Element o The <Body> Element • Modifying the background of an HTML webpage o Adding Background color o Adding Background Image • Specifying Metadata about an HTML webpage • Introduction to new elements in HTML 5 o The Markup Elements o The Media Elements o The Canvas Elements o The form elements o The Input type attribute values	
3	**Working with Text,List,Tables and Frames:** • Adding a plain text to an HTML webpage • Adding text in new line • Creating Headings on webpage • Creating a paragraph • Creating a Horizontal Rule • Creating a Subscript and Superscript • Aligning the Text • Formatting the Text • Grouping the Text • Indenting Quotations • Working with character entities	

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	• Commenting the Text • Working with Lists o Creating an Unordered List o Creating an Ordered List o Creating an Definition List o Nested Lists • Working with Tables o Creating a Table o Specifying a caption to a Table o Adding a Table Headings o Setting the Table Borders o Aligning a Table and Cell content o Changing the background color of a Table o Setting a Cell Padding and Cell Spacing o Nesting Tables • Working with Frames o Creating a Frames o Defining new element specific attributes o Specifying width and height of the Frame o Applying Hyperlink Target to a frame	
4	**Working with Hyperlinks, Images, Multimedia, Forms and Controls:** • Working with Hyperlinks o Creating Hyperlins o Setting hyperlink color o Linking Different sections of page • Working with Images o Inserting an Image on webpage o Display alternate text for an Image	

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	o Adding Border to an Image o Align an Image o Using Image as a Links • Creating Image Maps • Working with Multimedia o Embedding multimedia on web page o Handling Browser that do not support embedding o Creating a link to a multimedia file o Using <object> tag insert objects • Creating an HTML Form o Specifying the Action URL and The method to send form • Adding Controls to an HTML Form o Using the<input> tag o Adding Text Area<textarea> o Adding Selection Control • Understanding new form elements o The <datalist> element o The <keygen>Element • Grouping the controls of HTML Form • Specifying Label for a control	

Learning Outcomes: -

On the completion of the course students will:

1.Understand the meaning and syntax of different tags of HTML5

2.Learn the basic differences between HTML and HTML5

3.Understand the basic internet terminology and technology

4.To design web pages using simple and advanced tags of HTML5.

5.To understand the fundamental concept of Google AdSense and Analytics.

Books Recommended:

1. World wide web Design with HTML(First Edition-2010)
Tata McGraw Hill
By C Xavier

2. Web Enabled commercial application development using HTML, Javascript, DHTML and php
BPB Publication.By Ivan Bayross

3. The Complete Reference HTML and CSS (Fifth Edition)
McGraw Hill Education
Thomas A Powell

E-Resources:

1. HTML5 Introduction(https://www.w3schools.com/html/html5_intro.asp)
2. http://www.tutorialspoint.com/ht...
3. https://www.udemy.com/learn-html...
4. HTML 5 Cheat Sheet (PDF) - Smashing Magazine
5. http://html5please.com/
6. http://diveintohtml5.info/

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SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF COMPUTER APPLICATION

Discrete mathematics (New Syllabus 2021)

Code: _13030104

B.C.A.: 1st SEMESTER

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	P	Total		Th	Pr	Th	Viva	
3	-	2	5	5	30	30	70	20	150

Objectives:-The BASIC MATHS program at SSIU provides Mathematics majors with a quality undergraduate education in liberal studies, mathematics, science, to prepare them

- To, within a few years of graduation, have attained positions as professionals in industry, government, or academia;
- To have become responsible, accountable, current professionals who work effectively in multidisciplinary teams, readily adapt to broad technical challenges, and demonstrate leadership.

Prerequisites:- Students will able to understand Sets and functions, Limit of a Function and derivative of a functions. In Co-ordinate geometry they will learn about Quadrants and area of triangles. In integration they will learn simple basic formula of integration. Matrices, Types of Matrices, Algebraic Operations on Matrices, Transpose of a Matrix, Symmetric and Skew Symmetric Matrices, Elementary Operation (Transformation) of a Matrix, Minors and Cofactors of matrices, Adjoint and Inverse of a Matrix.

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Set Theory** ➢ Basic Definitions of Set theory ➢ Set Operations (Union, Intersection, Complement of a set,	03

	Cartesian product of a set) ➢ Properties of set operations ➢ De-Morgan's Law	
2	**Groups and Graph Theory:** ➢ Definition and examples ➢ Permutation groups, subgroups , cyclic group ➢ Finites and infinite graphs, paths and circuits ➢ Isomorphism, connected Graphs, Euler and Hamiltonian graphs , Sub graphs ➢ Trees ➢ Distance and center of tree ➢ Binary and spanning tree.	08
3	**Limit And Differentiation** ➢ Concept of Limit ➢ Some Standard Limits ➢ Continuity of a functions ➢ Definition of Derivative ➢ Rules for differentiation, Chain rule , ➢ logarithmic differentiation , ➢ higher order derivative ➢ Differentiation of function of a function	06
4	**Integration** ➢ Introduction to indefinite integral and Definite Integrals ➢ Substitution method and Integration by parts of Definite and indefinite integrals,	05
5	**MATRIX** ➢ Definition of Matrix ➢ Types of Matrix ➢ Invertible Matrix ➢ Rank of Matrix ➢ Solution of Simultaneous equations	06
6	**Lattices And Boolean Algebra** ➢ Introduction to Lattice ➢ Lattice as Partially Ordered Sets ➢ Properties of Lattices ➢ Sub-Lattice ➢ Types of lattices ➢ Definition and Properties of Boolean Algebra ➢ Boolean Sub-Algebra ➢ Isomorphic Boolean Algebra Boolean Expressions and their Equivalence	12

Learning Outcomes:-

1. Properties of set operations, application of De-Morgan's Law.
2. Represent domain, co domain and type of a function.
3. Decide limit, continuity and discontinuity of a function.
4. Apply the knowledge to solve some practical problems, such as constrained optimization problems and other problems involving Partial differentiation.
5. Able to evaluate distance, quadrant and area of a triangle.
6. Evaluate integration using standard formulas.
7. Evaluate determinants and inverse of a matrix., solution of linear system of equations

Teaching & Learning Methodology:-

- 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.
- Include inquiry based learning exercises in international or intercultural contexts.
- Include group work, with groups representing diverse cultures and nationalities.

Books Recommended:-

1. Business mathematics by V.K.Kapoor ,S.chand &sons Publication
2. Thomas' Calculus, Maurice D. Weir, Joel Hass, Frank R. Giordano, Pearson Education
3. Introduction to Linear Algebra with Application, Jim Defranza, Daniel Gagliardi, Tata McGraw-Hill
4. Advanced Engineering Mathematics, Erwin Kreysig, Wiley Publication.
5. Elementary Linear Algebra, Ron Larson, Cengage Learning
6. Engineering mathematics by Anthony Craft,Robert Davison & Martin Hargreaves, Pearson Education

E-Resources:-

The above mentioned contents can be referred through:
http://www.gujaratuniversity.org.in/web/NWD/Downloads/Syllabus/List%20of%20Syllabus/20%20-%20UG-CBCS%20Syallabus%20(wef%20Jun-2011)/BCA/Syllabus_BCA_Sem-1.pdf

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Communication Skills

Semester 1

CODE: 13030105

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
2	-	-	2		30	-	70	-	100

Objectives: -

- To enhance students' communicative and linguistic approach in English
- To provide icebreaking approach through LSRW skills and soft skills
- To learn ways to enhance overall communication skills

Prerequisites:-

- Being able to communicate effectively is the most important of all life skills; hence, students are expected to have good spirit for learning English as second language.

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Introduction to Communication Skills : LSRW** 1. Need for Effective communication 2. Importance of English as second language 3. Importance of Communication 4. Know What You Want To Say	6
2	**Grammar** Subject Verb agreement, Auxiliary and Modal auxiliary verb, parts and types of sentences, active and passive voice, Tenses.	4
3	**Basics of Communication** 1. Definition & types of Communication, 2. Cycle of communication 3. Forms of communication	8

	4. Components of Verbal & Non-verbal communication 5. Kinesics 6. Paralinguistic/ paralanguage 7. Chronemics 8. Proxemics	
4	**Listening Skill** 1. Definition & Types of Listening 2. Barriers to effective listening 3. Techniques to be good listener 4. Listening audio clips (practical exercise)	4
5	**Reading Skill** 1. Reading techniques 2. Reading Strategies 3. Comprehensive reading 4. Book review	6
6	**Speaking Skill & Phonetics transcription**	6
7	**Writing Skill** 1. Answering comprehension practical 2. Business Letters 3. Email writing	5
8	**Short Stories** • The Selfish Giant by Oscar Wilde • How Much Land Does a Man Need? By Leo Tolstoy	3
	Total hours:	42

Learning Outcomes: -

* Students will be able to communicate effectively.

* They feel confident in speaking and writing English language.

* Students will be able to improve the language skills i.e. Listening Skill, Speaking Skill, Reading Skill, and Writing Skill (LSRW).

* To make them learn about life skills and soft skills.

Teaching & Learning Methodology:-

- Power point presentation
- 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.
- It includes audio video clips that can provide ample number of exercise to the students
- Face- to face oral communication to provide a platform where they can perform and practice well.

Books Recommended:

Megh. Parul

1. Lesikar R V, Flatley M E ,Rentz K and Pandey Business Communication: Making Connections in a Digital World 2009: New Delhi, Tata Mcgrow Hill
2. Raman Minakshi, Communication Skills, 2011: New Delhi, Oxford University Press.
3. Leech, Geoffrey and Jan Svartvik. A Communicative Grammar of English. New Delhi: Pearson, 2009.
4. Wren & Martin, High school English Grammar, S. Chand and Co. Ltd

E-Resources:

1. http://www.free-english-study.com/
2. http://www.english-online.org.uk/course.htm
3. http://www.english-online.org.uk/

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SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF COMPUTER APPLICATION

Statistical Method and Operation Research

CODE :__13030201_____

BCA : 2nd 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	50	70	-	150

Objectives: - Operation research and statistical method program at SSIU provides Mathematics majors with a quality undergraduate education in liberal studies, mathematics, science, and to prepare them

- To, within a few years of graduation, have attained positions as professionals in industry, government, or academia;
- To have become responsible, accountable, current professionals who work effectively in multidisciplinary teams, readily adapt to broad technical challenges, and demonstrate leadership.

Prerequisites:- Student should be able to understand Measures of Central Tendency and Dispersion. Students entering in Probability should have a firm grasp of mathematics. Permutation and combinations of functions, Factorial Representation of Permutation and Combinations and Linear Programming Problem, Transportation and Assignment and Game theory from operation research.

