SWARRNIM STARTUP AND INNOVATION UNIVERSITY

SCHOOL OF BUSINESS

BOARD OF STUDIES

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BOARD OF STUDIES
CONSTITUTION BCA [NEP]

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ANNEXURE

1

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SWARNIM STARTUP & INNOVATION UNIV...

Swarnim School of Computing & IT

Board of Studies Constitution

Sr. No.	Members Name	Designation
01	Dr. Kavita Kshatriya	Chairperson
02	Mr. Vikas Chandra Sharma	Co-Chairperson
03	Dr. Hardikhsinh Rayjada	Faculty Member
04	Mr. Nirav Dave	Faculty Member
05	Ms. Pritee Solanki	Faculty Member
06	Ms. Apeksha Dave	Faculty Member
07	Mr. Hardik Parmar	Faculty Member
08	Dr. Jethva Harikrishna B.	Academic External Expert
09	Mr. Sagar Jasani	Industry External Expert
10	Prof. Swapnil Solanki	Member Secretary

AGENDA OF THE MEETING

Agenda 1: To Design curriculum of BCA (Honours) as per NEP-2020.

Agenda 2: To introduce the teaching and examination scheme of BCA Honours.

Mr. Vikas Chandra Sharma
Co-Chairperson
Board of Studies

Dr. Kavita Kshatriya
Chairperson
Board of Studies

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Swarnim School of Computing & IT

Minutes of First Board of Studies meeting of the School of Computing & IT held on August 25, 2023 at SWARNIM STARTUP & INNOVATION UNIVERSITY

Members Present:

Sr. No.	Members Name	Designation
01	Dr. Kavita Kshatriya	Chairperson
02	Mr. Vikas Chandra Sharma	Co-Chairperson
03	Dr. Hardikhsinh Rayjada	Faculty Member
04	Mr. Nirav Dave	Faculty Member
05	Ms. Pritee Solanki	Faculty Member
06	Ms. Apeksha Dave	Faculty Member
07	Mr. Hardik Parmar	Faculty Member
08	Dr. Jethva Harikrishna B.	Academic External Expert
09	Mr. Sagar Jasani	Industry External Expert
10	Prof. Swapnil Solanki	Member Secretary

Agenda 1:To Design curriculum of BCA (Honours) as per NEP-2020.

Resolved: The Members of BoS unanimously approved in BCA (Honours) program as per NEP data. following features of NEP are also Considered as below:

- Value Added Course/Indian Knowledge System.
- Skill Enhancement Courses
- Ability Enhancement Courses
- Interdisciplinary & Multidisciplinary studies
- Research based focus/On the job training in the final year of the program.

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The new subjects were as under:

- Multiple Entry and Exit
- Choice Based Credit System

Agenda 2: To introduce the teaching and examination scheme of BCA Honours as per NEP 2020.

Resolved: The Members of BOS unanimously approved the teaching and examination scheme of BCA Honours as per NEP 2020.

Mr. Vikas Chandra Sharma
Co-Chairperson
Board of Studies

Dr. Kavita Kshatriya
Chairperson
Board of Studies

Dr. Jethuro Harikrishnan

Swarrnim Start-up & Innovation University
Swarrnim School of Computing & IT
Gandhinagar

Mr. Sagar Jasani

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SWARNIM STARTUP & INNOVATION UNIVERSITY

Swarnim School of Computing & IT

Board of Studies

Attendance Record

Date: August 25, 2023, Friday Time: 03:30 pm

Venue: Seminar Hall

Sr. No.	Members Name	Designation	Signature
01	Dr. Kavita Kshatriya	Chairperson	
02	Mr. Vikas Chandra Sharma	Co-Chairperson	
03	Dr. Hardikhsinh Raj[illegible]da	Faculty Member	
04	Mr. Nirav Dave	Faculty Member	
05	Ms. Pritee Solanki	Faculty Member	
06	Ms. Apeksha Dave	Faculty Member	
07	Mr. Hardik Parmar	Faculty Member	
08	Dr. Jethva Harikrishna B.	Academic External Expert	
09	Mr. Sagar Jasani	Industry External Expert	
10	Prof. Swapnil Solanki	Member Secretary	

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ANNEXURE 1

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Course Design for School of Computing & IT

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10	Credit Distribution	25

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Hariprishna.

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF COMPUTING AND IT

1. VISION & MISSION OF SCHOOL OF COMPUTING & IT

1.1 Vision

- The vision is to be a leading Department in the field of Computer Applications and Information Technology education, recognized for producing highly skilled professionals who contribute to the advancement of the digital era.
- We strive to empower our students with comprehensive knowledge, technical expertise, and critical thinking skills, enabling them to excel in the rapidly evolving technology industry.

1.2 Mission

- The mission is to provide high-quality education in Computer Applications, fostering creativity, innovation, and problem-solving skills.
- Through experiential learning, industry collaborations, and a focus on research, we prepare our students for success in the digital age.
- To prioritize inclusivity, ethics, and holistic development, nurturing responsible individuals who contribute to society's advancement.

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Dr. Seth

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- Bachelor of Computer Application (Honours): If students wish to exit after 4th year.

v) The Programme has special provisions for independent learners to earn additional credits from inter / intra disciplinary subjects apart from mandatory credits by using governmental portals like Swayam or MOOC

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4. ELIGIBILITY CRITERIA

- The applicant must have passed the Gujarat Higher Secondary Education Board (GHSEB)/Central Board of Secondary Examination (CBSE)/Indian Council of Secondary Examination (ICSE) or its equivalent under the 10 + 2 pattern in any stream.
- The applicant must have obtained the following minimum aggregate marks for open category candidates 45% & for reserved category (SC/ST/SEBC) candidates : 40%

5. PROGRAMSTRUCTURE

The Semester system, Duration and other programme requirements are:

i) BCA Honours programmes hall have eight semesters duration.

ii) Each academic year shall have two semesters ; odd and even semesters.

iii) The medium of instruction shall be English. The candidate has to write the examination only in English except in the language papers.

iv) Each semester shall have 16 weeks with 90 work in days (excluding Sundays and other holidays).

v) The BCA Programme shall have multiplex it option at the end of ONE,TWO, or THREE academic years with the award of Certificate, Diploma and Degree.

vi) The candidate avail index it option shall re-enter the programme at the beginning of any academic year within the stipulated time of three years and can complete the degree with the prevailing syllabi within Seven years.

vii) Candidates shall have two option in Honours (Forth Year) – Honours with Research & Honours without Research. Students secure 75%

Dr. Sethumadhavi

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M.r. Sagar Jayani

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marks and above in the first six semesters and wish to undertake research at the under graduate level can choose research stream in the fourth year.

viii) All candidates shall be awarded Bachelor's degree Honours with Research/ Honours on successful completion of EIGHT semesters (FOUR academic years) undergraduate programme

ix) BCA Programme is specific in nature and hence, there shall not be any provision to change the programme.

6. CURRICULUMCOMPONENTS

Curricular components of the Programare:

i) Major Core.
ii) Minor
iii) Multidisciplinary (MDC)
iv) Ability Enhancement Courses (AEC)
v) Skill Enhancement Courses (SEC)
vi) Value Added Courses / Indian Knowledge System common for all UG (VAC/IKS)
vii) Internship / OJT.
viii) Research Project

Major/Core Course [3Year-48 credits][4Year–64credits]					
Sr. No	Subject Code	Semester	Credits	Lecture Hours [Th+Tu+Pr]	SubjectTitle
1	BCA230101	I	4	3 +0 +2	Fundamentals of Computers
2	BCA230102	I	4	3 +0 +2	Programming in C
3	BCA230201	II	4	3 +0 + 2	Data Structures using C
4	BCA230202	II	4	3 +0 +2	Object Oriented Concepts using C

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5	BCA230301	III	4	3 +0 +2	Data Base Management Systems
6	BCA230302	III	4	3 +0 + 2	C#andDOT NET Framework
7	BCA230303	III	4	3 +1 + 0	Computer Communication and Net
8	BCA230401	IV	4	3 +0 + 2	Python Programming
9	BCA230402	IV	4	3 +0 +2	Computer Multimedia and Animati
10	BCA230403	IV	4	3 +1+ 0	Operating System Concepts
11	BCA230501	V	4	3 +0 +2	PHP and MySQL
12	BCA230601	VI	4	3 +1 +0	Computer Network Security
13	HBCA230702	VII	4	3 +0 + 2	Block Chain Technology
14	HBCA230802	VIII	4	4 +0 +0	Automata Theory and Compiler De
15	HRBCA230702	VII	4	0 +0 + 8	Advanced Research-I
16	HRBCA230802	VIII	4	3 +0 +2	Advanced Research-II

Major-SubjectElective Course[3Year-16credits][4Year-32credits]					
Sr. No	Subject Code	Semester	Credits	LectureHours [Th+Tu+Pr]	SubjectTitle
1	BCA230503A	V	4	3 +0 +2	AI and Machine Learning Fundamentals
2	BCA230503B	V	4	3 +0 +2	Deep Learning
3	BCA230504A	V	4	3 +0 +2	StatisticalComputingandRProgramming
4	BCA230504B	V	4	3 +0 +2	Machine Learning Fundamentals
5	BCA230505A	V	4	3 +0 +2	Information Security Principles
6	BCA230505B	V	4	3 +0 +2	Cloud Computing Fundamentals
7	BCA230506A	V	4	3 +0 +2	Mobile Application Development Fundamentals
8	BCA230506B	V	4	3 +0 +2	Natural Language Processing
9	BCA230603A	VI	4	3 +0 +2	Reinforcement Learning
10	BCA230603B	VI	4	3 +0 +2	Big Data Analytics
11	BCA230604A	VI	4	3 +0 +2	Predictive Analytics

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12	BCA230604B	VI	4	3 +0 +2	Cybersecurity Fundamentals
13	BCA230605A	VI	4	3 +0 +2	Cloud Infrastructure and Services
14	BCA230605B	VI	4	3 +0 +2	Mobile App Testing and Debugging
15	BCA230606A	VI	4	3 +0 +2	Mobile Security and Privacy
16	BCA230606B	VI	4	3 +0 +2	Natural Language Processing
17	HRBCA230703A	VII	4	3 +0 +2	AI in Robotics
18	HRBCA230703B	VII	4	3 +0 +2	AI for Internet of Things
19	HRBCA230704A	VII	4	3 +0 +2	Time Series Analysis and Forecasting
20	HRBCA230704B	VII	4	3 +0 +2	Advanced Machine Learning
21	HRBCA230705A	VII	4	3 +0 +2	Cloud Data Management and Analytics
22	HRBCA230705B	VII	4	3 +0 +2	Ethical Hacking and Penetration Testing
23	HRBCA230706A	VII	4	3 +0 +2	Advanced Mobile App Development
24	HRBCA230706B	VII	4	3 +0 +2	Cross-Platform Mobile App Development
25	HRBCA230803A	VIII	4	3 +0 +2	AI in Financial Forecasting and Trading
26	HRBCA230803B	VIII	4	3 +0 +2	AI in Image and Video Processing
27	HRBCA230804A	VIII	4	3 +0 +2	Text Analytics
28	HRBCA230804B	VIII	4	3 +0 +2	Social Network Analysis
29	HRBCA230805A	VIII	4	3 +0 +2	Cloud DevSecOps
30	HRBCA230805B	VIII	4	3 +0 +2	Secure IoT Deployment in the Cloud
31	HRBCA230806A	VIII	4	3 +0 +2	Mobile Game Development
32	HRBCA230806B	VIII	4	3 +0 +2	Augmented Reality and Virtual Reality in Mobile Apps

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Minor [3 Year - 20 credits] [4 Year - 28 credits]					
Sr. No	Subject Code	Semester	Credits	LectureHours [Th+Tu+Pr]	SubjectTitle
1	BCA230103	I	4	3 +0 +2	Web Development Using HTML, CSS & XML
2	BCA230203	II	4	3 +0 + 2	Core Java
3	BCA230404	IV	4	3 + 1 + 0	E-Commerce
4	BCA230502	V	4	3 +1 +0	Software Engineering
5	As Applicable	VI	4	4 +0 + 0	As per Subject Elective List
6	As Applicable	VII	4	4 +0 + 0	As per Subject Elective List
7	As Applicable	VIII	4	4 +0 + 0	As per Subject Elective List

Ability Enhancement Courses (AEC) [3 Year - 10 credits] [4 Year - 10 credits]					
Sr. No	Subject Code	Semester	Credits	LectureHours [Th+Tu+Pr]	SubjectTitle
1	AEC230101	I	2	0 + 0 + 4	Communication Skills
2	AEC230202	II	2	0 + 0 + 4	Logical and Critical Thinking
3	AEC230303	III	2	0 + 0 + 4	Modern Indian Languages**
4	AEC230404	IV	2	0 + 0 + 4	Soft Skills
5	AEC230605	VI	2	2 + 0 + 0	Workplace Communication
Multi-Disciplinary Courses (MDC) [3 Year - 12 credits] [4 Year - 12 credits]					
Sr. No	Subject Code	Semester	Credits	LectureHours [Th+Tu+Pr]	SubjectTitle
1	BCA230104	I	4	3 +1 + 0	Mathematical Foundation
2	BCA230204	II	4	3 +1 +0	FoundationinStatistical Methods

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3	BCA230304	IV	4	3 +0 +2	Digital Marketing

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Skill Enhancement Course (SEC) [3 Year – 10 credits] [4 Year - 10 credits]					
Sr. No	Subject Code	Semester	Credits	LectureHours [Th+Tu+Pr]	SubjectTitle
1	SEC230101	I	2	2 + 0 + 0	Foundation of Entrepreneurship
2	SEC230202	II	2	2 + 0 + 0	Identifying Entrepreneurial Opportunities
3	SEC230303	III	2	2 + 0 + 0	Marketing Strategies for Startups
4	SEC230404	IV	2	2 + 0 + 0	Finance and Funding for Startups
5	SEC230505	V	2	2 + 0 + 0	Intellectual Property Rights

Value Added Courses (VAC/IKS) [3 Year - 8 credits] [4 Year - 8 credits]					
Sr. No	Subject Code	Semester	Credits	LectureHours [Th+Tu+Pr]	SubjectTitle
1	IKS230101	I	2	2 + 0 + 0	Indian Science and Technology
2	VAC230201	II	2	2 + 0 + 0	Environmental Studies
3	IKS230302	III	2	2 + 0 + 0	Understanding India
4	VAC230402	IV	2	0 + 0 + 4	Interpersonal Skills

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Internship/OJT [3 Year – 4 credits] [4 Year – 12 credits]					
Sr. No	Subject Code	Semester	Credits	Lecture Hours [Th+Tu+Pr]	Subject Title
1	BCA230602	VI	4	0 + 0 + 8	Internship
2	BCA230701	VII	6	0 + 0 + 12	On the Job Training (OJT)
3	BCA230801	VIII	6	0 + 0 + 12	On the Job Training (OJT)

Research Project [3 Year – 0 credits] [4 Year (Honours) – 12 credits]					
Sr. No	Subject Code	Semester	Credits	LectureHours [Th+Tu+Pr]	SubjectTitle
1	HRBCA230701	VII	6	0 + 0 + 12	Research Project
2	HRBCA230801	VIII	6	0 + 0 + 12	Research Project

[*Th - Theory; Tu - Tutorial; Pr - Practical]

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BCASemester –V

CategoryofCourse	SubjectCode	Subjecttitle	TeachingScheme(Perweek)			
			Theory	Tutorial	Practical	Credits
Major/ Core	BCA230501	PHP and MySQL	3	0	2	4
Minor	BCA230502	Software Engineering	3	1	0	4
Major		**One Major with two paper**	8	0	0	8
Minor		**One Minor with one paper**	4	0	0	4
Artificial Intelligence	BCA230503A	AI and Machine Learning Fundamentals				
	BCA230503B	Deep Learning				
Data Science	BCA230504A	Statistical Computing and R Programming				
	BCA230504B	Machine Learning Fundamentals				
Cloud Computing & Information Security	BCA230505A	Information Security Principles				
	BCA230505B	Cloud Computing Fundamentals				
Mobile Applications	BCA230506A	Mobile Application Development Fundamentals				
	BCA230506B	Data Management in Mobile Applications				
SEC	SEC230505	Intellectual Property Rights	2	0	0	2
Total Credits Earned						**22**

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Credits								
VII	12	4	0	0	-	-	6 (RP)	22
VIII	12	4	0	0	-	-	6 (RP)	22
Total no. Subjects	22	8	3	5	6		-	
4th Year Total Credits	88	32	12	10	14	8	12	176

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7. SEMESTER-WISE AND BROAD COURSE CATEGORY WISE DISTRIBUTION OF CREDITS AS PER UGC GUIDELINES

Semester	Disciplinary Core/Major	Minor (Electives)	MDC	AEC	SEC	VAC / IKS	RP	Minimum Credit
I	8	4	4	2	2	2	-	22
II	8	4	4	2	2	2	-	22
1st Year Total Credits	16	8	8	4	4	4	-	44
III	12	-	4	2	2	2	-	22
IV	12	4	-	2	2	2	-	22
2nd Year Total Credits	40	12	12	8	8	8	-	88
V	12	8	-	-	2	-	-	22
VI	12	4	-	2	4 (Internship)	-	-	22
Total no. Subjects	16	6	3	5	6		-	
3rd Year Total Credits	64	24	12	10	14	8	-	132
VII	12	4	0	0	-	-	6 (OJT)	22
VIII	12	4	0	0	-	-	6 (OJT)	22
Total no. Subjects	22	8	3	5	6		-	
4th Year Total	88	32	12	10	14	8	12	176

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8. Syllabus -BCA(Honours)

SWARRNIM
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WHERE IDEAS COME ALIVE.

SYLLABUS

Bachelor of Computer Application (Honours) Program

4Years || 8 Semesters

Full-Time Program

Batch 2023–2027

REGULATIONS–2023

As per National Educational Policy 2020 Guidelines

SWARRNIM STARTUP & INNOVATION UNIVERSITY

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SCHOOL OF COMPUTING & IT

i) Program Educational Objectives(PEO)

- The primary objective of this program is to provide a foundation of computing principles and business practices for effectively using / managing information systems and enterprise software
- It helps students analyze the requirements for system development and exposes students to business software and information systems
- This course provides students with options to specialize in legacy application software, systems of Software or mobile applications
- To produce outstanding IT professionals who can apply the theoretical knowledge into practice in the real world and develop standalone live projects themselves
- To provide opportunity for the study of modern methods of information processing and its applications.
- To develop among students the programming techniques and the problem-solving skills through programming
- To prepare students who wish to go on to further studies in computer science and related subjects.
- To acquaint students to Work effectively with a range of current, standard, Office Productivity software applications

ii) ProgramOutcomes(PO)

PO1.Fundamental and Domain Knowledge - Acquire and apply fundamental knowledge of theories and principles of management in the field of computer applications.

PO 2. Innovative Thinking & Problem Solving – Foster innovative thinking

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Mr. Sagar Jasani

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and problem-solving skills by utilizing various problem-solving theories in the context of computer applications.

PO 3. Critical Thinking – Cultivate independent and critical thinking abilities to analyze assumptions and business problems using relevant data for effective solutions in the field of computer applications.

PO 4. Effective Communication - Develop effective communication skills and soft skills specific to the field of computer applications, encompassing different styles and types of communication.

PO 5. Leadership and Team Work – Comprehend the impact of leadership and team work in the functioning of an organization within the context of computer applications. Understand various leadership styles and their implications in a business environment, as well as the significance of teamwork and team building in the field.

PO 6. Global Orientation and Cross-Cultural Appreciation - Understand the challenges and global aspects prevalent within the field of computer applications. Appreciate cross-cultural dimensions of management in the global context.

PO 7. Entrepreneurship - Recognize entrepreneurial opportunities within the modern business landscape in the field of computer applications. Explore scalability of existing business avenues and foster an entrepreneurial mindset for potential start-ups.

PO 8.Environment and Sustainability – Learn about environmental protection and sustainable practices relevant to computer applications. Develop an understanding of techniques related to climate change, water crisis/management, green washing, pollution control, and other environmental concerns within the field.

PO 9. Social Responsiveness and Ethics - Recognize and address ethical issues and practices in organizations within the field of computer applications, understanding their impact on societal benefits.

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PO 10. Life Long Learning – Recognize the importance of self-initiated learning in personal development and improving the quality of life, while also aligning with the objectives of the organization. Foster a mindset of continuous learning within the field of computer applications.

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9. CURRICULUMSTRUCTURE

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Bachelor of Computer Application (Honours)

Program REGULATIONS 2023

BCASemester – I						
Category ofCourse	SubjectCode	Subject title	Teaching Scheme (Per week)			
			Theory	Tutorial	Practical	Cr
Major/ Core	BCA230101	Fundamentals of Computers	3	0	2	
Major/ Core	BCA230102	Programming in C	3	0	2	
Minor	BCA230103	Web Development Using HTML, CSS & XML	3	0	2	
MDC	BCA230105	Mathematical Foundation	3	1	0	
AEC	AEC230101	Communication Skills	0	0	4	
SEC	SEC230101	Foundation of Entrepreneurship	2	0	0	
IKS	IKS230101	Indian Science and Technology	2	0	0	
Total Credits Earned						2

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BCASemester– II						
Category of Course	**Subject Code**	**Subject title**	**Teaching Scheme (Per week)**			
			Theory	**Tutorial**	**Practical**	**Cred**
Major/ Core	BCA230201	Data Structures using C	3	0	2	4
Major/Core	BCA230202	Object Oriented Concepts using C++	3	0	2	4
Minor	BCA230203	Core Java	3	0	2	4
MDC	BCA230204	Foundation in Statistical Methods	3	1	0	4
AEC	AEC230205	Logical & Critical Thinking	0	0	4	2
SEC	SEC230202	Identifying Entrepreneurial Opportunities	2	0	0	2
VAC	VAC230202	Environmental Studies	2	0	0	2
Total Credits Earned						**22**

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BCA Semester–III						
Category of Course	Subject Code	Subject title	Teaching Scheme(Per week)			
			Theory	Tutorial	Practical	Cr
Major/ Core	BCA230301	Data Base Management Systems	3	0	2	
Major/ Core	BCA230302	C# and DOT NET Framework	3	0	2	
Major/ Core	BCA230303	Computer Communication and Networks	3	1	0	
MDC	BCA230304	Digital Marketing	3	0	2	
AEC	AEC230302	Modern Indian Language**	2	0	0	
SEC	SEC230303	Marketing Strategies for Startups	2	0	0	
IKS	IKS230302	Understanding India	2	0	0	
Total Credits Earned						

**Modern Indian Language should be based on formative assessment (presentation / class participation / assignment / seminar / workshop). It is a 2-credit course. Hindi and Gujarati language are to be consideredasModernIndianLanguage

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Mr. Sagar Jasa

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BCA Semester–IV						
Category of Course	Subject Code	Subject title	Teaching Scheme (Per week)			
			Theory	Tutorial	Practical	Cr
Major/ Core	BCA230401	Python Programming	3	0	2	
Major/ Core	BCA230402	Computer Multimedia and Animation	3	0	2	
Major/ Core	BCA230403	Operating System Concepts	3	1	0	
Minor	BCA230404	E-Commerce	3	1	0	
AEC	AEC230405	English – II: Soft Skills	2	0	0	
SEC	SEC230404	Finance and Funding for Startups	2	0	0	
VAC	VAC230402	Interpersonal Skills	0	0	4	
Total Credits Earned						

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Mr. Sagar Jasoli

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BCA Semester –VI						
Category of Course	Subject Code	Subject title	Teaching Scheme(Per week)			
			Theory	Tutorial	Practical	Credits
Major/ Core	BCA230601	Computer Network Security	3	1	0	4
SEC/Internship	BCA230602	Industrial project	0	0	8	4
Major		**One Major with two paper**	8	0	0	8
Minor		**One Minor with one paper**	4	0	0	4
Artificial Intelligence	BCA230603A	Natural Language Processing				
	BCA230603B	Reinforcement Learning				
Data Science	BCA230604A	Big Data Analytics				
	BCA230604B	Predictive Analytics				
Cloud Computing & Information Security	BCA230605A	Cyber security Fundamentals				
	BCA230605B	Cloud Infrastructure and Services				
Mobile Applications	BCA230606A	Mobile App Testing and Debugging				
	BCA230606B	Mobile Security and Privacy				
SEC	SEC230605	Workplace Communication	2	0	0	2
Total Credits Earned						**22**

Dr. Jethva Hiral Krishnad.

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BCA Semester–VII

(With Research)

Category of Course	Subject Code	Subject title	Teaching Scheme (Per week)			
			Theory	Tutorial	Practical	Cr
RP	HRBCA230701	Research Project	0	0	12	
Major/ Core	BCA230702	Advanced Research-I	0	0	8	
Major		**One Major with two paper**	8	0	0	
Minor		**One Minor with one paper**	4	0	0	
Artificial Intelligence	HRBCA230703A	AI in Robotics				
	HRBCA230703B	AI for Internet of Things				
Data Science	HRBCA230704A	Time Series Analysis and Forecasting				
	HRBCA230704B	Advanced Machine Learning				
Cloud Computing & Information Security	HRBCA230705A	Cloud Data Management and Analytics				
	HRBCA230705B	Ethical Hacking and Penetration Testing				
Mobile Applications	HRBCA230706A	Advanced Mobile App Development				
	HRBCA230706B	Cross-Platform Mobile App Development				
Total Credits Earned						2

Dr. Jethva Harikrishna.

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BCA Semester–VIII
(With Research)

Category of Course	Subject Code	Subject title	Teaching Scheme(Per week)			
			Theory	Tutorial	Practical	Credi
RP	HRBCA230801	Research Project	0	0	12	6
Major/ Core	BCA230802	Advanced Research-II	0	0	8	4
Major		**One Major with two paper**	8	0	0	8
Minor		**One Minor with one paper**	4	0	0	4
Artificial Intelligence	HRBCA230803A	AI in Financial Forecasting and Trading				
	HRBCA230803B	AI in Image and Video Processing				
Data Science	HRBCA230804A	Text Analytics				
	HRBCA230804B	Social Network Analysis				
Cloud Computing & Information Security	HRBCA230805A	Cloud DevSecOps				
	HRBCA230805B	Secure IoT Deployment in the Cloud				
Mobile Applications	HRBCA230806A	Mobile Game Development				
	HRBCA230806B	Augmented Reality and Virtual Reality in Mobile Apps				
Total Credits Earned						**22**

Note: **IE** Certificate course of minimum 1 credit will be completed by students to get eligibility of honours degree.

Dr. Jethva Hari Krishna.

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BCASemester– VII(WithoutResearch)						
CategoryofCourse	SubjectCode	Subjecttitle	TeachingScheme(Perweek)			
			Theory	Tutorial	Practical	Credi
OJT	HBCA230701	On the Job Training	0	0	12	6
Major/ Core	HBCA230702	Block Chain Technology	3	0	2	4
Major		**One Major with two paper**	8	0	0	8
Minor		**One Minor with one paper**	4	0	0	4
Artificial Intelligence	HRBCA230703A	AI in Robotics				
	HRBCA230703B	AI for Internet of Things				
Data Science	HRBCA230704A	Time Series Analysis and Forecasting				
	HRBCA230704B	Advanced Machine Learning				
Cloud Computing & Information Security	HRBCA230705A	Cloud Data Management and Analytics				
	HRBCA230705B	Ethical Hacking and Penetration Testing				
Mobile Applications	HRBCA230706A	Advanced Mobile App Development				
	HRBCA230706B	Cross-Platform Mobile App Development				
Total Credits Earned						**22**

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BCA Semester–VIII
(Without Research)

Category of Course	Subject Code	Subject title	Teaching Scheme(Per week)			
			Theory	Tutorial	Practical	Credi
OJT	HBCA230801	On the Job Training	0	0	12	6
Major/ Core	HBCA230802	Automata Theory and Compiler Design	3	0	2	4
Major		**One Major with two paper**	8	0	0	8
Minor		**One Minor with one paper**	4	0	0	4
Artificial Intelligence	HRBCA230803A	AI in Financial Forecasting and Trading				
	HRBCA230803B	AI in Image and Video Processing				
Data Science	HRBCA230804A	Text Analytics				
	HRBCA230804B	Social Network Analysis				
Cloud Computing & Information Security	HRBCA230805A	Cloud DevSecOps				
	HRBCA230805B	Secure IoT Deployment in the Cloud				
Mobile Applications	HRBCA230806A	Mobile Game Development				
	HRBCA230806B	Augmented Reality and Virtual Reality in Mobile Apps				
Total Credits Earned						**22**

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Mr. Sagar Jas

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10.CREDITDISTRIBUTION

Semester	I	II	III	IV	V	VI	Total CreditF orBCA	VII	VIII	Total Creditfor BCA(H)
Credit	22	22	22	22	22	22	**132**	22	22	**176**

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SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCHOOL OF COMPUTING & IT

BCA - TEACHING SCHEME BATCH 2023-27 (NEP)

BCA (NEP) Semester – I

Category of Course	Subject Code	Subject title	Teaching Scheme (Per week)				Examination				Total
			Theory	Tutorial	Practical	Credits	Internal		External		
							Th	Pr	Th	Pr	
Major/ Core	BCA230101	Fundamentals of Computers	3	0	2	4	50	-	30	20	100
Major/ Core	BCA230102	Programming in C	3	0	2	4	50	-	30	20	100
Minor	BCA230103	Web Development Using HTML, CSS & XML	3	0	2	4	50	-	30	20	100
MDC	BCA230104	Mathematical Foundation	3	1	0	4	50	-	50	0	100
AEC	AEC230101	Communication Skills	2	0	0	2	25	-	25	-	50
SEC	SEC230101	Foundation of Entrepreneurship	2	0	0	2	25	-	25	-	50
IKS	IKS230101	Indian Science and Technology	2	0	0	2	25	-	25	-	50
Total Credits Earned						**22**	**275**	**0**	**215**	**60**	**550**

BCA Semester – II

Category of Course	Subject Code	Subject title	Teaching Scheme (Per week)				Examination				Total
			Theory	Tutorial	Practical	Credits	Internal		External		
							Th	Pr	Th	Pr	
Major/ Core	BCA230201	Data Structures using C	3	0	2	4	50	-	30	20	100
Major/ Core	BCA230202	Object Oriented Concepts using C++	3	0	2	4	50	-	30	20	100
Minor	BCA230203	Core Java	3	0	2	4	50	0	30	20	100
MDC	BCA230204	Foundation in Statistical Methods	3	1	0	4	50	-	50	-	100
AEC	AEC230202	Logical & Critical Thinking	2	0	2	2	25	-	25	-	50
SEC	SEC230202	Identifying Entrepreneurial Opportunities	2	0	0	2	25	-	25	-	50
VAC	VAC230202	Environmental Studies	2	0	0	2	25	-	25	-	50
Total Credits Earned						**22**	**275**	**0**	**215**	**60**	**550**

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BCA Semester – III

Category of Course	Subject Code	Subject title	Teaching Scheme (Per week)				Examination				Total
							Internal		External		
			Theory	Tutorial	Practical	Credits	Th	Pr	Th	Pr	
Major/ Core	BCA230301	Data Base Management Systems	3	0	2	4	50	-	30	20	100
Major/ Core	BCA230302	C# and DOT NET Framework	3	0	2	4	50	-	30	20	100
Major/ Core	BCA230303	Computer Communication and Networks	3	1	0	4	50	-	50	-	100
MDC	BCA230304	Digital Marketing	3	0	2	4	50	-	30	20	100
AEC	AEC230303	Modern Indian Language *	2	0	0	2	25	-	25	-	50
SEC	SEC230303	Marketing Strategies For Start Ups	2	0	0	2	25	-	25	-	50
IKS	IKS230302	Understanding India	2	0	0	2	25	-	25	-	50
Total Credits Earned						**22**	**275**	**0**	**215**	**60**	**550**

BCA Semester – IV

Category of Course	Subject Code	Subject title	Teaching Scheme (Per week)				Examination				Total
							Internal		External		
			Theory	Tutorial	Practical	Credits	Th	Pr	Th	Pr	
Major/ Core	BCA230401	Python Programming	3	0	2	4	50	-	30	20	100
Major/ Core	BCA230402	Computer Multimedia and Animation	3	0	2	4	50	-	30	20	100
Major/ Core	BCA230403	Operating System Concepts	3	1	0	4	50	-	50	-	100
Minor	BCA230404	E-Commerce	3	1	0	4	50	-	50	-	100
AEC	AEC230404	Soft Skills	2	0	0	2	25	-	25	-	50
SEC	SEC230404	Finance and Funding for Start Up	2	0	0	2	25	-	25	-	50
VAC	VAC230402	Emerging Technologies	0	0	4	2	-	25	-	25	50
Total Credits Earned						**22**	**250**	**25**	**210**	**65**	**550**

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BCA - TEACHING SCHEME BATCH 2023-27 (NEP)

BCA Semester – V

Category of Course	Subject Code	Subject title	Teaching Scheme (Per week)				Examination				Total
							Internal		External		
			Theory	Tutorial	Practical	Credits	Th	Pr	Th	Pr	
Major/ Core	BCA230501	PHP and MySQL	3	0	2	4	50	-	30	20	100
Minor	BCA230502	Software Engineering	3	1	0	4	50	-	50	-	100
							-	-	-	-	
Major		**One Major with two papers**	8	0	0	8					
		Paper 1					50	-	50	-	100
		Paper 2					50	-	50	-	100
Minor		**One Minor with one paper**	4	0	0	4	-				
		Paper 1					50	-	50	-	100
Artificial Intelligence	BCA230503A	AI and Machine Learning Fundamentals									
	BCA230503B	Deep Learning									
Data Science	BCA230504A	Statistical Computing and R Programming									
	BCA230504B	Machine Learning Fundamentals									
Cloud Computing & Information Security	BCA230505A	Information Security Principles									
	BCA230505B	Cloud Computing Fundamentals									
Mobile Applications	BCA230506A	Mobile Application Development Fundamentals									
	BCA230506B	Data Management in Mobile Applications									
SEC	SEC230505	Intellectual Property Rights	2	0	0	2	-	25	-	25	50
Total Credits Earned						**22**	**250**	**25**	**250**	**45**	**550**

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BCA Semester – VI

egory of Course	Subject Code	Subject title	Teaching Scheme (Per week)				Examination				Total
							Internal		External		
			Theory	Tutorial	Practical	Credits	Th	Pr	Th	Pr	
jor/ Core	BCA230601	Computer Network Security	3	1	0	4	50	-	50	-	100
C/Internship	BCA230602	Industrial project	0	0	8	4	-	50	-	50	100
Major		**One Major with two papers**	8	0	0	8					
		Paper 1					50	-	50	-	100
		Paper 2					50	-	50	-	100
Minor		**One Minor with one paper**	4	0	0	4	-				
		Paper 1					50	-	50	-	100
rtificial elligence	BCA230603A	Natural Language Processing									
	BCA230603B	Reinforcement Learning									
a Science	BCA230604A	Big Data Analytics									
	BCA230604B	Predictive Analytics									
Cloud mputing & formation Security	BCA230605A	Cybersecurity Fundamentals									
	BCA230605B	Cloud Infrastructure and Services									
Mobile plications	BCA230606A	Mobile App Testing and Debugging									
	BCA230606B	Mobile Security and Privacy									
AEC	AEC230605	Workplace Communication	2	0	0	2	25	-	25	-	50
		Total Credits Earned				22	225	50	225	50	550

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BCA Semester – VII (With Research)

Category of Course	Subject Code	Subject title	Teaching Scheme (Per week)				Examination				Total
							Internal		External		
			Theory	Tutorial	Practical	Credits	Th	Pr	Th	Pr	
RP	HRBCA230701	Research Project	0	0	12	6	-	75	-	75	150
Major/ Core	HRBCA230702	Advanced Research - I	0	0	8	4	-	50	-	50	100
Major		**One Major with two papers**	8	0	0	8					
		Paper 1					50	-	50	-	100
		Paper 2					50	-	50	-	100
Minor		**One Minor with one paper**	4	0	0	4			-		
		Paper 1					50	-	50	-	100
Artificial Intelligence	HRBCA230703A	AI in Robotics									
	HRBCA230703B	AI for Internet of Things									
Data Science	HRBCA230704A	Time Series Analysis and Forecasting									
	HRBCA230704B	Advanced Machine Learning									
Cloud Computing & Information Security	HRBCA230705A	Cloud Data Management and Analytics									
	HRBCA230705B	Ethical Hacking and Penetration Testing									
Mobile Applications	HRBCA230706A	Advanced Mobile App Development									
	HRBCA230706B	Cross-Platform Mobile App Development									
Total Credits Earned						22	150	125	150	125	550

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BCA - TEACHING SCHEME BATCH 2023-27 (NEP)

BCA Semester – VIII (With Research)

Category of Course	Subject Code	Subject title	Teaching Scheme (Per week)				Examination				Total
							Internal		External		
			Theory	Tutorial	Practical	Credits	Th	Pr	Th	Pr	
RP	HRBCA230801	Research Project	0	0	12	6	-	75	-	75	150
Major/ Core	HRBCA230802	Advanced Research - II	0	0	8	4	-	50	-	50	100
Major		**One Major with two papers**	8	0	0	8					
		Paper 1					50	-	50	-	100
		Paper 2					50	-	50	-	100
Minor		**One Minor with one paper**	4	0	0	4			-		
		Paper 1					50	-	50	-	100
Artificial Intelligence	HRBCA230803A	AI in Financial Forecasting and Trading									
	HRBCA230803B	AI in Image and Video Processing									
Data Science	HRBCA230804A	Text Analytics									
	HRBCA230804B	Social Network Analysis									
Cloud Computing & Information Security	HRBCA230805A	Cloud DevSecOps									
	HRBCA230805B	Secure IoT Deployment in the Cloud									
Mobile Applications	HRBCA230806A	Mobile Game Development									
	HRBCA230806B	Augmented Reality and Virtual Reality in Mobile Apps									
Total Credits Earned						22	150	125	150	125	550

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BCA Semester – VII (Without Research)

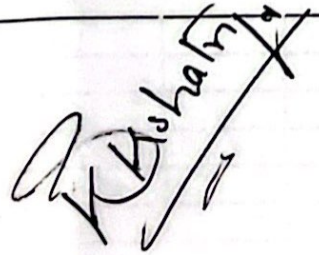
Category of Course	Subject Code	Subject title	Teaching Scheme (Per week)				Examination				Total
							Internal		External		
			Theory	Tutorial	Practical	Credits	Th	Pr	Th	Pr	
OJT	HBCA230701	On the Job Training	0	0	12	6	-	75	-	75	150
Major/ Core	HBCA230702	Block Chain Technology	3	0	2	4	50	-	50	-	100
Major		**One Major with two papers**	8	0	0	8					
		Paper 1					50	-	50	-	100
		Paper 2					50	-	50	-	100
Minor		**One Minor with one paper**	4	0	0	4	-				
		Paper 1					50	-	50	-	100
Artificial Intelligence	HRBCA230703A	AI in Robotics									
	HRBCA230703B	AI for Internet of Things									
Data Science	HRBCA230704A	Time Series Analysis and Forecasting									
	HRBCA230704B	Advanced Machine Learning									
Cloud Computing & Information Security	HRBCA230705A	Cloud Data Management and Analytics									
	HRBCA230705B	Ethical Hacking and Penetration Testing									
Mobile Applications	HRBCA230706A	Advanced Mobile App Development									
	HRBCA230706B	Cross-Platform Mobile App Development									
Total Credits Earned						22	200	75	200	75	550

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BCA Semester – VIII (Without Research)

Category of Course	Subject Code	Subject title	Teaching Scheme (Per week)				Examination				Total
							Internal		External		
			Theory	Tutorial	Practical	Credits	Th	Pr	Th	Pr	
OJT	HBCA230801	On the Job Training	0	0	12	6	-	75	-	75	150
Major/ Core	HBCA230802	Automata Theory and Compiler Design	3	0	2	4	50	-	30	20	100
Major		**One Major with two papers**	8	0	0	8					-
		Paper 1					50	-	50	-	100
		Paper 2					50	-	50	-	100
Minor		**One Minor with one paper**	4	0	0	4			-		
		Paper 1					50	-	50	-	100
Artificial Intelligence	HRBCA230803A	AI in Financial Forecasting and Trading									
	HRBCA230803B	AI in Image and Video Processing									
Data Science	HRBCA230804A	Text Analytics									
	HRBCA230804B	Social Network Analysis									
Cloud Computing & Information Security	HRBCA230805A	Cloud DevSecOps									
	HRBCA230805B	Secure IoT Deployment in the Cloud									
Mobile Applications	HRBCA230806A	Mobile Game Development									
	HRBCA230806B	Augmented Reality and Virtual Reality in Mobile Apps									
Total Credits Earned						22	200	75	200	95	550





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ANNEXURE

2

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ANNEXURE 2

SWARRNIM STARTUP & INNOVATION UNIVERSITY
WHERE IDEAS COME ALIVE.