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Measures of Central Tendency and Dispersion:** ➢ Arithmetic mean, Median,Mode, Harmonic	05

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	Mean, Geometric mean for grouped and ungrouped data. ➢ Concept of dispersion, Absolute and relative measure of dispersion, range variance, Standard deviation,Coefficient of variation	
2	**Permutation and Combinations** ➢ The Fundamental principle of counting ➢ Factorial Representation of Permutation ➢ Permutation Problems ➢ Combinations ➢ Factorial Representation of Combinations ➢ Combination Problems	03
3	**Sample space, Events and Probability** ➢ Experiments and random experiments, ➢ Ideas of deterministic and non-deterministic experiments; ➢ Definition of sample space, discrete sample space, events; Types of events, ➢ Union and intersections of two or more events, mutually exclusive events, Complementary event, Exhaustive event; Simple examples. ➢ Classical definition of probability, ➢ Addition theorem of probability without Proof (up to three events are expected). ➢ Definition of conditional probability ➢ Definition of independence of two events, simple numerical problems	08
4	**Linear Programming Problem:** ➢ Introduction, Requirement of LP, ➢ Basic Assumptions, Formulation of LP, General Statement of LP, ➢ Solution techniques of LP: Graphical Methods, ➢ Analytical Methods: Simplex, Big M and Two Phase, ➢ Sensitivity Analysis, ➢ Primal and Dual Problems, ➢ Economic Interpretation	12
5	**Transportation and Assignment:** ➢ Transportation Problems definition, Linear form, ➢ Solution methods: North west corner method,	08

	➢ least cost method. ➢ Vogel's approximation method. ➢ Transshipment Problems. ➢ Assignment Problems and Travelling sales man Problem	

Learning Outcomes Course Outcome:

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 able to define and formulate mathematical problems.
3. Students will be able to select optimal problems solving techniques for a given problemusing LP.
4. Students will be able to formulate and solve transportation, travelling sales man andtransshipment problems.
5. Students will be able to formulate and solve optimization problems related to job/ workassignments.
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 fordifferent applications.\
8. Student also learn basic concept of statistics and probability .

Teaching & Learning Methodology:-

- 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.
- Include inquiry based learning exercises in international or intercultural contexts.
- Include group work, with groups representing diverse cultures and nationalities.

Books Recommended:-

1. Advanced Engineering Mathematics, Erwin Kreysig, Wiley Publication.
2. Gupta and Kapoor : Fundamentals of Statistics, Sultan Chand and Sons.
3. Operation Research by J.K. Sharma

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Logic Development and Programming II

Semester 2

CODE: 13030202

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	0	2	5	4	30	50	70	-	150

Objectives:-The course fully covers the basics of programming in the "C" programming language and demonstrates fundamental programming techniques, customs.

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Structures & Unions:** **Structures** • Defining a structure • Accessing a structure variable • Operations on structure members • Copying and comparing variables • Arrays of structure • Arrays within Structures **Unions** • Defining Unions	11
2	**Pointer:** • Definition and Concept • Advantage of using pointer • Pointer Arithmetic	11

	• Array of Pointers • Pointers and Functions • Pointers with UDFs	
3	**Dynamic Memory Allocation &Link List:** • Dynamic Memory Allocation • Memory Allocation Function • malloc() • calloc() • realloc() • free() **Linked List** • Concepts • Advantages • Overview of types of Linked list • Operations on Singly Linked List(create,display, insert at • first,insert at last,delete at first,delete at last) • Application of Link list	8
4	**C Language Operators and Decision Making:** • **Files** • Concepts of File Management • Files functions – fopen(), fclose(), fprintf(), fscanf(), • fseek(), ftell(),rewind(), putc(), getc(), putw(),getw() • Error handling functions • **Preprocessors** • Types of Preprocessors • Macro substitution directives • File inclusion directives • Compiler control directives	8

Learning Outcomes:-

On the completion of the course students will:

1. To obtain in depth knowledge of C language.

2. To understandadvancedfeatures of C Programming Language.

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TEXT BOOK/S:

1. Introduction to C Programming

Publication : Oxford

By Reema Thareja

REFERENCE BOOKS:

1. Computer Fundamentals & Programming in C

Publication :Oxford

By Pradip Dey, Manas Ghosh

2. Programming in ANSIC (Fifth Edition 2011)

Publication :McGraw Hill

By Balagurusamy

WEB RESOURCES:

1. https://www.tutorialspoint.com/cprogramming/
2. http://www.javatpoint.com/c-programming-language-tutorial
3. https://www.programiz.com/c-programming
4. http://www.cprogramming.com/tutorial/c-tutorial.html
5. http://www.programmingsim

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Database Management System

Semester 2

CODE:13030203

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	4	7	5	30	50	70	-	150

Objectives: -This course introduces students to information of data, working of related data to gainknowledge. Students also will design the real life application

Prerequisites:-(1) Elementary knowledge about computers including some experience Using UNIX or Windows.

(2)Computer Programming & Utilization

(3) Knowledge about data structures and algorithms, corresponding to the basic course on Data Structures and Algorithms.

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Introduction:** • Data Vs. Information • Introduction of the Database and the DBMS • Role, Advantage and Disadvantages of DBMS • Types of Database	4
2	**Distributed Database Management Systems:** • Evolution of DDBMS • Distributed Processing and Distributed Database	2

	• DDBMS Advantages and Disadvantages • Characteristics of DDBMS • Components of DDBMS	
3	**Database Systems:** • The Database System Environment • DBMS Functions • The Relational Model • The E-R Model	4
4	**The Relational Database Model:** • A logical view of Data • Keys • Integrity Rules • Concept of Functional Dependency • Relational Set Operators • The Data Dictionary and The System Catalog • Relationship within the Relational Database	10
5	**The Entity Relationship Model:** • Entities • Attributes • Relationships • Connectivity and Cardinality • Existence Dependence • Relationship Strength • Weak Entities • Relationship Participation • Relationship Degree • Recursive Relationship • Composite Entities • Developing an ER diagram (Using Crow's-foot Model)	10
6	**Normalization of Database Tables:** • The need of Normalization • The Normalization process	10

Learning Outcomes:-

Install, configure, and interact with a relational database management system;Describe, define and apply the major components of the relational database model todatabase design;Learn and apply the Structured Query Language (SQL) for database definition and manipulation;Utilize a database modeling technique for a single entity class, a onetoone (1:1) relationship between entity classes, a one-to-many (1:M) relationship between entity classes, a many-to-many (M:M)relationship between entity classes, and recursive relationships;Define, develop and process single entity, 1:1, 1:M, and M:M database tables;Learn and implement the principles and concepts of information integrity, security and confidentiality;Apply ethical computing concepts and practices to database design and implementation

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Teaching & Learning Methodology:-

The challenge that teaching and learning computerprogramming presents, has encouraged thedesign and implementation of various new and innovativecomputer programming teaching methods.The presented methods aim to improve thestudents' success rates by increasing their motivationand encouraging the greater self-engagement, not only in assignments provided within a course, but also in further exploration of the programming challenges outside the assignments' boundaries.

Books Recommended:-

1.An introduction to Database Systems, C J Date, Addition-Wesley.
2, C Programming: Test Your Skills, 1/e by Ashok Kamthane
3, Database System Concepts, Abraham Silberschatz, Henry F. Korth& S. Sudarshan, McGraw-Hill.
4, Understanding SQL by Martin Gruber, BPB
5, SQL-PL/SQL by Ivan bayross

E-Resources:-

1,https://en.wikipedia.org/wiki/Database_management_system
2,https://searchdatamanagement.techtarget.com/resources/Database
3, https://searchsqlserver.techtarget.com/.../database-management-system

Practical List:-

Sr. No.	Practical
1	To study DDL-create and DML-insert commands. **(I)**Create tables according to the following definition. CREATE TABLE DEPOSIT (ACTNO VARCHAR2(5) ,CNAME VARCHAR2(18) , BNAME VARCHAR2(18) , AMOUNT NUMBER(8,2) ,ADATE DATE); CREATE TABLE BRANCH(BNAME VARCHAR2(18),CITY VARCHAR2(18)); CREATE TABLE CUSTOMERS(CNAME VARCHAR2(19) ,CITY VARCHAR2(18)); CREATE TABLE BORROW(LOANNO VARCHAR2(5), CNAME VARCHAR2(18), BNAME VARCHAR2(18), AMOUNT NUMBER (8,2)); **(ii)**Insert the data in above tables **(iii)**From the above given tables perform the following queries: (1)Describe deposit, branch. (2)Describe borrow, customers. (3)List all data from table DEPOSIT. (4)List all data from table BORROW. (5)List all data from table CUSTOMERS. (6)List all data from table BRANCH. (7)Give account no and amount of depositors. (8)Give name of depositors having amount greater than 4000.

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	(9)Give name of customers who opened account after date '1-12-96'.
2	Create the below given table and insert the data accordingly 1. Create Table Job (job_id, job_title, min_sal, max_sal) 2. Create table Employee (emp_no, emp_name, emp_sal, emp_comm, dept_no) 3. Create table deposit(a_no,cname,bname,amount,a_date). 4. Create table borrow(loanno, cname, bname, amount). Perform following queries (1)Retrieve all data from employee, jobs and deposit. (2)Give details of account no. and deposited rupees of customers having account opened between dates 01-01-06 and 25-07-06. (3)Display all jobs with minimum salary is greater than 4000. (4)Display name and salary of employee whose department no is 20. Give alias name to name of employee. (5)Display employee no,name and department details of those employee whose department liesin(10,20)..
3	To Perform various data manipulation commands, aggregate functions and sorting concept onall created tables. (1)List total deposit from deposit. (2)List total loan from karolbagh branch (3)Give maximum loan from branch vrce. (4)Count total number of customers (5)Count total number of customer's cities. (6)Create table supplier from employee with all the columns. (7)Create table sup1 from employee with first two columns. (8)Create table sup2 from employee with no data (9)Insert the data into sup2 from employee whose second character should be 'n'and string should be 5 characters long in employee name field. (10)Delete all the rows from sup1. (11)Delete the detail of supplier whose sup_no is 103. (12)Rename the table sup2. (13)Destroy table sup1 with all the data. (14)Update the value dept_no to 10 where second character of emp. name is 'm'. (15)update the value of employee name whose employee number is 103.
4	To study Single-row functions. (1) Write a query to display the current date. Label the column Date (2) For each employee, display the employee number, job, salary, and salary increased by 15% and expressed as a whole number. Label the column NewSalary (3) Modify your query no 4.(2) to add a column that subtracts the old salary fromthe new salary. Label the column Increase (4) Write a query that displays the employee's names with the first letter capitalized and all other letters lowercase, and the length of the names, for all employees whose name starts with J, A, or M. Give each column an appropriate label. Sort the results by the employees' last names.

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Internet Web Designing – II

Semester 2

CODE: 13030204

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Theory	Tutorial	Pr	Total		Theory	Practical	Theory	Practical	
3	-	2	5	4	30	50	70	-	150

Objectives: -To develop the skill about the basic and important terminology of Internet.To make the students able for web site design fundamentals using HTML scripting,CSS & XML, javascript.

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Introduction to HTML 5** Introduction • Basic Elements of HTML 5 • Markup Element o <article> o <aside> o <command> o <detail> o <summery> o <figure>	

	o <footer> o <header> o <hgroup> o <mark> o <meter> o <nav> o <progress> o <ruby> o <rt> o <rp> o <section> o <time> • Media Element o <audio> o <video> o <source> o <embed> • Canvas Element • Form Elements o <detailist> o <keygen> o <output> o The Input type attribute values o tel, search, url, email, datetime, date, month, week, time, datetime-local, number, range, colo	
2	**Style sheets :** o Need for CSS o introduction to CSS o basic syntax and structure using CSS o background images o colors and properties	

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	o manipulating texts using fonts, borders and boxes o margins o padding lists o positioning using CSS,	
3	**Introduction to JavaScript** • JavaScript Introduction o Understanding JavaScript o About Dynamic HTML o Selecting an development environment forjavaScript o HTML and JavaScript • Advanced JavaScript o Element of JavaScript o Variables o Operators o Flow control statement o Arrays o Functions o Event handling o Browser and JavaScript o Web page and JavaScript o Frames and JavaScript • Frames and Validation in JavaScript o Frames and JavaScript o Validating User forms	
4	**Introduction to XML and XML Document Type Definition** • XML o Introduction o XML versus HTML o XML terminologies o XML standards(XML,XML namespace,	

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	DTD,CSS,XSL,XML schema, Xquery, Xlink,Xpointer,Xpath) o XHTML • XML Documentation o Introduction to DTD o Document type declaration o Element type declaration o Attribute declaration o Conditional sections, limitations of DTD	

Learning Outcomes: -

On the completion of the course students will:

1.Understand the meaning and syntax of different tags of HTML

2.Learn the basic differences between HTML and HTML5

3.Understand the basic internet terminology and technology

4.To design web pages using simple and advanced tags of HTML.

Books Recommended:

1. HTML 5 in Simple Steps
   Publisher: DreamTech PressByKongent solution
   (Chapter-2 for unit 1)
2. Javascript 2nd Edition Step by step
   Author: Steve suehring
   (Chapter-22 for unit 3)
3. XML and Related Technologies (First Edition 2009)
   Pearson Education

E-Resources:

1. HTML5 Introduction(https://www.w3schools.com/html/html5_intro.asp)
2. http://www.tutorialspoint.com/ht...
3. https://www.udemy.com/learn-html...
4. HTML 5 Cheat Sheet (PDF) - Smashing Magazine
5. http://html5please.com/
6. http://diveintohtml5.info/

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Digital Electronics

Semester 2

CODE: 13030205

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	2	5	4	30	50	70	-	150

Learning Outcomes:

- Learn various number systems and their conversion used in digital components
- Introduce significant evolution in digital electronics
- Understand basic digital components for circuit design.
- Design basic electronics circuit for various applications and their analysis

Course outline:-

Sr.No.	Course Contents	Lectures (Hours)
1	**Introduction to Computer Organization** Digital computers, Basic components of digital computer, instructions, programming systems, assembly languages, high-level languages summary	3
2	**Number systems** Binary, Octal, Decimal, Hexadecimal numbers, addition, subtraction, mu ltiplcation, division, negative numbers, use of complements to represent negative numbers, complements in other numbering system, BCD numbers.	7
3	**Boolean algebra and Mapping Methods**	8

	Fundamental concepts of Boolean algebra, AND, OR, NOT, NAND, NOR gates, logical expressions, basic laws of Boolean algebra, simplification of expression, De Morgan's Theorem, sum of product, product of sum, K-maps to simplify expression (two-variable, three-variable, fourvariable), logical circuits using logical gates.	
4	**Digital integrated circuits** Introduction, Latch, Flip-Flop, register, multiplexer, De-multiplexer, Decoder, Encoder.	6
5	**Modern Computer Organization** Introduction, user and computer, computer organization, main memory, CPU operation, Interrupt concept, bus concept, booting sequence.	5
6	**CPU Architecture and instruction set** Introduction, CISC and RISC, Instruction set design, addressing modes, data representation, and binary data.	6

Reference Books:

1. Digital Computer Fundamentals (Sixth Edition) Thomas Bartee, McGraw-Hill
2. Computer Architecture and organization by B Govindrajalu (TMH)
3. Advanced microprocessor and interfacing by Badri Ram
4. Digital logic and computer design by M Moris Mano

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Data and File Structure

Semester 3

CODE: 13030301

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	2	5	4	30	50	70	-	150

Objectives: -The course improves the Data structure logical ability. To introduce various techniques for representation of the data in the real world. To teach concept of protection and management of data.

Prerequisites:-Computer Programming & utilization

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Introduction:** Data management concept, Data types,Perfomance analysis, Time & Space Complexity, Asymptotic notations Types of Data Structure-Linear and non Linear	5
2	**Linear Data Structure:** Array: Representation of arrays, Applications of arrays, sparse matrix and its representation Stack: Stack-Definitions & Concepts, Operations On Stacks, Applications of Stacks, Polish Expression, Reverse Polish Expression, Queue: Representation Of Queue, Operations On Queue, Circular Queue, Priority Queue, Array representation of Priority Queue, Double Ended Queue, Applications of Queue Linked List: Singly Linked List, Doubly Linked list, Circular linked list ,Linked implementation of Stack, Linked implementation of	10

	Queue, Applications of linked list	
3	**NONLINEAR DATA STRUCTURE :** Tree-Definitions and Concepts, Representation of binary tree, Binary tree traversal (Inorder, postorder, preorder), Threaded binary tree, Binary search trees, Applications Of TreesSome balanced tree mechanism, eg. AVL trees, Graph-Matrix Representation Of Graphs, Elementary Graph operations,(Breadth First Search, Depth First Search, Spanning Trees, Shortest path	11
4	**HASHING :** Hashing: The symbol table, Hashing Functions, Collision Resolution Techniques	7
5	**Sorting & Searching:** Sorting – Bubble Sort, Selection Sort, Quick Sort, Merge Sort Searching – Sequential Search and binary search	5

Learning Outcomes:-

*After learning the course the students should be able:

1. Differentiate primitive and non-primitive structures
2. Design and apply appropriate data structures for solving computing problems.
3. Apply sorting and searching algorithms to the small application

Teaching & Learning Methodology:-

The challenge that teaching and learning data structure presents, has encouraged the design and implementation of various new and innovative data structure teaching methods. The presented methods aim to improve the students' success rates by increasing their motivation and encouraging the greater self-engagement, not only in assignments provided within a course, but also in further exploration of the programming challenges outside the assignments' boundaries.

Books Recommended:-

1. An Introduction to Data Structures with Applications. by Jean-Paul Tremblay & Paul G. Sorenson Publisher-Tata McGraw Hill.
2. Data Structures using C & C++ -By Ten Baum Publisher – Prenctice-Hall International.
3. Fundamentals of Computer Algorithms by Horowitz, Sahni,Galgotia Pub. 2001 ed.
4. Fundamentals of Data Structures in C++-By SartajSahani.

E-Resources:-

1, https://www.tutorialspoint.com/data_structures_algorithms/index.htm

2, https://www.studytonight.com/data-structures/

Practical List:-

Sr. No.	Practical
1	Introduction to structures & pointers in C.
2	Stack operations Write a program to perform PUSH, POP, PEEP& CHANGE operations on Stack.
3	Queue Operations Write a program to implement insertion & deletion in a queue
4	Circular Queue Operations Write a program to implement insertion & deletion in a circular queue
5	Write a program for linked list insertion, deletion & copy
6	Write a program to perform Selection sort
7	Write a program to perform Selection sort
8	Write a program to sort the given number using bubble sort
9	Write a program to perform Merge sort
10	Write a program to perform Quick sort
11	Write a program to perform Sequential and binary search

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Relational Database Management System

Semester 3

CODE: 13030302

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	2	5	4	30	50	70	-	150

Objectives: - This course introduces students to information of data, working of related data to gain knowledge. Students also will design the real life application

Prerequisites:- (1) Elementary knowledge about computers including some experience using UNIX or Windows.
(2) Computer Programming & Utilization
(3) Knowledge about data structures and algorithms, corresponding to the basic course on Data Structures and Algorithms.

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Introduction:** • Data Vs. Information • Introduction of the Database and the DBMS • Role, Advantage and Disadvantages of DBMS • Types of Database	04
2	**Distributed Database Management Systems:** • Evolution of DDBMS • Distributed Processing and Distributed Database • DDBMS Advantages and Disadvantages • Characteristics of DDBMS	02

	• Components of DDBMS	
3	**Database Systems:** • The Database System Environment • DBMS Functions • The Relational Model • The E-R Model	04
4	**The Relational Database Model:** • A logical view of Data • Keys • Integrity Rules • Concept of Functional Dependency • Relational Set Operators • The Data Dictionary and The System Catalog • Relationship within the Relational Database	10
5	**The Entity Relationship Model:** • Entities • Attributes • Relationships • Connectivity and Cardinality • Existence Dependence • Relationship Strength • Weak Entities • Relationship Participation • Relationship Degree • Recursive Relationship • Composite Entities	08
6	**Normalization of Database Tables:** • The need of Normalization • The Normalization process	10

Learning Outcomes:-

After learning the course the students should be able:

1. Evaluate business information problem and find the requirements of a problem in terms of data.
2. Understand the uses the database schema and need for normalization.
3. Design the database schema with the use of appropriate data types for storage of data in database.
4. Use different types of physical implementation of database 5. Use database for concurrent use.
5. Backup data from database.

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, not only in assignments provided within a course, but also in further exploration of the programming challenges outside the assignments' boundaries.