Swarrnim School of Computing & IT

BCA (Honours) Programme
BCA Semester I

Course Title: Fundamentals of Computers

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
Core	BCA23 0102	4	60	20%	30%	-	30%	20%

Course Outcomes(COs)

1. Understand the basic concepts of computer hardware and software.
2. Demonstrate problem solving skills.
3. Understand the structure of operating system, its applications and commands.
4. To be familiar with network tools, concepts of protocols and network interfaces.
5. Understands the concept of Computer's Input/output devices.

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Syllabus:

Module	Contents	No of Sessions	Weightage
1	• **Computer Fundamentals:** Block Structure of a Computer, Characteristics of Computers, Generation of Computers and Classification of Computers. • **Programming Languages:** Classification, Machine Code, Assembly Language, Higher Level Language and Fourth Generation Languages. • **Number System:** Bit, Byte, Binary, Decimal, Hexadecimal and Octal Systems, Conversion from One System to the Other; Binary Arithmetic Addition, • Subtraction and Multiplication.	15	30%
2	• **Information Concepts & Processing System:** Evolution of Information Processing, Data, Information, Knowledge & Wisdom. • **Elements of a Computer Processing System:** Hardware - Input-Output Devices, VDU, CPU Storage Devices and Media. • **Software Concepts:** Type of Software, Translator, Compiler, Interpreter, Assembler, Loader. • **Application Software:** Office Automation.	15	35%
3	• **Operating System:** Concepts as Resource Manager, Batch Processing, Multiprogramming, Multiprocessing, Time Sharing and Real Time System. • **DOS:** Command Interpreter, Booting Internal & External Commands, Batch Files, exe, com, System Files, bin, txt, bmp Files.	7	15%
4	• **Computer Network and Communication:** Network Types, Network Topologies; Data Communication – Mode, Channel, and Media; OSI Reference Model, TCP/IP, Data Communication Equipment/Devices. • **Internet and its Applications:** E-Mail,	8	20%

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	TELNET, FTP, World Wide Web, Internet and Applications.		

Evaluation		
1	Assignments / Quizzes / Class Participation / Role Play/ Project etc.	30% (Internal Assessment)
2	Internal Examination	20% (Internal Assessment)
3	External Examination (University Exam)	50% (External Assessment)

Basic Text Books:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
1	P.K. Sinha	Computer fundamentals	BPB Publication	8th edition, 2022

Reference Books:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
1	Anita Goel	Computer Fundamentals	Pearson Education	Latest
2	Peter Norton	Inside PC	TMH	Latest
3	Alexis Leon, Methews Leon	Fundamentals of Information Technology"	Vikas Publishing	Latest

❖ **List of Journals / Periodicals / Magazines / Newspapers:**

The students will have to refer to past issues of the following journals in order to getrelevant topic/information pertaining to the subject.

1. "Computer" - This is the flagship magazine of the IEEE Computer Society, covering a wide range of topics related to computer science and technology. It features articles, research papers, and reviews on computer fundamentals.
2. "Communications of the ACM" - This monthly publication by the Association for Computing Machinery (ACM) covers various aspects of computing, including computer fundamentals. It includes articles, research papers, and industry insights.
3. "ACM Computing Surveys" - This journal focuses on surveys and tutorials that provide an overview of the fundamental concepts and developments in the field of computer science. It covers a broad range of topics and serves as a valuable resource for understanding computer fundamentals.
4. "Computer Science Review" - This journal publishes review articles and

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surveys on various topics in computer science, including computer fundamentals. It offers in-depth coverage of foundational concepts and emerging trends.

5. "IEEE Computer Architecture Letters" - This journal focuses specifically on computer architecture, which is a fundamental aspect of computer systems. It features short papers and letters that present novel ideas, designs, and analysis in computer architecture.
6. "International Journal of Computer Science and Information Technologies" - This journal covers various aspects of computer science and information technology, including computer fundamentals. It features research papers, articles, and case studies.
7. "IEEE Transactions on Computers" - This journal publishes research papers, articles, and surveys on computer-related topics, including computer fundamentals. It covers a wide range of areas, including computer architecture, algorithms, and software systems.
8. "Computerworld" - This popular magazine focuses on technology news, trends, and insights. While it covers a wide range of topics, it often includes articles and features related to computer fundamentals and emerging technologies.

WEB RESOURCES:

1. GeeksforGeeks (www.geeksforgeeks.org) - GeeksforGeeks is a popular platform that offers a wide range of articles, tutorials, and coding practice exercises for C programming. It covers various topics, ranging from basic concepts to advanced algorithms and data structures.
2. Tutorialspoint (www.tutorialspoint.com) - Tutorialspoint provides a comprehensive C programming tutorial that covers topics like basic syntax, control structures, functions, arrays, pointers, and file handling. It also offers an online compiler to practice coding.
3. Programiz (www.programiz.com) - Programiz provides interactive C programming tutorials, examples, and exercises. It covers the fundamentals of C programming and also delves into advanced topics like data structures and algorithms.
4. Codecademy (www.codecademy.com) - Codecademy offers an interactive online learning platform that includes a C programming course. It provides hands-on coding exercises and projects to help you practice and reinforce your understanding of C.
5. Cprogramming.com (www.cprogramming.com) - Cprogramming.com offers tutorials, examples, and a forum community for C programming enthusiasts. It covers topics such as basic syntax, data types, control structures, and pointers.
6. Stack Overflow (stackoverflow.com) - Stack Overflow is a popular question-and-answer platform where programmers can ask and answer questions related to C

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programming. It can be a valuable resource for troubleshooting and gaining insights from experienced programmers.

7. The GNU C Library Reference Manual (www.gnu.org/software/libc/manual) - The GNU C Library (glibc) reference manual is an authoritative resource that provides detailed documentation on the C standard library functions. It can be helpful for understanding the usage and behavior of various library functions.
8. The C Programming Language (C89/C90) Standard - The official ANSI C standard document (also known as C89 or C90) specifies the syntax and semantics of the C programming language. It is a valuable reference for understanding the language specifications.

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Practical List:- (Credit-1)

Sr. No.	Practical's	No of Sessions
1.	**How A Computer System Works?** Hardware Configuration, Introduction to Basic omponents of a Typical PC, Assembling a PC, Installing Operating System, Basic Troubleshooting During the Assembling, Basic Troubleshooting of PC, Introduction to Various Types of Cables and Connectors used in Networking, Introduction to Networking and Networking Concepts, Repeaters, Hubs, Switches, Bridges, Routers, Hubs vs Switches, Installing the NIC Card, MAC Address. **Ms Office 2010/2011:** **(A) Ms Word** Introduction to Ms Word: Menu Bar, Menus, Submenus, Tool Bar, Tools, Customizing Toolbar, Hiding Toolbar etc., Creating and Saving a Documents, Working with an Existing Document, Auto Text, Auto Complete and Auto Correct. Formatting a Document :Change the Appearance of Text & Paragraph, Copy, Paste and Paste Special Functions, Creating and Modifying a List, Change the Way Each Page Appears in the Document Giving Stress to Line and Page Break Options and Orientation, Changing the Look of Documents with Styles.	**7**
2.	**Using Tables and Columns:** Table Creation and Modification Giving Stress to Auto-Fit, Auto-Format and Table Sort. Working with Data in Table Giving Stress to Formulas, Presenting Text in Columns, Object Linking and Embedding, Inserting and Sizing Graphics, Hyperlink Envelopes & Label Creation, Grammar & Spell Check, Previewing and	**8**

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	Printing Documents. **(B) MS Excel** Introduction to Electronic Spreadsheet and Microsoft Excel :Creating and Formatting a Worksheet, Features of Excel, Inserting and Formatting Data in a Worksheet, Working with an Existing Data List, Auto Fill, Fill Series and Autocomplete Options, Formatting Cells; Sorting & Filtering Data, Conditional Formatting, Formulas and Functions (Details Usage of Important Data Functions Like Sum, If, Average etc.); Interlinking Worksheets and Files, Setting Filters and Performing alculations on Filtered Data etc. **(C) MS Power Point** **Introduction to Power Point:** **Creating A Presentation:** Features of Power Point - Editing Master Slides, Viewing and Editing a Presentation, Inserting, Sorting, Hiding and Deleting Slides, Inserting Pictures. **Clip Art and Movies in a Slide:** Creating and Enhancing a Table, Slide Layouts, Modifying the Slides and Title Master, Adding Transition and Animation Effect, Hyper Linking Slides & Files.	

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SWARRNIM
STARTUP & INNOVATION
UNIVERSITY

Swarrnim School of Computing & IT

BCA (Honours) Programme
Semester I

Course Title: PROGRAMMING IN C

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
Core	BCA230102	4	60	20%	30%	-	30%	20%

Course Outcomes(COs) :

1. Analyze a given problem and develop an algorithm to solve the problem.
2. Design. developsp and test programs written in 'C'.
3. Write, compile and debug programs in C language.
4. Use different data types in a computer program.
5. Design programs involving decision structures, loops and functions.

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Syllabus:

Module	Contents	No of Sessions	Weightage
1	• **Introduction**: History, Facilities, Concepts, Uses; Basic Program Structure, Header Files, Comments; A Simple C program, Identifiers, Basic Data Types and Sizes, Constants, Variables, Arithmetic, Relational and Logical Operators, Increment and Decrement Operators, Conditional Operator, Bit-wise Operators, Assignment Operators, Expressions, Type Conversions, Conditional Expressions, Precedence and Order of Evaluation. • **Input-Output Functions**: Data Input and Output getchar(), putchar(), scanf(), printf(), functions.	15	30%
2	• **Control Flow**: If-Else, While, Do-while, Goto, For Statements, Nested Control Structures, Switch, Break, Continue Statements, Comma Operator.	7	15%
3	• **Arrays & Functions:** Arrays Defining, Processing Array, Introduction to Multidimensional Arrays; gets(), puts() functions, Functions Types, Parameters, Prototypes, Passing Arrays to Functions, Recursion, Passing Arguments to a Function by Value; • **Storage Classes**: Automatic, External, Static, Register Variables in Single File Environment.	8	20%
4	• **Pointer:** Usage of Pointers, Addresses and Types, Pointer and Address Arithmetic, Pointer Operations and Declarations, Using Pointers as Function Arguments (Call By Reference, Call By Value), Pointer Array Duality Strings, Arrays of Pointers, Pointers to Functions, Concept of Dynamic Allocation of Memory, Pre-Processor Directives. • **Other Data Types**: Structures, Member Accessing, Pointers to Structures, Structures and Functions, Arrays of Structures, Unions,	15	35%

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	Enumerations and Bit Fields, Typedef. • **File Handling**: Introduction of File Handling, Modes of File Handling Uses of fopen(), fclose(), putc(), getc(), putw(), getw(), fscanf(), fprintf(), ferror() Functions.		

Evaluation		
1	Assignments / Quizzes / Class Participation / Role Play/ Project etc.	30% (Internal Assessment)
2	Internal Examination	20% (Internal Assessment)
3	External Examination (University Exam)	50% (External Assessment)

Basic Text Books:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
1	Yashavant P. Kanetkar	Let Us C	BPB Publication	19th edition, 2022

Reference Books:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
1	Peter Vander Linden, Schaum's	Outline of theory and problems of programming with C	TMH	Latest
2	Peter Vander Linden	Expert C programming	PHI	Latest
3	Balagurusamy E.	Computing Fundamentals and C Programming	TMH	Latest

❖ List of Journals / Periodicals / Magazines / Newspapers:

The students will have to refer to past issues of the following journals in order to getrelevant topic/information pertaining to the subject.

1. "C/C++ Users Journal" - This magazine focuses on C and C++ programming languages, offering tutorials, articles, and code examples.
2. "The C/C++ Users Group Newsletter" - This publication provides news, articles, and resources for C and C++ programmers.
3. "Journal of C Language Translation" - This journal focuses on the theory and practice of C language translation, including compiler technology and optimization.

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4. "ACM Transactions on Programming Languages and Systems" - A prestigious journal that covers a broad range of programming languages, including C, and publishes research papers and articles.
5. "IEEE Transactions on Software Engineering" - This journal covers various aspects of software engineering, including programming languages like C, and features research papers and articles.
6. "Software: Practice and Experience" - This journal publishes research papers, case studies, ar reviews related to software development and programming languages, including C.
7. "Embedded Systems Design" - This magazine covers topics related to embedded systems development, including C programming for microcontrollers and other embedded platforms.
8. "C Programming Expert" - An online magazine dedicated to C programming, offering tutorials, tips, and tricks for beginners and advanced programmers alike.

WEB RESOURCES:

1. Khan Academy (www.khanacademy.org)
2. Computer Hope (www.computerhope.com)
3. TechTerms (www.techterms.com)
4. HowStuffWorks (www.howstuffworks.com)
5. W3Schools (www.w3schools.com)
6. Computer Science for Fun (www.cs4fn.org)
7. Neso Academy (www.nesoacademy.org)
8. Studytonight (www.studytonight.com)
9. Computer Science Unplugged (csunplugged.org)
10. Exploring Computer Science (www.exploringcs.org)

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Computing & IT

BCA (Honours) Programme
Semester I

Course Title: Web Development Using HTML, CSS & XML

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
Minor	BCA230103	4	60	30%	20%	-	30%	20%

Course Outcomes (COs):

Course outcomes for the defined syllabus:

1. Understand web concepts, protocols, and client-server computing principles.
2. Create structured web content using HTML, CSS, and apply formatting and styling techniques.
3. Apply CSS for designing layouts, navigation, forms, and enhance user experience.
4. Implement dynamic elements using JavaScript, VBScript, and enhance interactivity.
5. Gain an introduction to XML, its manipulation, and basic server-side technologies for web applications.

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Syllabus:

Module	Contents	No of Sessions	Weightage
1	• World Wide Web, Web page, Home page, Web site, Static, Dynamic and Active web page, Overview of Protocols, Simple Mail Transfer Protocol, Gopher, Telnet, Emails, TFTP, Hyper Text Transfer Protocol, Client server computing concepts. Web Client and Web Sever Web Browser, • **Browsers:** Internet Explorer, Mozilla Firefox • Client, Side Scripting Languages, VB Script and Java Script, Active X control and Plug-ins, Web Server Architecture, Image maps, CGI, API web database connectivity, DBC, ODBC	7	15%
2	• Dynamic HTML, CSSP (Cascading Style Sheet Positioning) and JSSS (JavaScript assisted Style Sheet), Layers of Netscape, The ID Attribute. • **Introduction to HTML:** Element, Attribute, Headings, Paragraphs, Styles, Formatting, Comments, CSS, Links, Images, Tables, Lists, Blocks, Classes, ID, frames, File Paths, Head, Entities, Symbols, Color and Background of Web Pages, Hypertext, Hyperlink and Hypermedia, Links, Anchors and URLs, Links to External Documents, Different Section of a Page and Graphics, Creating Table, Frame, Form and Style Sheet.	15	35%
3	• **CSS:** Syntax, Colors, Backgrounds, Borders, Margins, Padding, Height/ Width, Box Model, Outline, Text, Fonts, Icons, Links, Lists, Position, Overflow, Float, Inline, Block, Align, Navigation Bar, Dropdowns, Image Gallery, Image Sprites, Attr Selectors, Forms, Counters, Website Layout, Units, Specificity.	15	35%
4	**XML:** Elements, Attributes, Namespaces, Display, HTTP request, Parser, DOM, XPath, XSLT, XQuery, XLink, Validator, DTD, Schema, Server	8	15%

Evaluation		
1	Assignments / Quizzes / Class Participation / Role Play/ Project etc.	30% (Internal Assessment)
2	Internal Examination	20% (Internal Assessment)
3	External Examination (University Exam)	50% (External Assessment)

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Basic Text Books:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
1	Shelley Powers	Dynamic Web Publishing 2	Sams.net	2nd Edition, 1998

Reference Books:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
1	Thomas A. Powell	Html & CSS: The Complete Reference	Osborne/McGraw-Hill	5th Edition
2	Heather Williamson	XML: The Complete Reference	Osborne/McGraw-Hill	6th Edition

❖ List of Journals / Periodicals / Magazines / Newspapers:

The students will have to refer to past issues of the following journals in order to getrelevant topic/information pertaining to the subject.

1. World Wide Web Journal
2. Web Development Quarterly
3. HTML & CSS Research Review
4. XML Technologies Review
5. Interactive Web Design Journal
6. Web Designer Magazine
7. HTML/CSS Today
8. XML Insight Magazine
9. Tech Web Designers' Digest
10. Coding & Markup Monthly
11. WebTech Times
12. Digital Web Daily
13. Code Chronicle
14. Tech Web Tribune
15. Design & Markup News

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WEB RESOURCES:

1. Khan Academy (www.khanacademy.org)
2. Computer Hope (www.computerhope.com)
3. TechTerms (www.techterms.com)
4. HowStuffWorks (www.howstuffworks.com)
5. W3Schools (www.w3schools.com)
6. Computer Science for Fun (www.cs4fn.org)
7. Neso Academy (www.nesoacademy.org)
8. Studytonight (www.studytonight.com)
9. Computer Science Unplugged (csunplugged.org)
10. Exploring Computer Science (www.exploringcs.org)

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Computing & IT
BCA (Honours) Programme
Semester I

Course Title: Mathematical Foundation

ategory of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
MDC	BCA230104	4	60	20%	30%	-	50%	-

Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

1. Understand sets and perform operations and algebra on sets.
2. Identify functions and determine their properties.
3. Develop basic knowledge of matrices and to solve equations using Cramer's rule.
4. Identify functions and determine their properties.
5. To develop the knowledge about derivatives and know various applications of differentiation.

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Syllabus:

Module	Contents	No. of Sessions	Weight age
1	**Set theory:** • Basic definition of Set Theory • Methods of representation of Set (Property method, Listing method) • Set operations (Union, Intersection, Complement of a set, Difference of sets, Symmetric difference, Cartesian product of sets) • Properties of set operations (Commutative, Associative, Distributive, De-Morgan's laws) • Power set and Cardinality of sets • Venn diagram • Applications	12	20%
2	**Relations and Functions:** • Relations • Equivalence relation • Examples • Introduction of Functions • Domain, Co-domain and Range of a function • Algebra of functions • Types of functions (Linear, Quadratic, Polynomial, Implicit and Explicit functions and examples related with it) • Exponential and Logarithmic with their properties and related examples • Applications	17	25%
3	**Matrices and Determinants:** • Definition of Matrix • Types of Matrixes (Square, Row, Column, Zero, Diagonal, Scalar, Identity, Transpose, Symmetric, Skew-symmetric) • Arithmetic operations of Matrices (Addition, Scalar Multiplication, Matrix Multiplication) • Introduction to Determinants with Basic properties	18	30%

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	• Invertible matrix • Computation of Inverse using Definition • Simultaneous Solution of set of Linear equations using Cramer's Rule • Matrix inversion method • Rank of Matrix • Applications		
	Limit, Differentiation: • **Limit** ➢ Concept of Limit ➢ Some standard Limits (without proof) ➢ Continuity of a function and related examples • **Differentiation:** ➢ Definition of Derivative ➢ Rules for Differentiation (without proof) ➢ Differentiation of composite functions ➢ Higher order derivatives till order 2 • Applications	**13**	**25%**

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Evaluation:		
1	Assignments/ Quizzes/Class Participation / Role Play/Project etc.	30% (Internal Assessment)
2	Internal Examination	20% (Internal Assessment)
3	External Examination (University Exam)	50% (External Assessment

Basic Textbooks:				
Sr. No.	Author/s	Name of the Book	Publisher	Edition
1	D.C. Sancheti & V.K Kapoor	Business Mathematics	D.C. Sancheti & V.K Kapoor	Latest

Reference Books:				
Sr. No.	Author/s	Name of the Book	Publisher	Edition
1	B.S. Vatsa	Discrete Mathematics	New Age International Limited Publishers	Latest
2	S. C. Gupta	Matrices	S. Chand	Latest
3	R.S. Agarwal	Differential Calculus	S. Chand	Latest

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SWARRNIM
STARTUP & INNOVATION
UNIVERSITY

Swarrnim School of Computing & IT

BCA (Honors) Programme

Semester I

Course Title: Communication Skills

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
AEC	AEC230101	2	30	20%	30%	-	50%	-

Course Outcomes(COs)

1. Inculcation of different skills will be added in a student's career.
2. Students' employability skills will be enhanced.
3. Ability to speak in English will be improved through practice.
4. Self Analysis tool will help the students to identify their strengths and weaknesses to work upon.
5. Hesitation of speaking in public and in English will be reduced.

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Syllabus:

Module	Contents	No of Sessions	Weightage
1	**People Skills** **Essential Skills For Success** Trainer will introduce himself/herself and briefly talk about soft skills. Talk about what soft skills are and their importance. **SWOT Analysis** Trainer will help students understand their strengths, weaknesses, opportunities and threats.	8	26%
2	**Fundamentals Of Communication** Trainer will talk about the importance of communication, how communication works.	4	14%
3	**First Impressions** **Self Presentation** Trainer will talk about how students can present themselves to others in various settings. Self-presentation plays a crucial role in creating initial impressions. A positive and confident self-presentation can set the tone for successful interactions and relationships. **4 A'S Of Dressing** Trainer will discuss the 4 A's of appearance which are: Appropriate Dressing, Authentic Dressing, Approachable Dressing and Affordable Dressing. **The Art of Attitude** Trainer will emphasize on the importance of attitude management and provide a basic understanding of how attitudes impact personal and professional growth. They will focus on cultivating positive mindsets and the transformative power of attitude.	6	20%
4	**Professional Ethics** **Polite Protocol** Trainer will explain the importance of greeting etiquettes and talk about formal greetings and informal greetings. **Concept Of Happiness & Appreciation** Trainer will explain the importance of happiness and how to identify your own happiness.	12	40%

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	Professional Interaction Trainer will introduce the concept of professionalism and what are professional ethics. An interactive activity will be conducted and there will be three scenarios presented in the activity, followed by a discussion about professional ethics.		
	Types of Ethics Trainer will talk about the different ethics that a student has to keep in mind in their professional lives and understand its importance.		

*Note:

1. Activities and content topics may vary according to the feasibility of technical, environmental and physical conditions.

Evaluation		
1	Assignments / Quizzes / Class Participation / Role Play/ Project etc.	30% (Internal Assessment)
2	Internal Examination	20% (Internal Assessment)
3	External Examination (University Exam)	50% (External Assessment

Reference Textbooks:

Sr No:	Text Book	Author Name	Publisher	Edition
1.	Corporate Soft Skills	Sarvesh Gulati	Rupa Publications	2006
2.	Successful Communication	Ken Lawson	Axis Publishing Limited	2006
3.	Soft Skills For Dummies	John Wiley & Sons	John Wiley & Sons, Inc.	2023

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Reference Books:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
1	Nitin Bhattnagar, Mamta Bhatnagar	Effective Communication And Soft Skills	Pearson Pub.	2012
2	©AICTE Approved	Communications Skills WorkBook	NA	NA
3	Roshan Lal Raina	Professional Communication	Himalaya Publishing House	2012
4	Christie Marlowe	Presenting Yourself: Business Manners, Personality, Etiquettes	Mason Crest	2014
5	Jeff Keller	Attitude is everything	Harper Collins	2017

List of Websites/ videos for reference:

1. Basics Of Communication Skills
2. Essential Skills For Success
3. Self Presentation
4. Fundamentals Of Communication
5. Appreciation And Gratitude

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Swarrnim School of Computing & IT

BCA (Honours) Programme

Semester - I

Course Title: Foundation of Entrepreneurship

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
SEC	230101	2	30	30%	20%	-	50%	-

Course Outcomes (COs)

1. To know various theories of entrepreneurship and trends.
2. To identify various issues and challenges in starting a new venture.
3. To understand innovation and its implications
4. To create entrepreneurial mindset through understanding entrepreneurial personality

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Syllabus:

Module	Contents	No of Sessions	Weightage
1	**Introduction to Entrepreneurship:** • Meaning, Role of Entrepreneur, • Entrepreneurial Process and different approaches, • Motivation for becoming an entrepreneur: Maslow's theory ,' Herj burg's theory, MC Gregor's theory, McClelland 's Need - achievement theory • Importance of Entrepreneurship, Functions of an Entrepreneur, Types of Entrepreneurs, Issues & Problems in Entrepreneurial Practices, entrepreneurial education and entrepreneurial mind, • Value creation- economic value and social Value, • Intrapreneurship (Corporate Entrepreneurship, Entrepreneurship and Startup	14	50%
2	**Characteristics or traits of successful entrepreneurs and myths related to entrepreneurship:** • Characteristics or traits of successful entrepreneurs, need for studying success characteristics / traits of entrepreneurs, • How to develop successful characteristics/traits of entrepreneur • Myths related to entrepreneurship.	8	25%
3	**Cognitive foundations of entrepreneurship** • Human cognition: its basic nature- and important limitations, • Creativity and innovation • ideas to reality	8	25%

Evaluation		
1	Assignments / Quizzes / Class Participation / Role Play/ Project etc.	30% (Internal Assessment)
2	Internal Examination	20% (Internal Assessment)
3	External Examination (University Exam)	50% (External Assessment

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Basic Text Books:

Sr. No.	Author/s	Nameof the Book	Publisher	Edition
1	S.S. Khanka, Gupta. C.B.	Entrepreneurship & Small Business Management	Sultan Chand and Sons	LatestEdition
2	Sami Uddin	Entrepreneurship Development in India	Mittal Publications	LatestEdition

Reference Books:

Sr. No.	Author/s	Name of theBook	Publisher	Edition
1	Dr. Bhatia.R.C	Entrepreneurship: Business and Management	Sultan Chand and Sons	Latest
2	Bruce R. Barringer	Entrepreneurship: Successfully Launching New Ventures	Pearson Education	Latest
3	Janakiram. B., Rizwana. M.	Entrepreneurship development	Excel Books	Latest
4	Khanna. S.S.	Entrepreneurial Development	Excel Books	Latest

List of Journals / Periodicals / Magazines / Newspapers:

The students will have to refer to past issues of the following journals in order to get relevant topic/information pertaining to the subject.

1. Journal of Entrepreneurship
2. Journal of Small Business Management
3. Journal of Entrepreneurship & Management
4. AMC Indian Journal of Entrepreneurship

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Swarrnim School of Computing & IT

BCA (Honours) Programme
Semester I

Course Title: Indian Science & Technology

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
IKS	IKS230101	2	30	20%	30%	-	50%	-

Course Outcomes (COs):

1. Gain an in-depth appreciation of India's technological heritage, including its contributions to metallurgy textiles, ceramics, and more.
2. Understand the historical evolution of water management systems and transportation methods in India. and their impact on society.
3. Explore the intersection of mathematics and astronomy in India, from ancient mathematical texts to significant astronomical discoveries.
4. Examine India's ecological wisdom and environmental practices, including their applications in agriculture, architecture, and sustainable land management.
5. Recognize India's role in shaping global technology and knowledge dissemination through its historical connections and contributions to various fields.

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Syllabus:

Module	Contents	No of Sessions	Weightage
1	• Fundamentals: An overview of Indian contributions to technology, Technological Innovations, • Metallurgy, Textile Chemistry & Pyro Technology: Copper/Bronze/Zinc: Important Mines (Zawar, Khatri mines), Iron and Wootz Steel Technology, Textile and Dyeing- Indian Specialties (Kutchi Embroidery, Cotton Textile etc.), Ceramic Technology, Stone (Lapidary), Shell, Ivory, Faience & Glass Technology	09	30%
2	• Water Management & Transportation: Harappan and Traditional Water Management System of Gujarat, Historical Sites- Sringeverpur, South Indian Water Management System, Western Ghats, Cave- Kanheri, etc., Communities Involved in Water Management, Modes of Transportations and Reforms, Grand Trunk Road (Uttarapath & Dakshinapath), Development of Trading Techniques, Boat & Ship Building	06	20%
3	• Mathematics & Astronomy: Mathematics contained in the Sulbasutra, Weaving Mathematics into Beautiful Poetry- Bhaskaracarya, The Evolution of Sine Function in India, The Discovery of Calculus by Kerala Astronomers, Vedanga Jyotish & Measuring Time & Calendar.	06	20%
4	• Ecology and Environment: Nakshatrara Gyaan and Agriculture, Vernacular Architecture, Forest Management and Urban Planning, Agroforestry, Tank, Lakes, and Stepwells • India's Contribution to the World	09	30%

Evaluation		
1	Assignments / Quizzes / Class Participation / Role Play/ Project etc.	30% (Internal Assessment)
2	Internal Examination	20% (Internal Assessment)
3	External Examination (University Exam)	50% (External Assessment)

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Basic Text Books:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
1	R.M. Pujari, Pradeep Kolhe, N. R. Kuma	'Pride of India: A Glimpse into India's Scientific Heritage'	Samskrita Bharati Publication	2006

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Reference Books:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
1	Vijnana Bharati	'Indian Contribution to science'	TMH	Latest
2	Kapil Kapoor, Michel Danino	Knowledge traditions and practices of India	CBSE	Latest

❖ List of Journals / Periodicals / Magazines / Newspapers:

The students will have to refer to past issues of the following journals in order to getrelevant topic/information pertaining to the subject.

1. Dr. Subhash Kak, Computation in Ancient India, Mount, Meru Publishing (2016)
2. Dharampal, *Indian Science and Technology in the Eighteenth Century*, Academy of Gandhian Studies, Hyderabad, 1971, republic. Other India Bookstore, Goa, 2000
3. Robert Kanigel, *The Man Who Knew Infinity: A Life of the Genius Ramanujan*, Abacus,London, 1999
4. Alok Kumar, *Sciences of the Ancient Hindus: Unlocking Nature in the Pursuit of Salvation*,CreateSpace Independent Publishing, 2014
5. B.V. Subbarayappa, *Science in India: A Historical Perspective*, Rupa, New Delhi, 2013
6. S. Balachandra Rao, *Indian Mathematics and Astronomy: Some Landmarks*, Jnana DeepPublications, Bangalore, 3rdedn, 2004
7. S. Balachandra Rao, *Vedic Mathematics and Science in Vedas*, Navakarnataka Publications,Bengaluru, 2019
8. Bibhuti Bhushan Datta, *Ancient Hindu Geometry: The Science of the Śulba*, 1932, repr.Cosmo Publications, New Delhi, 1993

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9. Bibhuti Bhushan Datta & Avadhesh Narayan Singh, *History of Hindu Mathematics*, 1935, repr. Bharatiya Kala Prakashan, Delhi, 2004

10. George Gheverghese Joseph, *The Crest of the Peacock*, Penguin Books, London & NewDelhi, 2000

11. J. McKim Malville &Lalit M. Gujral, *Ancient Cities, Sacred Skies: Cosmic Geometries andCity Planning in Ancient India*, IGNCA & Aryan Books International, New Delhi, 2000).

12. Clemency Montelle, *Chasing Shadows: Mathematics, Astronomy and the Early History ofEclipse Reckoning*, Johns Hopkins University Press, 2011

13. AnishaShekharMukherji, *Jantar Mantar: Maharaja Sawai Jai Singh's Observatory in Delhi*,

14. AMBI Knowledge Resources, New Delhi, 2010

15. Thanu Padmanabhan, (ed.), *Astronomy in India: A Historical Perspective*, Indian National Science Academy, New Delhi & Springer (India), 2010

16. Acharya Prafulla Chandra Ray, *A History of Hindu Chemistry*, 1902, republic., Shaibya Prakashan Bibhag, centenary edition, Kolkata, 2002

17. R. Balasubramaniam, *Delhi Iron Pillar: New Insights*, Indian Institute of Advance Study, Shimla & Aryan Books International, New Delhi, 2002

18. R. Balasubramaniam, *Marvels of Indian Iron through the Ages*, Rupa& Infinity Foundation, New Delhi, 2008

19. Anil Agarwal & Sunita Narain, (eds), *Dying Wisdom: Rise, Fall and Potential of India's Traditional Water-Harvesting Systems*, Centre for Science and Environment, New Delhi, 1997

20. Fredrick W. Bunce: *The Iconography of Water: Well and Tank Forms of the Indian Subcontinent*, DK Print world, New Delhi, 2013

WEB RESOURCES:

1. https://www.insaindia.res.in/
2. https://www.sciencehistory.org/
3. http://www.intach.org/
4. http://www.nationalmuseumindia.gov.in/
5. https://asi.nic.in/
6. https://math.iisc.ac.in/
7. https://www.icer.gov.in/
8. https://whc.unesco.org/

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SWARRNIM
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WHERE IDEAS COME ALIVE.

Swarrnim School of Computing & IT

BCA (Honours) Programme
BCA Semester II

Course Title: Data Structures Using C

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
Core	BCA230201	4	60	20%	30%	-	30%	20%

Course Outcomes(COs)

Here are concise course outcomes for the syllabus:

1. Apply arrays for varied applications, understand data structure classifications and operations.
2. Implement stacks and queues, perform infix-postfix conversion, and grasp recursion concepts.
3. Master linked lists, including insertion, deletion, sorting, and node counting.
4. Gain expertise in binary trees, traversals, and tree expression manipulation.
5. Proficiently use sorting (bubble, insertion, quick) and searching (sequential, binary) techniques.

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Syllabus:

Module	Contents	No of Sessions	Weightage
1	• Classification of Data Structure, Operations on Data Structure, Address Calculation, Application of arrays, Application of Arrays	7	15%
2	• **Continuous Implementation (Stack):** Array Representation, Operations on Stacks: Push & Pop, Applications of stack, Conversion of Infix to Prefix and Postfix Expressions, Evaluation of postfix expression using stack • **Recursion:** Recursive Definition and Processes Recursion Vs. Iteration Continuous. Implementation (Queue): Array representation and implementation of Queues.	15	35%
3	• **Non-Continuous Implementation:** Link Lists: Linear List concept, Linked List Terminology, Representation of Linked List in Memory, Types of Linked List, Single Linked List, Doubly Linked List, Operations on Link List: Create List Insert node (empty list, beginning, middle, end), Delete node (first, general case), Print list, Count Nodes, Sort Lists.	8	15%
4	• **Trees:** Introduction to Tree & its Terminology, Binary trees, Types of Binary trees, Representation of Binary Tree, Traversals (Inorder, Preorder, Postorder), Tree Expression. • **Sorting & Searching Techniques:** Bubble Sort, Insertion Sort, Quick Sort, Sequential Search, Binary Search.	15	35%

Evaluation		
1	Assignments / Quizzes / Class Participation / Role Play/ Project etc.	30% (Internal Assessment)
2	Internal Examination	20% (Internal Assessment)
3	External Examination (University Exam)	50% (External Assessment)

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Basic Text Books:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
1	S. Lipschutz	Data structures	Mc'Graw, Hill	2nd Edition

Reference Books:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
1	Aaron M. Tenenbaum	Data Structures Using C	Oxford University Press	5th Edition
2	Y. Langsam, M. Augenstein And A. M. Tenenbaum	Data Structures Using C And C++	Prentice - Hall Of India Pvt. Ltd.	2nd Edition

❖ **List of Journals / Periodicals / Magazines / Newspapers:**

The students will have to refer to past issues of the following journals in order to getrelevant topic/information pertaining to the subject.

1. ACM Transactions on Computing Systems
2. Journal of Computer Science and Technology
3. Journal of the ACMIEEE Software
4. CODE Magazine
5. Journal of Computing Sciences in Colleges
6. Computer Science Education
7. Design & Markup News

WEB RESOURCES:

1. Khan Academy (www.khanacademy.org)
2. Computer Hope (www.computerhope.com)
3. TechTerms (www.techterms.com)
4. HowStuffWorks (www.howstuffworks.com)
5. W3Schools (www.w3schools.com)
6. Computer Science for Fun (www.cs4fn.org)
7. Neso Academy (www.nesoacademy.org)
8. Studytonight (www.studytonight.com)
9. Computer Science Unplugged (csunplugged.org)
10. Exploring Computer Science (www.exploringcs.org)

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SWARRNIM
STARTUP & INNOVATION
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Swarrnim School of Computing & IT

BCA (Honours) Programme
BCA Semester II

Course Title: Object Oriented Concepts using C++

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
Core	BCA230202	4	60	20%	30%	-	30%	20%

Course Outcomes(COs)

Here are concise course outcomes for the syllabus:

1. Understand the fundamental concepts of Object-Oriented Programming (OOP) and grasp C++ basics, including operators, data types, and identifiers.
2. Master control flow structures like if-else, loops, and learn about classes, objects, encapsulation, constructors, and memory allocation.
3. Acquire proficiency in working with arrays, strings, functions (overloading, inline), and operator overloading.
4. Develop a solid understanding of pointers, inheritance, class hierarchy, and abstract classes.
5. Gain knowledge of file handling, exception handling, namespaces, and stream operations.
6.

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Syllabus:

Module	Contents	No of Sessions	Weightage
1	• Introduction- Introducing Object – Oriented Approach, Relating to other paradigms {Functional, Data decomposition}. • Basic terms and ideas- Abstraction, Encapsulation, Inheritance, Polymorphism, Review of C, Difference between C and C++ - cin, cout, new, delete, operators.	8	15%
2	• Classes and Objects: Encapsulation, information hiding, abstract data types, Object & classes, attributes, methods, C++ class declaration, State idendity and behaviour of an object, Constructors and destructors, instantiation of objects, Default parameter value, object types, C++ garbage collection, dynamic memory allocation, Metaclass / abstract classes.	15	35%
3	• Inheritance and Polymorphism- Inheritance, Class hierarchy, derivation – public, private & protected, Aggregation, composition vs classification hierarchies, Polymorphism, Categorization of polymorphism techniques, Method polymorphism, Polymorphism by parameter, Operator overloading, Parametric Polymorphism • Generic function- Template function, function name overloading, Overriding inheritance methods, Run time polymorphism, Multiple Inheritance.	15	35%
4	• Files and Exception Handling- Streams and files, Namespaces, Exception handling, Generic Classes	7	15%

Evaluation		
1	Assignments / Quizzes / Class Participation / Role Play/ Project etc.	30% (Internal Assessment)
2	Internal Examination	20% (Internal Assessment)
3	External Examination (University Exam)	50% (External Assessment)

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Basic Text Books:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
1	A. R. Venugopal, Rajkumar, T. Ravishanker	Mastering C++	TMH	3rd Edition

Reference Books:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
1	S. B. Lippman & J. Lajoie	C++ Primer	Addison Wesley	3rd Edition
2	R. Lafore	Object Oriented Programming using C++	Galgotia Publications	6th Edition
3	D. Parasons	Object Oriented Programming using C++	BPB Publication	2nd Edition

❖ **List of Journals / Periodicals / Magazines / Newspapers:**

The students will have to refer to past issues of the following journals in order to getrelevant topic/information pertaining to the subject.

1. A Journal of Object Technology
2. Journal of Computer Science and Technology
3. ACM Transactions on Programming Languages and Systems
4. C++ Users Journal (Now defunct, but archives might be useful)
5. C/C++ Users Journal (Also defunct, but archives might contain valuable content)
6. Journal of Computing Sciences in Colleges
7. Computer Science Education

WEB RESOURCES:

1. Khan Academy (www.khanacademy.org)
2. Computer Hope (www.computerhope.com)
3. TechTerms (www.techterms.com)
4. HowStuffWorks (www.howstuffworks.com)
5. W3Schools (www.w3schools.com)
6. Computer Science for Fun (www.cs4fn.org)
7. Neso Academy (www.nesoacademy.org)
8. Studytonight (www.studytonight.com)
9. Computer Science Unplugged (csunplugged.org)
10. Exploring Computer Science (www.exploringcs.org)

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Swarrnim School of Computing & IT

BCA (Honours) Programme
BCA Semester II

Course Title: Core Java

ategory of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
Minor	BCA230203	4	60	20%	30%	-	30%	20%

Course Outcomes(COs):

1. Proficiently apply Java programming concepts including data types, control structures, arrays, strings, inheritance, packages, and exception handling.
2. Proficiently apply Java programming concepts of lasses and multithreading
3. Design interactive Java applets using AWT controls, layout managers, and event listeners while mastering string handling.
4. Gain expertise in networking with datagram and TCP/IP server sockets, and learn to establish JDBC connections and utilize connection pooling.
5.

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Syllabus:

Module	Contents	No of Sessions	Weightage
1	• Java Programming: Data types, control structures, arrays, strings, and vector, operators	10	22%
2	• classes (inheritance, package, exception handling), abstraction, multithreaded programming	10	22%
3	• Java applets, AWT controls (Button, Labels, Combo box, list and other Listeners, menu bar) layout manager, string handling (only main functions)	15	34%
4	• Networking (datagram socket and TCP/IP based server socket) event handling, JDBC: Introduction, Drivers, Establishing Connection, Connection Pooling.	10	22%

Evaluation		
1	Assignments / Quizzes / Class Participation / Role Play/ Project etc.	30% (Internal Assessment)
2	Internal Examination	20% (Internal Assessment)
3	External Examination (University Exam)	50% (External Assessment)

Basic Text Books:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
1	Patrick Naughton and Herbertz Schildt	Java-2 The Complete Reference	TMH	3rd Edition

Reference Books:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
1	Herbertz Schildt	Java: A Beginner's Guide	McGraw-Hill Education	9th edition (4 April 2022)
2	Joshua Bloch	Effective Java		6th Edition

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❖ **List of Journals / Periodicals / Magazines / Newspapers:**

The students will have to refer to past issues of the following journals in order to getrelevant topic/information pertaining to the subject.

1. Journal of Computer Science and Technology
2. ACM Transactions on Computing Education
3. Java Magazine
4. Journal of Computing Sciences in Colleges
5. Computer Science Education
6. Journal of Computing Sciences in Colleges

WEB RESOURCES:

1. Khan Academy (www.khanacademy.org)
2. Computer Hope (www.computerhope.com)
3. TechTerms (www.techterms.com)
4. HowStuffWorks (www.howstuffworks.com)
5. W3Schools (www.w3schools.com)
6. Computer Science for Fun (www.cs4fn.org)
7. Neso Academy (www.nesoacademy.org)
8. Studytonight (www.studytonight.com)
9. Computer Science Unplugged (csunplugged.org)
10. Exploring Computer Science (www.exploringcs.org)

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Swarrnim School of Computing & IT

BCA (Honours) Programme
BCA Semester II

Course Title: Foundation in Statistical Methods

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
MDC	BCA230204	3+1	60	20%	30%	-	50%	2-

Course Outcomes(COs):

1. Develop proficiency in organizing data through tabulation, frequency distribution, and graphical representation.
2. Understand and compute measures like mean, median, mode, range, quartile deviation, mean deviation, and standard deviation for assessing data patterns.
3. The concept of skewness and apply Karl Pearson's Coefficients of Skewness in practical scenarios.
4. Gain insight into correlation types and methods, including Karl Pearson's correlation coefficient, to assess relationships between variables in datasets.
5.

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Syllabus:

Module	Contents	No of Sessions	Weightage
1	• Classification of data, Tabulation of data, Preparation of frequency distribution, Presentation of data through histogram, frequency polygon, frequency curve	12	26%
2	• Measures of Central Tendency: Computation of Arithmetic mean, median and mode for ungrouped data and grouped data.	10	22%
3	• Measures of dispersion: Computation of Range, Quartile deviation, mean deviation and Standard deviation • Concept of Skewness, Karl Pearson's Coefficients of Skewness(Numerical Applications Only)	15	34%
4	• Meaning of Correlation, types of correlation, correlation coefficient, Karl Pearson correlation coefficient. (Numerical Applications Only)	08	18%

Evaluation		
1	Assignments / Quizzes / Class Participation / Role Play/ Project etc.	30% (Internal Assessment)
2	Internal Examination	20% (Internal Assessment)
3	External Examination (University Exam)	50% (External Assessment)

Basic Text Books:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
1	Dr. S.P. Gupta	"Statistical Methods"	Sultan Chand & Sons	46th edition (1 January 2021)

Reference Books:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
1	S.C. Gupta & V.K. Kapoor	Fundamental of Mathematical Statistics	Sultan Chand	11th edition

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2	Mode .E.B.	"Elements of Statistics"	PrenticeHall	6th Edition

❖ List of Journals / Periodicals / Magazines / Newspapers:

The students will have to refer to past issues of the following journals in order to getrelevant topic/information pertaining to the subject.

1. Journal of Statistical Education
2. The American Statistician
3. Journal of Applied Statistics
4. Journal of Statistics Education
5. International Journal for Innovation Education and Research
6. Mathematics Teacher: Learning and Teaching PK-12

WEB RESOURCES:

1. www.statistics.com
2. stats.stackexchange.com
3. TechTerms (www.techterms.com)
4. HowStuffWorks (www.howstuffworks.com)
5. W3Schools (www.w3schools.com)
6. Computer Science for Fun (www.cs4fn.org)
7. Neso Academy (www.nesoacademy.org)
8. Studytonight (www.studytonight.com)

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❖ **List of Journals / Periodicals / Magazines / Newspapers:**

The students will have to refer to past issues of the following journals in order to getrelevant topic/information pertaining to the subject.

1. Journal of Computer Science and Technology
2. ACM Transactions on Computing Education
3. Java Magazine
4. Journal of Computing Sciences in Colleges
5. Computer Science Education
6. Journal of Computing Sciences in Colleges

WEB RESOURCES:

1. Khan Academy (www.khanacademy.org)
2. Computer Hope (www.computerhope.com)
3. TechTerms (www.techterms.com)
4. HowStuffWorks (www.howstuffworks.com)
5. W3Schools (www.w3schools.com)
6. Computer Science for Fun (www.cs4fn.org)
7. Neso Academy (www.nesoacademy.org)
8. Studytonight (www.studytonight.com)
9. Computer Science Unplugged (csunplugged.org)
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School of Computing & IT

BCA (Honours)

Programme BCA Semester

II

Course Title: Logical and Critical Thinking

Category Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
ACE	AEC230202	2	30			-		-

Course Outcomes (COs)

- Students are able to understand the basic concept of Logical and Critical Thinking and are able to solve problems
- Student analytical ability increased.
- Student can be placed in service based company, government sector, PSU and it will also help in higher study.

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School of Computing & IT

BCA (Honours)

Programme BCA Semester

II

Course Title: Logical and Critical Thinking

Category Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
ACE	AEC230202	2	30			-		-

Course Outcomes (COs)

- Students are able to understand the basic concept of Logical and Critical Thinking and are able to solve problems
- Student analytical ability increased.
- Student can be placed in service based company, government sector, PSU and it will also help in higher study.

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Syllabus:

Module	Contents	No of Sessions	Weightage
1	**Simplification and Approximation** (BODMAS Rule,Approximation.Short trick, Digit Sum,Square Roots and Cube roots based Question) **Coding Decoding** (Coding means Encryption and Decoding means Decryption among letters, alphabets and Special Symbols)	8	26%
2	**Crypt arithmetic** (Crypt arithmetic is a type of mathematical game consisting of Mathematical Equation) **Analogy & Odd one out** (An Analogy is a comparison between two objects or system of objects in which they are thought to be similar.)	4	14%
3	**Direction & Distance** (Description of Directions and Determination of Distance wrt. Directions, Sunrise and Sunset with Shadow Concept.) **Blood Relations** (In such questions, one person describes his /her relation with another person. Pointer- narrator relations Symbols relation as well as group relation)	6	20%
4	**Number System** Classifications of Number System [Rational/Irrational No's, Integers, fraction, Even-odd, Prime - Composite no's] Perfect number & Square , Face value-Place value Frequency of Digit Occurrence Concept of Divisibility Rule - finding the division of a number Cyclicity rule - Unit digit Concept, Trailing Zeroes Binomial Theorem - for remainder Factorizations - Prime - Composite factors, Total factors , Even-Odd factors	12	40%

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Evaluation		
1	Assignments/ Quizzes/ClassParticipation / Role Play/Projectetc.	30%(Internal Assessment)
2	InternalExamination	20%(InternalAssessment)
3	ExternalExamination(UniversityExam)	50%(External Assessment)

BasicTextBooks:

Sr. No.	Author/s	Nameof the Book	Publisher	Edition
1	R.S.AGRWAL	Reasoning for Competitive Examinations	S CHAND	2022
2	R.S. AGRWAL	Quantitative Aptitude for Competitive Examinations	S CHAND	2022

ReferenceBooks:

Sr. No.	Author/s	Name of theBook	Publisher	Edition
1	ARUN SHARMA	How To Prepare For Quantitative Aptitude	McGraw Hill Education	10TH 2022
2	R. PRAVEEN	Quantitative Aptitude and Reasoning	PHI Learning Pvt Ltd	3RD 2016

Relevant Websites

ARIHANT REASONING E-BOOK PDF
https://parikshatop.com/arihant-reasoning-book-pdf-download-free/
E BOOK FOR REASONING – ARUN SHARMA
https://z-lib.is/book/how-to-prepare-for-logical-reasoning-for-the-cat
E BOOK FOR APTITUDE– ARUN SHARMA
https://z-lib.is/book/how-to-prepare-for-quantitative-aptitude-for-the-cat
LINK FOR MULTIPLE QUANT E BOOK
https://www.google.com/search?q=aptitude+book+for+placement+pdf&oq=APTITUDE+BOOK&aqs=chrome.3.0i512l10.12648j0j15&sourceid=chrome&ie=UTF-8

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School of Computing & IT

BCA (Honours) Programmes

BCA (Hons.) Semester - II

Core Course Title: Identifying Entrepreneurial Opportunities

Categoryo fCourse	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
SEC	SEC230202	2	30	20%	30%	-	50%	-

Course Outcomes (COs)

1. Exploration of opportunities from the market
2. Check technical, market, financial and other types of Feasibility of a business idea.
3. Develop business model to describe the rationale of how an organization creates, delivers, and captures value
4. Identification of various Business Opportunities from the market

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Syllabus:

Module	Contents	No of Sessions	Weightage
1	**Opportunities: Their nature, discovery, and Creation:** • Opportunities: Their basic nature, opportunities: Discovered, created, or both, Opportunities: The role of information, experience and social network- The role of information in opportunity recognition, The role of experience and social networks in opportunity recognition, • How entrepreneurs can become skilled at recognizing opportunities…Entrepreneurship, Entrepreneurship and Startup	14	50%
2	**Business Idea Creation & IPR** • Meaning, sources of business ideas, techniques for idea generation like brain storming, • Focus group, six thinking hats as idea generation, • Characteristics of brilliant business ideas **Introduction:** • Knowledge creation, Innovation and Intellectual Property Rights, Concept of Intellectual Property, • Types of IPR – Patents – Copyright – Trademark – Industrial Designs – Trade Secrets – Geographical	8	25%
3	**Business Model:** • Introduction to business model, Types of business model, • Developing and testing a business model, Business modelling process, Business model canvas, • Business Models and value proposition, Business Model Failure: Reasons and Remedies Reinventing business model	8	25%

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Evaluation		
1	Assignments / Quizzes / Class Participation / Role Play/ Project etc.	30% (Internal Assessment)
2	Internal Examination	20% (Internal Assessment)
3	External Examination (University Exam)	50% (External Assessment

Basic Text Books:

Sr. No.	Author/s	Nameof the Book	Publisher	Edition
1	S.S. Khanka, Gupta. C.B.	Entrepreneurship & Small Business Management	Sultan Chand and Sons	LatestEdition
2	Sami Uddin	Entrepreneurship Development in India	Mittal Publications	LatestEdition

Reference Books:

Sr. No.	Author/s	Name of theBook	Publisher	Edition
1	Dr. Bhatia.R.C	Entrepreneurship: Business and Management	Sultan Chand and Sons	Latest
2	Bruce R. Barringer	Entrepreneurship: Successfully Launching New Ventures	Pearson Education	Latest
3	Janakiram. B., Rizwana. M.	Entrepreneurship development	Excel Books	Latest
4	Khanna. S.S.	Entrepreneurial Development	Excel Books	Latest

List of Journals / Periodicals / Magazines / Newspapers:

The students will have to refer to past issues of the following journals in order to get relevant topic/information pertaining to the subject.

1. Journal of Entrepreneurship
2. Journal of Small Business Management
3. Journal of Entrepreneurship & Management
4. AMC Indian Journal of Entrepreneurship

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School of Computing & IT

BCA (Honours) Programme

BCA Semester II

Course Title: Environmental Studies

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
VAC	VAC230201	2	30	20%	30%	-	50%	-

Course Outcomes (COs)

1. Enabling students to understand and realize the multi- disciplinary nature of the environment, its components, and inter-relationship between man and environment.
2. Understanding the relevance and importance of natural resources in the sustenance of life on earth and living standard. the importance of ecosystem, biodiversity, and nature.
3. Correlating the human population growth and its trend to the environmental degradation and developing the awareness about his/her role towards environmental protection. Identifying different types of environmental pollution and control measures.

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Syllabus:

Module	Contents	No of Sessions	Weightage
1	**Introduction to Environment and** • Definition and Components of Environment, Relationship between the different components of Environment, Man and Environment relationship, Impact of technology on Environment, Environmental Degradation, its scope. • Water resources: Sources of water - Surface and Ground water sources, Indian and Global scenario. • Land resources: Land pollution, land use, land degradation & its causes. • Forest resources: Definition and Types of Forests importance and benefits of forest, Deforestation causes and effects.	9	30%
2	**Ecology and Ecosystems:** • Ecology: Introduction, Objectives and Classification, Concept of an ecosystem-structure of ecosystem or Components of ecosystem- Producers, Consumers, Decomposers • Ecosystems: Forest Ecosystem, Grassland Ecosystem, Desert Ecosystem, Aquatic Ecosystem, Estuarine Ecosystem • Human Population and Environment: Population Growth, World and Indian scenario, Population and Environmental Degradation, Malthusian theory, Optimum theory, • Urbanization: Urban population growth and Environmental problems	12	40%
3	**Environmental pollutions:** • Water Pollution: Introduction – Water Quality standards, sources of water	9	30%

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	pollution Classification of water pollutants. Eutrophication • Air Pollution: Composition of air, Structure of atmosphere, Ambient Air Quality Standards, Classification of air pollutants, • Land Pollution: Land uses, Land degradation: causes,effects and control, soil erosion • Noise Pollution: Introduction, Sound and Noise,Causes and Effects • Global EnvironmentalIssues: Climate Change, Global Warming and Green House Effect, Acid Rain, Depletion of Ozone layer		

Evaluation		
1	Assignments / Quizzes / Class Participation / Role Play/ Project etc.	30% (Internal Assessment)
2	Internal Examination	20% (Internal Assessment)
3	External Examination (University Exam)	50% (External Assessment)

Basic Text Books:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
1	Snehal Popli & B.R.Shah	Basics of Environmental studies	Mahajan Publishing House	Latest

Reference Books:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
1	Prof Dr N S Varandani	Basics of Environmental Studies	LAP -Lambert Academic Publishing Germany	Latest
2	R. Rajagopalan	Environmental Studies	Oxford University Press	Latest
3	U K Khare	Basics of Environmental Studies	Tata McGraw Hill	Latest

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4	Daniel B Botkin &Edward A Keller	Environmental Sciences	John Wiley & Sons.	Latest

❖ List of Journals / Periodicals / Magazines / Newspapers:

The students will have to refer to past issues of the following journals in order to get relevant topic/information pertaining to the subject.

- Environmental Standard
- Indian Journal of Environmental Research and Studies
- Journal of Environmental Science and Technology.

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B.O.S. RECORDS

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Inbox 334

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Sent

Drafts 120

More

Labels

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Invitation for Industry Expert Panel Member in BoS

External Inbox ×

HOD BCA

Dear Sir/ Ma'am, Swarnim Startup and Innovation University has been approved by the Government of Gujarat under t

Sagar Jasani Fri, Aug 25, 1:

to me

Respected sir

Thank you for considering me for the BOS and it's a pleasure for me to be the part of the board. I wil

Regards
Sagar Jasani
BrainyBeam technologies
Ahmedabad

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Gmail hbjethva@gmail.com

Compose

Inbox 334
Starred
Snoozed
Sent
Drafts 120
More

Labels

Admission cancel
google sheet
NOC BCA
student leave
UGC data

H JETHVA Thu, Aug 24, 1
to me, vikas, hbjethva, dave, swapnil

I accept the invitation.

On Thu, Aug 24, 2023 at 6:54 AM HOD BCA <hod.bca@swarnim.edu.in> wrote:

Dear Sir/ Ma'am,

Swarnim Startup and Innovation University has been approved by the Government of Gujarat under the Gujarat I a young university aspiring to impart excellence in education. We offer various programs in **Health Science, Engine Liberal Arts, Design, Science and Agriculture.** The University has a vision to be a globally competent Institution in foundation of Innovation and Entrepreneurship.

We invite you to become part of the esteemed member of the **Board of Studies (BOS) of School of Computing &** curriculum as per the guidelines based on the New Education Policy and Government of Gujarat Education Departm Educational Institutions.

We intend to schedule the Board of Studies meeting In the 3rd week of August 2023, for the same we request you tc **Which is a convenient date to conduct the same.**

Kindly reply via the same mail regarding confirmation of date.

Warm Regards

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Gmail Search in mail

99+

Compose

Mail

Inbox 334

Chat

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Snoozed

Spaces

Sent

Drafts 120

Meet

More

Labels

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google sheet

NOC BCA

student leave

UGC data

HOD BCA <hod.bca@swarrnim.edu.in> Fri, Aug 25, 9

to Dr, swapnil

Dear Ma'am,

The Board of Studies Meeting for the School of Computing and IT is scheduled the on 25 Aug 2023. We request to ap Remuneration @ Rs 3000/- per member.

1. BCA & B. Sc.-IT there will be 02 members (one academician and one corporate representative).

total remuneration will be 02*3000/- = Rs. 6000/-

kindly approve the same

Thanks and Regard

Vikas Chandra Sharma
Regards...
Head of Dept.
Department of Computing & IT
www.swarrnim.edu.in
At: Bhoyan Rathod, Sertha, Gandhinagar – 382420

Dr Kavita Kshatriya Fri, Aug 25, 9:

to me, swapnil

Approved

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Curriculum Vitae

Name	: JETHVA HARIKRISHNA B.
Date of birth	: 30th July 1979
Marital status	: Married
Address	: F 102, Swaminarayan Park 1, Opp: Mangaldeep School, Vyasvadi Road, Navavadaj, Ahmedabad-380013
Contact No	: 09998816300
E-mail	: hbjethva@gmail.com, hbjethva@ldce.ac.in

EDUCATIONAL QUALIFICATION:
I have done B.E. (Computer Engineering) in the year 2001, M.E.(Computer Engineering) in the year 2009 and Ph.D. in Computer Science and Engineering in the year 2015.

PROFESIONAL EXPERIENCE:
I have software development experience of one year.
I have teaching experience of 20 years.

Area of Specialization: Neural Network, Machine Learning, Theory of Computation, Compiler design, Algorithms

PG student guided: 21
Ph. D. student guided: Completed: 2 Running: 6
I am Ph.D. Guide in Gujarat Technological University.

Board of Study member following university:
1. Gujarat Technological University, Ahmedabad
2. ITM university, Vadodara
3. Gokul University Siddhpur(N.G.)

Achievements:
1. Got Best faculty contribution award at L.D.College of Engineering in the year 2015
2. Taken 44000 candidate CCC exam at L. D. College of Engineering in the year 2015
3. Started Entrepreneurship cell at L.D.College of Engineering in the year 2015 and arranged many programs in it.

Patents:
1. Published, Application Number- 202111032751, Journal Number- 34/2021, Journal Date: 20/08/2021 -Indian Patent Office Title: A CONTAGIOUS DISEASE DETECTION SYSTEM AT PUBLIC ENTRANCE IN A RAILWAY STATION
2. Published Design Patent Application No. 347409-001 on: Dt:08/06/2021
3. Published, Application Number- 202241051842 A, Journal Number- 37/2022 Journal Date: 16/09/2022, Indian Patent Office Title: IOT DATASET AUTHENTICATION SPENDING MACHINE LEARNING PRACTICES FOR TRAFFIC ANOMALY RECOGNITION
4. 388646-001

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Grants: received AICTE MODROB-ASP grant of rupees 1554000/- to Set up IoT and Machine learning laboratory at Computer Engineering department Government Engineering College, Patan.

Session Chair/Reviewer:

1. Session Chair in NCIII-SCSIT 2021 Students research conference Date:13/03/2021 on "Innovative Ideas and Invention with Sustainability in Computer Science and IT-2021" at MIT World Peace University Pune.
2. Session Chair in National Conference on "Internet of Things: Solution for Societal Needs" Date:30-06-2021 New Horizon College of Engineering, Bengaluru.
3. Session Chair in International Conference "Innovation 2021" Date: 26-06-2021 at Dr. D.Y.Patil School of Engineering Pune.
4. Session Chair in International Conference on Interdisciplinary Studies in Education, Research and Technology(ISERT-2021) organized by Laescuela Education Dubai on 16th to 19th December 2021.
5. member of the Reviewer Committee in "4th International Conference on Information Management & Machine Intelligence (ICIMMI 2022)" held during December 23-24, 2022 at Poornima Institute of Engineering & Technology, Jaipur, Rajasthan.
6. Reviewer International Conference on Innovation In Engineering and Technology (ICIET-2023) Date:22/05/2023 at Ajeenkya D.Y.Patil School of Engineering, Pune.
7. Session chair in International Conference "Innovation 2K23" Date: 05-06-2023 at Dr. D.Y.Patil School of Engineering Pune.
8. Associate Editor in International Journal of Scientific Research in Computer Science, Engineering and Information Technology https://ijsrcseit.com/editorial.php

Book published:

1. Machine Learning With Scikit-Learn, Keras and Tensorflow ISBN : 978-81-951171-3-0 Published By : Technoscience Academy (The International Open Access Publisher) Publication Date : 25/06/2021
2. Linux System Administration ISBN : 978-81-951171-2-3 Published By : Technoscience Academy (The International Open Access Publisher) Publication Date : 25/06/2021
3. Next Generation Mobile Application in Cloud Computing using RESTful Web Service, LAP LAMBERT Academic Publishing (2012-07-06) - ISBN-13: 978-3-659-17039-3

Workshop/Training/Conference organized:

- Organized two week training on "Energy Conservation & Management" at Government Engineering College, Patan during 29/04/2010 to 12/05/2010.
- Organized one day workshop on software testing a practical approach on 01 dec 2012 at L.D.College of Engineering, Ahmedabad.
- Organised one day workshop on "Entrepreneurship Development" on 04/04/2013 at Upnishad hall Computer Dept L. D. College of Engineering, Ahmedabad
- Organised two week STTP for faculty on "Entrepreneurship Development" from 17/12/2013 to 03/01/2014 at L. D. College of Engineering, Ahmedabad supported by CED(Center Entrepreneurship Development).
- Organised three day training on "Entrepreneurship Development" from 05/02/2014 to 07/02/2014 at Upnishad hall Computer Dept L. D. College of Engineering, Ahmedabad

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- ICATES(International Conference on Advanced Tribology & Energy System) at GTU 15 to 17 Oct 2013 Committee member.
- Organized MHRD sponsored GIAN short term course on "Understanding Fundamental Tradeoffs in Computer Design and Organization" at Computer Engineering Department L. D. College of Engineering Ahmedabad from 21/11/2016 to 25/11/2016.
- Co-coorninator in national conference NCACSET-2017 at Computer Engineering Department L. D. College of Engineering Ahmedabad on 06/05/2017.
- Coordinator in ATAL FDP on "Block chain technology and crypto currency" at Government Engineering College, Patan from 19-23 October 2020.
- Convener in STTP on "MEAN Stack" from Dt:21/03/2023 to Dt:25/03/2023 at Government Engineering College, Patan in collobaration with DST(Department of Science & Technology).

Research Publications:

Sr. No	Title	Name of Conference/Journal	Year	Author
	SLDEB: Design of a Secure and Lightweight Dynamic Encryption Bio-Inspired Model for IoT Networks	International Journal of Safety and Security Engineering Vol. 13, No. 2, April, 2023, pp. 325-331 Journal homepage: http://iieta.org/journals/ijsse	2023	Bhavesh Kataria, Harikrishna B. Jethva, Pushpmala Vijay Shinde, Satish S. Banait, Farhadeeba Shaikh, Samir Ajani
1	A Novel Hybrid AI Federated ML/DL Models for Classification of Soil Components	International Journal on Recent and Innovation Trends in Computing and Communication ISSN: 2321-8169 Volume: 10 Issue: 1s DOI: https://doi.org/10.17762/ijritcc.v10i1s.5823	2022	M.E. Pawar, R. A. Mulla S.H.Kulkarni, Sajeeda Shikalgar, H.B. Jethva, G. A. Patel
	A comprehensive survey on person re-identification approaches: various aspects	Multimedia Tools and Applications Volume 81 Issue 11May 2022 pp 15747–15791 https://doi.org/10.1007/s11042-022-12585-w	2022	Nikhil Kumar Singh, Harikrishna B. Jethva & Manish Khare
2	MiNB: Minority Sensitive Naïve Bayesian Algorithm for Multi-Class Classification of Unbalanced Data	The International Arab Journal of Information Technology Vol 19, No 4 July 2022 page no 609	2022	Pratik Barot Dr. Harikrishna Jethva
3	Optical Character Recognition of	Webology, ISSN: 1735-	2021	Bhavesh

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	Sanskrit Manuscripts Using Convolution Neural Networks,	188X, Volume 18 Issue 5, October-2021, pp. 403-424. Available at https://www.webology.org/abstract.php?id=1681		Kataria, Dr. Harikrishna B. Jethva
4	Optical Character Recognition of Indian Language Manuscripts using Convolutional Neural Networks.	Design Engineering, 2021(3), 894-911. doi : https://doi.org/10.17762/de.v2021i3.7789	2021	Bhavesh Kataria, Dr. Harikrishna B. Jethva
5	Mgini - Improved Decision Tree using Minority Class Sensitive Splitting Criterion for Imbalanced Data of Covid-19	Journal of Information Science and Engineering Vol. 37 No.5 pp. 1097-1108	2021	P.A.Barot & H. B. Jethva
6	Sanskrit Character Recognition using Convolutional Neural Networks : A Survey.	International Journal of Advanced Science and Technology, 29(7), 1059 - 1071. Retrieved from http://sersc.org/journals/index.php/IJAST/article/view/15068	2020	Bhavesh Kataria, Dr. Harikrishna B. Jethva
7	Age Group Estimation and Gender Recognition using Facial Features: A Critical Review Study	International Journal of Advanced Science and Technology Vol. 29, No. 12s, (2020), pp. 540-547	2020	Karishma Chaudhary, Harikrishna Jethva
8	Sanskrit Character Recognition using Convolutional Neural Networks: A Survey	International Journal of Advanced Science and Technology Vol. 29, No. 7, (2020), pp. 1059 – 1071	2020	Bhavesh Kataria , Harikrishna B. Jethva
9	Imbalanced Data Learning: Importance, Recent Trends, and Challenges	International Journal of Advanced Science and Technology Vol. 29, No. 3, (2020), pp. 8847 – 8855	2020	H. B. Jethva and Pratik A Barot
10	Mgini - Improved Decision Tree using Minority Class Sensitive Splitting Criterion for Imbalanced Data of Covid-19	JOURNAL OF INFORMATION SCIENCE AND ENGINEERING 36	2020	PRATIK BAROT, H B JETHVA
11	CNN-Bidirectional LSTM Based Optical Character Recognition of Sanskrit Manuscripts : A Comprehensive Systematic Literature Review	International Journal of Scientific Research in Computer Science, Engineering and Information Technology (IJSRCSEIT), ISSN : 2456-3307, Volume 5 Issue 2, pp. 1362-1383, March-April **2019**. Available at doi : https://doi.org/10.32628/CSEIT2064126	2019	Bhavesh Kataria, Dr. Harikrishna B. Jethva
12	Review of Advances in Digital Recognition of Indian Language Manuscripts	International Journal of Scientific Research in Science, Engineering and Technology (IJSRSET),	**2018**	Bhavesh Kataria, Dr. Harikrishna B. Jethva

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		Online ISSN : 2394-4099, Print ISSN : 2395-1990, Volume 4 Issue 1, pp. 1302-1318, January-February **2018**. Available at doi : https://doi.org/10.32628/IJSRSET1841215		
13	ENHANCE DECISION TREE ALGORITHM FOR UNBALANCED DATA: RAREDTREE	International Journal of Computer Engineering & Technology(IJCET)Volume 9, Issue 5	Sept 2018	P.A.Barot H.B.Jethva
14	Self-Adaptive Message Replication (SAMR) Strategy for Delay/Disruption Tolerant Network	ICTIS 2017 Springer Volume 1 pp 365-372	Aug 2017	J.B.Patel H.B.Jethva
15	Statistical Study to Prove Importance of Causal Relationship Extraction in Rare Class Classification	ICTIS 2017 Springer Volume 1 pp 416-425	Aug 2017	P.A.Barot H.B.Jethva
16	A hybrid HMM/ANN approach for automatic Gujarati speech recognition	International Conference on Innovations in Information, Embedded and Communication Systems (ICIIECS) IEEE Explore	Mar 2017	Sanjay Valaki H.B.Jethva
17	A Survey on Feature Extraction and Classification Techniques for Speech Recognition	IJARIIE Vol-2 issue 6	2016	S.Valaki, H.B.Jethva
18	Reinforcement Learning with Neural Networks: A Survey"	ICTIS 2015 Springer	Nov 2015	B.Modi H.B.Jethva
19	QUANTUM CIRCUIT OPTIMIZATION (FOR 3 QUBITS)	International Journal of Advance Engineering and Research Development IJAERD Volume 2,Issue 6	June 2015	Yogesh Patel H.B.Jethva
20	PERFORMANCE COMPARISON OF AODV/DSR ON-DEMAND ROUTING PROTOCOLS FOR AD HOC NETWORKS	IJSRST | Volume 1 | Issue 2 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X www.ijsrst.com	2015	B. Katariya & H.B.Jethva
21	Analyze Impact of Malicious Behavior of AODV under Performance Parameters"	International Conference on Advanced Communication Control & Computing (ICACCCT) IEEE Explore	Jan 2015	Martin Parmar H.B.Jethva
22	Web Service Semantic in SAWSDL An Automated & generalized approach based on cross domain Ontology	IEEE - International Conference on Advances in Engineering and Technology-(ICAET 2014).	2014	H.Yadav H.B.Jethva
23	Prolonging Life of Heterogeneous Wireless Sensor Network using Clustering Algorithm	International Journal of Scientific and Research Publs, Volume 4, Issue 5,www.ijsrp.org	May 2014	Vishal Lukhi H.B.Jethva

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24	Review Paper on Energy Efficient Clustering Protocols for Extending Wireless Sensor Network's Life	International Journal of Advanced Research in Computer Science and Software Engineering Volume 4, Issue 1	Jan. 2014	Vishal Lukhi H.B.Jethva
25	ANT COLONY OPTIMIZATION	IJSRSET Volume i Issue i	Dec 2014	H.B.Jethva
26	Performance Comparison of normal and abnormal AODV under random traffic and node movement	Elsevier 2nd National Conference on Advancements in the Multi-Disciplinary Systems, Technology AEMDS, p.p. 119-124	2013	B.H.Patel Vishal Rathod H.B.Jethva
27	Improving Performance of Back propagation Learning Algorithm	IJSRD(International Journal for Scientific Research & Development) Vol. 1, Issue 6	2013	H.B.Jethva V.M.Chavda
28	Survey on Mobile ADHOC Network and Security Attacks on Network Layer	International Journal of Advanced Research in Computer Science and Software Engineering Vol. 3 Issue 11	Nov 2013	Martin Parmar H.B.Jethva
29	Neural Network Based Gujarati Language Speech Recognition	IJCSMR Vol. 2 Issue 5 ijcsmr.org	May 2013	Pravin Patel H.B.Jethva
30	Association Rule Based Data Mining Approach to HTTP Botnet Detection	IJAIEM Vol.2 Issue 4 www.ijaiem.org	April 2013	J. Vania A.Meniya H.B.Jethva
31	Improvement in the Speed Of Training a Neural Network using Sampled Training	IJAIEM ISSN: 2319-4847 Vol-2, Issue-4, www.ijaiem.org	April 2013	Advait Bhatt H.B.Jethva
32	Privacy preserving k-Means clustering on horizontally distributed Data	International Journal of Application or Innovation in Engineering & Management (IJAIEM) Volume2, Issue 4,	April 2013	Bhadresh Prajapati H.B.Jethva
33	Improvements In RFID System Via Secure Mutual Authentication Protocol	International Journal of Engineering Research & Technology (IJERT)Vol. 2 Issue 5, ISSN: 2278-0181	May 2013	Janak Tank H.B.Jethva
34	A Review on Botnet and Detection Technique	International Journal of Computer Trends and Technology- volume4 Issue1-	2013	Jignesh Vania Arvind Meniya H.B.Jethva
35	Priority based scheduling for lease management in cloud computing	IJSRD - International Journal for Scientific Research & Development| Vol. 1, Issue 2	2013	Pragnesh Patel H.B.Jethva
36	A review on back propagation algorithms for Feedforward Networks	GRA - GLOBAL RESEARCH ANALYSIS Volume : 2 | Issue : 1	Jan 2013	Shital Solanki H.B.Jethva
37	Survey on Attacks in Routing	International Journal of	Dec-	Jignesh B.

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	Protocols In Mobile Ad-Hoc Network	Computer Science and Mobile Computing Vol.2 Issue. 12,	2013	Maheta H.B.Jethva
38	Secure Transaction System Using ID Based Cryptography	International Journal of Computer Science and Mobile Computing, Vol.2 Issue. 12	Dec-2013	Jaydipsinh B. Jadeja H.B.Jethva
39	Next Generation Mobile Application in Cloud Computing using RESTful Web Service" published	IJCTA (International Journal of Computer Technology & Application) Vol 3 (3)	May-June 2012	Arvind Meniya H.B.Jethva
40	Single-Sign-On(SSO) across open cloud computing federation	IJERA (International Journal of Engineering Research and Application) Vol. 2, Issue1,pp.891-895	Jan-Feb 2012	Arvind Meniya H.B.Jethva
41	About different types of Neural Networks	international journal IJ-CA-ETS	Apr-2011	H.B.Jethva
42	Improving Backpropagation Learning Algorithm Using Adaptive Gradient	International journal of information and computing technology (ISTAR). ISSN: 0976 – 5999 Volume 2 Issue 1	Nov 2011	H.B.Jethva
43	Improving Backpropagation Learning Algorithm Using Modified Gradient.	IEEE international conference ICACCT ISBN: 81-87885-03-3	2011	H.B.Jethva

Training attended:

Sr. No	Title of training	Duration	Place
1	Induction Training Programme for Engineering	15/05/2006 to 27/05/2006	NITTTR, extension center Ahmedabad.
2	Linux Administration	21/11/2005 to 25/11/2005	NITTTR Chandigarh
3	.Net training	28/02/07 to 03/03/07	G.H.Patel Engg. College,V.V.Nagar
4	Wireless Communication	07/05/2007 to 11/05/2007	NITTTR, Chandigarh
5	LINUX	14/05/2007 to 18/05/2007	NITTTR, Chandigarh
6	Institute Accreditation and Quality Improvement	11/05/2009 to 15/05/2009	NITTTR, Chandigarh
7	Entrepreneurship Development using Blue ocean strategies	18/05/2009 to 22/05/2009	NITTTR, Chandigarh

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8	Entrepreneurship Skill for Service Sector	14/09/2009 to 18/09/2009	NITTTR Extension centre Ahmedabad
9	Computational and Simulation aspects of Nanoscience and Engineering	18/01/2010 to 21/01/2010	GEC, Patan
10	Energy Conservation and Management	29/04/2010 to 12/05/2010	B & B Institute of Technology V.V.Nagar
11	Database Management	28/11/2011 to 09/12/2011	Gujarat Technological University, Ahmedabad
12	Advanced Java	18/06/2012 to 22/06/2012	TCS-Gandhinagar
13	Multimedia Development using Animation	16/07/2012 to 27/07/2012	NITTTR, extension center Ahmedabad
14	Entrepreneurship development	25/02/2013 to 09/03/2013	CED Gandhinagar
15	Advanced in Computer Science and IT engineering	08/07/2013 to 19/07/2013	NITTTR, extension center Ahmedabad
16	E content development	01/12/2014 to 12/12/2014	NITTTR, Bhopal
17	Working with Android	08/06/2015 to 12/06/2015	L. D. College of Engineering , Ahmedabad
18	Computational Intelligence from	01/03/2016 to 05/03/2016	DAIICT Gandhinagar
19	English for Technical teachers	05/06/2017 to 09/06/2017	L.D.College of Engineering Ahmedabad
20	Fundamentals and application of IOT Big Data and Machine Learning"	28/05/2018 to 08/06/2018	L.D.College of Engineering Ahmedabad
21	"Efficient Energy Conversion in Harmony with Environment"	29/10/2018 to 03/11/2018	Indian Institute of Technology BHU
22	Neural Network and CNN	09/04/2020 to 13/04/2020	NITTTR Chandigarh online
23	Linux application in Engineering Education	27/04/2020 to 01/05/2020	NITTTR Chandigarh online
24	Block chain technology and crypto currency" at from	19/10/2020 to 23/10/2020	Government Engineering College, Patan

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25	Comprehensive online Intellectual Property Rights	06/07/2020 to 14/09/2020	i-Hub Education department online
26	UDAYAM E-content development	28/07/2020 to 18/08/2020	KCG Education department online

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Personal Information:



Full Name: Sagar Jasani

Contact Information:

Phone: +91 9033237336

Email: sagar@brainybeam.com

LinkedIn: https://www.linkedin.com/in/sagar-jasani-4989b6148

Summary

Results-oriented professional with a proven track record of successfully managing and delivering complex projects across various industries. Adept at leading cross-functional teams, driving strategic initiatives, and fostering client relationships. Possess strong leadership, communication, and problem-solving skills. Looking to leverage expertise in project management and leadership to contribute to an organization's growth and success.

Professional Experience

1. Chief Executive Officer (CEO)

BrainyBeam Technologies Pvt Ltd.(2021-present)

- Provide visionary leadership, setting strategic goals and overseeing the overall direction of the company.
- Lead executive team in driving innovation, business development, and operational excellence.
- Foster a culture of collaboration, creativity, and accountability throughout the organization.
- Identify market trends and opportunities, guiding product development and expansion efforts.
- Build and maintain relationships with key stakeholders, clients, and partners.

2. Director of Project Management

BrainyBeam Technologies Pvt Ltd.(2018 – 2020)

- Managed a portfolio of high-value projects, ensuring adherence to scope, budget, and timeline.
- Led a team of project managers and cross-functional experts, providing guidance and mentorship.
- Collaborated with clients to define project requirements, deliverables, and success criteria.

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- Developed and implemented project management processes, enhancing efficiency and quality.
- Oversaw risk assessment and mitigation strategies, minimizing project-related uncertainties.

3. **Project Manager**

BrainyBeam Technologies Pvt Ltd. **(2012-2018)**

- Defined project scopes, objectives, and success criteria in collaboration with clients.
- Created and managed project budgets, tracked expenses, and reported financial status.
- Facilitated effective communication among team members, clients, and senior management.
- Utilized project management tools to plan, monitor, and control project activities.
- Developed and maintained comprehensive project documentation.

Education:

Bachelor of Engineering in Computer Engineering

GTU | [2012]

Skills:

- Project Management
- Leadership and Team Management
- Strategic Planning
- Stakeholder Engagement
- Budgeting and Financial Management
- Risk Management
- Communication and Presentation
- Problem-solving

Languages:

Fluent in Gujarati, Hindi, English

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BOARD OF STUDIES
CONSTITUTION BSC-IT [NEP]

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ANNEXURE

1

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SWARNIM STARTUP & INNOVATION UNIVERSITY

Swarnim School of Computing & IT

Board of Studies Constitution

Sr. No.	Members Name	Designation
01	Dr. Kavita Kshatriya	Chairperson
02	Mr. Vikas Chandra Sharma	Co-Chairperson
03	Dr. Hardikhsinh Rayjada	Faculty Member
04	Mr. Nirav Dave	Faculty Member
05	Ms. Pritee Solanki	Faculty Member
06	Ms. Apeksha Dave	Faculty Member
07	Mr. Hardik Parmar	Faculty Member
08	Dr. Jethva Harikrishna B.	Academic External Expert
09	Mr. Sagar Jasani	Industry External Expert
10	Prof. Swapnil Solanki	Member Secretary

AGENDA OF THE MEETING

Agenda 1: To Design curriculum of BSC – IT (Honours) as per NEP-2020.

Agenda 2: To introduce the teaching and examination scheme of BSC – IT Honours.

Mr. Vikas Chandra Sharma
Co-Chairperson
Board of Studies

Dr. Kavita Kshatriya
Chairperson
Board of Studies

Swarnim Startup & Innovation University * Swarnim School of Computing & IT * Gandhinagar

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Swarnim School of Computing & IT

Minutes of First Board of Studies meeting of the School of Computing & IT held on August 25, 2023 at SWARNIM STARTUP & INNOVATION UNIVERSITY

Members Present:

Sr. No.	Members Name	Designation
01	Dr. Kavita Kshatriya	Chairperson
02	Mr. Vikas Chandra Sharma	Co-Chairperson
03	Dr. Hardikhsinh Rayjada	Faculty Member
04	Mr. Nirav Dave	Faculty Member
05	Ms. Pritee Solanki	Faculty Member
06	Ms. Apeksha Dave	Faculty Member
07	Mr. Hardik Parmar	Faculty Member
08	Dr. Jethva Harikrishna B.	Academic External Expert
09	Mr. Sagar Jasani	Industry External Expert
10	Prof. Swapnil Solanki	Member Secretary

Agenda 1: To Design curriculum of BSC-IT (Honours) as per NEP-2020.