Books Recommended:-

1. An introduction to Database Systems, C J Date, Addition-Wesley.
2, C Programming: Test Your Skills, 1/e by Ashok Kamthane
3, Database System Concepts, Abraham Silberschatz, Henry F. Korth & S. Sudar shan, McGraw-Hill.
4, Understanding SQL by Martin Gruber, BPB
5, SQL -PL/SQL by Ivan bayross

E-Resources:-

1, https://en.wikipedia.org/wiki/Database_management_system
2, https://searchdatamanagement.techtarget.com/resources/Database
3, https://searchsqlserver.techtarget.com/.../database-management-system

Practical List:-

1. Overview of DBMS.
2. To study commands of DDL, DML, DTL and DCL.
3. To study different operations, date – function and conversion functions.
4. To study different types of string functions.
5. To study different types of function & operators like group by clause, having clause, etc.
6. To design Entity Relation Model.
7. To study sub-queries.

Paul

Manik.

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Operating System

3rd Semester

CODE: 13030303

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	2	5	4	30	50	70	-	150

Objectives:- As a core subject of Computer Engineering/Information Technology, this course enables to understand importance of Operating System, its functionalities to manage resources of Computer and Peripherals, program development and its execution. Student will be made aware of Process Management, Memory Management, File Management and I/O Management in detail, which will be useful to them for Large Application Development in engineering field with emphasis given to Linux type of Open Source Operating System.

Prerequisites: - Data structures(stack, queue, linked list, tree, graph), hashing, File structures, Any structured Programming Language (like C)

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Introduction:** Introduction: Basics of Operating Systems: Definition – Generations of Operating systems – Types of Operating Systems, OS Service, System Calls, OS structure: Layered, Monolithic, Microkernel Operating Systems – Concept of Virtual Machine.	7
2	**Process Management Processes:** Definition , Process Relationship , Process states , Process State transitions , Process Control Block ,Context switching – Threads – Concept of multithreads , Benefits of threads – Types of threads Process Scheduling: Definition , Scheduling objectives ,Types of Schedulers ,Scheduling criteria : CPU utilization,	8

	Throughput, Turnaround Time, Waiting Time, Response Time (Definition only) , Scheduling algorithms : Pre emptive and Non , pre emptive , FCFS – SJF – RR , Multiprocessor scheduling : Types , Performance evaluation of the scheduling.	
3	**Inter process Communication-** Race Conditions, Critical Section, Mutual Exclusion, Hardware Solution, Strict Alternation, Peterson's Solution, The Producer Consumer Problem, Semaphores, Event Counters, Monitors, Message Passing, Classical IPC Problems: Reader's & Writer Problem, Dinning Philosopher Problem Scheduling, Scheduling Algorithms.	8
4	**Deadlocks:** Definition, Deadlock characteristics , Deadlock Prevention , Deadlock Avoidance :banker's algorithm, Deadlock detection and Recovery	5
5	**Memory Management:** Basic Memory Management, Definition, Logical and Physical address map, Memory allocation: Contiguous Memory allocation – Fixed and variable partition – Internal and External fragmentation and Compaction, Paging : Principle of operation – Page allocation – Hardware support for paging –Protection and sharing – Disadvantages of paging. **Virtual Memory:** Basics of Virtual Memory – Hardware and control structures – Locality of reference, Page fault , Working Set , Dirty page/Dirty bit – Demand paging (Concepts only) – Page Replacement policies : Optimal (OPT) , First in First Out (FIFO), Second Chance (SC), Not recently used (NRU) and Least Recently used (LRU)	8
6	**Unix/Linux Operating System** Development Of Unix/Linux, Role & Function Of Kernel, System Calls, Elementary Linux command & Shell Programming, Directory Structure, System Administration Case study: Linux, Windows Operating System	3

Learning Outcomes:-

After learning the course the students should be able to:

- ✓ Understand various generations of Operating System and functions of Operating System.
- ✓ Understand the concept of program, process and thread and Analyze various CPU Scheduling Algorithms and compare their performance.
- ✓ Solve Inter Process Communication problems using Mathematical Equations by various methods. Compare various Memory Management Schemes especially Paging and Segmentation in Operating System. Also apply various Page Replacement Techniques. Understand File Systems in Operating System like UNIX/Linux and Windows.
- ✓ Understand Input Output Management and use of Device Driver and Secondary Storage (Disk) Mechanism.
- ✓ Write shell scripts in Linux/UNIX environment.

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, not only in assignments provided within a course, but also in further exploration of the programming challenges outside the assignments' boundaries.

Books Recommended:-

1. Operating System Concepts (8th Edition) by Silberschatz, Peter B. Galvin and Greg Gagne, WileyIndian Edition (2010).
2. Modern Operating Systems (Third Edition) by Andrew S Tanenbaum, Prentice Hall India (2008).
3. Principles of Operating Systems by Naresh chauhan, Oxford Press (2014).
4. Operating Systems by D.M. Dhamdhere, Tata McGraw Hill 2nd edition.
5. Operating Systems (5th Ed) – Internals and Design Principles by William Stallings, Prentice Hall India, 2000
6. UNIX Concepts and Applications(4th Edition)– by Sumitabha Das, Tata McGraw Hill.
7. Unix Shell Programming – by Yashwant Kanetkar, BPB publications.

List of Open Source Software/learning website: -

www.nptel.ac.in

Practical List:-Practical
1. Study of Basic commands of Linux/UNIX.
2. Study of Advance commands and filters of Linux/UNIX.
3. Write a shell script to generate marksheet of a student. Take 3 subjects, calculate and display total marks, percentage and Class obtained by the student.
4. Write a shell script to find factorial of given number n.
5. Write a shell script which will accept a number b and display first n prime numbers as output.
6. Write a shell script which will generate first n fibonnacci numbers like: 1, 1, 2, 3, 5, 13,...
7. Write a menu driven shell script which will print the following menu and execute the given task.
8. MENU
9. Display calendar of current month
10. Display today's date and time
11. Display usernames those are currently logged in the system
12. Display your name at given x, y position
13. Display your terminal number Exit
14. Write a shell script to read n numbers as command arguments and sort them in descending order.
15. Write a shell script to display all executable files, directories and zero sized files from current directory.
16. Write a shell script to check entered string is palindrome or not.
17. Shell programming using filters (including grep, egrep, fgrep)
18. Study of Unix Shell and Environment Variables.
19. Write a shell script to validate the entered date. (eg. Date format is : dd-mm-yyyy).
20. Write an awk program using function, which convert each word in a given text into capital.

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Object Oriented Programming – I

Semester 3

CODE: 13030304

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	4	7	5	30	50	70	-	150

Objectives: - This course provides in-depth coverage of object-oriented programming principles and techniques using C++. Topics include classes, overloading, data abstraction, information hiding, encapsulation, inheritance, polymorphism, file processing, templates, exceptions, container classes, and low-level language features. The course briefly covers the mapping of UML design to C++ implementation and object-oriented considerations for software design and reuse. Perform object oriented programming to develop solutions to problems demonstrating

Prerequisites: - To familiarize the trainee with basic concepts of computer programming and developer tools. To present the syntax and semantics of the "C++" language as well as data types offered by the language. To allow the trainee to write their own programs using standard language infrastructure regardless of the hardware or software platform.

Major Equipment:

- Latest Desktop PCs with any C++ compiler
- Open source software dev C++
-

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Concepts of OOPC:**	4

	Introduction OOP, Procedural Vs. Object Oriented Programming, Principles of OOP, Benefits and applications of OOP.	
2	**C++ Basics:** Overview, Program structure, namespace, identifiers, variables, constants, enum, operators, typecasting, control structures.	6
3	**C++ Function:** Simple functions, Call and Return by reference, Inline functions, Macro Vs. Inline functions, Overloading of functions, default arguments, friend functions, virtual functions.	6
4	**Object and Classes:** Basics of object and class in C++, Private and public members, static data and function members, constructors and their types, destructors, operator overloading, type conversion.	7
5	**Inheritance:** Concept of Inheritance, types of inheritance: single, multiple, multilevel, hierarchical, hybrid, protected members, overriding, virtual base class.	7
6	**Polymorphism:** Pointers in C++, Pointes and Objects, this pointer, virtual and pure virtual functions, Implementing polymorphism.	6

Learning Outcomes:-

* On successful completion of the course, the student will:
* Describe the important concept of OOPC like object and class
* Describe the important concept of OOPC like Encapsulation, inheritance, & polymorphism
* Write the simple C++ programs using the variables, operators, control structures, function
* Write the simple object oriented programs in C++ using objects and classes.
* Use advance features like exception to make programs supporting reusability
* Use standard template library for faster development.
* Develop the applications using object oriented programming with C++.
* Design, develop, execute, debug and validate programs in OOP environment.

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, not only in assignments provided within a course, but also in further exploration of the C++ programming challenges outside the assignments' boundaries.

Parth

Megh.

Books Recommended:-

1) Object Oriented Design by Rumbaugh (Pearson publication)
2) Object-oriented programming in Turbo C++ By Robert Lafore, Galgotia Publication.
3) Object-oriented programming with C++ by E.Balagurusamy, 2nd Edition, TMH.
4) C++ Programming, Black Book, Steven Holzner, dreamtech
5) Object Oriented Programming with ANSI and Turbo C++, Ashok Kamthane, Pearson

E-Resources:-

1) C++ Fundamentals: http://www.oupinheonline.com
2) C++ Tutorials: http://www.tutorialspoint.com/cplusplus/cpp_overview.htm
3) Video tutorials of C++: http://nptel.iitm.ac.in/syllabus/syllabus.php?subjectId=106101006
4) Learn C++ Programming: http://www.learncpp.com
5) Complete C++: http://www.cplusplus.com

Practical List:-

Sr. No.	Practical
1	1. Write C++ program to accept two numbers and display its product. 2. Write a program to accept the length and breadth of rectangle from the user. Calculate and display the area and perimeter. 3. Write a program to accept one int type data and one float type data. Multiply the two numbers and display the result. 4. Develop minimum 5 programs using control structures (for, while, do.....While,) 5. Write a program to print Fibonacci series of N numbers.
2	1. Write a program to display a user entered number in words using Switch...Case. 2. Write a program to add two numbers using function. 3. Develop minimum 2 programs using arrays I. Write a program to accept 'n' integers from users into an array and display them one in each line. II. Write a program to accept and display string
3	1. Develop programs using reference variable, scope resolution operator, simple manipulators, and number data type. 2. Write a program to swap two numbers using function. Pass the values to be swapped to this function using call by- value method. 3. Write a program using function with argument to swap the value of a pair of integers using call by reference. 4. Write a program to store and display the name, runs, scored and wickets taken of a cricket player using structure.