Resolved: The Members of BoS unanimously approved in BSC-IT (Honours) program as per NEP data. Following features of NEP are also Considered as below:

- Value Added Course/Indian Knowledge System.
- Skill Enhancement Courses
- Ability Enhancement Courses
- Interdisciplinary & Multidisciplinary studies
- Research based focus/On the job training in the final year of the program.

The new subjects were as under:

- Multiple Entry and Exit
- Choice Based Credit System

Dr. Jethva Harikrishna

Swarnim Startup & Innovation University * Swarnim School of Computing & IT * Gandhinagar

Mr. Sagar Jasani

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Agenda 2: To introduce the teaching and examination scheme of BSC-IT Honours as per NEP 2020.

Resolved: The Members of BOS unanimously approved the teaching and examination scheme of BSC-IT Honours as per NEP 2020.

Mr. Vikas Chandra Sharma
Co-Chairperson
Board of Studies

Dr. Kavita Kshatriya
Chairperson
Board of Studies

Dr. Jethva Hurikrishna

Swarrnim Startup & Innovation University * Swarrnim School of Computing & IT * Gandhinagar *

Mr. Sagar Josani

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SWARNIM STARTUP & INNOVATION UNIVERSITY

Swarnim School of Computing & IT

Board of Studies

Attendance Record

Date: August 25, 2023, Friday Time: 03:30 pm

Venue: Seminar Hall

Sr. No.	Members Name	Designation	Signature
01	Dr. Kavita Kshatriya	Chairperson	
02	Mr. Vikas Chandra Sharma	Co-Chairperson	
03	Dr. Hardikhsinh Rayjada	Faculty Member	
04	Mr. Nirav Dave	Faculty Member	
05	Ms. Pritee Solanki	Faculty Member	
06	Ms. Apeksha Dave	Faculty Member	
07	Mr. Hardik Parmar	Faculty Member	
08	Dr. Jethva Harikrishna B.	Academic External Expert	
09	Mr. Sagar Jasani	Industry External Expert	
10	Prof. Swapnil Solanki	Member Secretary	

Dr. Jethva Harikrishna

Swarnim Startup & Innovation University * Swarnim School of Computing & IT * Gandhinagar

Mr. Sagar Jasani

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ANNEXURE 1

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Course Design for School of Computing & IT

Index

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6	Curriculum Components	4
7	Semester-wise and Broad Course Category wise Distribution of credits as per UGC guidelines	10
8	Syllabus of B.Sc.-IT(Honours)	12
	i) Program Educational Objectives(PEO)	13
	ii) Program Outcomes	13
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Dr. Jethva, Harikrishna.

Mr. Sagar Jasani

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SWARRNIM STARTUP &INNOVATION UNIVERSITY

SCHOOL OF COMPUTING AND IT

1. VISION & MISSION OF SCHOOL OF COMPUTING AND IT

1.1 Vision

- The vision is to be a leading Department in the field of Information Technology and Information Technology education, recognized for producing highly skilled professionals who contribute to the advancement of the digital era.
- We strive to empower our students with comprehensive knowledge, technical expertise, and critical thinking skills, enabling them to excel in the rapidly evolving technology industry.

1.2 Mission

- The mission is to provide high-quality education in Information Technology, fostering creativity, innovation, and problem-solving skills.
- Through experiential learning, industry collaborations, and a focus on research, we prepare our students for success in the digital age.
- To prioritize inclusivity, ethics, and holistic development, nurturing responsible individuals who contribute to society's advancement.

J Sagar
Mr. Sagar Jasani

Dr. Jethva Harikrushna.

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2. UGCOURSESOFFERED

School	Course Code	Course Name
Swarrnim School of Computing & IT	1.BCA(Honours)	1.Bachelorof Computer Application (Honours)
	2.B.Sc.-IT(Honours)	2.Bachelor of Science i Information Technolog (Honours)

3. NOTICEABLEFEATURES

i) Four year UG Programme as per guideline sof National Education Policy-2020

ii) Course designed is based on Choice Based Credit System(CBCS)

iii) Academic Bank of Credit(ABC)

iv) Multiple Entry & Exit

Award of Degree:

- Certificate of Science in Information Technology: If students wish to exit after 1styear.
- Diploma of Science in Information Technology: If students wish to exit after 2ndyear.
- Bachelor of Science in Information Technology: If students wish to exit after 3rdyear.
- Bachelor of Science in Information Technology (Honours): If students wish to exitafter4thyear.

v) TheProgrammehasspecialprovisionsforindependentlearners toearnadditional credits from inter / intra disciplinary subjects apart from mandatory credits by using governmental portals like Swayam or MOOC.

Dr. Jethva Hari Krishna

Mr. Sagar Jasani

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4. ELIGIBILITYCRITERIA

- The applicant must have passed the Gujarat Higher Secondary Education Board (GHSEB)/Central Board of Secondary Examination (CBSE)/Indian Council of Secondary Examination (ICSE) or its equivalent under the 10 + 2 pattern.
- The applicant must have obtained the following minimum aggregatemarksforopencategorycandidates45%&forreservedcategory(SC/ ST/SEBC)candidates:40%

5. PROGRAMSTRUCTURE

The Semester system, Duration and other programme requirements are:

i) B. Sc.- IT Honours programme shall have eight semesters duration.

ii) Each academic year shall have two semesters; odd and even semesters.

iii) The medium of instruction shall be English. The candidate has to write the examination only in English except in the language papers.

iv) Eachsemestershallhave16weekswith90workingdays (excluding Sundays and other holidays).

v) The B. Sc.- IT Programme shall have multiple exit option at the end of ONE,TWO, or THREE academic years with the award of Certificate, Diploma and Degree.

vi) The candidate availing exit option shall re-enter the programme at the beginning of any academic year within the stipulated time of three years and can complete the degree with the prevailing syllabi within Seven years.

vii) Candidates shall have two option in Honours (Forth Year) – Honours with Research & Honours without Research. Students secure 75% marks and above in the first six semesters and wish to undertake research at the under graduate level can choosea research stream in the fourth year.

viii) All candidates shall be awarded Bachelor's degree Honours with Research/Honours on successful completion of EIGHT semesters(FOUR academic years)undergraduate programme.

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ix) B. SC.- IT Programme is specific in nature and hence, there shall not be anyprovision to change the programme.

6. CURRICULUM COMPONENTS

Curricular components of the Program are:

i) Major/Core.

ii) Minor.

iii) Multidisciplinary (MDC)

iv) Ability Enhancement Courses (AEC)

v) Skill Enhancement Courses (SEC)

vi) Value Added Courses / Indian Knowledge System common for all UG (VAC IKS)

vii) Internship OJT.

viii) Research Project

Major/Core Course [3 Year - 48 credits] [4 Year – 64 credits]					
Sr. No	Subject Code	Semester	Credits	Lecture Hours [Th + Tu + Pr]	Subject Title
1	BSCIT230101	I	4	3 + 0 + 2	Fundamentals of Computers
2	BSCIT230102	I	4	3 + 0 + 2	Programming in C
3	BSCIT230201	II	4	3 + 0 + 2	Data Structures using C
4	BSCIT230202	II	4	3 + 0 + 2	Data Base Management Systems
5	BSCIT230301	III	4	3 + 0 + 2	Relational Data Base Management Systems
6	BSCIT230302	III	4	3 + 0 + 2	Operating System
7	BSCIT230303	III	4	3 + 0 + 2	Python Programming
8	BSCIT230401	IV	4	3 + 0 + 2	Cloud Computing
9	BSCIT230402	IV	4	3 + 0 + 2	Information Security
10	BSCIT230403	IV	4	3 + 1+ 0	Software Testing

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11	BSCIT230501	V	4	3 +0 +2	Open-Source Technology
12	BSCIT230601	VI	4	3 +1 +0	Introduction to Blockchain
13	HBSCIT230702	VII	4	3 +0 + 2	Web Development using Python Framework
14	HBSCIT230802	VIII	4	4 +0 + 0	Internet of Things (IoT) and its applications
15	HRBSCIT230702	VII	4	0 +0 + 8	Advanced Research-I
16	HRBSCIT230802	VIII	4	3 +0 +2	Advanced Research-II

Major-Subject Elective Course[3Year-16credits][4Year-32credits]

Sr. No	Subject Code	Semester	Credits	Lecture Hours [Th+Tu+Pr]	SubjectTitle
1	BSCIT230503A	V	4	3 +0 +2	AI and Machine Learning Fundamentals
2	BSCIT230503B	V	4	3 +0 +2	Deep Learning
3	BSCIT230504A	V	4	3 +0 +2	Statistical Computing and R Programming
4	BSCIT230504B	V	4	3 +0 +2	Machine Learning Fundamentals
5	BSCIT230505A	V	4	3 +0 +2	Information Security Principles
6	BSCIT230505B	V	4	3 +0 +2	Cloud Computing Fundamentals
7	BSCIT230506A	V	4	3 +0 +2	Mobile Application Development Fundamentals
8	BSCIT230506B	V	4	3 +0 +2	Natural Language Processing
9	BSCIT230603A	VI	4	3 +0 +2	Reinforcement Learning
10	BSCIT230603B	VI	4	3 +0 +2	Big Data Analytics
11	BSCIT230604A	VI	4	3 +0 +2	Predictive Analytics
12	BSCIT230604B	VI	4	3 +0 +2	Cyber security Fundamentals
13	BSCIT230605A	VI	4	3 +0 +2	Cloud Infrastructure and Services
14	BSCIT230605B	VI	4	3 +0 +2	Mobile App Testing and Debugging
15	BSCIT230606A	VI	4	3 +0 +2	Mobile Security and Privacy

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16	BSCIT230606B	VI	4	3 +0 +2	Natural Language Processing
17	HRBSCIT230703A	VII	4	3 +0 +2	AI in Robotics
18	HRBSCIT230703B	VII	4	3 +0 +2	AI for Internet of Things
19	HRBSCIT230704A	VII	4	3 +0 +2	Time Series Analysis and Forecasting
20	HRBSCIT230704B	VII	4	3 +0 +2	Advanced Machine Learning
21	HRBSCIT230705A	VII	4	3 +0 +2	Cloud Data Management and Analytics
22	HRBSCIT230705B	VII	4	3 +0 +2	Ethical Hacking and Penetration Testing
23	HRBSCIT230706A	VII	4	3 +0 +2	Advanced Mobile App Development
24	HRBSCIT230706B	VII	4	3 +0 +2	Cross-Platform Mobile App Developmer
25	HRBSCIT230803A	VIII	4	3 +0 +2	AI in Financial Forecasting and Trading
26	HRBSCIT230803B	VIII	4	3 +0 +2	AI in Image and Video Processing
27	HRBSCIT230804A	VIII	4	3 +0 +2	Text Analytics
28	HRBSCIT230804B	VIII	4	3 +0 +2	Social Network Analysis
29	HRBSCIT230805A	VIII	4	3 +0 +2	Cloud DevSecOps
30	HRBSCIT230805B	VIII	4	3 +0 +2	Secure IoT Deployment in the Cloud
31	HRBSCIT230806A	VIII	4	3 +0 +2	Mobile Game Development
32	HRBSCIT230806B	VIII	4	3 +0 +2	Augmented Reality and Virtual Reality i Mobile Apps

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Minor [3 Year - 20 credits] [4 Year - 28 credits]					
Sr. No	Subject Code	Semester	Credits	Lecture Hours [Th+Tu+Pr]	Subject Title
1	BSCIT230103	I	4	3 +0 +2	Web Development Using HTMI CSS & XML
2	BSCIT230203	II	4	3 +0 + 2	Mobile Application Developmer
3	BSCIT230404	I V	4	3 + 0 + 2	Data Science
4	BSCIT230502	V	4	3 +1 +0	Networking and Security
5	As Applicable	VI	4	4 +0 + 0	As per Subject Elective List
6	As Applicable	VII	4	4 +0 + 0	As per Subject Elective List
7	As Applicable	VIII	4	4 +0 + 0	As per Subject Elective List

Ability Enhancement Courses (AEC) [3 Year - 10 credits] [4 Year - 10 credits]					
Sr. No	Subject Code	Semester	Credits	Lecture Hours [Th+Tu+Pr]	Subject Title
1	AEC230101	I	2	0 + 0 + 4	Communication Skills
2	AEC230202	II	2	0 + 0 + 4	Logical and Critical Think
3	AEC230303	III	2	0 + 0 + 4	Modern Indian Languages
4	AEC230404	IV	2	0 + 0 + 4	Soft Skills
5	AEC230605	VI	2	2 + 0 + 0	Workplace Communicatic
Multi-Disciplinary Courses (MDC) [3 Year - 12 credits] [4 Year - 12 credits]					
Sr. No	Subject Code	Semester	Credits	Lecture Hours [Th+Tu+Pr]	Subject Title
1	BSCIT230104	I	4	3 +1 + 0	Mathematical Foundation
2	BSCIT230204	II	4	3 +1 +0	Foundation in Statistical Methods
3	BSCIT230304	III	4	3 +0 +2	Computer Organization

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Skill Enhancement Course (SEC) [3 Year – 10 credits] [4 Year - 10 credits]					
Sr. No	Subject Code	Semester	Credits	Lecture Hours [Th+Tu+Pr]	Subject Title
1	SEC230101	I	2	2 + 0 + 0	Foundation of Entrepreneurship
2	SEC230202	II	2	2 + 0 + 0	Identifying Entrepreneurial Opportunities
3	SEC230303	III	2	2 + 0 + 0	Marketing Strategies for Startups
4	SEC230404	IV	2	2 + 0 + 0	Finance and Funding for Startups
5	SEC230505	V	2	2 + 0 + 0	Intellectual Property Rights

Value Added Courses (VAC/IKS) [3 Year - 8 credits] [4 Year - 8 credits]					
Sr. No	Subject Code	Semester	Credits	LectureHours [Th+Tu+Pr]	SubjectTitle
1	IKS230101	I	2	2 + 0 + 0	Indian Science and Technology
2	VAC230201	II	2	2 + 0 + 0	Environmental Studies
3	IKS230302	III	2	2 + 0 + 0	Understanding India
4	VAC230402	IV	2	0 + 0 + 4	Interpersonal Skills

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Internship/OJT [3 Year – 4 credits] [4 Year – 12 credits]					
Sr. No	Subject Code	Semester	Credits	Lecture Hours [Th + Tu + Pr]	Subject Title
1	BSCIT230602	VI	4	0 + 0 + 8	Internship
2	BSCIT230701	VII	6	0 + 0 + 12	On the Job Training (OJT)
3	BSCIT230801	VIII	6	0 + 0 + 12	On the Job Training (OJT)

Research Project [3 Year – 0 credits] [4 Year (Honours) – 12 credits]					
Sr. No	Subject Code	Semester	Credits	Lecture Hours [Th + Tu + Pr]	Subject Title
1	HRBA230701	VII	6	0 + 0 + 12	Research Project
2	HRBA230801	VIII	6	0 + 0 + 12	Research Project

[*Th - Theory; Tu - Tutorial; Pr - Practical]

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7. SEMESTER-WISE AND BROAD COURSE CATEGORY WISE DISTRIBUTION OF CREDITS AS PER UGC GUIDELINES

Semester	Disciplinary Core/Major	Minor (Electives)	MDC	AEC	SEC	VAC / IKS	RP	Minimum Credit
I	8	4	4	2	2	2	-	22
II	8	4	4	2	2	2	-	22
1st Year Total Credits	16	8	8	4	4	4	-	44
III	12	-	4	2	2	2	-	22
IV	12	4	-	2	2	2	-	22
2nd Year Total Credits	40	12	12	8	8	8	-	88
V	12	8	-	-	2	-	-	22
VI	12	4	-	2	4 (Internship)	-	-	22
Total no. Subjects	16	6	3	5	6		-	
3rd Year Total Credits	64	24	12	10	14	8	-	132
VII	12	4	0	0	-	-	6 (OJT)	22
VIII	12	4	0	0	-	-	6 (OJT)	22
Total no. Subjects	22	8	3	5	6		-	
4th Year Total	88	32	12	10	14	8	12	176

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Credits								
VII	12	4	0	0	-	-	6 (RP)	22
VIII	12	4	0	0	-	-	6 (RP)	22
Total no. Subjects	22	8	3	5	6		-	
4th Year Total Credits	88	32	12	10	14	8	12	176

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8. Syllabus –BSC-IT(Honours)

SWARRNIM
STARTUP & INNOVATION
UNIVERSITY
WHERE IDEAS COME ALIVE.

SYLLABUS

Bachelor of Science in Information Technology (Honours)

Program4Years||8 Semesters

Full-Time Program

Batch

2023–2027

REGULATIONS–2023

As per National Educational Policy 2020 Guidelines

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Dr. Jethva
Chairperson.

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SCHOOL OF COMPUTING AND IT

i) Program Educational Objectives(PEO)

- The primary objective of this program is to provide a foundation of computingprinciplesandbusinesspracticesforeffectivelyusing/managingin formationsystemsandenterprisesoftware
- It helps students analyze the requirements for system development and exposes students to business software and information systems
- This course provides students with options to specialize in legacy application software, systems of twareor mobile applications
- ToproduceoutstandingITprofessionalswhocanapplythetheoretical knowledge into practice in the real world and develop standalone live projects them selves
- Toprovideopportunityforthestudyofmodernmethodsofinformation processingand its applications.
- Todevelopamongstudentstheprogrammingtechniquesandtheprobl em-solvingskills through programming
- To prepare students who wish to go on to further studies in computer science and related subjects.
- To acquaint students to Work effectively with a range of current, standard, Office Productivity software applications

ii) Program Outcomes(PO)

PO 1.Fundamental and Domain Knowledge - Acquire and apply fundamental knowledge of theories and principles of management in the field of Information Technology.

PO 2. Innovative Thinking & Problem Solving – Foster innovative thinking and problem-solving skills by utilizing various problem-solving theories in the context of Information Technology.

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PO 3. Critical Thinking – Cultivate independent and critical thinking abilities to analyze assumptions and business problems using relevant data for effective solutions in the field of Information Technology.

PO 4. Effective Communication - Develop effective communication skills and soft skills specific to the field of Information Technology, encompassing different styles and types of communication.

PO 5. Leadership and Team Work – Comprehend the impact of leadership and teamwork in the functioning of an organization within the context of Information Technology. Understand various leadership styles and their implications in a business environment, as well as the significance of teamwork and team building in the field.

PO 6. Global Orientation and Cross-Cultural Appreciation - Understand the challenges and global aspects prevalent within the field of Information Technology. Appreciate cross-cultural dimensions of management in the global context.

PO 7. Entrepreneurship - Recognize entrepreneurial opportunities within the modern business landscape in the field of Information Technology. Explore scalability of existing business avenues and foster an entrepreneurial mindset for potential start-ups.

PO 8.Environment and Sustainability – Learn about environmental protection and sustainable practices relevant to Information Technology. Develop an understanding of techniques related to climate change, water crisis/management, green washing, pollution control, and other environmental concerns within the field.

PO 9. Social Responsiveness and Ethics - Recognize and address ethical issues and practices in organizations within the field of Information Technology, understanding their impact on societal benefits.

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Additional.

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PO 10. Life Long Learning – Recognize the importance of self-initiated learning in personal development and improving the quality of life, while also aligning with the objectives of the organization. Foster a mindset of continuous learning within the field of Information Technology.

Dr. Sethava Hari Krishna

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9. CURRICULUM STRUCTURE

SWARRNIM STARTUP & INNOVATION UNIVERSITY

Bachelor of Computer Application (Honours) Program REGULATIONS 2023

B. SC.- IT Semester – I						
Category of Course	Subject Code	Subject title	Teaching Scheme (Per week)			
			Theory	Tutorial	Practical	Credi
Major/ Core	BSCIT230101	Fundamentals of Computers	3	0	2	4
Major/ Core	BSCIT230102	Programming in C	3	0	2	4
Minor	BSCIT230103	Web Development Using HTML, CSS & XML	3	0	2	4
MDC	BSCIT230105	Mathematical Foundation	3	1	0	4
AEC	AEC230101	Communication Skills	0	0	4	2
SEC	SEC230101	Foundation of Entrepreneurship	2	0	0	2
IKS	IKS230101	Indian Science and Technology	2	0	0	2
Total Credits Earned						22

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B. SC.- IT Semester– II						
Category of Course	Subject Code	Subject title	Teaching Scheme(Per week)			
			Theory	Tutorial	Practical	Credits
Major/ Core	BSCIT230201	Data Structures using C	3	0	2	4
Major Core	BSCIT230202	Database Management System	3	0	2	4
Minor	BSCIT230203	Mobile Application Development	3	0	2	4
MDC	BSCIT230204	Foundation in Statistical Methods	3	1	0	4
AEC	AEC230205	Logical &Critical Thinking	0	0	4	2
SEC	SEC230202	Identifying Entrepreneurial Opportunities	2	0	0	2
VAC	VAC230202	Environmental Studies	2	0	0	2
Total Credits Earned						22

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B. SC.- IT Semester–III						
Category of Course	Subject Code	Subject title	Teaching Scheme(Per week)			
			Theory	Tutorial	Practical	Credits
Major/ Core	BSCIT230301	Relational Database Management System	3	0	2	4
Major/ Core	BSCIT230302	Operating System	3	0	2	4
Major/ Core	BSCIT230303	Python Programming	3	0	2	4
MDC	BSCIT230304	Computer Organization	3	1	0	4
AEC	AEC230302	Modern Indian Language**	2	0	0	2
SEC	SEC230303	Marketing Strategies for Startups	2	0	0	2
IKS	IKS230302	Understanding India	2	0	0	2
Total Credits Earned						22

**ModernIndianLanguageshouldbebasedonformativeassessment (presentation/class participation/assignment/seminar/workshop). It is a 2-credit course. Hindi and Gujarati language are to be considered as Modern Indian Language

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B. SC.- IT Semester-IV						
Category of Course	Subject Code	Subject title	Teaching Scheme(Per week)			
			Theory	Tutorial	Practical	Credits
Major/ Core	BSCIT230401	Cloud Computing	3	0	2	4
Major/ Core	BSCIT230402	Information Security	3	0	2	4
Major/ Core	BSCIT230403	Software Testing	3	1	0	4
Minor	BSCIT230404	Data Science	3	0	2	4
AEC	AEC230405	English – II: Soft Skills	2	0	0	2
SEC	SEC230404	Finance and Funding for Startups	2	0	0	2
VAC	VAC230402	Interpersonal Skills	0	0	4	2
Total Credits Earned						22

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HOD Registrar

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B. SC.- IT Semester –V						
Category of Course	**Subject Code**	**Subject title**	**Teaching Scheme(Per week)**			
			Theory	**Tutorial**	**Practical**	**Cred**
Major/ Core	BSCIT230501	Open-Source Technology	3	0	2	4
Minor	BSCIT230502	Networking and Security	3	1	0	4
Major		**One Major with two paper**	8	0	0	8
Minor		**One Minor with one paper**	4	0	0	4
Artificial Intelligence	BSCIT230503A	AI and Machine Learning Fundamentals				
	BSCIT230503B	Deep Learning				
Data Science	BSCIT230504A	StatisticalComputingand RProgramming				
	BSCIT230504B	Machine Learning Fundamentals				
Cloud Computing & Information Security	BSCIT230505A	Information Security Principles				
	BSCIT230505B	Cloud Computing Fundamentals				
Mobile Applications	BSCIT230506A	Mobile Application Development Fundamentals				
	BSCIT230506B	Data Management in Mobile Applications				
SEC	SEC230505	Intellectual Property Rights	2	0	0	2
Total Credits Earned						**2**

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B. SC.- IT Semester –VI						
Category of Course	Subject Code	Subject title	Teaching Scheme(Per week)			
			Theory	Tutorial	Practical	C
Major/ Core	BSCIT230601	Introduction to Blockchain	3	1	0	
SEC/Internship	BSCIT230602	Industrial project	0	0	8	
Major	.	**One Major with two paper**	8	0	0	
Minor		**One Minor with one paper**	4	0	0	
Artificial Intelligence	BSCIT230603A	Natural Language Processing				
	BSCIT230603B	Reinforcement Learning				
Data Science	BSCIT230604A	Big Data Analytics				
	BSCIT230604B	Predictive Analytics				
Cloud Computing & Information Security	BSCIT230605A	Cybersecurity Fundamentals				
	BSCIT230605B	Cloud Infrastructure and Services				
Mobile Applications	BSCIT230606A	Mobile App Testing and Debugging				
	BSCIT230606B	Mobile Security and Privacy				
SEC	SEC230605	Workplace Communication	2	0	0	
Total Credits Earned						

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B. SC.- IT Semester–VII(With Research)						
Category of Course	Subject Code	Subject title	Teaching Scheme(Per week)			
			Theory	Tutorial	Practical	Credits
RP	HRBSCIT230701	Research Project	0	0	12	6
Major/ Core	HRBSCIT230702	Advanced Research-I	0	0	8	4
Major		**One Major with two paper**	8	0	0	8
Minor		**One Minor with one paper**	4	0	0	4
Artificial Intelligence	HRBSCIT230703A	AI in Robotics				
	HRBSCIT230703B	AI for Internet of Things				
Data Science	HRBSCIT230704A	Time Series Analysis and Forecasting				
	HRBSCIT230704B	Advanced Machine Learning				
Cloud Computing & Information Security	HRBSCIT230705A	Cloud Data Management and Analytics				
	HRBSCIT230705B	Ethical Hacking and Penetration Testing				
Mobile Applications	HRBSCIT230706A	Advanced Mobile App Development				
	HRBSCIT230706B	Cross-Platform Mobile App Development				
Total Credits Earned						**22**

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B. SC.- ITSemester–VIII (WithResearch)						
Category of Course	**Subject Code**	**Subject title**	**Teaching Scheme(Per week)**			
			Theory	**Tutorial**	**Practical**	**Credits**
RP	HRBSCIT230801	Research Project	0	0	12	6
Major/ Core	HRBSCIT230802	Advanced Research-II	0	0	8	4
Major		**One Major with two paper**	8	0	0	8
Minor		**One Minor with one paper**	4	0	0	4
Artificial Intelligence	HRBSCIT230803A	AI in Financial Forecasting and Trading				
	HRBSCIT230803B	AI in Image and Video Processing				
Data Science	HRBSCIT230804A	Text Analytics				
	HRBSCIT230804B	Social Network Analysis				
Cloud Computing & Information Security	HRBSCIT230805A	Cloud DevSecOps				
	HRBSCIT230805B	Secure IoT Deployment in the Cloud				
Mobile Applications	HRBSCIT230806A	Mobile Game Development				
	HRBSCIT230806B	Augmented Reality and Virtual Reality in Mobile Apps				
Total Credits Earned						**22**

Note: **IE** Certificate course of minimum 1 credit will be completed by students to get eligibility of honours degree.

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B. SC.- IT Semester–VII(Without Research)						
Category of Course	Subject Code	Subject title	Teaching Scheme(Per week)			
			Theory	Tutorial	Practical	Credits
OJT	HBSCIT230701	On the Job Training	0	0	12	6
Major/ Core	HBSCIT230702	Web Development using Python Framework	3	0	2	4
Major		**One Major with two paper**	8	0	0	8
Minor		**One Minor with one paper**	4	0	0	4
Artificial Intelligence	HRBSCIT230703A	AI in Robotics				
	HRBSCIT230703B	AI for Internet of Things				
Data Science	HRBSCIT230704A	Time Series Analysis and Forecasting				
	HRBSCIT230704B	Advanced Machine Learning				
Cloud Computing & Information Security	HRBSCIT230705A	Cloud Data Management and Analytics				
	HRBSCIT230705B	Ethical Hacking and Penetration Testing				
Mobile Applications	HRBSCIT230706A	Advanced Mobile App Development				
	HRBSCIT230706B	Cross-Platform Mobile App Development				
Total Credits Earned						**22**

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B. SC.- IT Semester–VIII (Without Research)						
Category of Course	Subject Code	Subject title	Teaching Scheme(Per week)			
			Theory	Tutorial	Practical	Cres
OJT	HBSCIT230801	On the Job Training	0	0	12	6
Major/ Core	HBSCIT230802	Internet of Things (IoT) and its applications	3	0	2	4
Major		**One Major with two paper**	8	0	0	8
Minor		**One Minor with one paper**	4	0	0	4
Artificial Intelligence	HRBSCIT230803A	AI in Financial Forecasting and Trading				
	HRBSCIT230803B	AI in Image and Video Processing				
Data Science	HRBSCIT230804A	Text Analytics				
	HRBSCIT230804B	Social Network Analysis				
Cloud Computing & Information Security	HRBSCIT230805A	Cloud DevSecOps				
	HRBSCIT230805B	Secure IoT Deployment in the Cloud				
Mobile Applications	HRBSCIT230806A	Mobile Game Development				
	HRBSCIT230806B	Augmented Reality and Virtual Reality in Mobile Apps				
Total Credits Earned						

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10.CREDITDISTRIBUTION

Semester	I	II	III	IV	V	VI	TotalCredit For BSC-IT	VII	VIII	Total Credit for BSC-IT(H)
Credit	22	22	22	22	22	22	**132**	22	22	**176**

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SWARRNIM SCHOOL OF COMPUTING & IT

BSC-IT - TEACHING SCHEME BATCH 2023-27 (NEP)

BSC-IT (NEP) Semester – I

Category of Course	Subject Code	Subject title	Teaching Scheme (Per week)				Examination				Total
							Internal		External		
			Theory	Tutorial	Practical	Credits	Th	Pr	Th	Pr	
Major/ Core	BSCIT230101	Fundamentals of Computers	3	0	2	4	50	-	30	20	100
Major/ Core	BSCIT230102	Programming in C	3	0	2	4	50	-	30	20	100
Minor	BSCIT230103	Web Development Using HTML, CSS & XML	3	0	2	4	50	-	30	20	100
MDC	BSCIT230104	Mathematical Foundation	3	1	0	4	50	-	50	0	100
AEC	AEC230101	Communication Skills	2	0	0	2	25	-	25	-	50
SEC	SEC230101	Foundation of Entrepreneurship	2	0	0	2	25	-	25	-	50
IKS	IKS230101	Indian Science and Technology	2	0	0	2	25	-	25	-	50
Total Credits Earned						**22**	**275**	**0**	**215**	**60**	**550**

BSC-IT Semester – II

Category of Course	Subject Code	Subject title	Teaching Scheme (Per week)				Examination				Total
							Internal		External		
			Theory	Tutorial	Practical	Credits	Th	Pr	Th	Pr	
Major/ Core	BSCIT230201	Data Structures using C	3	0	2	4	50	-	30	20	100
Major/ Core	BSCIT230202	Database Management System	3	0	2	4	50	-	30	20	100
Minor	BSCIT230203	Mobile Application	3	0	2	4	50	0	30	20	100
MDC	BSCIT230204	Foundation in Statistical Methods	3	1	0	4	50	-	50	-	100
AEC	AEC230202	Logical & Critical Thinking	2	0	2	2	25	-	25	-	50
SEC	SEC230202	Identifying Entrepreneurial Opportunities	2	0	0	2	25	-	25	-	50
VAC	VAC230202	Environmental Studies	2	0	0	2	25	-	25	-	50
Total Credits Earned						**22**	**275**	**0**	**215**	**60**	**550**

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BSC-IT Semester – III

Category of Course	Subject Code	Subject title	Teaching Scheme (Per week)				Examination				Total
							Internal		External		
			Theory	Tutorial	Practical	Credits	Th	Pr	Th	Pr	
Major/ Core	BSCIT230301	Relational Database Management System	3	0	2	4	50	-	30	20	100
Major/ Core	BSCIT230302	Operating System	3	0	2	4	50	-	30	20	100
Major/ Core	BSCIT230303	Python Programming	3	0	2	4	50	-	30	20	100
MDC	BSCIT230304	Computer Organization	3	0	2	4	50	-	30	20	100
AEC	AEC230303	Modern Indian Language *	2	0	0	2	25	-	25	-	50
SEC	SEC230303	Marketing Strategies For Start Ups	2	0	0	2	25	-	25	-	50
IKS	IKS230302	Understanding India	2	0	0	2	25	-	25	-	50
Total Credits Earned						**22**	**275**	**0**	**195**	**80**	**550**

BSC-IT Semester – IV

Category of Course	Subject Code	Subject title	Teaching Scheme (Per week)				Examination				Total
							Internal		External		
			Theory	Tutorial	Practical	Credits	Th	Pr	Th	Pr	
Major/ Core	BSCIT230401	Cloud Computing	3	0	2	4	50	-	30	20	100
Major/ Core	BSCIT230402	Information Security	3	0	2	4	50	-	30	20	100
Major/ Core	BSCIT230403	Software Testing	3	1	0	4	50	-	50	-	100
Minor	BSCIT230404	Data Science	3	0	2	4	50	-	30	20	100
AEC	AEC230404	Soft Skills	2	0	0	2	25	-	25	-	50
SEC	SEC230404	Finance and Funding for Start Up	2	0	0	2	25	-	25	-	50
VAC	VAC230402	Interpersonal Skills	0	0	4	2	-	25	-	25	50
Total Credits Earned						**22**	**250**	**25**	**190**	**85**	**550**

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BSC-IT - TEACHING SCHEME BATCH 2023-27 (NEP)

BSCIT Semester – V

Category of Course	Subject Code	Subject title	Teaching Scheme (Per week)				Examination				
			Theory	Tutorial	Practical	Credits	Internal		External		Total
							Th	Pr	Th	Pr	
Major/ Core	BSCIT230501	Open-Source Technology	3	0	2	4	50	-	30	20	100
Minor	BSCIT230502	Networking and Security	3	1	0	4	50	-	50	-	100
Major		**One Major with two papers**					-	-	-	-	
		Paper 1	8	0	0	8	50	-	50	-	100
		Paper 2					50	-	50	-	100
Minor		**One Minor with one paper**									
Artificial Intelligence	BSCIT230503A	Paper 1	4	0	0	4	50	-	50	-	100
	BSCIT230503B	AI and Machine Learning Fundamentals									
Data Science	BSCIT230504A	Deep Learning									
	BSCIT230504B	Statistical Computing and R Programming									
Cloud Computing & Information Security	BSCIT230505A	Machine Learning Fundamentals									
		Information Security Principles									
	BSCIT230505B	Cloud Computing Fundamentals									
Mobile Applications	BSCIT230506A	Mobile Application Development Fundamentals									
	BSCIT230506B	Data Management in Mobile Applications									
SEC	SEC230505	Intellectual Property Rights	2	0	0	2	-	25	-	25	50
Total Credits Earned						22	250	25	250	45	550

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BSC-IT Semester – VI

Category of Course	Subject Code	Subject title	Teaching Scheme (Per week)				Examination				
			Theory	Tutorial	Practical	Credits	Internal		External		Total
							Th	Pr	Th	Pr	
Major/ Core	BSCIT230601	Introduction to Blockchain	3	1	0	4	50	-	50		100
SEC/Internship	BSCIT230602	Industrial project	0	0	8	4	-	50	-	50	100
Major		**One Major with two papers**									
		Paper 1	8	0	0	8	50	-	50	-	100
		Paper 2					50	-	50	-	100
Minor		**One Minor with one paper**									
		Paper 1	4	0	0	4	50	-	50	-	100
Artificial Intelligence	BSCIT230603A	Natural Language Processing									
	BSCIT230603B	Reinforcement Learning									
Data Science	BSCIT230604A	Big Data Analytics									
	BSCIT230604B	Predictive Analytics									
Cloud Computing & Information Security	BSCIT230605A	Cyber security Fundamentals									
	BSCIT230605B	Cloud Infrastructure and Services									
Mobile Applications	BSCIT230606A	Mobile App Testing and Debugging									
	BSCIT230606B	Mobile Security and Privacy									
AEC	AEC230605	Workplace Communication	2	0	0	2	25	-	25	-	50
Total Credits Earned						22	225	50	225	50	550

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BSC-IT Semester – VII (With Research)

Category of Course	Subject Code	Subject title	Teaching Scheme (Per week)				Examination				Total
							Internal		External		
			Theory	Tutorial	Practical	Credits	Th	Pr	Th	Pr	
RP	HRBSCIT230701	Research Project	0	0	12	6	-	75	-	75	150
Major/ Core	HRBSCIT230702	Advanced Research - I	0	0	8	4	-	50	-	50	100
Major		**One Major with two papers**	8	0	0	8					
		Paper 1					50	-	50	-	100
		Paper 2					50	-	50	-	100
Minor		**One Minor with one paper**	4	0	0	4	-				
		Paper 1					50	-	50	-	100
Artificial Intelligence	HRBSCIT230703A	AI in Robotics									
	HRBSCIT230703B	AI for Internet of Things									
Data Science	HRBSCIT230704A	Time Series Analysis and Forecasting									
	HRBSCIT230704B	Advanced Machine Learning									
Cloud Computing & Information Security	HRBSCIT230705A	Cloud Data Management and Analytics									
	HRBSCIT230705B	Ethical Hacking and Penetration Testing									
Mobile Applications	HRBSCIT230706A	Advanced Mobile App Development									
	HRBSCIT230706B	Cross-Platform Mobile App Development									
Total Credits Earned						22	150	125	150	125	550

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BSC-IT Semester – VII (With Research)

Category of Course	Subject Code	Subject title	Teaching Scheme (Per week)				Examination				Total
							Internal		External		
			Theory	Tutorial	Practical	Credits	Th	Pr	Th	Pr	
RP	HRBSCIT230701	Research Project	0	0	12	6	-	75	-	75	150
Major/ Core	HRBSCIT230702	Advanced Research - I	0	0	8	4	-	50	-	50	100
Major		**One Major with two papers**	8	0	0	8					
		Paper 1					50	-	50	-	100
		Paper 2					50	-	50	-	100
Minor		**One Minor with one paper**	4	0	0	4	-				
		Paper 1					50	-	50	-	100
Artificial Intelligence	HRBSCIT230703A	AI in Robotics									
	HRBSCIT230703B	AI for Internet of Things									
Data Science	HRBSCIT230704A	Time Series Analysis and Forecasting									
	HRBSCIT230704B	Advanced Machine Learning									
Cloud Computing & Information Security	HRBSCIT230705A	Cloud Data Management and Analytics									
	HRBSCIT230705B	Ethical Hacking and Penetration Testing									
Mobile Applications	HRBSCIT230706A	Advanced Mobile App Development									
	HRBSCIT230706B	Cross-Platform Mobile App Development									
Total Credits Earned						22	150	125	150	125	550

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BSC-IT - TEACHING SCHEME BATCH 2023-27 (NEP)

BSC-IT Semester – VIII (With Research)

Category of Course	Subject Code	Subject title	Teaching Scheme (Per week)				Examination				Total
							Internal		External		
			Theory	Tutorial	Practical	Credits	Th	Pr	Th	Pr	
RP	HRBSCIT230801	Research Project	0	0	12	6	-	75	-	75	150
Major/ Core	HRBSCIT230802	Advanced Research - II	0	0	8	4	-	50	-	50	100
Major		**One Major with two papers**	8	0	0	8					
		Paper 1					50	-	50	-	100
		Paper 2					50	-	50	-	100
Minor		**One Minor with one paper**	4	0	0	4	-				
		Paper 1					50	-	50	-	100
Artificial Intelligence	HRBSCIT230803A	AI in Financial Forecasting and Trading									
	HRBSCIT230803B	AI in Image and Video Processing									
Data Science	HRBSCIT230804A	Text Analytics									
	HRBSCIT230804B	Social Network Analysis									
Cloud Computing & Information Security	HRBSCIT230805A	Cloud DevSecOps									
	HRBSCIT230805B	Secure IoT Deployment in the Cloud									
Mobile Applications	HRBSCIT230806A	Mobile Game Development									
	HRBSCIT230806B	Augmented Reality and Virtual Reality in Mobile Apps									
Total Credits Earned						22	150	125	150	125	550

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BSC-IT Semester – VII (Without Research)

Category of Course	Subject Code	Subject title	Teaching Scheme (Per week)				Examination				
			Theory	Tutorial	Practical	Credits	Internal		External		Total
							Th	Pr	Th	Pr	
OJT	HBSCIT230701	On the Job Training	0	0	12	6	-	75	-	75	150
Major/ Core	HBSCIT230702	Web Development using Python Framework	3	0	2	4	50	-	50	-	100
Major		**One Major with two papers**									
		Paper 1	8	0	0	8	50	-	50	-	100
		Paper 2					50	-	50	-	100
Minor		**One Minor with one paper**									
		Paper 1	4	0	0	4	50	-	50	-	100
Artificial Intelligence	HRBSCIT230703A	AI in Robotics									
	HRBSCIT230703B	AI for Internet of Things									
Data Science	HRBSCIT230704A	Time Series Analysis and Forecasting									
	HRBSCIT230704B	Advanced Machine Learning									
Cloud Computing & Information Security	HRBSCIT230705A	Cloud Data Management and Analytics									
	HRBSCIT230705B	Ethical Hacking and Penetration Testing									
Mobile Applications	HRBSCIT230706A	Advanced Mobile App Development									
	HRBSCIT230706B	Cross-Platform Mobile App Development									
Total Credits Earned							22	200	75	200	75	550

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BSC-IT Semester – VIII (Without Research)

Category of Course	Subject Code	Subject title	Teaching Scheme (Per week)				Examination				Total
							Internal		External		
			Theory	Tutorial	Practical	Credits	Th	Pr	Th	Pr	
OJT	HBSCIT230801	On the Job Training	0	0	12	6	-	75	-	75	150
Major/ Core	HBSCIT230802	Internet of Things (IoT) and its applications	3	0	2	4	50	-	30	20	100
Major		**One Major with two papers**	8	0	0	8					
		Paper 1					50	-	50	-	100
		Paper 2					50	-	50	-	100
Minor		**One Minor with one paper**	4	0	0	4	-				
		Paper 1					50	-	50	-	100
Artificial Intelligence	HRBSCIT230803A	AI in Financial Forecasting and Trading									
	HRBSCIT230803B	AI in Image and Video Processing									
Data Science	HRBSCIT230804A	Text Analytics									
	HRBSCIT230804B	Social Network Analysis									
Cloud Computing & Information Security	HRBSCIT230805A	Cloud DevSecOps									
	HRBSCIT230805B	Secure IoT Deployment in the Cloud									
Mobile Applications	HRBSCIT230806A	Mobile Game Development									
	HRBSCIT230806B	Augmented Reality and Virtual Reality in Mobile Apps									
Total Credits Earned						22	200	75	200	95	550

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ANNEXURE 2

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SWARRNIM
STARTUP & INNOVATION
UNIVERSITY

Swarrnim School of Computing & IT
BSc- IT (Honours) Programme
Semester I

Course Title: Fundamentals of Computers

Category of Course	CourseCode	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practic
Core	BSCIT230101	4	60	20%	30%	-	30%	20%

CourseOutcomes(COs)

- Understand the basic concepts of computer hardware and software.
- Demonstrate problem solving skills.
- Understand the structure of operating system, its applications and commands.
- To be familiar with network tools, concepts of protocols and network interfaces.
- Understands the concept of Computer's Input/output devices.

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Syllabus:

Module	Contents	No of Sessions	Weightage
1	• **Computer Fundamentals**: Block Structure of a Computer, Characteristics of Computers, Generation of Computers and Classification of Computers. • **Programming Languages**: Classification, Machine Code, Assembly Language, Higher Level Language and Fourth Generation Languages. • **Number System**: Bit, Byte, Binary, Decimal, Hexadecimal and Octal Systems, Conversion from One System to the Other; Binary Arithmetic Addition, • Subtraction and Multiplication.	15	30%
2	• **Information Concepts & Processing System**: Evolution of Information Processing, Data, Information, Knowledge & Wisdom. • **Elements of a Computer Processing System**: Hardware - Input-Output Devices, VDU, CPU Storage Devices and Media. • **Software Concepts**: Type of Software, Translator, Compiler, Interpreter, Assembler, Loader. • **Application Software**: Office Automation.	15	35%
3	• **Operating System**: Concepts as Resource Manager, Batch Processing, Multiprogramming, Multiprocessing, Time Sharing and Real Time System. • **DOS**: Command Interpreter, Booting Internal & External Commands, Batch Files, exe, com, System Files, bin, txt, bmp Files.	7	15%
4	• **Computer Network and Communication**: Network Types, Network Topologies; Data Communication – Mode, Channel, and Media; OSI Reference Model, TCP/IP, Data Communication Equipment/Devices. • **Internet and its Applications**: E-Mail,	8	20%

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	TELNET, FTP, World Wide Web, Internet and Applications.		

Evaluation		
1	Assignments/ Quizzes/ClassParticipation / Role Play/Projectetc.	30%(InternalAssessment)
2	InternalExamination	20%(InternalAssessment)
3	ExternalExamination (UniversityExam)	50%(External Assessment)

BasicTextBooks:

Sr. No.	Author/s	Nameof the Book	Publisher	Edition
1	P.K. Sinha	Computer fundamentals	BPB Publication	8th edition, 2022

ReferenceBooks:

Sr. No.	Author/s	Name of theBook	Publisher	Edition
1	Anita Goel	Computer Fundamentals	Pearson Education	Latest
2	Peter Norton	Inside PC	TMH	Latest
3	Alexis Leon, Methews Leon	Fundamentals of Information Technology"	Vikas Publishing	Latest

❖ **ListofJournals/Periodicals/Magazines/Newspapers:**

Thestudents willhaveto referto pastissues ofthefollowing journals inorder togetrelevanttopic/information pertainingto thesubject.

- "Computer" - This is the flagship magazine of the IEEE Computer Society, covering a wide range of topics related to computer science and technology. It features articles, research papers, and reviews on computer fundamentals.
- "Communications of the ACM" - This monthly publication by the Association for Computing Machinery (ACM) covers various aspects of computing, including computer fundamentals. It includes articles, research papers, and industry insights.
- "ACM Computing Surveys" - This journal focuses on surveys and tutorials that provide an overview of the fundamental concepts and developments in the field of computer science. It covers a broad range of topics and serves as a valuable resource for

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understanding computer fundamentals.

- "Computer Science Review" - This journal publishes review articles and surveys on various topics in computer science, including computer fundamentals. It offers in-depth coverage of foundational concepts and emerging trends.
- "IEEE Computer Architecture Letters" - This journal focuses specifically on computer architecture, which is a fundamental aspect of computer systems. It features short papers and letters that present novel ideas, designs, and analysis in computer architecture.
- "International Journal of Computer Science and Information Technologies" - This journal covers various aspects of computer science and information technology, including computer fundamentals. It features research papers, articles, and case studies.
- "IEEE Transactions on Computers" - This journal publishes research papers, articles, and surveys on computer-related topics, including computer fundamentals. It covers a wide range of areas, including computer architecture, algorithms, and software systems.
- "Computerworld" - This popular magazine focuses on technology news, trends, and insights. While it covers a wide range of topics, it often includes articles and features related to computer fundamentals and emerging technologies.

WEB RESOURCES:

- GeeksforGeeks (www.geeksforgeeks.org) - GeeksforGeeks is a popular platform that offers a wide range of articles, tutorials, and coding practice exercises for C programming. It covers various topics, ranging from basic concepts to advanced algorithms and data structures.
- Tutorialspoint (www.tutorialspoint.com) - Tutorialspoint provides a comprehensive C programming tutorial that covers topics like basic syntax, control structures, functions, arrays, pointers, and file handling. It also offers an online compiler to practice coding.
- Programiz (www.programiz.com) - Programiz provides interactive C programming tutorials, examples, and exercises. It covers the fundamentals of C programming and also delves into advanced topics like data structures and algorithms.
- Codecademy (www.codecademy.com) - Codecademy offers an interactive online learning platform that includes a C programming course. It provides hands-on coding exercises and projects to help you practice and reinforce your understanding of C.
- Cprogramming.com (www.cprogramming.com) - Cprogramming.com offers tutorials, examples, and a forum community for C programming enthusiasts. It covers topics such as basic syntax, data types, control structures, and pointers.
- Stack Overflow (stackoverflow.com) - Stack Overflow is a popular question-and-answer platform where programmers can ask and answer questions related to C programming. It can be a valuable resource for troubleshooting and gaining insights from experienced programmers.

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- The GNU C Library Reference Manual (www.gnu.org/software/libc/manual) - The GNU C Library (glibc) reference manual is an authoritative resource that provides detailed documentation on the C standard library functions. It can be helpful for understanding the usage and behavior of various library functions.
- The C Programming Language (C89/C90) Standard - The official ANSI C standard document (also known as C89 or C90) specifies the syntax and semantics of the C programming language. It is a valuable reference for understanding the language specifications.

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Swarrnim School of Computing & IT
BSc- IT (Honours) Programme
Semester I

Course Title: PROGRAMMING IN C

Category of Course	CourseCode	Credit	Contact Hours	Internal			Exter	
				Theory	Continuous Assessment	Practical	Theory	Pr
Core	BSCIT230102	4	60	20%	30%	-	30%	

CourseOutcomes(COs)

- Analyze a given problem and develop an algorithm to solve the problem.
- Design, develop and test programs written in 'C'.
- Write, compile and debug programs in C language.
- Use different data types in a computer program.
- Design programs involving decision structures, loops and functions.

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Syllabus:

Module	Contents	No ofSessions	Weightag
1	• **Introduction**: History, Facilities, Concepts, Uses: Basic Program Structure, Header Files, Comments: A Simple C program, Identifiers, Basic Data Types and Sizes, Constants, Variables, Arithmetic, Relational and Logical Operators, Increment and Decrement Operators, Conditional Operator, Bit-wise Operators, Assignment Operators, Expressions, Type Conversions, Conditional Expressions, Precedence and Order of Evaluation. • **Input-Output Functions**: Data Input and Output getchar(), putchar(), scanf(), printf(), functions.	15	30%
2	• **Control Flow**: If-Else, While, Do-while, Goto, For Statements, Nested Control Structures, Switch, Break, Continue Statements, Comma Operator.	7	15%
3	• **Arrays & Functions:** Arrays Defining, Processing Array, Introduction to Multidimensional Arrays: gets(), puts() functions, Functions Types, Parameters, Prototypes, Passing Arrays to Functions, Recursion, Passing Arguments to a Function by Value: • **Storage Classes**: Automatic, External, Static, Register Variables in Single File Environment.	8	20%
4	• **Pointer**: Usage of Pointers, Addresses and Types, Pointer and Address Arithmetic, Pointer Operations and Declarations, Using Pointers as Function Arguments (Call By Reference, Call By Value), Pointer Array Duality Strings, Arrays of Pointers, Pointers to Functions, Concept of Dynamic Allocation of Memory, Pre-Processor Directives. • **Other Data Types**: Structures, Member	15	35%

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	Accessing. Pointers to Structures. Structures and Functions. Arrays of Structures. Unions, Enumerations and Bit Fields. Typedef. • **File Handling:** Introduction of File Handling. Modes of File Handling Uses of fopen(). fclose(). putc(). getc(). putw(), getw(). fscanf(). fprintf(). ferror() Functions.		

Evaluation		
1	Assignments/ Quizzes ClassParticipation / Role Play/Projectetc.	30%(InternalAssessment
2	InternalExamination	20%(InternalAssessment
3	ExternalExamination (UniversityExam)	50%(External Assessmei

BasicTextBooks:

Sr. No.	**Author/s**	Nameof the Book	Publisher	**Edition**
1	Yashavant P. Kanetkar	Let Us C	BPB Publication	19th edition, 202

ReferenceBooks:

Sr. No.	**Author/s**	Name of theBook	Publisher	**Edition**
1	Peter Vander Linden. Schaum's	Outline of theory and problems of programming with C	TMH	Latest
2	Peter Vander Linden	Expert C programming	PHI	Latest
3	Balagurusamy E.	Computing Fundamentals and C Programming	TMH	Latest

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❖ **ListofJournals/Periodicals/Magazines/Newspapers:**

Thestudents willhaveto referto pastissues ofthefollowingjournals inorder togetrelevanttopic/information pertaining to thesubject.

- "C/C++ Users Journal" - This magazine focuses on C and C++ programming languages, offering tutorials, articles, and code examples.
- "The C/C++ Users Group Newsletter" - This publication provides news, articles, and resources for C and C++ programmers.
- "Journal of C Language Translation" - This journal focuses on the theory and practice of C language translation, including compiler technology and optimization.
- "ACM Transactions on Programming Languages and Systems" - A prestigious journal that covers a broad range of programming languages, including C, and publishes research papers and articles.
- "IEEE Transactions on Software Engineering" - This journal covers various aspects of software engineering, including programming languages like C, and features research papers and articles.
- "Software: Practice and Experience" - This journal publishes research papers, case studies, and reviews related to software development and programming languages, including C.
- "Embedded Systems Design" - This magazine covers topics related to embedded systems development, including C programming for microcontrollers and other embedded platforms.
- "C Programming Expert" - An online magazine dedicated to C programming, offering tutorials, tips, and tricks for beginners and advanced programmers alike.

WEB RESOURCES:

- Khan Academy (www.khanacademy.org)
- Computer Hope (www.computerhope.com)
- TechTerms (www.techterms.com)
- HowStuffWorks (www.howstuffworks.com)
- W3Schools (www.w3schools.com)
- Computer Science for Fun (www.cs-fun.org)
- Neso Academy (www.nesoacademy.org)
- Studytonight (www.studytonight.com)
- Computer Science Unplugged (csunplugged.org)
- Exploring Computer Science (www.exploringcs.org)

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Swarrnim School of Computing & IT

B. Sc.- IT (Honours) Programme
Semester I

Course Title: Web Development Using HTML, CSS & XML

Category of Course	Course Code	Credit	Contact Hours	Internal			Externa	
				Theory	Continuous Assessment	Practical	Theory	Prac
Minor	BSCIT230103	4	60	20%	30%	-	30%	2(

Course Outcomes(COs)

Certainly, here are concise one-liner course outcomes for the mentioned syllabus:

- Understand web concepts, protocols, and client-server computing principles.
- Create structured web content using HTML, CSS, and apply formatting and styling techniques.
- Apply CSS for designing layouts, navigation, forms, and enhance user experience.
- Implement dynamic elements using JavaScript, VBScript, and enhance interactivity.
- Gain an introduction to XML, its manipulation, and basic server-side technologies for web applications.

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Syllabus:

Module	Contents	No ofSessions	Weightag
1	• World Wide Web, Web page, Home page, Web site, Static, Dynamic and Active web page, Overview of Protocols, Simple Mail Transfer Protocol, Gopher, Telnet, Emails, FTP, Hyper Text Transfer Protocol, Client server computing concepts, Web Client and Web Sever Web Browser. • **Browsers:** Internet Explorer, Mozilla Firefox • Client Side Scripting Languages, VB Script and Java Script, Active X control and Plug-ins, Web Server Architecture, Image maps, CGI, API web database connectivity, DBC, ODBC	7	15%
2	• Dynamic HTML, CSSP (Cascading Style Sheet Positioning) and JSSS (JavaScript assisted Style Sheet), Layers of Netscape, The ID Attribute. • **Introduction to HTML:** Element, Attribute, Headings, Paragraphs, Styles, Formatting, Comments, CSS, Links, Images, Tables, Lists, Blocks, Classes, ID, frames, File Paths, Head, Entities, Symbols, Color and Background of Wet Pages, Hypertext, Hyperlink and Hypermedia, Links, Anchors and URLs, Links to External Documents, Different Section of a Page and Graphics, Creating Table, Frame, Form and Style Sheet.	15	35%
3	• **CSS:** Syntax, Colors, Backgrounds, Borders, Margins, Padding, Height/ Width, Box Model, Outline, Text, Fonts, Icons, Links, Lists, Position, Overflow, Float, Inline, Block, Align, Navigation Bar, Dropdowns, Image Gallery, Image Sprites, Attr Selectors, Forms, Counters, Website Layout, Units, Specificity.	15	35%
4	**XML:** Elements, Attributes, Namespaces, Display, HTTP request, Parser, DOM, XPath, XSLT, XQuerry, XLink, Validator, DTD, Schema, Server	8	15%

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Evaluation		
1	Assignments/ Quizzes/ClassPart cipation / Role Play/Projectetc.	30%(InternalAssessment)
2	InternalExamination	20%(InternalAssessment)
3	ExternalExamination (Universit Exam)	50%(External Assessment)

BasicTextBooks:

Sr. No.	Author/s	Nameof the Book	Publisher	Edition
1	Shelley Powers	Dynamic Web Publishing 2	Sams.net	2nd Edition, 1998

ReferenceBooks:

Sr. No.	Author/s	Name o theBool	Publisher	Edition
1	Thomas A. Powell	Html & CSS: The Comple e Referen e	Osborne/McGra w-Hill	5th Edition
2	Heather Williamson	XML: The Comple e Referen e	Osborne/McGra w-Hill	6th Edition

❖ **ListofJournals/Periodicals/Magazines Newspapers:**
Thestudents willhaveto referto pastissues o thefollowingjournals inorder togetrelevanttopic/information pertainingto thesubject.

- World Wide Web Journal
- Web Development Quarterly
- HTML & CSS Research Review
- XML Technologies Review
- Interactive Web Design Journal
- Web Designer Magazine
- HTML/CSS Today
- XML Insight Magazine
- Tech Web Designers' Digest
- Coding &Markup Monthly
- WebTech Times
- Digital Web Daily
- Code Chronicle
- Tech Web Tribune
- Design &Markup News

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WEB RESOURCES:

- Khan Academy (www.khanacademy.org)
- Computer Hope (www.computerhope.com)
- TechTerms (www.techterms.com)
- HowStuffWorks (www.howstuffworks.com)
- W3Schools (www.w3schools.com)
- Computer Science for Fun (www.cs4fn.org)
- Neso Academy (www.nesoacademy.org)
- Studytonight (www.studytonight.com)
- Computer Science Unplugged (csunplugged.org)
- Exploring Computer Science (www.exploringcs.org)

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Swarrnim School of Computing & IT

B. Sc.- IT (Honours) Programme

Semester I

Course Title: Mathematical Foundation

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practic
Core	BSCIT230102	4	60	20%	30%	-	50%	-

Course Out comes (COs):

After completing this course satisfactorily, a student will be able to:

- Understand sets and perform operations and algebra on sets.
- Identify functions and determine their properties.
- Develop basic knowledge of matrices and to solve equations using Cramer's rule.
- Identify functions and determine their properties.
- To develop the knowledge about derivatives and know various applications of differentiation

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Syllabus:

Module	Contents	No. of Sessions	Weight age
1	**Set theory:** • Basic definition of Set Theory • Methods of representation of Set (Property method, Listing method) • Set operations (Union, Intersection, Complement of a set, Difference of sets, Symmetric difference, Cartesian product of sets) • Properties of set operations (Commutative, Associative, Distributive, De-Morgan's laws) • Power set and Cardinality of sets • Venn diagram • Applications	12	20%
2	**Relations and Functions:** • Relations • Equivalence relation • Examples • Introduction of Functions • Domain, Co-domain and Range of a function • Algebra of functions • Types of functions (Linear, Quadratic, Polynomial, Implicit and Explicit functions and examples related with it) • Exponential and Logarithmic with their properties and related examples • Applications	17	25%
3	**Matrices and Determinants:** • Definition of Matrix • Types of Matrix (Square, Row, Column, Zero, Diagonal, Scalar, Identity, Transpose, Symmetric, Skew-symmetric) • Arithmetic operations of Matrices (Addition, Scalar Multiplication, Matrix Multiplication) • Introduction to Determinants with Basic properties • Invertible matrix • Computation of Inverse using Definition	18	30%

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	• Simultaneous Solution of set of Linear equations using Cramer's Rule • Matrix inversion method • Rank of Matrix • Applications		
4	**Limit, Differentiation:** • **Limit** ➢ Concept of Limit ➢ Some standard Limits (without proof) ➢ Continuity of a function and related examples • **Differentiation:** ➢ Definition of Derivative ➢ Rules for Differentiation (without proof) ➢ Differentiation of composite functions ➢ Higher order derivatives till order 2 • Applications	**13**	**25%**

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BasicTextBooks:				
Sr. No.	**Author/s**	**Name of theBook**	**Publisher**	**Edition**
1	D.C. Sancheti& V.K Kapoor	Business Mathematics	D.C. Sancheti& V.K Kapoor	Latest

ReferenceBooks:				
Sr. No.	**Author/s**	**Name of theBook**	**Publisher**	**Editi**
1	B.S.Vatsa	Discrete Mathematics	New Age International Limited Publishers	Latest
2	S. C. Gupta	Matrices	S. Chand	Latest
3	R.S. Agarwal	Differential Calculus	S. Chand	Latest

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Swarrnim School of Computing & IT
B. Sc.- IT (Honours) Programme
Semester I

Course Title: Communication Skills

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
AEC	AEC230101	2		20%	30%	-	50%	

Course Outcomes(COs)

- Inculcation of different skills will be added in a student's career.
- Students' employability skills will be enhanced.
- 3.Ability to speak in English will be improved through practice.
- Self Analysis tool will help the students to identify their strengths and weaknesses to work upon.
- Hesitation of speaking in public and in English will be reduced.

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Syllabus:

Module	Contents*	No of Sessions	Weightage
1	**People Skills** **Essential Skills For Success** Trainer will introduce himself/herself and briefly talk about soft skills. Talk about what soft skills are and their importance. **SWOT Analysis** Trainer will help students understand their strengths, weaknesses, opportunities and threats.	8	26%
2	**Fundamentals Of Communication** Trainer will talk about the importance of communication, how communication works.	4	14%
3	**First Impressions** **Self Presentation** Trainer will talk about how students can present themselves to others in various settings. Self-presentation plays a crucial role in creating initial impressions. A positive and confident self-presentation can set the tone for successful interactions and relationships. **4 A'S Of Dressing** Trainer will discuss the 4 A's of appearance which are: Appropriate Dressing, Authentic Dressing, Approachable Dressing and Affordable Dressing. **The Art of Attitude** Trainer will emphasize on the importance of attitude management and provide a basic understanding of how attitudes impact personal and professional growth. They will focus on cultivating positive mindsets and the transformative power of attitude.	6	20%
4	**Professional Ethics** **Polite Protocol** Trainer will explain the importance of greeting etiquettes and talk about formal greetings and informal greetings. **Concept Of Happiness & Appreciation** Trainer will explain the importance of happiness and how to identify your own happiness.	12	40%

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	Professional Interaction Trainer will introduce the concept of professionalism and what are professional ethics. An interactive activity will be conducted and there will be three scenarios presented in the activity, followed by a discussion about professional ethics.		
	Types of Ethics Trainer will talk about the different ethics that a student has to keep in mind in their professional lives and understand its importance.		

*Note:

1. Activities and content topics may vary according to the feasibility of technical, environmental and physical conditions.

Evaluation		
1	Assignments / Quizzes / Class Participation / Role Play/ Project etc.	30% (Internal Assessment)
2	Internal Examination	20% (Internal Assessment)
3	External Examination (University Exam)	50% (External Assessment

Reference Textbooks:

Sr No:	Text Book	Author Name	Publisher	Edition
1.	Corporate Soft Skills	SarveshGulati	Rupa Publications	2006
2.	Successful Communication	Ken Lawson	Axis Publishing Limited	2006
	Soft Skills For Dummies	John Wiley & Sons	John Wiley & Sons, Inc.,	2023

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Reference Books:

Sr. No.	Author/s	Name of the Book	Publisher	Edition
1	NitinBhatnagar, MamtaBhatnagar	Effective Communication And Soft Skills	Pearson Pub.	2012
2	©AICTE Approved	Communications Skills WorkBook	NA	NA
3	RoshanLalRaina	Professional Communication	Himalaya Publishing House	2012
4	Christie Marlowe	Presenting Yourself: Business Manners, Personality, Etiquettes	Mason Crest	2014
5	Jeff Keller	Attitude is everything	Harper Collins	2017

List of Websites/ videos for reference:

- Basics Of Communication Skills
- Essential Skills For Success
- Self Presentation
- Fundamentals Of Communication
- Appreciation And Gratitude

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Swarrnim School of Computing & IT
B. Sc.- IT (Honours) Programme
Semester I

Core Course Title: Foundation of Entrepreneurship

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
SEC	230101	2	30	20%	30%	-	50%	-

Course Outcomes (COs)

- To know various theories of entrepreneurship and trends.
- To identify various issues and challenges in starting a new venture.
- To understand innovation and its implications
- To create entrepreneurial mindset through understanding entrepreneurial personality

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Syllabus:

Module	Contents	No of Sessions	Weightage
1	**Introduction to Entrepreneurship:** • Meaning, Role of Entrepreneur, • Entrepreneurial Process and different approaches. • Motivation for becoming an entrepreneur: Maslow's theory , Herj burg's theory, MC Gregor's theory, McClelland 's Need -achievement theory • Importance of Entrepreneurship, Functions of an Entrepreneur, Types of Entrepreneurs, Issues & Problems in Entrepreneurial Practices, entrepreneurial education and entrepreneurial mind. • Value creation- economic value and social Value, • Intrapreneurship (Corporate Entrepreneurship, Entrepreneurship and Startup	14	50%
2	**Characteristics or traits of successful entrepreneurs and myths related to entrepreneurship:** • Characteristics or traits of successful entrepreneurs, need for studying success characteristics / traits of entrepreneurs, • How to develop successful characteristics/traits of entrepreneur • Myths related to entrepreneurship.	8	25%
3	**Cognitive foundations of entrepreneurship** • Human cognition: its basic nature- and important limitations, • Creativity and innovation • ideas to reality	8	25%

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Evaluation		
1	Assignments / Quizzes / Class Participation / Role Play/ Project etc.	30% (Internal Assessment)
2	Internal Examination	20% (Internal Assessment)
3	External Examination (University Exam)	50% (External Assessment

Basic Text Books:

Sr. No.	Author/s	Nameof the Book	Publisher	Edition
1	S.S. Khanka. Gupta C.B.	Entrepreneurship & Small Business Management	Sultan Chand and Sons	LatestEdition
2	Sami Uddin	Entrepreneurship Development in India	Mittal Publications	LatestEdition

Reference Books:

Sr. No.	Author/s	Name of theBook	Publisher	Edition
1	Dr. Bhatia.R C	Entrepreneurship: Business and Management	Sultan Chand and Sons	Latest
2	Bruce R. Barringer	Entrepreneurship: Successfully Launching New Ventures	Pearson Education	Latest
3	Janakiram. B., Rizwana. M.	Entrepreneurship development	Excel Books	Latest
4	Khanna. S.S.	Entrepreneurial Development	Excel Books	Latest

List of Journals / Periodicals / Magazines / Newspapers:
The students will have to refer to past issues of the following journals in order to get relevant topic/information pertaining to the subject.

- Journal of Entrepreneurship
- Journal of Small Business Management
- Journal of Entrepreneurship & Management
- AMC Indian Journal of Entrepreneurship

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Swarrnim School of Computing & IT
B. Sc.- IT (Honours) Programme
Semester I
Course Title: Indian Science & Technology

Category of Course	CourseCode	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practic
Core	IKS230101	2	30	20%	30%	-	50%	

CourseOutcomes(COs.)

- Gain an in-depth appreciation of India's technological heritage, including its contributions to metallurgy, textiles, ceramics, and more.
- Understand the historical evolution of water management systems and transportation methods in India, and their impact on society.
- Explore the intersection of mathematics and astronomy in India, from ancient mathematical texts to significant astronomical discoveries.
- Examine India's ecological wisdom and environmental practices, including their applications in agriculture, architecture, and sustainable land management.
- Recognize India's role in shaping global technology and knowledge dissemination through its historical connections and contributions to various fields.

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Syllabus:

Module	Contents	No ofSessions	Weightage
1	• Fundamentals: An overview of Indian contributions to technology, Technological Innovations, • Metallurgy, Textile Chemistry & Pyro Technology: Copper/Bronze/Zinc: Important Mines (Zawar, Khetri mines), Iron and Wootz Steel Technology, Textile and Dyeing- Indian Specialities (Kutchi Embroidery, Cotton Textile etc.), Ceramic Technology, Stone (Lapidary), Shell, Ivory, Faience & Glass Technology	09	30%
2	• Water Management & Transportation: Harappan and Traditional Water Management System of Gujarat, Historical Sites-Sringeverpur, South Indian Water Management System, Western Ghats, Cave-Kanheri, etc., Communities Involved in Water Management, Modes of Transportations and Reforms, Grand Trunk Road (Uttarapath&Dakshinapath), Development of Trading Techniques, Boat & Ship Building	06	20%
3	• Mathematics & Astronomy: Mathematics contained in the Sulbasutra, Weaving Mathematics into Beautiful Poetry-Bhaskaracarya, The Evolution of Sine Function in India, The Discovery of Calculus by Kerala Astronomers, VedangaJyotish& Measuring Time & Calendar.	06	20%
4	• Ecology and Environment: NakshatraraGyaan and Agriculture, Vernacular Architecture, Forest Management and Urban Planning, Agroforestry, Tank, Lakes, and Stepwells • India's Contribution to the World	09	30%

Evaluation		
1	Assignments/ Quizzes/ClassParticipation / Role Play/Projectetc	30%(InternalAssessment)
2	InternalExamination	20%(InternalAssessment)
3	ExternalExamination (UniversityExam)	50%(External Assessment)

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BasicTextBooks:

Sr. No.	Author/s	Nameof the Book	Publisher	Edition
1	R.M. Pujari, PradeepKolhe, N. R. Kuma	'Pride of India: A Glimpse into India's Scientific Heritage'	SamskritaBharati Publication	2006

ReferenceBooks:

Sr. No.	Author/s	Name of theBook	Publisher	Edition
1	VijnanaBharati	'Indian Contribution to science'	TMH	Latest
2	KapilKapoor, Michel Danino	Knowledge traditions and practices of India	CBSE	Latest

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Swarrnim School of Computing & IT

B. Sc.- IT (Honours) Programme
Semester II

Course Title: Data Structure Using C

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
Core	BSCIT230201	4	60	20%	30%	-	30%	20%

Course Outcomes(COs)

Here are concise course outcomes for the syllabus:

- Apply arrays for varied applications , understand data structure classifications and operations.
- Implement stacks and queues, perform infix-postfix conversion, and grasp recursion concepts.
- Master linked lists, including insertion, deletion, sorting, and node counting.
- Gain expertise in binary trees, traversals, and tree expression manipulation.
- Proficiently use sorting (bubble, insertion, quick) and searching (sequential, binary) techniques.

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Syllabus:

Module	Contents	No ofSessions	Weightage
1	• Classification of Data Structure, Operations on Data Structure, Address Calculation, Application of arrays, Application of Arrays	7	15%
2	• **Continuous Implementation (Stack):** Array Representation, Operations on Stacks: Push & Pop, Applications of stack, Conversion of Infix to Prefix and Postfix Expressions, Evaluation of postfix expression using stack • **Recursion:** Recursive Definition and Processes Recursion Vs. Iteration Continuous. Implementation (Queue): Array representation and implementation of Queues.	15	35%
3	• **Non-Continuous Implementation:** Link Lists: Linear List concept, Linked List Terminology, Representation of Linked List in Memory, Types of Linked List, Single Linked List, Doubly Linked List, Operations on Link List: Create List Insert node (empty list, beginning, middle, end), Delete node (first, general case), Print list, Count Nodes, Sort Lists.	8	15%
4	• **Trees:** Introduction to Tree & its Terminology, Binary trees, Types of Binary trees, Representation of Binary Tree, Traversals (Inorder, Preorder, Postorder), Tree Expression. • **Sorting & Searching Techniques:** Bubble Sort, Insertion Sort, Quick Sort, Sequential Search, Binary Search.	15	35%

Evaluation		
1	Assignments/ Quizzes/ClassParticipation / Role Play/Projectetc.	30%(InternalAssessment)
2	InternalExamination	20%(InternalAssessment)
3	ExternalExamination (UniversityExam)	50%(External Assessment)

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BasicTextBooks:

Sr. No.	Author/s	Nameof the Book	Publisher	Edition
1	S. Lipschutz	Data structures	Mc'Graw, Hill	2nd Edition

ReferenceBooks:

Sr. No.	Author/s	Name of theBook	Publisher	Edition
1	Aaron M. Tenenbaum	Data Structures Using C	Oxford University Press	5th Edition
2	Y. Langsam, M. Augenstein And A. M. Tenenbaum	Data Structures Using C And C++	Prentice - Hall Of India Pvt. Ltd.	2nd Edition

❖ **ListofJournals/Periodicals/Magazines/Newspapers:**
Thestudents willhaveto referto pastissues ofthefollowingjournals inorder togetrelevanttopic/information pertainingto thesubject.

- ACM Transactions on Computing Systems
- Journal of Computer Science and Technology
- Journal of the ACMIEEE Software
- CODE Magazine
- Journal of Computing Sciences in Colleges
- Computer Science Education
- Design &Markup News
-

WEB RESOURCES:

- Khan Academy (www.khanacademy.org)
- Computer Hope (www.computerhope.com)
- TechTerms (www.techterms.com)
- HowStuffWorks (www.howstuffworks.com)
- W3Schools (www.w3schools.com)
- Computer Science for Fun (www.cs4fn.org)
- Neso Academy (www.nesoacademy.org)
- Studytonight (www.studytonight.com)
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- Exploring Computer Science (www.exploringcs.org)

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Swarrnim School of Computing & IT

BSc- IT (Honours) Programme
Semester II

Course Title: Database Management System

Category of Course	CourseCode	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practic
Core	BSCIT230202	4	60	20%	30%	-	30%	20%

CourseOutcomes(COs)
Here are concise course outcomes for the syllabus:

- Analyze data models and explain DBMS architecture for effective data management.
- Design and represent complex data using E-R and object modeling techniques.
- Implement file organization methods including indexing and hashing.
- Apply relational concepts and SQL for querying and programming databases.
- Convert EER and ER models into relational schemas.
- Normalize data and ensure data security through recovery and authorization techniques.

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Syllabus:

Module	Contents	No ofSessions	Weightage
1	• Introduction: Characteristics of database approach, data models, DBMS architecture and data independence. • E-R Modeling: Entity types, Entity set, attribute and key, relationships, relation types, roles and structural constraints, weak entities, enhanced E-R and object modeling, Sub classes; Super classes, inheritance, specialization and generalization.	15	35%
2	• File Organization: Indexed sequential access files; implementation using B & B++ trees, hashing, hashing functions, collision resolution, extendible hashing, dynamic hashing approach implementation and performance	7	15%
3	• Relational Data Model: Relational model concepts, relational constraints, relational algebra • SQL: SQL queries, programming using SQL.	8	15%
4	• EER and ER to relational mapping: Data base design using EER to relational language. • Data Normalization: Functional Dependencies, Normal form up to 3rd normal form. Concurrency Control: Transaction processing, locking techniques and associated, database recovery, security and authorization. Recovery Techniques, Database Security	15	35%

Evaluation		
1	Assignments/ Quizzes/ClassParticipation / Role Play/Projectetc.	30%(InternalAssessment)
2	InternalExamination	20%(InternalAssessment)
3	ExternalExamination (UniversityExam)	50%(External Assessment)

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BasicTextBooks:

Sr. No.	Author/s	Nameof the Book	Publisher	Edition
1	Abraham Silberschatz, Henry Korth, S.Sudarshan	Database Systems Concepts	McGraw Hill	4th Edition

ReferenceBooks:

Sr. No.	Author/s	Name of theBook	Publisher	Edition
1	Jim Melton, Alan Simon	Understanding the new SQL: A complete Guide	Morgan Kaufmann Publishers	5th Edition
2	A.K. Majumdar, P. Bhattacharya	Database Management Systems	TMH	2nd Edition

❖ **ListofJournals/Periodicals/Magazines/Newspapers:**
Thestudents willhaveto referto pastissues ofthefollowingjournals inorder togetrelevanttopic/information pertainingto thesubject.

- ACM Transactions on Computing Systems
- Journal of Computer Science and Technology
- Journal of the ACMIEEE Software
- CODE Magazine
- Journal of Computing Sciences in Colleges
- Computer Science Education
- Design &Markup News

WEB RESOURCES:

- Khan Academy (www.khanacademy.org)
- Computer Hope (www.computerhope.com)
- TechTerms (www.techterms.com)
- HowStuffWorks (www.howstuffworks.com)
- W3Schools (www.w3schools.com)
- Computer Science for Fun (www.cs4fn.org)
- Neso Academy (www.nesoacademy.org)
- Studytonight (www.studytonight.com)
- Computer Science Unplugged (csunplugged.org)
- Exploring Computer Science (www.exploringcs.org)

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Swarrnim School of Computing & IT

BSc- IT (Honours) Programme
Semester II

Course Title: Mobile Application Development

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practica
Minor	BSCIT230203	4	60	20%	30%	-	30%	20%

CourseOutcomes(COs)
Here are concise course outcomes for the syllabus:

- Design user-friendly mobile interfaces and layouts.
- Develop functional mobile applications using relevant programming languages.
- Employ effective testing and debugging techniques for app quality assurance.
- Deploy mobile apps in compliance with security and distribution guidelines.
- Stay informed about emerging trends and technologies in the mobile development landscape.

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Syllabus:

Module	Contents	No ofSessions	Weightage
1	• Introduction to Mobile App Development: Understand the various mobile application development platforms and ecosystems. Describe the mobile app development lifecycle and its stages. Differentiate between native, web, and hybrid app development approaches. • User Interface Design for Mobile Apps: Apply principles of mobile user interface (UI) and user experience (UX) design. Design responsive and user-friendly layouts for mobile screens. Utilize UI components effectively and implement intuitive navigation patterns.	15	35%
2	• Programming for Mobile Apps: Demonstrate proficiency in programming languages (e.g., Java, Kotlin, Swift) used in mobile app development. Implement basic mobile app logic, data storage, and integration with external services.	7	15%
3	• Testing and Debugging Mobile Apps: Apply testing techniques for mobile applications on emulators and real devices. Diagnose and resolve common errors and issues in mobile app development. Perform user acceptance testing and ensure usability standards. • App Deployment and Distribution: Prepare mobile apps for deployment, adhering to platform-specific guidelines. Navigate the app store submission process and understand distribution strategies. Deploy mobile apps to target users and devices effectively.	8	15%
4	• Security Considerations in Mobile App Development: Identify potential security risks in mobile app development. Apply secure coding practices to protect data and enhance app security. Implement basic authentication and authorization mechanisms in mobile apps. • Emerging Trends in Mobile App Development: Recognize and discuss current trends in mobile app development. Evaluate the potential of integrating emerging technologies (e.g., AR/VR) in mobile apps.	15	35%

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WEB RESOURCES:

- Khan Academy (www.khanacademy.org)
- Computer Hope (www.computerhope.com)
- TechTerms (www.techterms.com)
- HowStuffWorks (www.howstuffworks.com)
- W3Schools (www.w3schools.com)
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- Studytonight (www.studytonight.com)
- Computer Science Unplugged (csunplugged.org)
- Exploring Computer Science (www.exploringcs.org)

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Swarrnim School of Computing & IT
BSc- IT (Honours) Programme
Semester II
Course Title: Foundation in Statistical Methods

Category of Course	CourseCode	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practic
MDC	BSCIT230204	3+1	60	20%	30%	-	50%	-

CourseOutcomes(COs):

- Develop proficiency in organizing data through tabulation, frequency distribution, and graphical representation.
- Understand and compute measures like mean, median, mode, range, quartile deviation, mean deviation, and standard deviation for assessing data patterns.
- The concept of skewness and apply Karl Pearson's Coefficients of Skewness in practical scenarios.
- Gain insight into correlation types and methods, including Karl Pearson's correlation coefficient, to assess relationships between variables in datasets.

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Syllabus:

Module	Contents	No ofSessions	Weightage
1	• Classification of data, Tabulation of data, Preparation of frequency distribution, Presentation of data through histogram, frequency polygon. frequency curve	12	26%
2	• Measures of Central Tendency: Computation of Arithmetic mean, median and mode for ungrouped data and grouped data.	10	22%
3	• Measures of dispersion: Computation of Range. Quartile deviation, mean deviation and Standard deviation • Concept of Skewness, Karl Pearson's Coefficients of Skewness(Numerical Applications Only)	15	34%
4	• Meaning of Correlation, types of correlation, correlation coefficient, Karl Pearson correlation coefficient. (Numerical Applications Only)	08	18%

Evaluation		
1	Assignments/ Quizzes/ClassParticipation / Role Play/Projectetc.	30%(InternalAssessment)
2	InternalExamination	20%(InternalAssessment)
3	ExternalExamination (UniversityExam)	50%(External Assessment)

BasicTextBooks:

Sr. No.	Author/s	Nameof the Book	Publisher	Edition
1	Dr. S.P. Gupta	"Statistical Methods"	Sultan Chand & Sons	46th edition (1 January 2021)

ReferenceBooks:

Sr. No.	Author/s	Name of theBook	Publisher	Edition
1	S.C. Gupta & V.K. Kapoor	Fundamental of Mathematical Statistics	Sultan Chand	11th edition
2	Mode .E.B.	"Elements of Statistics"	PrenticeHall	6th Edition

❖ **ListofJournals/Periodicals/Magazines/Newspapers:**
Thestudents willhaveto referto pastissues ofthefollowingjournals inorder togetrelevanttopic/information pertainingto thesubject.