4	1.Write a program to find area of circle using object oriented programming such that the class circle must have three members functions namely: I. Read () to accept the radius from the user. II. Compute () for calculating the area. III. Display() for displaying the result 2. Write a program to find area of circle using object oriented programming such that the class circle must have three inline functions namely: I. Read () to accept the radius from the user. II. Compute () for calculating the area. III. Display() for displaying the result 3. Write a program that uses a class where the member functions are defined inside a class. 4. Write a program that uses a class where the member functions are defined outside a class 5. Write a program to demonstrate the use of zero argument and parameterized constructors. 6. Write a program to demonstrate the use of dynamic constructor. 7. Develop programs using various types of constructors and destructor.
5	1.Develop programs using : I. Single inheritance II. Multilevel inheritance III. multiple inheritance 2. Define minimum 5 different classes such as student, distance, shape, employee, feet, time, data etc. with data member & member functions. Also develop programs to test those classes functionality.
6	1. Develop Programs using array of objects and static member functions. 2. Write a program to demonstrate the use of static data members. 3. Write a program to demonstrate the use of const data members.
7	1. Write a program to demonstrate the overloading of increment and decrement operators. 2. Write a program to demonstrate the overloading of binary arithmetic operators. 3. Write a program to demonstrate the overloading of memory management operators.
8	1. Write a program to add two complex numbers using operator overloaded by a friend function. 2. Write a program to demonstrate function overriding. 3. Write a program to demonstrate dynamic binding using virtual function. 4. Write a program to demonstrate pure virtual function. 5. Write a program to demonstrate the use of "this" pointer.
9	1. Write a program to write and read a string from/to file.

Megh. Paul

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Software Engineering

Semester 3

CODE : 13030305

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	2	5	4	30	50	70	-	150

Objectives:

It Deliver an opportunity to students where they can deal with real life problems and learn an individual as well as teamwork approach for software development.

Prerequisites:-None

Course outline:-

Sr.No.	Course Contents	Number of Hours
1	**Software process Models and lifecycle:** Software Product, Product, Software Processes, Evolving Role of Software, Software Engineering: A Study of different Software Process Models, The Linear Sequential Model, The Prototyping Model, The RAD Model, Evolutionary Process Models, Process, Product and Process, Object Oriented Software Engineering	4
2	**Project Management Concepts & Project Metrics:** The Management Spectrum, People, Product, Process, Project, The W5HH Principle, Metrics in the Process and Project Domains (FP & LOC), Software Measurement, Metrics for Project and Software Quality	5

3	**Software Project Planning, Scheduling and Tracking:** Project Planning Objectives, Software Project Estimation using COCOMO Model, Software Scope and Resources, Empirical Estimation Models, Basic Concepts and Relationship Between People and Effort, Defining a Task Set for the Software Project, Selecting Software Engineering Tasks, Defining a Task Network and Scheduling, Earned Value Analysis	4
4	**Software Requirements Specification:** Requirement Gathering and Analysis, Software Requirement Specification(SRS),Formal requirements specification and verification - axiomatic and algebraic specifications	3
5	**Analysis Modeling, Software Design Concepts and Principles:** The Elements of the Analysis Model, Data Modeling, Functional Modeling and Information Flow, Behavioral Modeling and Structured Analysis, Software Design and Software Engineering, The Design Process, Design Principles, Design Concepts, Modular Design, Design Heuristics for Effective Modularity, The Design Model ,Design Documentation, Object Modeling using UML, Software Architecture and Data Design, Architectural Styles	4
6	**User Interface Design, Component Level Design:** User Interface Design, Task Analysis and Modeling, Interface Design Activities and Implementation Tools, Design Evaluation, Structured Programming and Comparison of Design Notation	5
7	**Risk Analysis & Management:** Reactive versus Proactive Risk Strategies, Software Risks (Risk Identification, Risk Projection, Risk Refinement, Risk Mitigation)	3
8	**Coding, Software Testing Techniques & Software Testing Strategies:** Software Testing Fundamentals and Test Case Design, White-Box Testing and Black-Box Testing, ISO/IEC/IEEE Software Testing standards, Testing for Specialized Environments, Unit Testing, Integration and Validation Testing, Software Documentation and Debugging Techniques	3
9	**Software Quality Assurance and Configuration Management** - Quality Concepts and Software Quality Assurance, Quality Planning and Control, Software Reviews (Formal Technical Reviews), Software Reliability and Fault Tolerance, The SCM Process Identification of Objects in the Software Configuration,Six Sigma, Version Control and Change Control	4
10	**Emerging and advanced topics in Software Engineering:** Security Engineering, Agile Methods, Client Server Software Engineering, Aspect Oriented Software Development, Software Engineering Aspects of Programming Languages, Re-engineering, Web Engineering	3

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Learning Outcomes:-

After completion of the course students will be able to

1. Prepare SRS (Software Requirement Specification) document and SPMP (Software Project Management Plan) document.
2. Apply the concept of Functional Oriented and Object Oriented Approach for Software Design.
3. Recognize how to ensure the quality of software product, different quality standards and software review techniques.
4. Apply various testing techniques and also upgrade it using advanced Software Engineering

Teaching & Learning Methodology:-

For teaching this subject power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work

Books Recommended:-

1. Roger S. Pressman, Software Engineering: A practitioner's approach, McGraw Hill.
2. Rajib Mall, Fundamentals of Software Engineering, Prentice Hall India.
3. Pankaj Jalote, An integrated approach to Software Engineering by Springer.
4. Ian Sommerville, Software Engineering, Addision and Wesley.

E-Resources:-

1) Software:-Rational Rose, Microsoft Visio, Enterprise resource planning
2) Project Management Tools
3) SCM Tools
4) SQA Tools
5) Analysis and Design Tools
6) User Interface Development Tools
7) Testing Tools
8) Client/Server Tools
9) Reengineering Tool

List of Experiments:

Prepare following document form below mentioned projects:

1.	DFD (Data Flow Diagrams)
2.	E-R Diagram
3.	Use-Case Diagram
4.	Activity Diagram
5.	Class Diagram
6.	Sequence Diagram
7.	State Diagram

8.	Implementation
9.	Test case design
10.	Program Testing
Case Study:-	
1) Student college management System	
2) Library Information System	
3) Railway/Flight Reservation system	
4) Online Banking System	
5) Hospital Management System	
6) ATM(Automatic Teller machine)	

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Object Oriented Programming - II

Semester 4

CODE: 13030401

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
4	-	4	8	6	30	50	70	-	150

Objectives: - To understand the concept of object oriented programming. This course Provide fundamental knowledge of the various aspects of java programming and enables students to appreciate recent development in the area of programming.

Prerequisites: - Object oriented concepts

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Basics of JAVA:** Features of Java, Byte Code and Java Virtual Machine, JDK, Data types, Operator, Control Statements – if , else, nested if, if-else ladders, Switch, while, do-while, for, for-each, break, continue.,	03
2	**Array and String:** Single and Multidimensional Array, String class, String Buffer class, Operations on string, Command line argument, Use of Wrapper Class.	04
3	**Classes, Objects and Methods:** Class, Object, Object reference, Constructor, Constructor Overloading, Method Overloading, Recursion, Passing and Returning object form Method, new operator, this and static keyword, finalize() method, Access control, modifiers, Nested class, Inner class, Anonymous inner class ,Abstract class.	06

4	**Inheritance and Interfaces:** Use of Inheritance, Inheriting Data members and Methods, constructor in inheritance ,method overriding, super keyword ,Final keyword, Creation and Implementation of an interface , instanceof operator, Interface inheritance, Dynamic method dispatch ,Comparison between Abstract Class and interface	06
5	**Package:** Use of Package, CLASSPATH, Import statement, Static import, Access control	04
6	**Exception Handling:** Exception and Error, Use of try, catch, throw, throws and finally, Built in Exception, Custom exception, Throwable Class	05
7	**Multithreaded Programming:** Use of Multithread programming, Thread class and Runnable interface , Thread priority, Thread synchronization , Thread communication, Deadlock	05
8	**IO Programming:** Introduction to Stream, Byte Stream, Character stream, Readers and Writers, File Class, File InputStream, File Output Stream, InputStreamReader, OutputStreamWriter, FileReader, FileWriter,Buffer Reader	05
9	**Collection Classes :** List, Abstract List, Array List, Linked List, Enumeration, Vector, Properties, Introduction to Java.util package.	05
10	**Networking with java.net:** InetAddress class ,Socket class, Datagram Socket class, Datagram Packet class	05

Learning Outcomes:-

After successful completion of the course students should be able to:

1. Understand object oriented programming concepts and implement in java.
2. Compare building blocks of OOPs language, inheritance, package and interfaces.
3. Identify exception handling methods.
4. Implement multithreading in object oriented programs.

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

Books Recommended:-

1. Java Fundamentals A comprehensive Introduction By Herbert Schildt, Dale Skrien, McGraw Hill Education.
2. Programming with Java A Primer – E.Balagurusamy,,Mc Graw hill Education.
3. The Complete Reference, Java 2 (Fourth Edition),Herbert Schild, - TMH.
4. Programming with Java, M. P. Bhave S.A. Patekar, Pearson.
5. Introduction to Java Programming 7th ed., Y. Daniel Liang, Pearson.

E-Resources:-

1. Java Development Kit: http://www.oracle.com/technetwork/java/javase/downloads/index.html
2. http://docs.oracle.com/javase/specs/jls/se7/html/index.html
3. http://docs.oracle.com/javase/tutorial/java/index.html
4. http://www.javatpoint.com/
5. http://www.tutorialspoint.com/java/
6. http://www.learnjavaonline.org/
7. http://www.c4learn.com/javaprogramming/
8. http://www.learn-java-tutorial.com/

Practical List:-

Sr. No.	Practical
1.	Display greatest number from three numbers.
2.	To check given number is prime or not.
3.	To reverse the given number.
4.	Display Fibonacci series.
5.	To print given pattern on screen. 1 2 3 4 3 2 1 1 2 3 3 2 1 1 2 2 1 1 1
6.	To search an element from an array.
7.	Sort the array in ascending order.

8.	Multiplication of 3X3 matrices.
9.	Create a class Calculator with arithmetic functions such as addition, subtraction, multiplication, and division.
10.	Create a class Time with hours, minutes, and seconds as member variables and calculate sum of two Time objects.
11.	Create a class which can perform following tasks using method overloading a) Addition of two float values b) Addition of two arrays. c) Addition of two Strings
12.	Write an OOP to demonstrate use of following functions of String class 1) getChars() 2) equals() 3) equalsIgnoreCase() 4) startsWith() 5) endsWith() 6) subString()
13.	Write an OOP to demonstrate use of following functions of StringBuffer class 1) deleteCharAt() 2) insert()
14.	Write an OOP to sort list of strings in alphabetical order.
15.	To catch Arithmetic Exception such as division by zero
16.	To catch multiple exceptions such as ArrayIndexOutOfBoundsException , NumberFormatException, NullPointerException.
17.	Write an OOP To throw your own exception
18.	Write an OOP for copying character from one file to another.
19.	Write an OOP for writing bytes to file
20.	Write an OOP for reading bytes from a file
21.	Write an OOP for copying bytes from one file to another.
22.	Write an OOP for reading and writing primitive datatype.
23.	Write an OOP for reading and writing using a random access file.