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- Journal of Statistical Education
- The American Statistician
- Journal of Applied Statistics
- Journal of Statistics Education
- International Journal for Innovation Education and Research
- Mathematics Teacher: Learning and Teaching PK-12

WEB RESOURCES:

- www.statistics.com
- stats.stackexchange.com
- TechTerms (www.techterms.com)
- HowStuffWorks (www.howstuffworks.com)
- W3Schools (www.w3schools.com)
- Computer Science for Fun (www.cs4fn.org)
- Neso Academy (www.nesoacademy.org)
- Studytonight (www.studytonight.com)

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B. Sc.- IT (Honours) Programme

Semester II

Course Title: Logical and Critical Thinking

Category Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
ACE	AEC230202	2	30	20%	30%	-	50%	-

Course Outcomes (COs)

- Students are able to understand the basic concept of Logical and Critical Thinking and are able to solve problems
- Student analytical ability increased.
- Student can be placed in service based company, government sector, PSU and it will also help in higher study.

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Syllabus:

Module	Contents	No of Sessions	Weightag
1	**Simplification and Approximation** (BODMAS Rule,Approximation.Short trick, Digit Sum.Square Roots and Cube roots based Question) **Coding Decoding** (Coding means Encryption and Decoding means Decryption among letters, alphabets and Special Symbols)	8	26%
2	**Crypt arithmetic** (Crypt arithmetic is a type of mathematical game consisting of Mathematical Equation) **Analogy & Odd one out** (An Analogy is a comparison between two objects or system of objects in which they are thought to be similar.)	4	14%
3	**Direction & Distance** (Description of Directions and Determination of Distance wrt. Directions, Sunrise and Sunset with Shadow Concept.) **Blood Relations** (In such questions, one person describes his /her relation with another person. Pointer- narrator relations Symbols relation as well as group relation)	6	20%
4	**Number System** Classifications of Number System [Rational/Irrational No's, Integers, fraction, Even-odd, Prime - Composite no's] Perfect number & Square , Face value-Place value	12	40

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	Frequency of Digit Occurrence Concept of Divisibility Rule - finding the division of a number Cyclicity rule - Unit digit Concept, Trailing Zeroes Binomial Theorem - for remainder Factorizations - Prime - Composite factors, Total factors , Even-Odd factors		

Evaluation		
1	Assignments/ Quizzes/ClassParticipation / Role Play/Projectetc.	30%(Internal Assessment)
2	InternalExamination	20%(InternalAssessment)
3	ExternalExamination(UniversityExam)	50%(External Assessment)

BasicTextBooks:

Sr. No.	Author/s	Nameof the Book	Publisher	Edition
1	R.S.AGRWAL	Reasoning for Competitive Examinations	S CHAND	2022
2	R.S. AGRWAL	Quantitative Aptitude for Competitive Examinations	S CHAND	2022

ReferenceBooks:

Sr. No.	Author/s	Name of theBook	Publisher	Edition
1	ARUN SHARMA	How To Prepare For Quantitative Aptitude	McGraw Hill Education	10TH 2022
2	R. PRAVEEN	Quantitative Aptitude and Reasoning	PHI Learning Pvt Ltd	3RD 2016

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Relevant Websites

ARIHANT REASONING E-BOOK PDF

https://parik shatop.com/arihant-reasoning-book-pdf-download-free/

E BOOK FOR REASONING – ARUN SHARMA

https://z-lib. s/book/how-to-prepare-for-logical-reasoning-for-the-cat

E BOOK FOR APTITUDE– ARUN SHARMA

https://z-lib is/book/how-to-prepare-for-quantitative-aptitude-for-the-cat

LINK FOR MULTIPLE QUANT E BOOK

https://www google.com/search?q=aptitude+book+for+placement+pdf&oq=APTITU DE+BOOK&aqs=chrome.3.0i512l10.12648j0j15&sourceid=chrome&ie =UTF-8

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SWARRNIM
STARTUP & INNOVATION
UNIVERSITY

School of Computing & IT

Programme B. Sc.- IT

Semester II

Core Course Title: Identifying Entrepreneurial Opportunities

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practica
SEC	SEC230202	2	30	20%	30%	-	50%	-

Course Outcomes (COs)

- Exploration of opportunities from the market
- Check technical, market, financial and other types of Feasibility of a business idea.
- Develop business model to describe the rationale of how an organization creates, delivers, and captures value
- Identification of various Business Opportunities from the market

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	experience and social networks in opportunity recognition. • How entrepreneurs can become skilled at recognizing opportunities…Entrepreneurship, Entrepreneurship and Startup		
2	**Business Idea Creation & IPR** • Meaning, sources of business ideas, techniques for idea generation like brain storming, • Focus group, six thinking hats as idea generation, • Characteristics of brilliant business ideas **Introduction:** • Knowledge creation, Innovation and Intellectual Property Rights, Concept of Intellectual Property. • Types of IPR – Patents – Copyright – Trademark – Industrial Designs – Trade Secrets – Geographical	8	25%
3	**Business Model:** • Introduction to business model, Types of business model, • Developing and testing a business model, Business modelling process, Business model canvas, • Business Models and value proposition, Business Model Failure: Reasons and Remedies Reinventing business model	8	25%

Evaluation		
1	Assignments / Quizzes / Class Participation / Role Play/ Project etc.	30% (Internal Assessment)
2	Internal Examination	20% (Internal Assessment)
3	External Examination (University Exam)	50% (External Assessment

Basic Text Books:

Sr. No.	Author/s	Nameof the Book	Publisher	Edition
1	S.S. Khanka, Gupta. C.B.	Entrepreneurship & Small Business Management	Sultan Chand and Sons	LatestEdition
2	Sami Uddin	Entrepreneurship Development in India	Mittal Publications	LatestEdition

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Reference Books:

Sr. No.	Author/s	Name of theBook	Publisher	Edition
1	Dr. Bhatia R.C	Entrepreneurship: Business and Management	Sultan Chand and Sons	Latest
2	Bruce R. Barringer	Entrepreneurship: Successfully Launching New Ventures	Pearson Education	Latest
3	Janakiram B., Rizwana. M.	Entrepreneurship development	Excel Books	Latest
4	Khanna. S S.	Entrepreneurial Development	Excel Books	Latest

List of Journals / Periodicals / Magazines / Newspapers:
The students will have to refer to past issues of the following journals in order to get relevant topic/information pertaining to the subject.

1. Journal of Entrepreneurship
2. Journal of Small Business Management
3. Journal of Entrepreneurship & Management
4. AMC Indian Journal of Entrepreneurship

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SWARRNIM
STARTUP & INNOVATION
UNIVERSITY

School of Computing & IT

Programme B. Sc.- IT

Semester II

Course Title: Environmental Studies

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
VAC	VAC230201	2	30	20%	30%	-	50%	-

Course Outcomes (COs)

- Enabling students to understand and realize the multi- disciplinary nature of the environment, its components, and inter-relationship between man and environment.
- Understanding the relevance and importance of natural resources in the sustenance of life on earth and living standard. the importance of ecosystem, biodiversity, and nature.
- Correlating the human population growth and its trend to the environmental degradation and developing the awareness about his/her role towards environmental protection. Identifying different types of environmental pollution and control measures.

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Module	Contents	No of Sessions	V
1	**Introduction to Environment andEnvironmental Studies, Natural Resources:** • Definitionand Components of Environment, Relationship between thedifferentcomponents of Environment,ManandEnvironment relationship, Impact of technology onEnvironment, Environmental Degradation,itsscope. • Waterresources:Sourcesofwater-SurfaceandGroundwatersources.IndianandGlobal scenario. • Landresources:Land pollution,landuse,landdegradation&its causes. • Forestresources:DefinitionandTypesofforestsimportance and benefits of forest, Deforestation causesandeffects.	9	
2	**EcologyandEcosystems:** • Ecology:Introduction, Objectives andClassification, Concept of an ecosystem-structureofecosystemorComponentsofecosystem-Producers,Consumers,Decomposers • Ecosystems:ForestEcosystem,GrasslandEcosystem, DesertEcosystem,AquaticEcosystem,EstuarineEcosystem • HumanPopulationandEnvironment:PopulationGrowth,WorldandIndian scenario,Population andEnvironmentalDegradation,Malthusiantheory,Optimum theory, • Urbanization: Urban population growth and Environmentalproblems	12	
3	**Environmentalpollutions:** • WaterPollution:Introduction–WaterQualitystandards, sources of water pollution Classification ofwaterpollutants. Eutrophication • Air Pollution: Composition of air. Structure of atmosphere,AmbientAirQualityStandards.Classification ofairpollutants, • LandPollution:Landuses,Landdegradation:causes,effectsandcontrol,soilerosion • Noise Pollution:Introduction, Sound and Noise,Causes and Effects • GlobalEnvironmental Issues:ClimateChange. GlobalWarmingand GreenHouseEffect.AcidRain,Depletion ofOzone layer	9	

Evaluation		
1	Assignments / Quizzes / Class Participation / Role Play / Project etc.	30% (Internal Assessment)
2	Internal Examination	20% (Internal Assessment)
3	External Examination (University Exam)	50% (External Assessment)

Basic Text Books:

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Sr. No.	Author/s	Name of the Book	Publisher
1	SnehalPop i&B.R.Shah	Basics of l nvi onmentalstudies	MahajanPublishingHouse

Reference Books:

Sr. No.	Author/s	Name of the Book	Publisher
1	ProfDrNSV arandani	Basics of EnvironmentalStudies	LAP-Lambert AcademicPublishingGe
2	R.Rajagopa an	Environmental Studies	OxfordUniversityPress
3	UKKhare	Basics of EnvironmentalStudies	TataMcGraw Hill
4	DanielBBo kin&EdwardAKeller	Environmental Sciences	JohnWiley& Sons.

❖ **ListofJourn ls/Periodicals/Magazines/Newspapers:**

Thestudentsv illhavetorefertopast issuesofthefollowingjournals inordertoget elevanttopic/informationpertaining tothesubject.

- En ironmentalStandard
- IndianJournalofEnvironmentalResearchandStudies
- JournalofEnvironmentalScienceandTechnology.

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Gmail hbjethva@gmail.com

Compose

Inbox 334
Starred
Snoozed
Sent
Drafts 120
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Labels

Admission cancel
google sheet
NOC BCA
student leave
UGC data

H JETHVA Thu, Aug 24, 1
to me, vikas, hbjethva, dave, swapnil

I accept the invitation

On Thu, Aug 24, 2023 at 6:54 AM HOD BCA <hod.bca@swarnim.edu.in> wrote:

Dear Sir/ Ma'am,

Swarnim Startup and Innovation University has been approved by the Government of Gujarat under the Gujarat I a young university aspiring to impart excellence in education. We offer various programs in Health Science, Engine Liberal Arts, Design, Science and Agriculture. The University has a vision to be a globally competent institution in foundation of Innovation and Entrepreneurship.

We invite you to become part of the esteemed member of the **Board of Studies (BOS) of School of Computing &** curriculum as per the guidelines based on the New Education Policy and Government of Gujarat Education Departm Educational Institutions

We intend to schedule the Board of Studies meeting in the 3rd week of August 2023, for the same we request you tc Which is a convenient date to conduct the same.

Kindly reply via the same mail regarding confirmation of date.

Warm Regards

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Gmail

in:sent

Compose

Inbox 334

Starred

Snoozed

Sent

Drafts 120

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Invitation for Industry Expert Panel Member in BoS

External Inbox ×

HOD BCA
Dear Sir/ Ma'am, Swarnim Startup and Innovation University has been approved by the Government of Gujarat under

Sagar Jasani Fri, Aug 25, 1
to me

Respected sir

Thank you for considering me for the BOS and it's a pleasure for me to be the part of the board. I wi

Regards
Sagar Jasani
BrainyBeam technologies
Ahmedabad

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google sheet
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student leave
UGC data

Mail Chat Spaces Meet

HOD BCA <hod.bca@swarrnim.edu.in> Fri, Aug 25, 9
to Dr, swapnil

Dear Ma'am,

The Board of Studies Meeting for the School of Computing and IT is scheduled the on 25 Aug 2023. We request to ap
Remuneration @ Rs 3000/- per member.

1. BCA & B. Sc.-IT there will be 02 members (one academician and one corporate representative).

total remuneration will be 02*3000/- = Rs. 6000/-

kindly approve the same

Thanks and Regard

Vikas Chandra Sharma
Regards...
Head of Dept.
Department of Computing & IT
www.swarrnim.edu.in
At: Bhoyan Rathod, Sertha, Gandhinagar – 382420

Dr Kavita Kshatriya Fri, Aug 25, 9:
to me, swapnil

Approved

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Curriculum Vitae

Name	: JETHVA HARIKRISHNA B.
Date of birth	: 30th July 1979
Marital status	: Married
Address	: F 102, Swaminarayan Park 1, Opp: Mangaldeep School, Vyasvadi Road, Navavadaj, Ahmedabad-380013
Contact No	: 09998816300
E-mail	: hbjethva@gmail.com, hbjethva@ldce.ac.in

EDUCATIONAL QUALIFICATION:
I have done B.E. (Computer Engineering) in the year 2001, M.E.(Computer Engineering) in the year 2009 and Ph.D. in Computer Science and Engineering in the year 2015.

PROFESIONAL EXPERIENCE:
I have software development experience of one year.
I have teaching experience of 20 years.

Area of Specialization: Neural Network, Machine Learning, Theory of Computation, Compiler design, Algorithms

PG student guided: 21
Ph. D. student guided: Completed: 2 Running: 6
I am Ph.D. Guide in Gujarat Technological University.

Board of Study member following university:
1. Gujarat Technological University, Ahmedabad
2. ITM university, Vadodara
3. Gokul University Siddhpur(N.G.)

Achievements:
1. Got Best faculty contribution award at L.D.College of Engineering in the year 2015
2. Taken 44000 candidate CCC exam at L. D. College of Engineering in the year 2015
3. Started Entrepreneurship cell at L.D.College of Engineering in the year 2015 and arranged many programs in it.

Patents:
1. Published, Application Number- 202111032751, Journal Number- 34/2021, Journal Date: 20/08/2021 -Indian Patent Office Title: A CONTAGIOUS DISEASE DETECTION SYSTEM AT PUBLIC ENTRANCE IN A RAILWAY STATION
2. Published Design Patent Application No. 347409-001 on: Dt:08/06/2021
3. Published, Application Number- 202241051842 A, Journal Number- 37/2022 Journal Date: 16/09/2022, Indian Patent Office Title: IOT DATASET AUTHENTICATION SPENDING MACHINE LEARNING PRACTICES FOR TRAFFIC ANOMALY RECOGNITION
4. 388646-001

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Grants: received AICTE MODROB-ASP grant of rupees 1554000/- to Set up IoT and Machine learning laboratory at Computer Engineering department Government Engineering College, Patan.

Session Chair/Reviewer:

1. Session Chair in NCIII-SCSIT 2021 Students research conference Date:13/03/2021 on "Innovative Ideas and Invention with Sustainability in Computer Science and IT-2021" at MIT World Peace University Pune.
2. Session Chair in National Conference on "Internet of Things: Solution for Societal Needs" Date:30-06-2021 New Horizon College of Engineering, Bengaluru.
3. Session Chair in International Conference "Innovation 2021" Date: 26-06-2021 at Dr. D.Y.Patil School of Engineering Pune.
4. Session Chair in International Conference on Interdisciplinary Studies in Education, Research and Technology(ISERT-2021) organized by Laescuela Education Dubai on 16th to 19th December 2021.
5. member of the Reviewer Committee in "4th International Conference on Information Management & Machine Intelligence (ICIMMI 2022)" held during December 23-24, 2022 at Poornima Institute of Engineering & Technology, Jaipur, Rajasthan.
6. Reviewer International Conference on Innovation In Engineering and Technology (ICIET-2023) Date:22/05/2023 at Ajeenkya D.Y.Patil School of Engineering, Pune.
7. Session chair in International Conference "Innovation 2K23" Date: 05-06-2023 at Dr. D.Y.Patil School of Engineering Pune.
8. Associate Editor in International Journal of Scientific Research in Computer Science, Engineering and Information Technology https://ijsrcseit.com/editorial.php

Book published:

1. Machine Learning With Scikit-Learn, Keras and Tensorflow ISBN : 978-81-951171-3-0 Published By : Technoscience Academy (The International Open Access Publisher) Publication Date : 25/06/2021
2. Linux System Administration ISBN : 978-81-951171-2-3 Published By : Technoscience Academy (The International Open Access Publisher) Publication Date : 25/06/2021
3. Next Generation Mobile Application in Cloud Computing using RESTful Web Service, LAP LAMBERT Academic Publishing (2012-07-06) - ISBN-13: 978-3-659-17039-3

Workshop/Training/Conference organized:

- Organized two week training on "Energy Conservation & Management" at Government Engineering College, Patan during 29/04/2010 to 12/05/2010.
- Organized one day workshop on software testing a practical approach on 01 dec 2012 at L.D.College of Engineering, Ahmedabad.
- Organised one day workshop on "Entrepreneurship Development" on 04/04/2013 at Upnishad hall Computer Dept L. D. College of Engineering, Ahmedabad
- Organised two week STTP for faculty on "Entrepreneurship Development" from 17/12/2013 to 03/01/2014 at L. D. College of Engineering, Ahmedabad supported by CED(Center Entrepreneurship Development).
- Organised three day training on "Entrepreneurship Development" from 05/02/2014 to 07/02/2014 at Upnishad hall Computer Dept L. D. College of Engineering, Ahmedabad

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- ICATES(International Conference on Advanced Tribology & Energy System) at GTU 15 to 17 Oct 2013 Committee member.
- Organized MHRD sponsored GIAN short term course on "Understanding Fundamental Tradeoffs in Computer Design and Organization" at Computer Engineering Department L. D. College of Engineering Ahmedabad from 21/11/2016 to 25/11/2016.
- Co-coorninator in national conference NCACSET-2017 at Computer Engineering Department L. D. College of Engineering Ahmedabad on 06/05/2017.
- Coordinator in ATAL FDP on "Block chain technology and crypto currency" at Government Engineering College, Patan from 19-23 October 2020.
- Convener in STTP on "MEAN Stack" from Dt:21/03/2023 to Dt:25/03/2023 at Government Engineering College, Patan in collobaration with DST(Department of Science & Technology).

Research Publications:

Sr. No	Title	Name of Conference/Journal	Year	Author
	SLDEB: Design of a Secure and Lightweight Dynamic Encryption Bio-Inspired Model for IoT Networks	International Journal of Safety and Security Engineering Vol. 13, No. 2, April, 2023, pp. 325-331 Journal homepage: http://iieta.org/journals/ijsse	2023	Bhavesh Kataria, Harikrishna B. Jethva, Pushpmala Vijay Shinde, Satish S. Banait, Farhadeeba Shaikh, Samir Ajani
1	A Novel Hybrid AI Federated ML/DL Models for Classification of Soil Components	International Journal on Recent and Innovation Trends in Computing and Communication ISSN: 2321-8169 Volume: 10 Issue: 1s DOI: https://doi.org/10.17762/ijritcc.v10i1s.5823	2022	M.E. Pawar, R. A. Mulla S.H.Kulkarni, Sajeeda Shikalgar, H.B. Jethva, G. A. Patel
	A comprehensive survey on person re-identification approaches: various aspects	Multimedia Tools and Applications Volume 81 Issue 11May 2022 pp 15747–15791 https://doi.org/10.1007/s11042-022-12585-w	2022	Nikhil Kumar Singh, Harikrishna B. Jethva & Manish Khare
2	MiNB: Minority Sensitive Naïve Bayesian Algorithm for Multi-Class Classification of Unbalanced Data	The International Arab Journal of Information Technology Vol 19, No 4 July 2022 page no 609	2022	Pratik Barot Dr. Harikrishna Jethva
3	Optical Character Recognition of	Webology, ISSN: 1735-	2021	Bhavesh

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	Sanskrit Manuscripts Using Convolution Neural Networks,	188X, Volume 18 Issue 5, October-2021, pp. 403-424. Available at https://www.webology.org/abstract.php?id=1681		Kataria, Dr. Harikrishna B. Jethva
4	Optical Character Recognition of Indian Language Manuscripts using Convolutional Neural Networks.	Design Engineering, 2021(3), 894-911. doi : https://doi.org/10.17762/de.v2021i3.7789	2021	Bhavesh Kataria, Dr. Harikrishna B. Jethva
5	Mgini - Improved Decision Tree using Minority Class Sensitive Splitting Criterion for Imbalanced Data of Covid-19	Journal of Information Science and Engineering Vol. 37 No.5 pp. 1097-1108	2021	P.A.Barot & H. B. Jethva
6	Sanskrit Character Recognition using Convolutional Neural Networks : A Survey.	International Journal of Advanced Science and Technology, 29(7), 1059 - 1071. Retrieved from http://sersc.org/journals/index.php/IJAST/article/view/15068	2020	Bhavesh Kataria, Dr. Harikrishna B. Jethva
7	Age Group Estimation and Gender Recognition using Facial Features: A Critical Review Study	International Journal of Advanced Science and Technology Vol. 29, No. 12s, (2020), pp. 540-547	2020	Karishma Chaudhary, Harikrishna Jethva
8	Sanskrit Character Recognition using Convolutional Neural Networks: A Survey	International Journal of Advanced Science and Technology Vol. 29, No. 7, (2020), pp. 1059 – 1071	2020	Bhavesh Kataria , Harikrishna B. Jethva
9	Imbalanced Data Learning: Importance, Recent Trends, and Challenges	International Journal of Advanced Science and Technology Vol. 29, No. 3, (2020), pp. 8847 – 8855	2020	H. B. Jethva and Pratik A Barot
10	Mgini - Improved Decision Tree using Minority Class Sensitive Splitting Criterion for Imbalanced Data of Covid-19	JOURNAL OF INFORMATION SCIENCE AND ENGINEERING 36	2020	PRATIK BAROT, H B JETHVA
11	CNN-Bidirectional LSTM Based Optical Character Recognition of Sanskrit Manuscripts : A Comprehensive Systematic Literature Review	International Journal of Scientific Research in Computer Science, Engineering and Information Technology (IJSRCSEIT), ISSN : 2456-3307, Volume 5 Issue 2, pp. 1362-1383, March-April **2019**. Available at doi : https://doi.org/10.32628/CSEIT2064126	2019	Bhavesh Kataria, Dr. Harikrishna B. Jethva
12	Review of Advances in Digital Recognition of Indian Language Manuscripts	International Journal of Scientific Research in Science, Engineering and Technology (IJSRSET),	**2018**	Bhavesh Kataria, Dr. Harikrishna B. Jethva

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		Online ISSN : 2394-4099, Print ISSN : 2395-1990, Volume 4 Issue 1, pp. 1302-1318, January-February 2018. Available at doi : https://doi.org/10.32628/IJSRSET1841215		
13	ENHANCE DECISION TREE ALGORITHM FOR UNBALANCED DATA: RAREDTREE	International Journal of Computer Engineering & Technology(IJCET)Volume 9, Issue 5	Sept 2018	P.A.Barot H.B.Jethva
14	Self-Adaptive Message Replication (SAMR) Strategy for Delay/Disruption Tolerant Network	ICTIS 2017 Springer Volume 1 pp 365-372	Aug 2017	J.B.Patel H.B.Jethva
15	Statistical Study to Prove Importance of Causal Relationship Extraction in Rare Class Classification	ICTIS 2017 Springer Volume 1 pp 416-425	Aug 2017	P.A.Barot H.B.Jethva
16	A hybrid HMM/ANN approach for automatic Gujarati speech recognition	International Conference on Innovations in Information, Embedded and Communication Systems (ICIIECS) IEEE Explore	Mar 2017	Sanjay Valaki H.B.Jethva
17	A Survey on Feature Extraction and Classification Techniques for Speech Recognition	IJARIIE Vol-2 issue 6	2016	S.Valaki, H.B.Jethva
18	Reinforcement Learning with Neural Networks: A Survey"	ICTIS 2015 Springer	Nov 2015	B.Modi H.B.Jethva
19	QUANTUM CIRCUIT OPTIMIZATION (FOR 3 QUBITS)	International Journal of Advance Engineering and Research Development IJAERD Volume 2,Issue 6	June 2015	Yogesh Patel H.B.Jethva
20	PERFORMANCE COMPARISON OF AODV/DSR ON-DEMAND ROUTING PROTOCOLS FOR AD HOC NETWORKS	IJSRST | Volume 1 | Issue 2 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X www.ijsrst.com	2015	B. Katariya & H.B.Jethva
21	Analyze Impact of Malicious Behavior of AODV under Performance Parameters"	International Conference on Advanced Communication Control & Computing (ICACCCT) IEEE Explore	Jan 2015	Martin Parmar H.B.Jethva
22	Web Service Semantic in SAWSDL An Automated & generalized approach based on cross domain Ontology	IEEE - International Conference on Advances in Engineering and Technology-(ICAET 2014).	2014	H.Yadav H.B.Jethva
23	Prolonging Life of Heterogeneous Wireless Sensor Network using Clustering Algorithm	International Journal of Scientific and Research Publs, Volume 4, Issue 5,www.ijsrp.org	May 2014	Vishal Lukhi H.B.Jethva

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24	Review Paper on Energy Efficient Clustering Protocols for Extending Wireless Sensor Network's Life	International Journal of Advanced Research in Computer Science and Software Engineering Volume 4, Issue 1	Jan. 2014	Vishal Lukhi H.B.Jethva
25	ANT COLONY OPTIMIZATION	IJSRSET Volume i Issue i	Dec 2014	H.B.Jethva
26	Performance Comparison of normal and abnormal AODV under random traffic and node movement	Elsevier 2nd National Conference on Advancements in the Multi-Disciplinary Systems, Technology AEMDS, p.p. 119-124	2013	B.H.Patel Vishal Rathod H.B.Jethva
27	Improving Performance of Back propagation Learning Algorithm	IJSRD(International Journal for Scientific Research & Development) Vol. 1, Issue 6	2013	H.B.Jethva V.M.Chavda
28	Survey on Mobile ADHOC Network and Security Attacks on Network Layer	International Journal of Advanced Research in Computer Science and Software Engineering Vol. 3 Issue 11	Nov 2013	Martin Parmar H.B.Jethva
29	Neural Network Based Gujarati Language Speech Recognition	IJCSMR Vol. 2 Issue 5 ijcsmr.org	May 2013	Pravin Patel H.B.Jethva
30	Association Rule Based Data Mining Approach to HTTP Botnet Detection	IJAIEM Vol.2 Issue 4 www.ijaiem.org	April 2013	J. Vania A.Meniya H.B.Jethva
31	Improvement in the Speed Of Training a Neural Network using Sampled Training	IJAIEM ISSN: 2319-4847 Vol-2, Issue-4, www.ijaiem.org	April 2013	Advait Bhatt H.B.Jethva
32	Privacy preserving k-Means clustering on horizontally distributed Data	International Journal of Application or Innovation in Engineering & Management (IJAIEM) Volume2, Issue 4,	April 2013	Bhadresh Prajapati H.B.Jethva
33	Improvements In RFID System Via Secure Mutual Authentication Protocol	International Journal of Engineering Research & Technology (IJERT)Vol. 2 Issue 5, ISSN: 2278-0181	May 2013	Janak Tank H.B.Jethva
34	A Review on Botnet and Detection Technique	International Journal of Computer Trends and Technology- volume4 Issue1-	2013	Jignesh Vania Arvind Meniya H.B.Jethva
35	Priority based scheduling for lease management in cloud computing	IJSRD - International Journal for Scientific Research & Development| Vol. 1, Issue 2	2013	Pragnesh Patel H.B.Jethva
36	A review on back propagation algorithms for Feedforward Networks	GRA - GLOBAL RESEARCH ANALYSIS Volume : 2 | Issue : 1	Jan 2013	Shital Solanki H.B.Jethva
37	Survey on Attacks in Routing	International Journal of	Dec-	Jignesh B.

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	Protocols In Mobile Ad-Hoc Network	Computer Science and Mobile Computing Vol.2 Issue. 12,	2013	Maheta H.B.Jethva
38	Secure Transaction System Using ID Based Cryptography	International Journal of Computer Science and Mobile Computing, Vol.2 Issue. 12	Dec-2013	Jaydipsinh B. Jadeja H.B.Jethva
39	Next Generation Mobile Application in Cloud Computing using RESTful Web Service" published	IJCTA (International Journal of Computer Technology & Application) Vol 3 (3)	May-June 2012	Arvind Meniya H.B.Jethva
40	Single-Sign-On(SSO) across open cloud computing federation	IJERA (International Journal of Engineering Research and Application) Vol. 2, Issue1,pp.891-895	Jan-Feb 2012	Arvind Meniya H.B.Jethva
41	About different types of Neural Networks	international journal IJ-CA-ETS	Apr-2011	H.B.Jethva
42	Improving Backpropagation Learning Algorithm Using Adaptive Gradient	International journal of information and computing technology (ISTAR). ISSN: 0976 – 5999 Volume 2 Issue 1	Nov 2011	H.B.Jethva
43	Improving Backpropagation Learning Algorithm Using Modified Gradient.	IEEE international conference ICACCT ISBN: 81-87885-03-3	2011	H.B.Jethva

Training attended:

Sr. No	Title of training	Duration	Place
1	Induction Training Programme for Engineering	15/05/2006 to 27/05/2006	NITTTR, extension center Ahmedabad.
2	Linux Administration	21/11/2005 to 25/11/2005	NITTTR Chandigarh
3	.Net training	28/02/07 to 03/03/07	G.H.Patel Engg. College,V.V.Nagar
4	Wireless Communication	07/05/2007 to 11/05/2007	NITTTR, Chandigarh
5	LINUX	14/05/2007 to 18/05/2007	NITTTR, Chandigarh
6	Institute Accreditation and Quality Improvement	11/05/2009 to 15/05/2009	NITTTR, Chandigarh
7	Entrepreneurship Development using Blue ocean strategies	18/05/2009 to 22/05/2009	NITTTR, Chandigarh

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8	Entrepreneurship Skill for Service Sector	14/09/2009 to 18/09/2009	NITTTR Extension centre Ahmedabad
9	Computational and Simulation aspects of Nanoscience and Engineering	18/01/2010 to 21/01/2010	GEC, Patan
10	Energy Conservation and Management	29/04/2010 to 12/05/2010	B & B Institute of Technology V.V.Nagar
11	Database Management	28/11/2011 to 09/12/2011	Gujarat Technological University, Ahmedabad
12	Advanced Java	18/06/2012 to 22/06/2012	TCS-Gandhinagar
13	Multimedia Development using Animation	16/07/2012 to 27/07/2012	NITTTR, extension center Ahmedabad
14	Entrepreneurship development	25/02/2013 to 09/03/2013	CED Gandhinagar
15	Advanced in Computer Science and IT engineering	08/07/2013 to 19/07/2013	NITTTR, extension center Ahmedabad
16	E content development	01/12/2014 to 12/12/2014	NITTTR, Bhopal
17	Working with Android	08/06/2015 to 12/06/2015	L. D. College of Engineering , Ahmedabad
18	Computational Intelligence from	01/03/2016 to 05/03/2016	DAIICT Gandhinagar
19	English for Technical teachers	05/06/2017 to 09/06/2017	L.D.College of Engineering Ahmedabad
20	Fundamentals and application of IOT Big Data and Machine Learning"	28/05/2018 to 08/06/2018	L.D.College of Engineering Ahmedabad
21	"Efficient Energy Conversion in Harmony with Environment"	29/10/2018 to 03/11/2018	Indian Institute of Technology BHU
22	Neural Network and CNN	09/04/2020 to 13/04/2020	NITTTR Chandigarh online
23	Linux application in Engineering Education	27/04/2020 to 01/05/2020	NITTTR Chandigarh online
24	Block chain technology and crypto currency" at from	19/10/2020 to 23/10/2020	Government Engineering College, Patan

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25	Comprehensive online Intellectual Property Rights	06/07/2020 to 14/09/2020	i-Hub Education department online
26	UDAYAM E-content development	28/07/2020 to 18/08/2020	KCG Education department online

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Personal Information:



Full Name: Sagar Jasani

Contact Information:

Phone: +91 9033237336

Email: sagar@brainybeam.com

LinkedIn: https://www.linkedin.com/in/sagar-jasani-4989b6148

Summary

Results-oriented professional with a proven track record of successfully managing and delivering complex projects across various industries. Adept at leading cross-functional teams, driving strategic initiatives, and fostering client relationships. Possess strong leadership, communication, and problem-solving skills. Looking to leverage expertise in project management and leadership to contribute to an organization's growth and success.

Professional Experience

1. Chief Executive Officer (CEO)

BrainyBeam Technologies Pvt Ltd.(2021-present)

- Provide visionary leadership, setting strategic goals and overseeing the overall direction of the company.
- Lead executive team in driving innovation, business development, and operational excellence.
- Foster a culture of collaboration, creativity, and accountability throughout the organization.
- Identify market trends and opportunities, guiding product development and expansion efforts.
- Build and maintain relationships with key stakeholders, clients, and partners.

2. Director of Project Management

BrainyBeam Technologies Pvt Ltd.(2018 – 2020)

- Managed a portfolio of high-value projects, ensuring adherence to scope, budget, and timeline.
- Led a team of project managers and cross-functional experts, providing guidance and mentorship.
- Collaborated with clients to define project requirements, deliverables, and success criteria.

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- Developed and implemented project management processes, enhancing efficiency and quality.
- Oversaw risk assessment and mitigation strategies, minimizing project-related uncertainties.

3. **Project Manager**

BrainyBeam Technologies Pvt Ltd. **(2012-2018)**

- Defined project scopes, objectives, and success criteria in collaboration with clients.
- Created and managed project budgets, tracked expenses, and reported financial status.
- Facilitated effective communication among team members, clients, and senior management.
- Utilized project management tools to plan, monitor, and control project activities.
- Developed and maintained comprehensive project documentation.

Education:

Bachelor of Engineering in Computer Engineering

GTU | [2012]

Skills:

- Project Management
- Leadership and Team Management
- Strategic Planning
- Stakeholder Engagement
- Budgeting and Financial Management
- Risk Management
- Communication and Presentation
- Problem-solving

Languages:

Fluent in Gujarati, Hindi, English

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BOARD OF STUDIES
CONSTITUTION BSC-IT [OLD]

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SWARNIM STARTUP & INNOVATION UNIVERSITY
Swarnim School of Computing & IT

Board of Studies Constitution

Sr. No.	Members Name	Designation
01	Dr. Kavita Kshatriya	Chairperson
02	Mr. Vikas Chandra Sharma	Co-Chairperson
03	Dr. Hardikhsinh Rayjada	Faculty Member
04	Mr. Nirav Dave	Faculty Member
05	Ms. Pritee Solanki	Faculty Member
06	Ms. Apeksha Dave	Faculty Member
07	Mr. Hardik Parmar	Faculty Member
08	Dr. Jethva Harikrishna B.	Academic External Expert
09	Mr. Sagar Jasani	Industry External Expert
10	Prof. Swapnil Solanki	Member Secretary

AGENDA OF THE MEETING

Agenda 1: To discuss & finalize the teaching scheme of BSC – IT Course as per the guidelines of UGC.

Agenda 2: To finalize the syllabus of BSC – IT Course.

Agenda 3: To include the approved syllabus of the innovation & Entrepreneurship throughout 3 years of BSC – IT course as per the norms of University.

Mr. Vikas Chandra Sharma
Co-Chairperson
Board of Studies

Dr. Kavita Kshatriya
Chairperson
Board of Studies

Swarnim Startup & Innovation University
Swarnim School of Computing

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Swarnim School of Computing & IT

Minutes of First Board of Studies meeting of the School of Computing & IT held on August 25, 2023 at SWARNIM STARTUP & INNOVATION UNIVERSITY

Members Present:

Sr. No.	Members Name	Designation
01	Dr. Kavita Kshatriya	Chairperson
02	Mr. Vikas Chandra Sharma	Co-Chairperson
03	Dr. Hardikhsinh Rayjada	Faculty Member
04	Mr. Nirav Dave	Faculty Member
05	Ms. Pritee Solanki	Faculty Member
06	Ms. Apeksha Dave	Faculty Member
07	Mr. Hardik Parmar	Faculty Member
08	Dr. Jethva Harikrishna B.	Academic External Expert
09	Mr. Sagar Jasani	Industry External Expert
10	Prof. Swapnil Solanki	Member Secretary

Agenda 1: To discuss and finalize the teaching scheme of BSC-IT Course as per the Guidelines of UGC.

Agenda 2: To finalize the syllabus of BSC-IT Course.

Agenda 3: To include the approved syllabus of the innovation & Entrepreneurship throughout 3 years of BSC-IT course as per the norms of university.

Mr. Vikas Chandra Sharma
Co-Chairperson
Board of Studies

Dr. Kavita Kshatriya
Chairperson
Board of Studies

Swarnim Startup & Innovation University * Gandhinagar * Swarnim School of Computing & IT

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SWARNIM STARTUP & INNOVATION UNIVERSITY

Swarnim School of Computing & IT

Board of Studies

Attendance Record

Date: August 25, 2023, Friday Time: 03:30 pm

Venue: Seminar Hall

Sr. No.	Members Name	Designation	Signature
01	Dr. Kavita Kshatriya	Chairperson	
02	Mr. Vikas Chandra Sharma	Co-Chairperson	
03	Dr. Hardikhsinh Rayjada	Faculty Member	
04	Mr. Nirav Dave	Faculty Member	
05	Ms. Preeti Solanki	Faculty Member	
06	Ms. Apeksha Dave	Faculty Member	
07	Mr. Hardik Parmar	Faculty Member	
08	Dr. Jethva Harikrishna B.	Academic External Expert	
09	Mr. Sagar Jasani	Industry External Expert	
10	Prof. Swapnil Solanki	Member Secretary	

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Sr. No.	Subject Name	Credit	Teaching scheme per week				Examination				Total
			Th	Tut	Practical	Total	Internal		External		
							Th	Pr	Th	Pr	
13030105	Technical communication skill	3	3	0	0	3	30	50	70	-	150
13030104	Discrete Mathematics	3	3	2	0	5	30	50	70	-	150
14360101	Networking & internet environment	3	3	0	4	7	30	50	70	-	150
14360103	Computer fundamentals and emerging technology	4	3	0	2	5	30	50	70	-	150
14360102	Problem solving methodologies and programming in c	4	3	0	2	5	30	50	70	-	150
	Introduction to Enterpreniurship	3	3	1	0	4	20	30	20	30	100
	Total	20	18	3	8	29	170	280	370	30	850

Semester 2 (BSC.IT)

Sr. No.	Subject Name	Credit	Teaching scheme per week				Examination				Total
			Th	Tut	Practical	Total	Internal		External		
							Th	Pr	Th	Pr	
14360202	Web Programming	4	3	0	2	5	30	50	70	-	150
14360201	DATA STRUCTURE USING C LANGUAGE	4	3	0	2	5	30	50	70	-	150
14360204	MATHAMATICAL AND STATASTICALS FOUNDATION OF COMPUTER SCIENCE	5	3	2	0	5	30	50	70	-	150
14360203	COMPUTER ORGANIZATION AND ARCHITECTURE	4	3	0	2	5	30	50	70	-	150
	Introduction to Innovation & Ideation	3	2	1	0	3	20	30	20	30	100
	Total	20	14	3	6	23	140	230	300	30	700

Semester 3 (BSC.IT)

Subject Code	Subject Name	Credit	Teaching scheme per week				Examination				Total
			Th	Tut	Practical	Total	Internal		External		
							Th	Pr	Th	Pr	
	SAD, Software Quality Assurance and Testing	4	3	0	2	5	30	50	70	-	150
	C++ and Object Oriented Programming	4	3	0	2	5	30	50	70	-	150
	RDBMS Using Oracle	4	3	0	2	5	30	50	70	-	150
	Web development using Joomla! CMS	5	3	0	4	7	30	50	70	-	150
	Entrepreneural Motivation	3	2	1	0	3	20	30	20	30	100
	Total	20	14	1	10	25	140	230	300	30	700

J Sajed
Mr. Sagar Jusani

Dr. Jethva Harikrishna

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Semester 4 (BSC.IT)

Subject Code	Subject Name	Credit	Teaching scheme per week				Examination				Total
			Th	Tut	Practical	Total	Internal		External		
							Th	Pr	Th	Pr	
	Programming with JAVA	5	4	0	4	8	30	50	70	-	150
	Network Technology and Administration	4	3	0	2	5	30	50	70	-	150
	Operating Systems Concepts With Unix and Linux	4	3	0	2	5	30	50	70	-	150
	Programming withC#	4	3	0	2	5	30	50	70	-	150
	Project Feasibility & Marketing Skills	3	2	1	0	3	20	30	20	30	100
	Total	20	15	1	10	26	140	230	300	30	700

Semester 5 (BSC.IT)

Subject Code	Subject Name	Credit	Teaching scheme per week				Examination				Total
			Th	Tut	Practical	Total	Internal		External		
							Th	Pr	Th	Pr	
	Programming with ASP.Net	4	3	0	2	5	30	-	70	50	150
	Advanced Java Programming	5	4	0	2	6	30	-	70	50	150
	Search Engine Techniques and Digital Technology Trends	4	3	0	2	5	30	-	70	50	150
	Software Develpoment Project-I	10	0	0	10	10	-	50	-	100	150
	Scaling up the Venture (Family Business)	3	2	1	-	3	20	30	20	30	100
	Total	26	12	1	16	29	110	80	230	280	700

Semester 6 (BSC.IT)

Subject Code	Subject Name	Credit	Teaching scheme per week				Examination				Total
			Th	Tut	Practical	Total	Internal		External		
							Th	Pr	Th	Pr	
	Data Warehousing with SQL Server 2012	4	3	0	2	5	30	-	70	50	150
	INTERNET OF THINGS (IOT)	4	3	0	2	5	30	-	70	50	150
	Mobile Computing using Android	4	3	0	2	5	30	-	70	50	150
	Software Develpoment Project-II	12	0	0	12	12	-	100	-	200	300
	Idea to MVP	3	2	1	-	3	20	30	20	30	100
	Total	27	11	1	18	30	110	130	230	380	850

J Sagar

Mr. Sugar Jasuni

Dr. Jethva

Harikrishna

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Computing & IT

Bachelor of Science in Information Technology (Bsc.IT)
Technical communication skill
Semester 1
CODE: 13030105

Teaching & Evaluation Scheme:-

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

Objectives: -

- To 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	6

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	• Need for Effective communication • Importance of English as second language • Importance of Communication • Know What You Want To Say	
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** • Definition & types of Communication, • Cycle of communication • Forms of communication • Components of Verbal & Non-verbal communication • Kinesics • Paralinguistic/ paralanguage • Chronemics • Proxemics	8
4	**Listening Skill** • Definition & Types of Listening • Barriers to effective listening • Techniques to be good listener • Listening audio clips (practical exercise)	4
5	**Reading Skill** • Reading techniques • Reading Strategies • Comprehensive reading • Book review	6
6	**Speaking Skill & Phonetics transcription**	6
7	**Writing Skill** • Answering comprehension practical • Business Letters • 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.

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* 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:

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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Swarrnim School of Computing & IT

Bachelor of Science in Information Technology (Bsc.IT)

Discrete Mathematics

Semester 1

Code:-13030104

Teaching & Evaluation Scheme:-

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

Objectives:-The Maths-1 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:-Maths-1 majors are expected to have cleared 12th Science stream and must have a basic understanding of calculus, physics and chemistry or computer science

Course outline:-

Sr.	Course Contents	Number

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No.		of Hours
1	**Set Theory** • Basic Definitions of Set theory • Set Operations (Union, Intersection, Complement of a set, Cartesian product of a set) • Properties of set operations • De-Morgan's Law	5
2	**Limit And Differentiation** • Concept of Limit • Some Standard Limits • Continuity of a function • Discontinuity of a Function and examples • Definition of Derivative • Rules for differentiation(without proof) • Differentiation of function of a function • Chain Rule • 2^{nd} Order Derivatives	12
3	**Indeterminate Forms** • Indeterminate Forms • Improper Integrals of Type-1 and Type-2	5
4	**Sequences and Series** • Introduction of Convergence, Divergence of Sequences and infinite series • Comparison Test • Ratio Test • Root Test • Integral Test	8
5	**MATRIX** • Definition of Matrix • Types of Matrix (Square, Row, Column, Zero, Diagonal, Scalar, Identity, Transpose, Symmetric, Skew-Symmetric) • Arithmetic Operations of Matrices(Addition, Scalar Multiplication, Matrix Multiplication) • Introduction to Determinants • Invertible Matrix • Rank of a Matrix • Matrix Inversion Method • Simultaneous Solution of a set of Linear equations using Cramer's rule	12

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Computing & IT

Bachelor of Science in Information Technology (Bsc.IT)
Networking & internet environment

Semester 1

CODE:-14360101

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Theory	Tutorial	Pr	Total		Theory	Practical	Theory	Practical	
3	0	4	7	3	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	

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• Packet switching • Message switching • Different types of connections • Dial-UP connections • ISDN • ADSL • Leased Line Connections • Satellite Connections • Internet service provider • Computer Networks • Use of computer Networks • Network Devices • Network Types • Network Topologies • E-Mail • Introduction • E-mail System • E-mail Protocols • About E-mail addresses • Structure of E-mail Message • E-mail clients and server • Mailing list • E-mail security • World Wide Web • Introduction • Basic Elements • Search engines • Introduction • Criteria • Search Agent • o About Popular search engines	
Getting Started With HTML 5: • New Structure • New Form Elements and Attributes • Browser support • Defining HTML Markup • Basic structure of HTML Document • The <!DOCTYPE html> Element • The <HTML> Element • The <head> Element • The <title> Element • The <Body> Element	

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- Modifying the background of an HTML webpage
- Adding Background color
- Adding Background Image
- Specifying Metadata about an HTML webpage
- Introduction to new elements in HTML 5
- The Markup Elements
- The Media Elements
- The Canvas Elements
- The form elements
- The Input type attribute values

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
- Commenting the Text
- Working with Lists
- Creating an Unordered List
- Creating an Ordered List
- Creating an Definition List
- Nested Lists
- Working with Tables
- Creating a Table
- Specifying a caption to a Table
- Adding a Table Headings
- Setting the Table Borders
- Aligning a Table and Cell content
- Changing the background color of a Table
- Setting a Cell Padding and Cell Spacing
- Nesting Tables
- Working with Frames
- Creating a Frames

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- Defining new element specific attributes
- Specifying width and height of the Frame
- Applying Hyperlink Target to a frame

Working with Hyperlinks, Images, Multimedia, Forms and Controls:

- Working with Hyperlinks
- Creating Hyperlins
- Setting hyperlink color
- Linking Different sections of page
- Working with Images
- Inserting an Image on webpage
- Display alternate text for an Image
- Adding Border to an Image
- Align an Image
- Using Image as a Links
- Creating Image Maps
- Working with Multimedia
- Embedding multimedia on web page
- Handling Browser that do not support embedding
- Creating a link to a multimedia file
- Using <object> tag insert objects
- Creating an HTML Form
- Specifying the Action URL and The method to send form
- Adding Controls to an HTML Form
- Using the<input> tag
- Adding Text Area<textarea>
- Adding Selection Control
- Understanding new form elements
- The <datalist> element

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- The <keygen>Element
- Grouping the controls of HTML Form
- Specifying Label for a control

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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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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Computing & IT

Bachelor of Science in Information Technology (Bsc.IT)
Computer fundamentals and emerging technology

Semester 1

CODE:- 14360103

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 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

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Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Introducing Today's Technologies: Computers, Devices, and the Web** Today's Technology • Computers • Mobile and Game Devices • Data and Information • The Web • Digital Security and Privacy • Programs and Apps • Operating Systems • Applications • Communications and Networks • Wired and Wireless Communications • Networks • Computers and Mobile Devices • Mobile Computers and Desktops • Servers • Supercomputers • Cloud Computing • Ports and Connections	8
2	**Processors, Memory, Adapters and Buses** **Inside the case :** • Motherboard • Processors • Memory • Adapters • Buses **Digital Storage** • Storage • Hard Drives • Portable Flash Memory Storage	6
3	**Input and Output Devices** **Input Devices** o Keyboards o Pointing Device	6

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	○ Touch Screens o ○ Scanners and Reading Devices **Output Devices** • Displays • Printers • Other Output Devices	
4	**Computer Codes** • Introduction to Computer Codes • Decimal System • Binary System • Hexadecimal System • Octal System • 4-bit BCD System • 8-bit BCD System • ASCII code • 16-bit Unicode	7
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:-

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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

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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.

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Computing & IT

Bachelor of Science in Information Technology (Bsc.IT)

Problem solving methodologies and programming in c

Semester 1

CODE:-14360102

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	**Introduction to 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

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	and Flow Chart	
3	**Getting Started With 'C' Language:** • Basic Structure of C • Executing C program • Character set & C Tokens • Identifiers & Keywords • DataTypes • Constants and Variables • Type Casting • o Comments	9
4	**C Language Operators and Decision Making:** **Operators& Expression** • Types of Operators and Expression • Precedence &Associability **Console based I/O and related built-in I/O function** • printf(),scanf(),getch(),getchar(),putchar() • Concept of HeaderFile and #include,#define **Decision Making Structure** • If • If-else • Nested If-else • Switch	10
5	**Control Structure & Array:** **Loop Control Structure** • While • Do-While • For • Nested loop **Other Statements** • break,continue,goto,exit **Array** • One,Two – Dimensional Arrays • Initialization and working with Array. • Introduction to Multidimensional Arrays.	10

arning Outcomes:-

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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

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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. * * * * * * * * * * 1 2 3 4 5 2 3 4 5 3 4 5 4 5 5 AAAAA BBBB CCC DD E 1 0 1 1 0 1 0 1 0 1
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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Swarnim Start-Up and Innovation University

Department of Innovation and Entrepreneurship (IE)

Syllabus of 3 Year Degree Course

Effective from Even Semester, 2021

Course: Orientation Program in Start-up and Entrepreneurship **Semester– I**

Course Code: 12300009

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1) Introduction:

The course is directed towards students who want to initiate a new enterprise, management of family businesses and students who want to consider entrepreneurship as a career choice. The focus of this course is on seeding the entrepreneurial spirit and making them ready for opportunities exploration and idea identification by motivating and mentoring them. The students will be able to explore the risk and rewards associated with entrepreneurship.

Through case studies and guest speakers, they can understand the entrepreneurship and its process, various opportunities, entrepreneurial ecosystem, influencing factors, entrepreneurial characteristics, different personality traits, developing entrepreneurial mindset, and university support for start-ups and new enterprise.

2) The course has the following objectives:

- Increase the understanding of entrepreneurship, entrepreneur and enterprise.
- Identify the various influencing factors associated with entrepreneurship process.
- Understanding the role of the entrepreneurship ecosystem and entrepreneurship education.
- Understanding entrepreneurial personality traits and entrepreneurial skills.
- Understating the concept of creativity and innovation.
- Identify the new venture possibilities/entrepreneurial opportunities: especially in emerging economy context.
- Developing an understanding of best techniques for idea generation and opportunities exploration.

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3) Course Outcomes

Upon successful completion of this course, a student will be able to:

- Apply the basic principles of entrepreneurship
- Distinguish the concepts of the entrepreneurship ecosystem, entrepreneurship education, and various entrepreneurial opportunities.
- Understanding various individual attributes of entrepreneurial personality traits, entrepreneurial characteristics, behavioural attributes and importance of creativity and innovation.
- Develop an understanding of best techniques for idea generation and opportunities exploration.

4) Teaching Methods and Course Materials:

- The course will include Interactive lectures, solving case studies, market research, workshops, library readings, videos and group discussions.
- Some cases are identified which students will read and prepare for the discussion.
- Guest speakers from 'Startups' will share their entrepreneurial journey.

5) Individual/Group Presentation:

The student has to select any Start-up that is at growth (scaling or establishing) phase. Their presentation/Assignment will cover following topics:

- Company History and Description
- The journey of the entrepreneur
- The vision and mission of the company
- Significant steps taken by the entrepreneur
- Current stage/situation of the business
- Conflict/split in business (if any)
- Learning from the case (case Summary)

6) Cases for Class Presentation:

Sl. No.	Title of the Case	Students' Names

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7) Study Material: Compiled study material will be provided by the Faculty. Additional materials will be provided as and when the course progresses.

8) Assessment Components: The assessment of this course will be based on following parameters:

Sr. No.	Components	Weightage %
1.	Presentations/Assignment	20%
2.	Mid-term Examination	30%
3.	End-term Examination	40%
4.	Attendance and Class Participation	10%

9) Course Outlines (1st Semester) (Total 36 Hrs.)

Unit 1 Entrepreneurship and Startup: An Overview **(08 Hrs.)**

Introduction to Entrepreneurship: Meaning, Role of Entrepreneur, Entrepreneurial Process: different approaches, Motivation for becoming an Entrepreneur, Importance of Entrepreneurship, Functions of an Entrepreneur, Types of Entrepreneur, Issues & Problems in Entrepreneurial Practices.

Unit 2 Entrepreneurial Characteristics and Personality Traits **(05 Hrs.)**

Characteristics of Entrepreneurship: Innovator, Risk taker, Curious, Imaginative, Persistent, Goal setting, Hardworking, Managerial skills, Research Skills, Soft skills and Innovator.

Unit 3 Types of Startup Firms and Registration Process **(12 Hrs.)**

Introduction to Startup, Origin of Startup Ecosystem, Types of Startup Firms, Definition of Startup India, Startup India Action Plan: Proposed Schemes and Incentives, Startup India Network, Schemes and Policies: Central and State Government, Registration Process, Prospects & Challenges in Startup India.

Unit 4 Creativity and Innovation for Startup **(05 Hrs.)**

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Introduction to Innovation, Types of Innovations, Sources of Innovation, Innovation variables, Innovative Practices, Role of creativity in innovation.

Unit 5 Identifying and analyzing Business Opportunities **(06 Hrs.)**

Understanding business and environment, Opportunity identification: Business opportunities based on existing industries, Demand/market driven opportunities. Sources of information for opportunity.

10) Reference Material (1st Semester)

Text Books:

a) S.S. Khanka, Gupta. C.B. (2017). Entrepreneurship & Small Business Management, Sultan Chand and Sons, Since 1950.

b) Sami Uddin (1989). Entrepreneurship Development in India, Delhi, Mittal Publications.

c) Desai, V. (2011). Dynamics of Entrepreneurial Development Management: Planning for future sustainable growth. (6th edition). Himalaya Publishing House.

Reference Books:

a) Dr. Bhatia.R.C., (2020). Entrepreneurship: Business and Management, Sultan Chand and Sons.

b) Bruce R. Barringer, R Duane Ireland(2018). Entrepreneurship: Successfully Launching New Ventures (6th edition). Pearson Education Publishing.

c).Janakiram. B., Rizwana. M. (2011). Entrepreneurship development: Text and cases. Excel Books.

d) Khanna. S.S., (2011), Entrepreneurial Development: Text & Cases, Excel Books.

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Journals:

1. Journal of Entrepreneurship
2. Journal of Small Business Management
3. Journal of Entrepreneurship & Management
4. AMC Indian Journal of Entrepreneurship

Websites:

1. https://www.startupindia.gov.in

(Department for Promotion of Industry and Internal Trade, Ministry of Commerce and Industry, Government of India)

2. http://www.startupgujarat.in/

(Startup Cell Gujarat, Industries Commissionerate, Government of Gujarat)

3. https://www.entrepreneur.com/

4. https://www.econlib.org

5. https://www.oberlo.in/

11) Instructions:

Assignment- Business opportunities identification and Idea generation for Start-Up related to any industry/sector.

Individual assignment submission is must for every student.

OR

Presentation- Case Study solution on any entrepreneurial venture/ Interview of Successful Entrepreneurs/Field Visit of any Enterprise- Students have to solve a case study allotted by the faculty and present it in front of the class with possible alternatives/solutions of their own OR Interview of Successful Entrepreneurs should be conducted by the students by covering following aspects: Background of the entrepreneur, education and qualification, source of getting the business idea, his enterprise journey, Success mantras etc. OR Visit of any Enterprise firm and interaction with the owner of the business firm and prepare a field report on parameters like: type of business, scale of business, product/service dealing in, target customer, problems faced and measures to solve the faced challenges.

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Computing & IT

Bachelor of Science in Information Technology (Bsc.IT)

Web Programming
Semester 2
CODE:-14360202

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>	

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- <hgroup>
- <mark>
- <meter>
- <nav>
- <progress>
- <ruby>
- <rt>
- <rp>
- <section>
- <time>
- Media Element
- <audio>
- <video>
- <source>
- <embed>
- Canvas Element
- Form Elements
- <detailist>
- <keygen>
- <output>
- The Input type attribute values
- tel, search, url, email, datetime, date, month, week, time,
- datetime-local, number, range, colo

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2	***Style sheets :*** • Need for CSS • introduction to CSS • basic syntax and structure using CSS • background images • colors and properties • manipulating texts using fonts, borders and boxes • margins • padding lists • positioning using CSS,	
3	**Introduction to JavaScript** • JavaScript Introduction • Understanding JavaScript • About Dynamic HTML • Selecting an development environment forjavaScript • HTML and JavaScript • Advanced JavaScript • Element of JavaScript • Variables • Operators • Flow control statement • Arrays • Functions • Event handling • Browser and JavaScript • Web page and JavaScript • Frames and JavaScript • Frames and Validation in JavaScript • Frames and JavaScript • Validating User forms	
4	**Introduction to XML and XML Document Type Definition** • XML • Introduction • XML versus HTML • XML terminologies • XML standards(XML,XML namespace, • DTD,CSS,XSL,XML schema, Xquery, Xlink,Xpointer,Xpath) • XHTML • XML Documentation • Introduction to DTD • Document type declaration • Element type declaration • Attribute declaration	

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	• 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 computing & IT

Bachelor of Science in Information Technology (Bsc.IT)

DATA STRUCTURE USING C LANGUAGE

Semester 2

CODE:-14360201

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

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	• 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

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of computing & IT

Bachelor of Science in Information Technology (Bsc.IT)

MATHAMATICAL AND STATASTICALS FOUNDATION OF COMPUTER SCIENCE

Semester 2

CODE:-14360204

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: -The Engineering Maths program at SSIU provides Engineering Maths majors with a quality undergraduate education in liberal studies, mathematics, science, and engineering 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:-Vector Algebra, Types of Vectors, Addition of Vectors, Multiplication of a Vector by a Scalar, Scalar and Vector Products of Vectors, Three Dimensional Geometry, Equation of a Line in Space, Angle between Two Lines, Shortest Distance between Two Lines, Plane, Co planarity of Two Lines, Angle between Two Planes, Distance of a Point from a Plane, Angle between a Line and a Plane.Integrals, Integration as an Inverse Process of Differentiation, Integrals of some Particular Functions, Integration by Partial Fractions, Integration by Parts, Definite Integral, Fundamental Theorem of Calculus, Evaluation of Definite Integrals by Substitution, Properties of Definite Integrals, Area under Simple Curves and Area between Two Curves by integration.

Course outline:-

Sr.	Course Contents	Number of Hours

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No.		
1	**Graph Theory** • Introduction • Definition of graphs and its terminology • Simple graph, Multi graph • Degree of a vertex • Types of a graphs • Sub graph and Isomorphic Graphs • Path • Matrix representation of graphs • Tree and basic terminology • Binary and complete binary tree	12
2	**Partial Derivatives** • Partial Derivatives • Chain rule • Implicit Function • Tangent plane, Normal line • Linear approximation • Total differential • Lagrange multipliers • Jacobian	10
3	**Integration** • Introduction to indefinite integral • Definition of Integration & Methods of Integration • Substitution Methods • Some Standard Formulae (without proof) and example based on the standard forms • Introduction to definite integration and simple examples on it	7
4	**Application of integration** • Volume by slicing • Volume of solids of revolution by disk method • Volume by cylindrical shell	6
5	**Eigen Values and Eigen Vectors** • Eigen value and Eigen vectors • Cayley-Hamilton Theorem • Diagonalization • Quadratic forms • Canonical forms	7

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of computing & IT

Bachelor of Science in Information Technology (Bsc.IT)

COMPUTER ORGANIZATION AND ARCHITECTURE

Semester 2

CODE:-14360203

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:

Understand how logic circuits and boolean algebra forms as the basics of digital computer.

Demonstrate the building up of Sequential and Combinational logic from basic gates

Prerequisites:

General Knowledge of Computer

Unit. No.	Topic Contents	Number of Hours
1	**Digital Logic Circuits** Logic Gatesl AND,OR,NOT NAND,NOR XOR, Exclusive NOR gates Boolean Algebra Boolean algebra? Boolean variable and Boolean function (Analog and Digital Signals) Truth table Postulates Theorem related to postulates Simplified Boolean function using postulates and draw logical diagram of	12

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	simplified function Simplified Boolean function using Karnaugh map method with DON'T CARE condition sequential And Combinational Circuits Clock pulses Combinational circuit, sequential circuit and adder Flip Flops SR, Clocked SR, D, JK, JK- Master Slave, T Universal Gate	
2	**Digital Component** Integrated Circuits Decoders (2 X 4, 3 X 8) Encoders (Octal to Binary-8X 3) Multiplexer (4 X 1) Demultiplexer (1 X 4) Register Block diagram of register Parallel register and shift register	10

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		▪ Asynchronous 4-bits Binary Counter
3	**Data Representation**	• Multiplication and division of two binary numbers • Floating point representation • Fixed point representation • Error Detection code – (Parity Bit)
4	**Central Processing Unit**	• Introduction Of CPU • Major component of CPU • General Register Organization ▪ control word ▪ Accumulator Register • **Stack Organization** ▪ Register stack ▪ Memory stack ▪ Polish notation and reverse polish notation • **Arithmetic And Logic Unit** ▪ Block diagram of ALU • **Interrupts**
5	**Input-Output Organization**	• Memory buses • Block diagram and function • Data Bus, Address Bus and Control lines • Input Output Buses • Concept of input output interface • Input Out Processor (IOP) • Direct Memory Access • DMA controller

Reference Books:

1. Computer System Architecture – By Morris Mano (PHI).
2. Digital Logic And Computer Design – By Morris Mano.
3. Digital Computer Electronics – By Malvino And Leach.

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Course: Basic Program in Entrepreneurship **Semester –II**

Course Code: 12300010

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1) Introduction:

The course is directed towards students who want to initiate a new enterprise, management of family businesses and students who want to consider entrepreneurship as a career choice. The focus of this course is on seeding the entrepreneurial spirit and makes them ready for idea identification, opportunities exploration, feasibility analysis, and provide them mentoring and ecosystem support.

Through case studies, market survey and guest speakers, the students can understand the entrepreneurship and its process, various opportunities, entrepreneurial ecosystem, various influencing factors, developing entrepreneurial mindset, and university support for start-ups and new enterprise.

2) The course has the following objectives:

- Identifying best techniques for idea generation and opportunities exploration from start-up perspective.
- Understanding the importance of market research and project feasibility analysis for start-ups.
- Designing a business model as a framework for finding a systematic way to unlock long-term value for an organization.
- Uncovering several types of feasibility analysis.

3) Course Outcomes

Upon successful completion of this course, a student will be able to:

- Develop an understanding of best techniques for idea generation, opportunities exploration, and market research.

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- Check technical, market, financial and other types of Feasibility of their business idea.
- Develop business model to describe the rationale of how an organization creates, delivers, and captures value
- Conduct the customer's survey to know the need of their business idea.

4) Teaching Methods and Course Materials:

- The course will include Interactive lectures, solving case studies, market research, workshops, library readings, videos and group discussions.
- Some cases are identified which students will read and prepare for the discussion.
- Guest speakers from 'Startups' will share their entrepreneurial journey.

5) Individual/Group Presentation:

The student has to select any Start-up that is at growth (scaling or establishing) phase. Their Presentation/Assignment will cover following topics:

- Company History and Description
- The journey of the entrepreneur
- The vision and mission of the company
- Significant steps taken by the entrepreneur
- Current stage/situation of the business
- Conflict/split in business (if any)
- Learning from the case (case Summary)

6) Cases for Class Presentation:

Sl. No.	Title of the Case	Students' Names

7) Study Material: Compiled study material will be provided by the Faculty. Additional materials will be provided as and when the course progresses.

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8) Assessment Components:

Sr. No.	Components	Weightage %
1.	Presentations/Assignment	20%
2.	Mid-term Examination	30%
3.	End-term Examination	40%
4.	Attendance and Class Participation	10%

9). Course Outlines (2nd Semester) (Total 36 Hrs.)

Unit 1 Developing Successful Business Idea **(08 Hrs.)**

Business idea: Overview, Idea Generation techniques: SCAMPER, Focus groups, Reverse Brainstorming, Brain Writing, Problem Inventory analysis, Creative problem solving, Gordon Method, Checklist Method, Free Association, Collective notebook Method, Attribute Listing. Selection of business idea.

Unit 2 Developing Effective Business Model **(10 Hrs.)**

Introduction to business model, Types of business model, Developing and testing a business model, Business modeling process, Business model canvas, Reinventing business model.

Unit 3 Feasibility Analysis **(06 Hrs.)**

Concept of feasibility analysis, types of feasibility analysis: product/service feasibility, industry/target market feasibility, organizational feasibility, financial feasibility, entrepreneur feasibility, role of feasibility analysis in developing business idea.

Unit 4 Market Research **(12 Hrs.)**

Market Research: Introduction, Need of market research, Market research process, Data collection sources and methods, Questionnaire designing, Sampling, Data analysis and interpretation, Report writing.

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10 (II). Reference Material (2nd Semester)

Text Books:

a) Naresh K. Malhotra and Satyabhusan Das, (2019). Marketing Research: An Applied Orientation (Seventh Edition), Pearson Education.

b) Kothari C.R., Garg Gaurav, (2019). Research Methodology: Methods and Techniques (Fourth edition). New Age International Publishers.

c) Krishnaswamy. O.R., Ranganatham, M. (2016). Research methodology in Social sciences,, Himalaya Publication.

d) Arya Kumar (2012). Entrepreneurship: Crating and Leading an Entrepreneurial Organization. Pearson Education.

e) Shajahan, S. (2000). Research Methods for Management. Jaico Publishing House.

References:

Magazine:

1. Enterprise & Industry Magazine
2. Black Enterprise Magazine

Journals:

1. International Small Business Journal
2. International Journal of Management and Enterprise Development, 2015

Websites:

1. https://www.entrepreneur.com/
2. https://www.businessmodelsinc.com/
3. https://www.imsmarketing.ie/
4. https://www.designorate.com/a-guide-to-the-scamper-technique-for-creative-thinking/

11) Instructions:

Assignment- Conducting Market Survey to check the need of product idea in market.

Individual assignment submission is must for every student.

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OR

Presentation- Case Study solution on any entrepreneurial venture/ Interview of Successful Entrepreneurs/Field Visit of any Enterprise- Students have to solve a case study allotted by the faculty and present it in front of the class with possible alternatives/solutions of their own OR Interview of Successful Entrepreneurs should be conducted by the students by covering following aspects: Background of the entrepreneur, education and qualification, source of getting the business idea, his enterprise journey, Success mantras etc. OR Visit of any Enterprise firm and interaction with the owner of the business firm and prepare a field report on parameters like: type of business, scale of business, product/service dealing in, target customer, problems faced and measures to solve the faced challenges.

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Computing & IT

Bachelor of Science in Information Technology (Bsc.IT)

Subject– SAD, Software Quality Assurance and Testing

Semester - 3

CODE:

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	0	2	4	4	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:-

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No.	Topics	Details	Marks weight In %	Min Lect.
1.	**System Analysis & Design, Software Engineering & Concept of Quality Assurance**	• Definitions: System, Subsystem, Business System, Information System (Definitions only) • Systems Analyst (Role: Information Analyst, Systems Designer & Programmer Analyst) • SDLC • Fact – finding techniques (Interview, Questionnaire, Record review and observation) • Tools for Documenting Procedures and Decisions Decision Trees and Decision Tables • Data Flow analysis Tool DFD (context and zero level) and Data Dictionary • Software Engineering (Brief introduction) • Introduction to QA • Quality Control (QC) • Difference between QA and Q • Quality Assurance activities	20	15

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2	**Basics of Software Testing, Types of Software Testing, Verification and Validation**	• Introduction to software Testing
		• Software faults and failures
		  • Bug/Error/Defect/Faults/Failures
		  • Testing Artifacts
		  • Test case
		  • Test Script
		  • Test Plan
		  • Test Harness
		  • Test Suite
		• Static Testing
		  • Informal Review
		  • Walthrough
		  • Technical Review
		  • Inspection
		• Dynamic Testing
		• Test levels
		  • Unit Testing
		  • Integration Testing
		  • System Testing
		  • Acceptance Testing
		Techniques of software Testing
		• Black Box Testing
		  • Equivalence Partitioning
		  • Boundary Data Analysis
		  • Decision Table Testing
		  • State Transition Testing
		• White Box Testing
		  • Statement testing and coverage
		  • Decision testing and coverage
		• Grey Box Testing
		• Nonfunctional Testing
		  • Performance Testing
		  • Stress Testing
		  • Load Testing
		  • Usability Testing
		  • Security Testing
			20	**16**

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3	**Software Development Life Cycle Models and Automated Testing**	• Waterfall Model
		• Iterative Model
		• V-Model
		• Spiral Model
		• Big Bang Model
		• Prototyping Model
		• Introduction to Automated Testing
		  • Concept of Freeware, Shareware, licensed tools
		• Theory and Practical Case-Study of Testing Tools
		  • Win runner
		  • Load runner
		  • QTP
		  • Rational Suite
			20	10

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4	**Project Economics , Project scheduling and Tracking**	• Concepts of Project Management • Project Costing based on metrics • Empirical Project Estimation Techniques. • Decomposition Techniques. • Algorithmic methods. • Automated Estimation Tools • Concepts of project scheduling and tracking • Effort estimation techniques • Task network and scheduling methods • Timeline chart • Pert Chart • Monitoring and control progress • Graphical Reporting Tools	20	11

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5	**CAD Project Management Tool UML**	• MS – VISIO for designing & Documentation • MS – Project for controlling and Project Management • UML designing and skill based tools Overview of ♦ Class Diagram ♦ Use Case Diagram ♦ Activity Diagram	20	8
		TOTAL	**100**	**60**

Reference Book

1. Analysis & Design of Information System - James A. Senn.
2. Pankaj Jalote, "Software Engineering – A Precise Approach", Wiley India
3. UML Distilled by Martin Fowler, Pearson Edition, 3rd Edition
4. Fundamentals of Software Engineering – RajibMall (PHP)
5. Software Engineering – A Practitioner's Approach – Pressman
6. UML – A Beginner's Guide –Jasson Roff – TMH
7. Roger Pressman , "Software Engineering"
8. http://en.wikipedia.org/wiki/Software_testing
9. http://www.onestoptesting.com/

http://www.opensourcetesting.org/functional.php

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Computing & IT

Bachelor of Science in Information Technology (Bsc.IT)

Subject – C++ and Object Oriented Programming

Semester - 3

CODE:

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	2	4	5	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.

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Course outline

No	Topics	Details	Marks weight in %	App. Lect.
1	**Principles of object oriented programming, Tokens, expressions and control statements**	• Procedure – oriented programming • Object oriented programming paradigm • Basic concepts of object oriented Programming • Benefits of object oriented programming • Application of object oriented programming • What is c++? • Application of c++ • Input/output operators • Structure of c++ program • Introduction of namespace • Tokens : keywords, identifiers, basic data types, user- defined types, derived data types, symbolic constants, type compatibility, declaration of variables, dynamic initialization of variables, reference variables • Operators in C++: scope resolution operator, member referencing operator, memory management operator, manipulators,type cast operator. • Expression : Expression and their types, special assignment operator, implicit conversions, operator precedence • Control structures ♦ Conditional control structure :- simple if, if…else , nested if else, switch etc. ♦ Looping control structure:- for, while , do…while	20	11

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2	**Functions in C++ Classes and Objects**	• The main function • Function prototype • Call by reference • Return by reference • Inline function • Default arguments • Const arguments • Functions overloading • Adding C Functions turbo C++ • C structures revisited • Specifying a class • Local Classes • Nested Clases • Defining member functions, nesting of Member functions, private member function, making outside function inline • Arrays within a class • Memory allocation for objects • Static data member • Static member functions • Arrays of objects • Objects as function arguments • Friendly functions • Returning objects • Const member function • Pointer to members	20	13

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3	**Constructor and Destructor, Operator overloading and type conversion**	• Characteristics of constructor • Explicit constructor • Parameterized constructor • Multiple constructor in a class • Constructor with default argument • Copy constructor • Dynamic initialization of objects • Constructing two dimensional array • Dynamic constructor • MIL , Advantage of MIL • Destructors • Concept of operator overloading • Over loading unary and binary operators • Overloading of operators using friend Function • Manipulation of string using operators • Rules for operator overloading • Type conversions. • Comparison of different method of conversion	20	11

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4	**Inheritance Pointer, Virtual functions, and Polymorphism, RTTI**	• Defining derived classes • Types of inheritance (Single, Multiple, Multi-level, Hierarchical, Hybrid) • Virtual base class & Abstract class • Constructors in derived class • Application of Constructor and Destructor in inheritance • Containership, Inheritance V/s Containership • Pointer to Object • Pointer to derived class • this pointer • Rules for virtual function • Virtual function and pure virtual function. • Default argument to virtual function • Run Time Type Identification	20	10

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5	**Console I/O operations, Working with Files, Exception handling, Introduction to Template STL**	• C++ streams • C++ stream classes • Unformatted and formatted I/O operations • Use of manipulators. • File stream classes • Opening and closing a file • Error handling • File modes • File pointers • Sequential I/O operations • Updating a file (Random access) • Command line arguments • Overview of Exception Handling • Need for Excception Handling • various components of exception handling • Overview of Exception Handling • Introduction to templates • Class templates • Function templates • Member function templates • Overloading of template function • Non-type Template argument • Primary and Partial Specialization • Introduction to STL • Overview of iterators, containers	20	15
		TOTAL	100	60

Reference Books:

1. Complete Reference C++ by Herbert Schildt McGraw Hill Publications
2. Computer Science- A Structured approach using C++ by Forouzan, Gilburg,THOMSON
3. Object Oriented Programming in C++ - E.Balagurusamy, BPB
4. Object Oriented programming in C++ by Robert Lafore, Pearson Education
5. Mastering C++ - Venugopal
6. The C++ Programming Language by Bjarne Stroustrup, Pearson Education
7. Object Oriented Programmin in C++ - Robaret Laphore
8. Let us C++ - Yashvant Kanitkar, BPB

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Computing & IT

Bachelor of Science in Information Technology (Bsc.IT)

Subject Name: RDBMS Using Oracle

Semester - 3

CODE:

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	-	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:-

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RDBMS Using Oracle				
No.	**Topics**	**Details**	**Marks weight In %**	**Min Lect.**
1	**DBMS Overview, SQL, SQL*Plus**	• Introduction to DBMS • Introduction to RDBMS • Dr.E.F.Codd Rules • Importance of E.R.Diagram in Relational DBMS. • Normalization • Introduction to SQL • SQL Commands and Datatypes • Introduction to SQL*Plus • SQL*Plus formatting commands • Operator and Expression • SQL v/s SQL*Plus	20	10
2	**Managing Tables and Data, Data Control And Transaction Control Command**	• Creating , Altering & Dropping tables • Data Manipulation Command like • Insert, update, delete • Different type of constraints and applying of constration • SELECT statement with WHERE, GROUP BY and HAVING,ROLLUP AND CUBE, ORDER BY, DISTINCT, Special operator like IN, ANY, ALL, BETWEEN, EXISTS, LIKE • Join (Inner join ,outer join, self join) • subquery, minus, intersect, union • Built in functions • Numeric Function abs, ceil, cos, decode, exp, floor, greatest, least, log, log10, max, min, rem, round , sign, sin, sinh, sqrt, tan, trunc • Character Function chr, concat, initcap, lower, lpad, ltrim, replace, rpad, rtrim, soundex, substr, treat, trim, upper • Date Function add_months, last_day, months_between, next_day, round (date), sysdate, systimestamp, trunc (date), to_date, to_char • Aggregate function Sum, Count, AVG, MAX, MIN • General Functions COALESCE, CASE WHEN, DECODE • Creating user & role	20	15

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		• Grant, Revoke command • What is transaction? • Starting and Ending of Transaction Commit, Rollback, SavePoint		
3	**Other ORACLE Database Objects, Concurrency control using lock**	• View • Sequence • Synonyms, • Database Links • Index o B*Tree Indexes o Bitmap Indexes o Function-Based Indexes o Application Domain Indexes • Cluster, • Snapshot • What Are Locks? • Locking Issues o Lost Updates o Pessimistic Locking o Optimistic Locking o Blocking o Deadlocks o Lock Escalation • Lock Types o DML Locks o DDL Locks o Latches o Manual Locking and User-Defined Locks	20	10
4	**Introduction to PL/SQL, Advanced PL/SQL**	• SQL v/s PL/SQL • PL/SQL Block Structure • Language construct of PL/SQL • (Variables, Basic and Composite Data type, Conditions looping etc.) • %TYPE and %ROWTYPE • Using Cursor(Implicit, Explicit) • Exception Handling • Creating and Using Procedure, Functions, • Package, • Triggers • Creating Objects, • Object in Database-Table • PL/SQL Tables, Nested Tables, Varrays	20	15

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5	**Oracle Database Structure and Storage Database, Resource Management and Task Scheduling**	• Instance Architecture o Database Processes o Memory Structure. o Data files • Creating & Altering Database • Opening & shutdown Database • Initialization Parameter • Control Files, Redo Logs files • Tablespace(Create, Alter, Drop) • Rollback Segment (Create, Alter) (System & Transaction RBS) • Oracle Blocks • Import • Export • SQL*Loader • Managing Automated Database Maintenance Tasks • Managing Resources with Oracle Database Resource Manager • Oracle Scheduler Concepts • Scheduling Jobs with Oracle Scheduler • Administering Oracle Scheduler	20	10
	Total		100	60

Reference Books:

1. Oracle Database 12c The Complete Reference (Oracle Press) by Bob Bryla , Kevin Loney – Oracle Press
2. Oracle Database 12c SQL – Jason Price – Oracle Press
3. Oracle Database 12c PL/SQL Programming by McLaughlin – Oracle Press
4. SQL,PL/SQL The programming - Lang.Of Oracle Ivan Bayross - BPB

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Computing & IT

Bachelor of Science in Information Technology (Bsc.IT)

Subject – Web Development Using Joomla CMS

Semester - 3

CODE:

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	2	5	5	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:-

Module	Contents	No ofSessions	Weightage
1	**Introduction to Joomla** • What is Joomla? • Overview of CMS and its advantages • Joomla's features and architecture • Joomla vs. other CMS platforms • Installing and Configuring Joomla **System requirements and hosting**	15	33%

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	considerations • Downloading and installing Joomla • Configuration options and setup process • Exploring the Joomla administration interface • Managing Content in Joomla		
2	**Creating and organizing categories** • Adding and editing articles • Formatting text and adding media • Using menus and navigation • Managing modules and plugins • Joomla Templates and Layouts **Introduction to Joomla templates** • Customizing templates and layout structure • Using template overrides • Responsive design and mobile optimization • Extending Joomla Functionality	**7**	**16%**
3	**Overview of extensions (modules, plugins, components)** • Installing and configuring extensions • Exploring popular Joomla extensions • Creating custom modules and plugins • User Management and Access Control • Managing user accounts and groups • User registration and login processes • Implementing access control levels and permissions **Multimedia Integration** • Adding images, videos, and audio • Working with media managers • Embedding multimedia from external sources	**8**	**18%**
4	**Search Engine Optimization (SEO) and**	**15**	**33%**

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	Performance Optimization • SEO best practices for Joomla • Optimizing URLs and metadata • Caching and performance optimization techniques **Advanced Topics** • E-commerce integration with Joomla • Multilingual websites using Joomla • Social media integration • Backup and restore procedures **Joomla Security and Maintenance** • Securing Joomla installations • Regular updates and patching • Backup and disaster recovery strategies • Troubleshooting common issues		

BasicTextBooks:

Sr. No.	Author/s	Nameof the Book	Publisher	Edition
1	Eric Tiggeler	Joomla! 3 Beginner's Guide	Packt Publishing	1st Edition (2013)

ReferenceBooks:

Sr. No.	Author/s	Name of theBook	Publisher	Edition
1	Stephen Burge	Joomla! 3 Explained: Your Step-by-Step Guide	Addison-Wesley Professional	2nd Edition (2014)
2	Mark Dexter and Louis Landry	Joomla! Programming	Pearson	1st Edition (2012)
3	Simon Kloostra	Joomla! 3 SEO and Performance	Packt Publishing	1st Edition (2013)

❖ **ListofJournals/Periodicals/Magazines/Newspapers:**

Thestudents willhaveto referto pastissues ofthefollowingjournals inorder togetrelevanttopic/information pertainingto thesubject.