Mem. Paul

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

OPEN SOURCE TECHNOLOGY

Semester 4

CODE : 13030402

Teaching & Evaluation 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:

This course covers the basic introduction about HTML, CSS, JAVASCRIPT and brief of LAMP (Linux, Apache, MySQL, PHP) to design static as well as Dynamic web pages. We can use Windows Operating system instead of Linux.

Prerequisites: LAMP is an Open Source Web Development platform that uses Linux as an operating system, Apache as web server , MySQL as a Relational Database Management System and PHP as a Object Oriented Scripting Language. This subject covers the wide range of web technologies both client side and server side to provide the exposure to the students to develop Rich Internet Applications using them.

Course outline:-

Sr.No.	Course Contents	Number of Hours
1	**INTRODUCTION** :Concept Of Internet, Introduction of HTML, XHTML, CSS and JavaScript.	6
2	**XML**:Introduction to XML, uses of XML, simple XML, XML key components, DTD and Schemas, Well formed, using XML with application.XML, XSL and XSLT. Introduction to XSL, XML transformed simple example, XSL elements, transforming with XSLT	6
3	**INTRODUCTION OF PHP** : History of PHP, Apache Web Server, MySQL and Open Source,Relationship between Apache, MySQL and PHP (AMP Module),PHP configuration in IIS, Apache Web server	6
4	**BASICS OF PHP:** PHP structure and Syntax, Creating the PHP pages, rules of PHP syntax, Integrating HTML with PHP, Constants, Variables : static and global variable, Conditional Structure & Looping, PHP Operators, Arrays, foreach constructs, User defined function (argument function, Variable function, Return Function, default argument, variable length argument).	7
5	**INTRODUCTION TO MYSQL :** MySQL structure and syntax, Types of MySQL tables and storages engines, MySQL commands, Integration of PHP with MySQL, Connection to the MySQL server, Working with PHP and arrays of data, Referencing two tables , Joining two tables	7
6	**WORKING WITH DATABASE :** Basic command with PHP examples, Connection to server, creating database, selecting a database, listing database, listing table ,names creating a table, inserting data, altering tables, queries, deleting database, deleting data and tables, PHP myadmin and database bugs.	7

Learning Outcomes:-

After successful completion of this course, student will be able to

- Understand the basic structure of web designing technology
- Apply the concepts of web technology in designing static and dynamic web pages
- Design interactive web pages incorporating validation techniques
- We can save the data into database and get data when necessary.

Patel

Megh.

Teaching & Learning Methodology:-

For teaching this subject we use notepad or notepad++ or dream viewer or net beans software, Apache Server to store, process and deliver Web pages to clients.

Books Recommended:-

1Developing Web Applications, Ralph Moseley and M. T. Savaliya, Wiley-India
2. Web Technologies, Black Book, dreamtech Press
3. HTML 5, Black Book, dreamtech Press
4. Web Design, Joel Sklar, Cengage Learning
5. Internet and World Wide Web How to program, P.J. Deitel & H.M. Deitel, Pearson

E-Resources:-

Browsers like IE, Mozila,

FireFox etc - Server software XAMPP/WAMP/LAMP

www.apachefriends.org

www.w3.org

www.w3schools.com

Practical List:-

Sr. No.	Practical's
1	Creating the PHP page.
2	Programs using arrays and control and loop structures
3	Testing different PHP functions and user define function
4	Creating forms using buttons, textboxes and other form elements. Use ($_POST and $_GET to retrieve data.)
5	Passing hidden information to the form processing script via hidden form controls and a URL query string.
6	Creating forms with sessions and cookies
7	Allowing the user to upload their own images
8	View the data contained in the My SQL database.
9	Connect to the database from your website.
10	Revision of all practicals.

Paul

Megh

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Object Oriented Web Technology

Semester 4

CODE: 13030403

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	2	5	4	30	50	70	-	150

Objectives: -

The course builds upon the procedural and object-oriented programming logic tools from earlier courses. This course covers C# development using Visual Studio .NET and focuses on C# syntax, logic constructs, application development using windows forms, and the object-oriented nature of the language. Through the experience of creating these programs and methods the student will learn the fundamentals of C# programming to solve problems in various domains.

Prerequisites: -

1. Readings in the course text
2. Exams on all covered chapters in the course text
3. Lab projects
4. Regular and prompt attendance
5. Class Participation and daily work

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Introduction :** • What is .NET? • What is the CLR? • The FCL • Primitive Types • Namespaces • Statements and Expressions • Operators	06

2	**Classes and Objects:** • Constructors • Reference Types • Object Oriented Programming • Access Modifiers • Abstract Classes • Virtual Members • Static Classes • Debugging and Error Handling	04
3	**ADO.NET:** • Benefits of ADO.NET • ADO.NET compared to classic ADO • Datasets • Managed Providers • Data Binding: Introducing Data Source Controls • Reading and Write Data Using the Sql Data Source Control	04
4	**Windows Forms and Controls in details:** • The Windows Forms Model • Creating Windows Forms Windows Forms Properties and Events • Windows Form Controls, • Menus -Dialogs -ToolTips	04
5	**Visual Inheritance in C#.NET:** • Apply Inheritance techniques to Forms • Creating Base Forms • Programming Derived Forms	04
6	**Mastering Windows Forms:** • Printing - Handling Multiple Events • GDI+ • Creating Windows Forms Controls	04
7	**Themes and Master Pages:** • Creating a Consistent Web Site, • Themes - Master Pages • Displaying Data with the GridView Control Introducing the GridView Control • Filter Data in the GridView Control • Allow Users to Select from a DropDownList in the Grid • Add a Hyperlink to the Grid • Deleting a Row and Handling Errors	06
8	**Managing State:** • Preserving State in Web Applications and Page-Level State • Using Cookies to Preserve State • ASP.NET Session State • Storing Objects in Session State • Configuring Session State • Setting Up an Out-of-Process State Server	06

Prof. Patel

	• Storing Session State in SQL Server • Using Cookieless Session IDs • Application State Using the DataList and Repeater Controls • Overview of List-Bound Controls • Creating a Repeater Control and DataList Control	

Learning Outcomes:-

Knowledge Outcomes:

1. Articulate the basic syntax and features of the C# programming language
2. Define C# constructs which implement the three basic control structures
3. Define arithmetic, relational, and logical operators
4. Describe object-oriented (OO) concepts related to classes and objects
5. Describe the concepts behind sound user interface design
6. Describe the concepts behind variables, constants, and calculations

Skill Outcomes:

1. Demonstrate the ability to create Object-Oriented (OO) application programs
2. Demonstrate the ability to create appropriate classes and objects
3. Demonstrate the ability to create windows-based applications
4. Demonstrate the ability to create user interfaces including but not limited to various boxes, buttons, menus, dialog boxes

Teaching & Learning Methodology:-

Lectures, analysis of business practice examples, discussions, presentations of students' papers and case studies, exercises - students' individual and group work

Books Recommended:-

1. Christian Nagel, Professional C# .Net, Wrox Publication
2. Matthew Macdonald and Robert Standefer, ASP.NET Complete Reference, TMH
3. Vijay Mukhi, C# The Basics, BPB Publications

E-Resources:-

1. http://www.tarleton.edu/cis/studentresources.html
2. http://online.tarleton.edu/fac_dev/applications/student_blackboard/index.htm

Practical List:-

Sr. No.	Practical
1	Write a program to check whether empty query string is entered in Asp .net
2	Write a program to change color of Label text control programmatically in Asp .Net
3	Write a program to Enable-Disable Textbox and change width of TextBox programmatically in Asp .Net
4	Write a program to increase and decrease font size programmatically.

5	Write C# code to display the asterisk pattern as shown below: ***** ***** ***** ***** *****
6	Write C# code to prompt a user to input his/her name and country name and then the output will be shown as an example below: Hello Ram from country India!
7	Write C# code to do the following - Convert binary to decimal - Convert decimal to hexadecimal - Convert decimal to binary - Convert decimal to octa
8	Write C# code to convert infix notation to postfix notation.
9	Write a C# code to convert digits to words
10	Write a C# code to Convert following currency conversion. Rupees to dollar, frank, euro.
11	Write a C# code to Perform Celsius to Fahrenheit Conversion and Fahrenheit to Celsius conversion.
12	Write ASP.Net program to Store Objects in Session State and Storing Session State in SQL Server.

Pawl

Megh.

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Data Communication and Network

Semester 4

CODE: 13030404

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	2	5	4	30	50	70	-	150

Objectives:

The aims of this module are:

- To introduce the basics of data communications and computer networks.
- To examine and understand network protocols and architectures.
- To educate the student in modern networking technologies.

Prerequisites:-

Student must have a working knowledge of fundamental of procedure oriented language(c) and data structure. For some practical aspects of the course, a working knowledge of wire shark software.

Course outline:-

Sr.No.	Course Contents	Number of Hours
1	**INTRODUCTION TO DATA COMMUNICATION AND NETWORKING:** Uses of Computer Networks, Network Hardware, Network Software Internet Reference Models (OSI and TCP/IP)	05

2	**PHYSICAL LAYER:** Basis for Data Communication, Guided Transmission Media , Wireless Transmission Medium, Circuit Switching and Telephone Network, High Speed Digital Access	08
3	**DATA LINK LAYER:** Data Link Layer Design Issues, Error Detection and Correction, Data Link Control and Protocols, Example Data Link Protocol	07
4	**MEDIUM ACCESS LAYER:** Channel Allocation Problem, Multiple Access, CSMA, CSMA/CD, CSMA/CA	06
5	**LOCAL AREA NETWORK:** Ethernet, Fast Ethernet, Gigabit Ethernet, Wireless LAN, Bluetooth, Connecting Devices(Bridge, Hub, Switch, Router, Gateway)	06
6	**NETWORK LAYER:** Network layer design issues, Routing Algorithms (Optimality Principle, Static routing Algorithms, Shortest Path, Flooding, Dynamic routing algorithms, Dynamic Routing algorithms, Distance Vector, Link State Routing).	06

Learning Outcomes:-

Learning outcomes are a required element of the syllabus. They are statements about what students will know and be able to do with what they know upon successful completion of the course. These statements are further defined as observable and measurable - meaning that student progress on learning outcomes can and is assessed in the course.

Learning outcomes benefit faculty because they form a solid foundation for course organization and planning. Well constructed learning outcomes make the selection and design of assignments and assessments more focused. They also assist with keeping focus on the things faculty most value in the course.

Learning outcomes benefit students by providing specific learning targets to pursue. They can also help students better understand faculty actions and choices in the course.

Paul

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Teaching & Learning Methodology:-

The challenge that teaching and learning computer networking presents, has encouraged implementation of various new and computer network connections. Aim to improve the students' success rates by increasing their motivation and encouraging the greater self-engagement, not only in assignments provided within a course, but also in further exploration of the networking challenges outside the assignments' boundaries.

Books Recommended:-

1. Data Communication & Networking, Forouzen, Tata McGraw Hill
2. Andrew S. Tanenbaum (Fifth Edition)

E-Resources:-

1) https://en.wikipedia.org/wiki/List_of_network_protocols_(OSI_model)
2) https://www.webopedia.com/TERM/C/CSMA_CD.html
3) **https://www.studytonight.com/computer-networks/osi-model-datalink-layer**
4) https://turbofuture.com/misc/Data-Communication

Practical List:-

Sr. No.	Practical's
1	Study practical of OSI reference model.
2	Study practical of TCP/IP model.
3	Preparing LAN Cable using RJ45.
4	Preparing of Network cables.
5	Establishment of LAN Connection.
6	Troubleshooting of network.
7	Study practical of switch, Hub, Router, Gateway, Bridge.
8	Study of Wireshark packet tracer.
9	Prepare a demo Network using concept of Subnetting.

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Data Center Management

Semester 4

CODE: 13030405

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	2	5	4	30	50	70	-	150

Objectives: - Data Centre Management is well organized and thoughtfully prepared. The Subject is demanding and requires high level of self-discipline and persistence. In return, it offers deep insights in leadership, and inspires students to develop their leadership capabilities. It has been designed for the data centre industry and is great value for emerging leaders and their organizations.

Prerequisites: - Operating System and Computer Network

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	Basic Introduction of Data center Architecture, Requirement, Required Physical Area for Equipment and Unoccupied Space	06
2	Required power to run all the devices, Required cooling and HVAC Required weight, Network Bandwidth	05
3	Budget Constraints, Selecting a Geographic Location Safety from Natural hazards and manmade disaster	05
4	Data Center design and planning and cabling	04
5	Data Center Maintenance monitoring, Physical and logical security	05
6	Data center Consolidation, Reasons for data center Consolidation, Consolidation opportunity, Server consolidation, Storage Consolidation, Network Consolidation, Service Consolidation, Process Consolidation, Staff Consolidation, Data Consolidation phases	04

7	Data center servers, Sever Capacity Planning System Management Best Practices, Server Cluster Best Practices, Data Storage Best Practices.	05
8	Best Practices for System Administration, System Administration Work Automation,	04

Learning Outcomes:-

After successful completion of the course students should be able to:
1. Manage Server Systems and Data Centers Infrastructure Management.
2. Utilize the Storage, Bandwidth, Efficiency of systems and other resources for Data centre.
3. Monitoring the Networks and Resources.
4. Create ability to manage and maintain Server.

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

Books Recommended:-

1. Administering Data Centers: Servers, Storage and Voice over IP, Kailash Jayaswal
2. Data center fundamentals, Mauricio Arregoces, Maurizio Portol
3. Enterprise Data Center: Design and Methodology by Rob Snevely

E-Resources:-

1. Software: VMware
2. Nagios, Ganglia, Untangle,
3. https://www.techopedia.com/definition/29712/data-center-design

Practical List:-

Sr. No.	Practical
1	Installation of any server.
2	Manage workgroup and Create domain using Active Directory
3	Create user, Groups and Organization Unit
4	Create and apply policy on different group and OU
5	Concept of structure Cabling in network based environment
6	Setup VMware workstation and manage resources
7	Manage and maintain ESXI server
8	Monitoring the cluster using Open source (Nagios/Ganglia) tools.
9	Resource allocation to clients from server
10	Case study to design a datacenter as per requirement

SWARRNIM STARTUP AND INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Object Oriented Programming – III

Semester : 5th

CODE: 13030501

Teaching and Examination Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Theory	Tutorial	Pr	Total		Theory	Practical	Theory	Practical	
3	-	2	5	4	30	-	70	50	150

Contents:

Sr.	Topic	Weightage	Teaching Hrs.
1	**Introduction to Python**: The Python programming language, What is a program?, What is debugging?, The first program. **Variables, expressions and statements** Values and types, Variables, Variable names and keywords, Statements, Operators and operands, Expressions, Order of operations, Comments, Debugging.	10%	5
2	**Operators**: Modulus operator, Boolean expressions, Logical operators, Conditional execution, Alternative execution, Chained conditionals, Nested conditionals	10%	5
3	**User Defined Function and Introduction to Packages**: **Functions:** Function calls, Type conversion functions, Math functions, Composition, Adding new functions, Definitions and uses, Parameters and arguments, Variables and parameters are local, Fruitful functions and void functions, Why functions?. Recursion Function **Introduction to Packages:** Usage of Packages, Installation of Packages, brief introduction to NUMPY Package	20%	9

4	**Python Data Structure – I**: **Strings** A string is a sequence, Len, Traversal with a for loop, String slices, Strings are immutable, Searching, Looping and counting, String methods, The in operator, String comparison, Debugging. **List** ListA list as a sequence, Lists are mutable, Traversing a list, List operations, List slices, List methods, Map, Filter and reduce, Deleting elements, Lists and strings, Objects and values, Aliasing, List arguments.	25%	12
5	**Python Data Structure – II**: **Tuples, Set, Dictionary** **Tuples:** Python Tuples, Accessing values in Tuples, update and delete tuples Basic tuples operation, Built in Tuples Function, List Vs Tuples. **Set:** Defining set, create and accessing values in a set, set Methods, Frozenset Dictionary: What is python Dictionary, Creating a Dictionary, Adding elements to a Dictionary, Accessing and removing an elements from Dictionary, Dictionary Methods	25%	12
6	**File Operations**: Need of a file. Opening, closing and read/write operations in file.	10%	5

***Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

Reference Books:

1. Think Python, How to Think Like a Computer Scientist (TextBook) Allen Downey; Green Tea Press Needham, Massachusetts.
2. Beginning programming with Python for Dummies John Paul Mueller; John Wiley & Sons

Paul

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Object Oriented Analysis and Desgin

Semester 5

CODE: 13030502

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
4	-	2	6	5	30		70	50	150

Course outline:-

Learning Outcome:		
After learning the course the students should be able to: • After successful completion of this course, student will be able to demonstrate the importance of modelling in the software development life cycle. • Become familiar with the Unified modelling Language. • Understand the object-oriented approach to analysing and designing systems and software solutions. Employ the Unified modelling Language notations to create effective and efficient system designs. • Understand the difference between writing programs for the software and doing analysis and design. • Problem formulation and decomposition (analysis) and solution building (design) will be covered.		
Theory syllabus		
Unit	Content	Hrs
1	**Introduction to OOAD and UML:** Overview of Software Development Life Cycle (Waterfall Model), Introduction to Object Oriented analysis and design, overview of model with types and UML, UML structure:building blocks and architecture, Overview of static and dynamic UML diagrams **Forward & Reverse Engineering:** Introduction to Forward & Reverse Engineering using UML	
2	**Use case Model:** Introduction to use case diagram, Elements of use case diagram with notations: association/uses, include, extend, generalization	

3	**Class & Object Model:** Basics of object oriented concepts, Introduction to class and object diagram, Identify the elements based on noun phrase method, Elements of class diagram with notations: object, class, link, association, multiplicity, link attributes, association end names, association classes, qualified association, association ends, N-ray association, aggregation and composition, generalization, abstract class	
4	**Sequence & Collaboration Model :** Introduction to Sequence & Collaboration diagram, Elements, Elements of sequence diagram Collaboration diagram with notations: object, messages, activation, lifeline, destroyingobjects, guard condition	
5	**State Model:** Introduction to State Diagram, Event ,Change Event, Signal Event, Call Event, Time Event , States, Transition & Conditions, Transition, Guard Condition, Action, State Diagrams, One shot 08 State Diagram, Creating State Diagram ,State Diagram Behaviour, Activity, Do-activity, Entry Activity, Exit Activity, Nested State Diagram, Nested States, Signal Generalization, Concurrency	
6	**Activity and Swim lane Model:** Introduction to Activity and Swim lane diagram, Elements, Elements of Activityand Swim lane diagram with notations: initial state or start point, activity or action state, action flow, decisionsand branching, guard condition, Synchronization (fork and join), time event, merge event, swim lanes, final state or end point	
7	**Component and Deployment Model:** Introduction to Component and deployment Diagram, Elements ofComponent and deployment Diagram	

8	**Forward & Reverse Engineering:** Introduction to Forward & Reverse Engineering using UML	

Practical List

- Draw activity diagram, class diagram, sequence diagram, use case diagram, object diagram using EA
- Write a program based on Reflection
- Demonstrate a program based on Delegation
- Demonstrate a program based on Design Patterns
- Program on factory pattern
- Demonstrate a program based on Up casting and Down casting
- Demonstrate a program based on Object Serialization/Deserialization

Text Books

1	Object Oriented Modelling and Design with UML: by J. Rambaugh, et al., Second Edition Pearson

Reference Books

1	Magnifying object-oriented analysis and design by ArpitaPatil and Netra, PHI
2	2 UML 2 and the Unified Process: Practical Object-Oriented Analysis and Design by Jim Arlow / IlaNeustadt
3	The UML Users guide by Grady Booch, J. Rambaugh, Ivar Jacobson, Pearson Education
4	Object Oriented System Development by Ali Bahrami, McGraw Hill

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Android Programming

Semester 5

CODE: 13030504

Type of Course: BCA

Prerequisite: Basic Knowledge of Core Java and Object Oriented Concepts.

Rationale: Introduce with mobile market and mobile application development.

Teaching and Examination Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Theory	Tutorial	Pr	Total		Theory	Practical	Theory	Practical	
3	-	2	5	4	30	-	70	50	150

Contents:

Sr.	Topic	Weightage	Teaching Hrs.
1	**Introduction to mobile computing & Mobile Development**: Introduction to MC, Applications, Limitations and architecture. Cellular overview, Cellular networks, Mobile IP, History of mobile software development. The open handset alliance, The android platform, android SDK, Building a simple application.	15%	7
2	**Android Application Design Essentials**: Anatomy of an android applications, Android terminologies, Application context, Activities, services, Intents, Receiving and broadcasting intents, Android manifest file and its common settings using intent filter, Permissions, Managing application resources in a hierarchy, Working with different types of resources.	20%	10
3	**Android User Interface Design Essentials**: User interface screen elements, Designing user interfaces with layouts, drawing and working with Using android networking APIs, Using android web APIs.	20%	10

4	**Database Connectivity Using SQLite**: Using android data and storage APIs, Managing data using SQLite, Sharing data between applications with content providers.	25%	12
5	**Working with Common API**: Using Android Networking APIs Using Android Web APIs Using Android Telephony APIs, Notification.	18%	8
6	**Publishing your Application**:	2%	1

***Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

Reference Books:

1. Android Wireless Application Development (TextBook)
   Lauren Darcey and Shane Conder; Pearson Education; First Edition
2. Professional Android 2 Application
   Development Reto Meier; Wiley India Pvt
   Ltd,2011
3. Beginning Android
   Mark L Murphy,; Wiley India Pvt Ltd.(2009)
4. Pro Android
   Sayed Y Hashimi and Satya Komatineni; Wiley India Pvt Ltd.(2009)

Parul

Megh.

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Cyber Security

CODE : 13030601

BCA : 6th Semester

Teaching and Examination Scheme:

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	2	5	4	30		70	50	150

Content:

Sr. No.	Topics	Weightage %
1	**Systems Vulnerability Scanning** Overview of vulnerability scanning, Open Port / Service Identification, Banner / Version Check, Traffic Probe, Vulnerability Probe, Vulnerability Examples, OpenVAS, Metasploit. Networks Vulnerability Scanning - Netcat, Socat, understanding Port and Services tools - Datapipe, Fpipe, WinRelay, Network Reconnaissance – Nmap, THC-Amap and System tools. Network Sniffers and Injection tools – Tcpdump and Windump, Wireshark, Ettercap, Hping Kismet	25
2	**Network Defense tools** Firewalls and Packet Filters: Firewall Basics, Packet Filter Vs Firewall, How a Firewall Protects a Network, Packet Characteristic to Filter, Stateless Vs Stateful Firewalls, Network Address Translation (NAT) and Port Forwarding, the basic of Virtual Private Networks, Linux Firewall, Windows Firewall, Snort: Introduction Detection System	25
3	**Web Application Tools** Scanning for web vulnerabilities tools: Nikto, W3af, HTTP utilities - Curl, OpenSSL and Stunnel, Application Inspection tools – Zed Attack Proxy, Sqlmap. DVWA, Webgoat, Password Cracking and Brute-Force Tools – John the Ripper, L0htcrack, Pwdump, HTC-Hydra	25
4	**Introduction to Cyber Crime and law** Cyber Crimes, Types of Cybercrime, Hacking, Attack vectors, Cyberspace and Criminal Behavior, Clarification of Terms, Traditional Problems Associated with Computer Crime, Introduction to Incident Response, Digital Forensics, Computer Language, Network Language, Realms of the Cyber world, A Brief History of the Internet, Recognizing and Defining Computer Crime, Contemporary Crimes, Computers as Targets, Contaminants and Destruction of Data, Indian IT ACT 2000.	10
5	**Introduction to Cyber Crime Investigation** Firewalls and Packet Filters, password Cracking, Keyloggers and Spyware, Virus and Warms, Trojan and backdoors, Steganography, DOS and DDOS attack, SQL injection, Buffer Overflow, Attack on wireless Networks	15

Reference Books:

1. Anti-Hacker Tool Kit (Indian Edition) by Mike Shema, Publication Mc Graw Hill.
2. Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives by Nina Godbole and Sunit Belpure, Publication Wiley

Course Outcome:
After learning the course the students should be able to: student should understand cyber-attack, types of cybercrimes, cyber laws and also how to protect them self and ultimately society from such attacks

List of Experiments:

1. TCP scanning using NMAP
2. Port scanning using NMAP
3. TCP / UDP connectivity using Netcat
4. Network vulnerability using OpenVAS
5. Web application testing using DVWA
6. Manual SQL injection using DVWA
7. XSS using DVWA
8. Automated SQL injection with SqlMap

Design based Problems (DP)/Open Ended Problem:

Paul

Megh.

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Cloud Computing

Semester 6

CODE: 13030602

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	2	5	4	30		70	50	150

Learning Outcomes:

- After learning the course the students should be able to
- Understand the computing paradigm and cloud computing
- Understand the architecture of cloud computing
- Understand and use the service models and deployments
- Work on any real cloud service
- Understand the service management and security of cloud

Course outline:-

Sr.No.	Course Contents	Lectures (Hours)
1	**Introduction** Overview of computing paradigms, Recent trends in computing, evolution of cloud computing, Overview of cloud computing, Cloud computing-Concepts, properties, characteristics, Role of open standards.	5
2	**CLOUD COMPUTING ARCHITECTURE** Cloud computing architecture, Cloud service delivery models	8

	(XAAS), Cloud Deployment models.	
3	**INFRASTRUCTURE AS A SERVICE** Introduction, Hypervisors, Resource virtualization, Examples, How to implement IAAS, IAAS implementation using OpenStack	5
4	**PLATFORM AS A SERVICE** Introduction, Cloud Platform and Management, Examples, Containers, Application Stagin, How to implement PAAS.	6
5	**SOFTWARE AS A SERVICE** Introduction, Web services, Web 2.0, Web OS, Examples, How to implement SAAS.	6
6	**CLOUD SECURITY** Infrastructure security, Data Security, Storage Identity and Access Management, Access Control, Trust and Reputation, Authentication in Cloud computing.	6
7	**SERVICE MANAGEMENT IN CLOUD** Service Orchestration -Cloud computing and Service Management, licensing of software, Service Level Agreements (SLAs), Billing & Accounting, Comparing scaling hardware, economics of scaling, managing data. Cloud performance, Existing project experience	5

Practical Content

- Understanding single core and multi core Architecture
- Understanding Computer Network fundamentals and Designing LANs
- Implementation of Infrastructure as a service(IaaS) using Hypervisors
- Implementation of private cloud platform using openstack cloud
- Working with IaaS of Public cloud platforms
- Implementation of Platform as a service(PaaS) in private cloud environment
- Implementation Platform as a service(PaaS) in public cloud environment
- Implementation Software as a service(SaaS) in private cloud environment
- Implementing Software as a service(SaaS) in public cloud environment
- Implementation of Storage as a service(StaaS)

Reference Books:

1. Barrie Sosinsky: "Cloud Computing Bible", Wiley-India, 2010
2. Rajkumar Buyya, James Broberg, Andrzej M. Goscinski: "Cloud Computing: Principles and Paradigms",Wiley, 2011
3. Nikos Antonopoulos, Lee Gillam: "Cloud Computing: Principles, Systems and Applications", Springer,2012
4. Ronald L. Krutz, Russell Dean Vines: "Cloud Security: A Comprehensive Guide to Secure CloudComputing", Wiley-India, 2010

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Data Warehousing and Data Mining

Semester 6

CODE: 13030605

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	2	5	4	30		70	50	150

LEARNING OBJECTIVES:

The educational Objectives of this Course are:

- To Introduce various Data Mining Applications in real world scenario
- To be learning more about various mining tools for analysis and decision making
- Applying efficient mining methods to solve engineering problems
- Learning concepts of Business Intelligence in solutions, organizational changes, products, technologies andmethods to organize key data to improve performance and profit.

Course outline:-

Sr. No	Topic	Lecture Hours	Weightage ()%
1	**Data Warehousing fundamentals** • Introduction • A Multi-Dimensional Data Model • Data Warehouse Architecture • Data Warehouse Implementation • From Data Warehouse to Data Mining to Business Intelligence	8	13

2	**Data Pre-processing** • Data Cleaning • Data Integration and Transformation • Data Reduction • Data Discretization and Concept Hierarchy Generation	7	10
3	**Data Extraction, Transformation and Loading (ETL)** • Extracting the Data • Transforming the Data • Loading the Data into a DW System • ETL Using Export Import • Challenges for ETL • ETL Tools • Difference between ETL and BI Tools	8	13
4	**Introduction to Business Intelligence** • Introduction • A Data Framework For BI Structured Vs. Semi-Structured Data Framework Architecture For Structured Data Architecture For Semi-Structured Data • BI as a Product, Process, Solution and Tools • Factor driving Business Intelligence • Role of Data, Information and Knowledge in Data Warehouse, Data Mining and Decision Support System • Difference between BI and other related technologies. • Utilization and benefits of BI in Organization. • Obstacles to BI • Business Intelligence User Tools • Research issues in BI	10	15
5	**Mining Frequent Patterns, Associations, and Correlations** • **Basic Concepts and a Road Map** • **Efficient and Scalable Frequent Item set Mining Methods** • **Mining Various Kinds of Association Rules** • **Constraint based Association Mining**	7	10

6	Classification and Prediction • The fundamentals of classification systems • Issues regarding Classification and prediction • Differences between classification, recommendation, and clustering • Applications of classification • Classification methods: Decision tree, Bayesian Classification, Rule based, CART Neural Network CBR Rough set Approach Fuzzy Logic Genetic Algorithms • Prediction methods: • The fundamentals of Prediction • Linear and nonlinear regression • Accuracy and Error Measures • Accuracy of Classifier	8	13

Practical Content

Reference Books:

1. Data Mining concepts and Techniques by Jiawei Han, Micheline Kamber – Elsevier.
2. M. Kantardzic, "Data mining: Concepts, models, methods and algorithms, John Wiley &Sons Inc.
3. Business Intelligence by Rajiv Sabherwal, Irma Becerra-Fernandez, Wiley Publications, John Wiley & Sons, Inc.

LIST OF EXPERIMENTS:

Sr. No.	Practical Aim
1	Data Preprocessing Techniques in Standard Tool like Excel Miner/Mat Lab
2	Perform ETL on any standard dataset (Export – Import, Data Pump etc.)
3	Generating different types of graphs on different types of data.
4	Implement and simulate different classification algorithm on standard dataset
5	Implement and simulate different clustering algorithm on standard dataset
6	Future prediction on Data mining Tool
7	Computing association rule with TANAGRA and WEKA
8	Building decision tree with TANAGRA and WEKA. Error rate estimation using a Cross validation.
9	Generate intelligent report for enterprise data using BI tools
10	A Survey paper on latest research in Data Ming and Business Intelligence