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1) Joomla Community Magazine:About: The official online publication of the Joomla project. It covers a wide range of topics related to Joomla, including tutorials, extension reviews, community news, and developer insights.
   Website: Joomla Community Magazine
2) JoomlaShineBlog:About: JoomlaShine is a popular Joomla template and extension provider. Their blog covers Joomla tutorials, templates, extensions, and web development tips.
   Website: JoomlaShine Blog
3) OSTrainingBlog:About: OSTraining offers Joomla training and tutorials. Their blog provides valuable Joomla and web development tutorials, tips, and news.
   Website: OSTraining Blog
4) JoomlArtBlog:About: JoomlArt is another well-known Joomla template and extension provider. Their blog covers Joomla templates, extensions, and web design trends.
   Website: JoomlArt Blog
5) SitePoint:About: SitePoint is a popular online resource for web developers and designers. While it covers a broad range of web-related topics, it often includes articles and tutorials related to Joomla.
   Website: SitePoint
6) Smashing Magazine:About: Smashing Magazine is a comprehensive resource for web professionals. It covers web design and development topics, and occasionally includes articles about Joomla.
   Website: Smashing Magazine
7) CMS Critic:About: CMS Critic is a news and review site that covers various content management systems, including Joomla. It provides reviews, comparisons, and news related to Joomla and other CMS platforms.
   Website: CMS Critic
8) Joomla Reddit Community:About: The Joomla subreddit is a community-driven forum where Joomla enthusiasts discuss news, share tips, and seek assistance.
   Website: Joomla Subreddit
9) Joomla Official Forum:About: The official Joomla forum is a place for Joomla users and developers to seek help, share knowledge, and discuss various Joomla-related topics.
   Website: Joomla Official Forum

WEB RESOURCES:

1) Joomla Official Website (https://www.joomla.org/): The official Joomla website provides documentation, blogs, and news about Joomla and its community.
2) Joomla Community Magazine (https://magazine.joomla.org/): The Joomla Community Magazine provides articles, tutorials, and news about Joomla and related topics. It covers topics related to web development, design, and Joomla extensions.
3) Joomla Forum (https://forum.joomla.org/): The official Joomla forum is a place where you can find discussions, questions, and answers related to Joomla and its extensions.
4) Joomla Documentation (https://docs.joomla.org/): The official Joomla documentation is a valuable resource for learning about Joomla, its features, and how to use it.
5) Joomla Extensions Directory (JED) (https://extensions.joomla.org/): JED is the official directory for Joomla extensions. You can find extensions, templates, and plugins for various purposes.

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6) Joomla Stack Exchange (https://joomla.stackexchange.com/): This is a Q&A community where Joomla developers and users can ask and answer questions related to Joomla development and usage.
7) Joomlal Developers Community (https://developer.joomla.org/): This is a resource for Joomla developers, providing information on coding, development, and best practices.
8) JoomlaShack Blog (https://www.joomlashack.com/blog/): JoomlaShack is a popular Joomla template and extension provider. Their blog often features articles on Joomla-related topics.
9) JoomlaBeginner Blog (https://www.joomlabeginner.com/blog/): JoomlaBeginner is a resource for Joomla beginners and often publishes articles and tutorials on Joomla usage.

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Practical List:- (Credit- 01)

Sr. No.	Practical's	No of Sessions
1	**Installation:** • Download Joomla from the official website. • Install Joomla on your web server using an FTP client or a control panel like cPanel. • Follow the installation wizard's steps, including configuring the database.	1
2	**Accessing the Admin Panel:** • Log in to the Joomla administrator panel using the URL "yoursite.com/administrator". • Use the admin credentials you set during installation.	1
3	**Creating Content:** • Create articles, categories, and tags for organizing content. • Add images, videos, and other media to your articles. • Use the WYSIWYG editor for formatting content.	1
4	**Managing Menus:** • Create menus to structure your website's navigation. • Add menu items that link to articles, categories, or external URLs. • Organize menu items into dropdowns or submenus.	1
5	**Installing Extensions:** • Browse the Joomla Extensions Directory (JED) for extensions like templates, modules, and plugins. • Install extensions via the Joomla admin panel. • Configure and customize extensions to enhance your website's functionality.	1
6	**User Management:** • Create user groups and assign access levels. • Add and manage user accounts with different roles and permissions. • Implement user registration and login systems.	2

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7	**Template Customization:** • Choose and install a template for your site. • Customize the template's appearance, including colors, fonts, and layouts. • Create template overrides for advanced customization.	1
8	**SEO Optimization:** • Optimize your website for search engines by configuring SEO-friendly URLs. • Use meta tags and descriptions for better search engine visibility. • Install SEO extensions for advanced SEO management.	1
9	**Backing Up Your Site:** • Regularly back up your Joomla site and database. • Utilize backup extensions or your hosting control panel for automated backups.	2
10	**Security Measures:** • Keep Joomla and its extensions up to date to patch security vulnerabilities. • Implement strong passwords and user authentication. • Install security extensions to enhance protection.	1

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Course: Intellectual Property Rights **Semester –III**

Course Code: 12300011

1) Introduction:

The course is directed towards students who want to initiate a new enterprise, management of family businesses and students who want to consider entrepreneurship as a career choice. This course will introduce the concept of intellectual property and explain how it creates value. The students will learn about the major forms of intellectual property protection- copyright, trademarks, and patents, as well as alternative forms of intellectual property protection.

Through case studies, library readings and guest speakers, the course is designed to educate the IPR enthusiasts and inventors regarding the basics of IPR and enable them to clearly differentiate between the different types of IPRs.

2) The course has the following objectives:

- To introduce fundamental aspects of Intellectual property Rights to students who are going to play a major role in development and management of innovative projects in industries.
- To disseminate knowledge on patents, patent regime in India and registration aspects.
- To disseminate knowledge on copyrights and its related rights and registration aspects.
- To disseminate knowledge on trademarks and registration aspects.
- To disseminate knowledge on Design, Geographical Indication (GI), Plant Variety and Layout Design Protection and their registration aspects.
- To make them aware about current trends in IPR and Govt. steps in fostering IPR.

3) Course Outcomes

Upon successful completion of this course, a student will be able to:

- The students once they complete their academic projects, shall get an adequate knowledge on patent and copyright for their innovative research works.

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- During their research career, information in patent documents provide useful insight on novelty of their idea from state-of-the art search. This provide further way for developing their idea or innovations.
- Pave the way for the students to catch up Intellectual Property(IP) as an career option as a R&D IP Counsel, Government Jobs as Patent Examiner, Private Jobs in any corporate, Patent agent and Trademark agent and as an Entrepreneur.

4) Teaching Methods and Course Materials:

- The course will include Interactive lectures, solving case studies, workshops, library readings, videos and group discussions.
- Some cases are identified which students will read and prepare for the discussion.
- Guest speakers from 'Startups' will share their entrepreneurial journey.

5) Individual/Group Presentation:

The student has to select any Start-up that is at growth (scaling or establishing) phase. Their Presentation/Assignment will cover following topics:

- Company History and Description
- The journey of the entrepreneur
- The vision and mission of the company
- Significant steps taken by the entrepreneur
- Current stage/situation of the business
- Conflict/split in business (if any)
- Learning from the case (case Summary)

6) Cases for Class Presentation:

Sl. No.	Title of the Case	Students' Names

7) Study Material: Compiled study material will be provided by the Faculty. Additional materials will be provided as and when the course progresses.

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8) Assessment Components:

Sr. No.	Components	Weightage %
1.	Presentations/Assignment	20%
2.	Mid-term Examination	30%
3.	End-term Examination	40%
4.	Attendance and Class Participation	10%

9). Course Outlines (3rd Semester) (Total 36 Hrs.) [Govt. of Gujarat]

Unit 1 Introduction: Knowledge creation, Innovation and Intellectual Property Rights, Concept of Intellectual Property, Historical view of Intellectual Property system in India and International Scenario, Evolution of Intellectual Property Laws in India, Legal basis of Intellectual Property Protection, Need for Protecting Intellectual Property, Theories on concept of property - Public Vs. Private, Tangible Vs. Intangible, Industrial Vs. Intellectual, Major IP Laws in India, Types of IPR – Patents – Copyright –Trademark – Industrial Designs – Trade Secrets – Geographical Indications

Unit 2 Patents: Concept of Patent, Criteria of Patentability, Inventions NOT patentable, Process of Obtaining a Patent, Duration of Patents, Rights of Patentee, Limitation of rights, Infringement and Enforcement

Unit 3 Copyrights: Meaning of Copyright, Copyright Vs. Moral rights, Copyright eligibility, Term of Copyright, Registration of Copyright, Infringement and Remedies

Unit 4 Trademark: Meaning of Trademark, Criteria for trademark, Protection of Well-known marks, Concept of distinctiveness, Procedure for Trademark Registration, Term of protection, Infringement and Remedies

Unit 5 Industrial Designs: Meaning of Industrial Designs, Subject matter of Design, Exclusion of Designs, Novelty and Originality, Rights in Industrial Designs: Nature, Acquisition and duration of rights, Infringement and Enforcement Mechanisms

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Unit 6 Semiconductor Integrated Circuits Layout Design: Concept of SICLDR, Criteria of SICLDR, Rights in SICLDR, Procedure for registration of Lay-out Design, Infringement and Enforcement Mechanisms

Unit 7 Geographical Indications: Meaning of GI, Difference between GI and Trade Marks, Concept of Authorized user, Infringement, Offences & Penalties

Unit 8 Plant Varieties Protection: Protection of Plant Varieties and Farmer's rights, GM Corps, Objectives of Plant Varieties Act, registration of Plant Varieties, Duration and effect of Registration, Infringement, Offences, Remedies

Unit 9 Trade Secrets: Meaning of Trade Secrets, Need to protect Trade secrets, Essentials and Misuse of Trade Secrets, Criteria of Protection, Procedure for registration, Infringement

Unit 10 Commercialization of IPR: Traditional IP and Evolving IP, Assignment, Licensing, Cross License, Patent Pool, Negotiations, Defensive Publications, Technical Disclosures, Patent Pooling, Patent Trolling, Brand Management, Brand and Pricing Strategies, Patent Mining, Patent Landscaping and Patent Mapping

10) Reference Material: (3rd Semester)

Text book:

1. Nithyananda, K V. (2019). Intellectual Property Rights: Protection and Management. India, IN: Cengage Learning India Private Limited.

2. Neeraj, P., & Khusdeep, D. (2014). Intellectual Property Rights. India, IN: PHI learning Private Limited.

Reference book:

1. Ahuja, V K. (2017). Law relating to Intellectual Property Rights. India, IN: Lexis Nexis.

E-resources:

1. Subramanian, N., & Sundararaman, M. (2018). Intellectual Property Rights – An Overview. Retrieved from http://www.bdu.ac.in/cells/ipr/docs/ipr-eng-ebook.pdf

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2. World Intellectual Property Organisation. (2004). WIPO Intellectual property Handbook. Retrieved from https://www.wipo.int/edocs/pubdocs/en/intproperty/489/wipo_pub_489.pdf

Reference Journal:

Journal of Intellectual Property Rights (JIPR): NISCAIR

Useful Websites:

1. Cell for IPR Promotion and Management (http://cipam.gov.in/)

2. World Intellectual Property Organisation (https://www.wipo.int/about-ip/en/)

3. Office of the Controller General of Patents, Designs & Trademarks (http://www.ipindia.nic.in/)

11) Instructions:

Assignment- Undertaking Innovative academic research project and integrating the IPR process in their research work.

Individual assignment submission is must for every student.

OR

Presentation- Case Study solution on any entrepreneurial venture/ Interview of Successful Entrepreneurs/Field Visit of any Enterprise- Students have to solve a case study allotted by the faculty and present it in front of the class with possible alternatives/solutions of their own OR Interview of Successful Entrepreneurs should be conducted by the students by covering following aspects: Background of the entrepreneur, education and qualification, source of getting the business idea, his enterprise journey, Success mantras etc. OR Visit of any Enterprise firm and interaction with the owner of the business firm and prepare a field report on parameters like: type of business, scale of business, product/service dealing in, target customer, problems faced and measures to solve the faced challenges.

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Computing & IT

Bachelor of Science in Information Technology (Bsc.IT)

Subject–Programming with JAVA

Semester - 4

CODE:

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
4	0	4	5	6	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	**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	06

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	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.	
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

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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.

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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.

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Computing & IT

Bachelor of Science in Information Technology (Bsc.IT)
Subject – Network Technology and Administration
Semester - 4
CODE:

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	0	2	4	4	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	**Basics of Network, Network Models and LAN Sharing.** Network concepts - What is network - Use of network Network model -peer - to - peer -client - server Network Services - File service, - Print service, - Comm. service, - Data base service, - Security service, - Application service Network Access Methods - csma I cd, csma I ca, - Token passing - Polling Network Topologies - Bus. Ring, Star, Mesh.Tree.HybridAdvancedoONetwork Topologies Ethernet,CDDI,FDDI Communication Methods - Unicasting -	6

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	Multicasting - Broadcasting OSI reference model with 7 layers TCP/IP network model with 4 layers File And Print Sharing in LAN. aping of network drive Disk quota Encryption	
2	**Transmission Media Multiplexing Switching Concepts, IP ADDRESSING** Transmission Media, Types of Transmission media Multiplexing & - Guided media Switching - Co - Axial Cable, Concepts, - Twisted Pair Cable, IP ADDRESSING - Crimping of Twisted pair cable - Fiber Optic Cable Unguided media - Infrared, Laser, Radio, Microwave, Bluetooth tech. Different Frequency Ranges Multiplexing &Demultiplexing Multiplexing Types -FDM. -TOM, - COM, -WDM Switching Tech. - Circuit Switching, - Message Switching, - Packet Switching What is ip address? Types of ip address ipv4 - Class structure	4
3	**Network devices, Network Protocols** CABLE NETWORK DEVICES LAYER1 DEVICES - LAN CARD, - MODEM I - DSL & ADSL - HUB(Active,Passive,Smart hub) - REPEATER LAYER2 DEVICES - SWITCH(Manageable, nonmanagable) • BRIDGE(Source route, Transactional) LAYER3 DEVICES - ROUTER - LAYER3 SWITCH -BROUTER -GATEWAY - Network Printer WIRELESS NETWORK DEVICES Wireless switch Wireless router, ACCESSPOINT Packets &Protocols DConn. Oriented protocols TCP& connection less protocols-UDP TCP/IP STACK -HTTP - FTP -SMTP -POP3 -SNMP -TELNET -ARP -RARP IPX/SPX	8
4	**Network Routing, Windows 2008 server** What is routing 20 12 , Requirements of routing Types of Routing - static -dynamic - default Routing protocols - Exterior Routing protocol 1)BGP - Interior Routing protocol (1)Distance vector routing -RIP -IGRP - EIGRP (2)Link state routing -OSPF - IS IS Installation of 2008 enterprise server Various editions of windows 2008 server Installation & Configuration of Active Directory - Domains, Trees, Forests concept Accounts(User, Group,Computer) Policy (Security and audit) Logging Events MMC(Microsoft Management console)	4.
5	**Basics of Network Security, Internet connection & Sharing** Fundamental ofDNetwork Security Requirements of network Security Policies, Standard, Procedures, Baselines,Guidelines Security methods - Encryption - Cryptography - Authentication Security Principle -CIA Model Basics of Internat How internal is connect with computer Technology related internat - Dial up tech. - ISDN network tech. - Lease line tech. VPN - Types of VPN - Use of VPN - VPN protocols(PPTP, L2TP, IPsec.) Proxy server, Firewall GPS,GPRS CCTV tech.	6
	Total hours:	42

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Computing & IT

Bachelor of Science in Information Technology (Bsc.IT)

Subject – Operating Systems Concepts With Unix and Linux

Semester - 4

CODE:

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	2	4	4	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, Process Management, Memory Management.** •Meaning of OS • Functions of OS • Features of OS • OS Types (User Point of View) • OS Types (Features Point of View) • Introduction of OS process • Process State Transition Diagram • Process Scheduling o FCFS	6

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	○ SJN ○ Round Robin ○ Priority Base Non Preemptive ○ Priority Base Preemptive • Physical Memory and Virtual Memory • Memory Allocation • Contiguous Memory Allocation • Noncontiguous Memory Allocation • Virtual Memory Using Paging • Virtual Memory Using Segmentation	
2	**Getting Started with Unix, Unix Shell Command, Text Editing With vi Editor.** • Unix Architecture • Unix Features • Types Of Shell (C, Bourn, Korn) • Unix File System, • Types Of Files, Ordinary Files, Directory Files, Device Files • Unix File & Directory Permissions • Connecting Unix Shell: Telnet Login Commands passwd, logout, who, who am i, clear • File I Directory Related Command Is, cat, cd, pwd, mv, cp, In, rm, rmdir, mkdir, umask, chmod, chown, chgrp, find,pg,more.less.head,tail,wc,touch • Operators in Redirection & Piping 0 <><<>> I ' 1 • Advance Tools • Finding Patterns in Files grep,fgrep,egrep • Working with columns and fields • Tools for sorting: sort,uniq • Comparing files : cmp,comm.,diff • Changing Information in Files : tr,sed, • Examining File Contents : od • Tools for mathematical calculations be.factor • Monitoring Input and Output tee.script • Tools For Displaying Date and Time cal.date • Communications telnet,wall,mtod,write,mail,news,finger • Process Related Commands : ps, command to run process in background, nice,kill,at,batch,cron, crontab,wait,sleep • Concept of Mounting a File System mount command • Concept of DeMounting a File System umount command • Introduction of vi editor • Modes in vi and Switching mode in vi • Cursor movement and • Screen control commands • Entering text, cut. copy, paste in vi editor	4
3	**Shell Programming Getting Started with Linux, Linux Booting**	8

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	• Shell Keywords • Shell Variables • System variables PS2, PATH, HOME,LOGNAME,MAIL, IFS, SHELL, TERM, MAILCHECK • User variables set, unset and echo command with shell variables • Positional Parameters Interactive shell script using read and echo Decision Statements o if then fi o if then else fl o if then elif else fi o case esac • test command • Logical Operators • Looping statements o for loop o while loop o until loop o break continue command • Arithmetic in Shell script • Various shell script examples • History of Linux • GNU, GPL Concept • Open Source & Freeware Structure and Features of Linux • Installation and Configuration of Linux - Using with Ubuntu • Startup, Shutdown and boot loaders of Linux • Linux Booting Process - LILO Configuration - GRUB Configuration • User Interfaces (GUI and CUI)	
4	**Working with X- Windows (Ubuntu).** • Layred Structure of X - Window Manager - Desktop Environment - Start Menu - User Configuration - startx Command • Window Managers - GNOME, KDE, Purpose of window manager • The KDE Desktop - KDE Panel. Desktop Icons, Managing Windows - The KDE Control Panel • The GNOME Desktop - The GNOME Panel - Desktop Icons, Managing Windows - The GNOME Control Panel • Configuring X - /etc/X11/Xorg.conf file	4

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	- Tuning Xorg.conf - Choosing a Window Manager • Create, Delete, Rename, Copy files	
5	**Linux Admin (Ubuntu).** • Creating Linux User Account and Password • Installing and Managing Samba Server • Installing and Managing Apache Server • Optimizing LDAP Services • Optimizing DNS Services • Optimizing FTP Services	6
	Total hours:	42

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Computing & IT

Bachelor of Science in Information Technology (Bsc.IT)

Subject – Programming with C#

Semester - 4

CODE:

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	2	4	4	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	**.NET Framework and Visual Studio IDE, Language Basics** Introduction to .NET Framework Features I Advantages CLR, CTS and CLS BCL I FCL I Namespaces Assembly and MetaData JIT and types Managed Code and Unmanaged Code Introduction to .NET Framework and IDE versions Different components (windows) of IDE Types of Projects in IDE (Console, Windows, Web, Setup, etc.) Data Types (Value Type & Reference Type) Boxing and UnBoxing Operators (Arithmetic, Relational, Bitwise, etc.) Arrays (One Dimensional, Rectangular, Jagged) Decisions (If types and switch case) Loops (for, while, do..while,	6

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	foreach)	
2	**Class and Inheritance Property, Indexer, Pointers, Delegates, Event, Collections** Concept of Class, Object, Encapsulation, Inheritance, Polymorphism Creating Class and Objects Methods with "ref' and "out" parameters Static and Non-Stanc Members Constructors Overloading Constructor, Method and Operator Inheritance Sealed Class & Abstract Class Overriding Methods Interface inheritance Creating and using Property Creating and using Indexer Creating and using Pointers (unsafe concept) Creating and using Delegates (Single I Multicasting) Creating and using Events with Event Delegate Collections (Arraylist, HashTable, Stack, Queue. Sortedlist) and their differences.	4
3	**Windows Programming** Creating windows Application MessageBox class with all types of Show() method Basic Introduction to Form and properties Concept of adding various Events with event parameters Different Windows Controls - Button - Label - TextBox - RadioButton - CheckBox - ComboBox - ListBox - PictureBox - ScrollBar - TreeView - Menu (MenuStrip, ContextMenuStrip) - ToopStrip - Timer - Panel and GroupBox Dialog Boxes (ColorDialog, FontDialog, SaveFileDialog and OpenFileDialog) - MDI Concept with MDI Notepad Concept of tnherinno Form	8
4	**Database Programming with ADO.NET** Concept of Connected and Disconnected Architecture Data Providers in ADO.NET Connection Object Connected Architecture - Command - DataReader Disconnected Architecture - DataAdapter - Dataset - DataTable - DataRow - DataColumn - DataRelation - DataView	4

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	Data Binding GridView Programming	
5	**User Controls (Components), Crystal Reports, Setup Project** Creating User Control with - Property - Method - Event Using User Control in Windows Projects as component, Creating Crystal Reports Types of Reports Report Sections Formula, Special Fiend and Summary in Report Types of Setup Projects Creating Setup Project - File System Editor - User Interface Editor - Launch Conditions Editor	6
	Total hours:	42

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Course: Intermediate Program in Entrepreneurship **Semester –IV**

Course Code: 12300012

1) Introduction:

The course is directed towards students who want to initiate a new enterprise, management of family businesses and students who want to consider entrepreneurship as a career choice. The focus of this course is on fund raising, financial structure development, provides mentors network and industrial collaboration. It also uncovers several chapters on product development, preparing pitch deck and learning company formation procedure in India for start-ups.

Through case studies, student research and guest speakers, students will be able to market their product in market, pitch their idea to investors and register their company by considering legal and ethical aspects of business.

2) The course has the following objectives:

- Increase the understanding of entrepreneurial finance and financial support for start-ups.
- Understanding the role new product innovation for start-ups.
- Understand triple helix model of innovation.
- Identify the role of start-up ecosystem partners: university ecosystem and different stakeholders.
- Understand pitching and negotiation strategies for start-ups
- Understand new product design and market positioning

3) Course Outcomes

Upon successful completion of this course, a student will be able to:

- Apply the basic principles of entrepreneurial finance.
- Understanding of new product design and development.

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- Understanding the importance of industrial collaboration and triple helix model for industrial innovation.
- Understanding the importance of industrial collaboration and triple helix model for industrial innovation.
- Understand various market funds for start-ups.
- Register any one form of business.
- Make pitch deck to present business idea to different stakeholders.

4) Teaching Methods and Course Materials:

- The course will include Interactive lectures, solving case studies, market research, workshops, library readings, videos and group discussions.
- Some cases are identified which students will read and prepare for the discussion
- Guest speakers from 'Startups' who will share their entrepreneurial journey.

5) Individual/Group Presentation:

The student has to select any Start-up that is at growth (scaling or establishing) phase. Their presentation/Assignment will cover following topics:

- Company History and Description
- The journey of the entrepreneur
- The vision and mission of the company
- Significant steps taken by the entrepreneur
- Current stage/situation of the business
- Conflict/split in business (if any)
- Learning from the case (case Summary)

6) Cases for Class Presentation:

Sl. No.	Title of the Case	Students' Names

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7) Study Material: Compiled study material will be provided by the Faculty. Additional materials will be provided as and when the course progresses.

8) Assessment Components:

Sr. No.	Components	Weightage %
1.	Presentations/Assignment	20%
2.	Mid-term Examination	30%
3.	End-term Examination	40%
4.	Attendance and Class Participation	10%

9) Course Outlines (4th Semester) (Total 36 Hrs.)

Unit 1 Product Management **(08 Hrs.)**

Product design: Meaning, Product design issues, Key factors related to design decisions, New product development process. Prototyping: Overview, Methods of Prototyping, Difference between MVP, POC, Prototype & Product.

Unit 2 Entrepreneurial Finance: An overview **(10 Hrs.)**

Fundraising: Overview, Different stages of fundraising, Sources of Start-Up Capital, Introduction to entrepreneurial finance, Types of financial statements, Interpreting Balance Sheet, Break even analysis.

Unit 3 Infrastructural Support for Entrepreneurship **(03 Hrs.)**

Triple Helix Structure Model for Innovation and Entrepreneurship, University-based technology transfer.

Unit 4 Pitching Investors and Business Negotiation **(08 Hrs.)**

Pitching: Meaning, Importance, Component of Pitch Deck, Negotiation: Meaning, Negotiation stages, Primary Negotiation Strategies. Presentation skills: Importance, Designing and delivering effective business presentations.

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Interview of Successful Entrepreneurs should be conducted by the students by covering following aspects: Background of the entrepreneur, education and qualification, source of getting the business idea, his enterprise journey, Success mantras etc. OR Visit of any Enterprise firm and interaction with the owner of the business firm and prepare a field report on parameters like: type of business, scale of business, product/service dealing in, target customer, problems faced and measures to solve the faced challenges.

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Unit 5 Company Formation **(07 Hrs.)**

Formation of business entity: Introduction, Forms of business entity: Proprietorship, Partnership and Corporation, Steps for incorporation of private/public limited company, procedure for setting up a business in India.

10) Reference Books (4th Semester)

a) Smith, Janet, Smith, Richard, Bliss, Richard (2011). Entrepreneurial Finance_ Strategy, Valuation, and Deal Structure-Stanford Economics and Finance.

b) Paul Pignataro(2013).Financial Modeling and Valuation, Wiley publisher.

c) James McNeill Stancill (2003). Entrepreneurial Finance for New and Emerging Businesses-South-Western College Pub.

d) Philip J. Adelman, Alan M. Marks (2013). Entrepreneurial Finance, Prentice Hall.

e) Drucker, P. (2014). Innovation and entrepreneurship. Routledge.

f) Etzkowitz, H., & Zhou, C. (2017). The triple helix: University–industry–government innovation and entrepreneurship. Routledge.

g) Ulrich, K. T. (2003). Product design and development. Tata McGraw-Hill Education.

h) Cremades, A. (2016). The art of startup fundraising: pitching investors, negotiating the deal, and everything else entrepreneurs need to know. John Wiley & Sons.

11) Instructions:

Assignment- Development of Business Idea into a working Prototype as well as Developing financial plan and funding proposal for startup.

Individual assignment submission is must for every student.

OR

Presentation- Case Study solution on any entrepreneurial venture/ Interview of Successful Entrepreneurs/Field Visit of any Enterprise- Students have to solve a case study allotted by the faculty and present it in front of the class with possible alternatives/solutions of their own OR

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Computing & IT

Bachelor of Science in Information Technology (Bsc.IT)

Subject - Programming with ASP.Net

Semester - 5

CODE:

Teaching & Evaluation Scheme:-

Teaching Scheme			Credits	Evaluation Scheme				
				Internal		External		Total
Th	Tu	Pr		Th	Pr	Th	Pr	
3	0	2	4	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	**Framework & Web Contents** Overview of ASP.NET framework, Understanding ASP.NET Controls, Applications Web servers, installation of IIS. Web forms, web form controls server controls, client controls, web forms & HTML, Adding controls to a web form ,Buttons, Text Box , Labels, Checkbox, Radio Buttons, List Box, etc. Running a web Application, creating a multiform web project.	6
2	**Validation & State Management**	4

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Computing & IT

Bachelor of Science in Information Technology (Bsc.IT)

Subject - Programming with ASP.Net

Semester - 5

CODE:

Teaching & Evaluation Scheme:-

Teaching Scheme			Credits	Evaluation Scheme				
				Internal		External		Total
Th	Tu	Pr		Th	Pr	Th	Pr	
3	0	2	4	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	**Framework & Web Contents** Overview of ASP.NET framework, Understanding ASP.NET Controls, Applications Web servers, installation of IIS. Web forms, web form controls server controls, client controls, web forms & HTML, Adding controls to a web form ,Buttons, Text Box , Labels, Checkbox, Radio Buttons, List Box, etc. Running a web Application, creating a multiform web project.	6
2	**Validation & State Management**	4

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	Form Validation Client side validation, server Side validation Validation Control Required Field Comparison Range. Calendar control, Ad rotator Control, Internet Explorer Control. State management View state, Session state, Application state	
3	**ADO.Net Database & LINQ** Architecture of ADO.NET Connected and Disconnected Database, Create Connection using ADO.NET Object Model, Connection Class, Command Class, DataAdapter Class, Dataset Class. Display data on data bound Controls and Data Grid. Database Accessing on web applications Data Binding concept with web, creating data grid, Binding standard web server controls. Display data on web form using Data bound controls.	8
4	**Using XML** Writing datasets to XML, Reading datasets with XML. Web services Introduction, Remote method call using XML, SOAP, web service description language, building & consuming a web service, Web Application deployment.	4
5	**Web Application and Configuration** Overview Asp.net Configuration, Common Configuration , Tracing, Custom Error, Authentication & Authorization, AJAX Web Services	6
	Total hours:	42

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Computing & IT

Bachelor of Science in Information Technology (Bsc.IT)

Subject - Advanced Java Programming

Semester - 5

CODE:

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
4	0	2	5	5	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	**Distributed Computing using RMI, Database Programming with JDBC** • Introduction to RMI • RMI Architecture • Stubs and Skeleton • Introduction and Need for JDBC • Database Drivers • JDBC APIs for database Connectivity (Java.sql Package) • Connection • Statement	6

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	• Prepared statement • Callable statement • Result set • Other JDBC APIs • Database Meta Data • Result Set Meta Data	
2	**Servlet Programming** • Servlet Basics, Basic Servlet structure, Servlets Generating text/html content, Packaging Servlets, The servlet life-cycle. • Handling Client Request Form Data, Reading Form Data from Servlets, Handling Client Request, Reading Request Headers, Understanding HTTP/1.1 Request Headers, Changing the page according to how the user got there, Accessing the Standard CGI Variables. • Generating the Server Response, HTTP Status Codes, Specifying Status Codes, HTTP / 1.1 Status Codes, Using Redirections, HTTP Response Headers, Setting Response Headers from Servlets, Understanding HTTP / 1.1 Response Headers, Using Servletsto Generate JPEG Images.	4
3	**Listeners and Filters** • Listeners and Filters Using Servlet Context Listener, • HttpSessionListener, Understanding of all the other Listeners viz. • ServletRequestListener, ServletContextAttributeListener, ServletRequestAttributeListener, Http Session Attribute Listener • Using Filters for pre and post processing of request.	8
4	**JSP Programming** JSP Basic Syntax, HTML Text, HTML comments, Template Text, JSP Comment, JSPExpression, JSP Scriptlet, JSP Declaration, JSP Directives, JSP Action, JSP Expression Language Element, Custom Tag (Custom Action), Escaped Template Text, Using JSP Scripting 08 Elements, Using Predefined Variables, XML syntax for Expressions, Scriptlets, Declarations and Directives, Using Scriptlets, Using Declarations, Using Page Directive, Using Standard Actions Tags – , , , Using JavaBeans in JSP pages – , , , Sharing Beans, Use of Scopes and their Attributes	4
5	**MVC, Tag Library** • Integrating Servlets and JSP in a Web Application (MVC Architecture for Web Applications), Implementing MVC with Request Dispatcher, Understanding Data Sharing Between Servlets and JSP, • JSP Expression Language, Accessing Scoped Variables, Bean Properties, Collections and Implicit Objects Using EL, Using EL Operators • Tag Library– Basics; Using JSTL – c:out, c:forEach,	6

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	c:forTokens, c:if, c:choose, c:set, c:remove, c:import, c:url, c:param, c:redirect and c:catch Tags	
	Total hours:	42

References Books :

1. Complete reference J2EE .
2. Professional Java Server Programming J2EE 1.3 Edition Apress Publication.
3. Beginning Java J2EE 5 from Novice to Professional Apress Publication.

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Computing & IT

Bachelor of Science in Information Technology (Bsc.IT)

Subject - Search Engine Techniques and Digital Technology Trends

Semester - 5

CODE:

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	0	2	4	4	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	**The Search Engines: Reflecting Consciousness and Connecting Commerce Search Engine Basics** • The Mission of Search Engines • The Market Share of Search Engines • The Human Goals of Searching • Determining Searcher Intent: A Challenge for Both Marketers and Search Engines • How People Search?	6

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	• How Search Engines Drive Commerce on the Web? • Eye Tracking: How Users Scan Results Pages? • Click Tracking: How Users Click on Results? Natural Versus Paid • Understanding Search Engine Results • Algorithm-Based Ranking Systems: Crawling, Indexing, and Ranking • Determining Searcher Intent and Delivering Relevant • Fresh Content • Analyzing Ranking Factors • Using Advanced Search Technique • Vertical Search Engines • Country-Specific Search Engines	
2	**Determining SEO Objectives and Defining Site's Audience First Stages of SEO** • Setting SEO Goals and Objectives • Developing an SEO Plan Prior to Site Development • Understanding Audience and Finding Niche • SEO for Raw Traffic • SEO for E-Commerce Sales • SEO for Mindshare/Branding • SEO for Lead Generation and Direct Marketing • SEO for Reputation Management • SEO for Ideological Influence • The Major Elements of Planning • Identifying the Site Development Process and Players • Defining Site's Information Architecture • Auditing an Existing Site to Identify SEO Problems • Identifying Current Server Statistics Software and Gaining Access • Determining Top Competitors • Assessing Historical Progress • Benchmarking Current Indexing Status • Benchmarking Current Rankings • Benchmarking Current Traffic Sources and Volume • Leveraging Business Assets for SEO • Combining Business Assets and Historical Data to Conduct SEO/Website SWOT Analysis	4
3	**Developing an SEO-Friendly Website** • Making Site Accessible to Search Engines • Creating an Optimal Information Architecture • Root Domains, Subdomains, and Microsites • Optimization of Domain Names/URLs • Keyword Targeting • Content Optimization • Duplicate Content Issues Controlling Content with Cookies and Session IDs	8

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	• Content Delivery and Search Spider Control • Redirects, Content Management System (CMS) Issues • Optimizing Flash • Best Practices for Multilanguage/Country Targeting	
4	**Keyword Research, Optimizing for Vertical Search** • The Theory Behind Keyword Research • Traditional Approaches: Domain Expertise • Site Content Analysis • Keyword Research Tools • Determining Keyword Value/Potential ROI, Leveraging the Long Tail of Keyword Demand, Trending, Seasonality, and Seasonal Fluctuations in Keyword Demand • The Opportunities in Vertical Search • Optimizing for Local Search • Optimizing for Image Search • Optimizing for Product Search • Optimizing for News, Blog, and Feed Search • Others: Mobile, Video/Multimedia Search	4
5	**Digital Technology Trends** • Digital Business o Introduction to digital business, o difference between digital business and ecommerce, o digital business opportunities, o Risk and barriers to digital business adoption • Block Chain Technology o Tracing blockchain origin, o Blockchain feature, o How BlockChain Work? • Virtual Reality, Augmented Reality(AR): o Introduction to Virtual Reality (VR), o Needs of VR o Introduction and brief history of AR o Difference between AR and VR o opportunities for augmented reality	6
	Total hours:	42

Reference book :

(1) The Art of SEO : Mastering Search Engine Optimization By Eric Enge, Stephan Spencer, Rand Fishkin, Jessie C Stricchiola, O'Reilly Media, October, 2009

(2) Web Searching Technology and Search Engine Optimization[ISBN: 978 - 93 - 81786 - 92 - 5] by Bharat & Company

(3) SEO: Search Engine Optimization Bible, By Jerri L. Ledford, 2nd Edition, Wiley India, April, 2009

(4) SEO Warrior: Essential Techniques for Increasing Web Visibility By John I Jerkovic, O'Reilly Media, November, 2009

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References Links :

(1) http://www.gartner.com/technology/research/digital-business/
(2) https://blockchain.info/
(3) Virtual Reality, Steven M. LaValle,University of Illinoise, Cammbridge University Press. http://vr.cs.uiuc.edu/
(4) Augmented Reality: Ebok http://libro.eb20.net/Reader/rdr.aspx?b=1073012 Greg Kipper, Joseph Rampolia, Elsevier Science

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Course: Advanced Program in Entrepreneurship **Semester –V**

Course Code: 12300013

1) Introduction:

The course is directed towards students who want to initiate a new enterprise, management of family businesses and students who want to consider entrepreneurship as a career choice. The focus of this course is on developing business plan, scalability and growth for incubated start-ups and succession planning of any enterprise.

Through case studies and guest speakers, the students can learn making business plan for achieving short term and long term objectives, developing business model and will be able to manage the scalability of a venture.

2) The course has the following objectives:

- Increase the understanding of Start-up scalability.
- Understanding of sustainable business model development.
- Creating business growth plan.
- Understanding the succession planning of a venture.

3) Course Outcomes

Upon successful completion of this course, a student will be able to:

- Apply the basic principles of Start-up scalability
- Understanding various individual attributes of strategic business plan development
- Develop strategies for start-ups growth.
- Experience real world financial modeling and valuation through IPO.

4) Teaching Methods and Course Materials:

The course will include Interactive lectures, solving case studies, market research, workshops, library readings, videos and group discussions.

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- Some cases are identified which students will read and prepare for the discussion
- Guest speakers from 'Startups' will share their entrepreneurial journey.

5) Individual/Group Presentation:

The student has to select any Start-up that is at growth (scaling or establishing) phase. Their presentation/Assignment will cover following topics:

- Company History and Description
- The journey of the entrepreneur
- The vision and mission of the company
- Significant steps taken by the entrepreneur
- Current stage/situation of the business
- Conflict/split in business (if any)
- Learning from the case (case Summary)

6) Cases for Class Presentation:

Sl. No.	Title of the Case	Students' Names

5) Study Material: Compiled study material will be provided by the Faculty. Additional materials will be provided as and when the course progresses.

6) Assessment Components:

Sr. No.	Components	Weightage %
1.	Presentations/Assignment	20%
2.	Mid-term Examination	30%
3.	End-term Examination	40%
4.	Attendance and Class Participation	10%

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9) Course Outlines (5th Semester) (Total 36 Hrs.)

Unit 1 Business plan preparation for new ventures **(06 Hrs.)**

Business plan: introduction, Benefits of business plan, Elements of a business plan, Mistakes to avoid in making business plan, Updating the business plan.

Unit 2 Branding and Promotion strategies for startups **(08 Hrs.)**

Introduction to sales and marketing, Difference between sales and marketing, Market Segmentation, Define the Target Market, Marketing mix, Distribution channels: Concept and types, Personal selling process, Definition of branding, Types of brand, Brand elements, IMC tools.

Unit 3 Startup Scalability **(08 Hrs.)**

Introduction, 4 stages in the life cycle of an entrepreneurial firms, Growth strategies for ventures (market penetration strategies, market development strategies, new geographical market, new demographic market, product development strategies, Diversification strategies), Franchising, licensing, export strategies for growth, Joint Venture, mergers and acquisitions, Leveraged Buyouts.

Unit 4 Start-up to IPO **(06 Hrs.)**

IPO: Overview, Timing of IPO, Steps of issuing an IPO, Advantages and disadvantages of going IPO, Marketing strategies for IPO.

Unit 5 Succession Planning and Ending the venture **(08 Hrs.)**

Exit strategies for entrepreneurs, Succession of business, Options of selling the business, Steps for selling a business, Bankruptcy, Liquidation, Turnaround Strategies, Buyouts.

10) Reference Books (5th Semester)

Main Text Books:

a) Vijaya Kumar Ivaturi and Meena Ganesh (2020) The Manual for Indian Start-ups: Tools to Start and Scale-up Your New Venture; Published by: Penguin Enterprises.

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b) S. Anil Kumar (2020), Small Business and Entrepreneurship; Published by: Dreamtech Press

c) Harpreet S. Grover and Vibhore Goyal (2019), Lets Build A Company Published by: Penguin Random House India.

d) Darren Lee-Ross and Conrad Lashley (2009) Entrepreneurship and Small Business Management in the Hospitality Industry; Published by: Elsevier Ltd.

e) Peter S. Cohan (2019), *Scaling Your Startup; Mastering the Four Stages from Idea to $10 Billion* Published by: Apress publications.

f) Ian Whiteling (2010), *Start Your Own Business* Published by: Crimson Publishing

Reference Books:

a) Pankaj Goyal (2017) Before You Start Up: How to Prepare to Make Your Startup Dream a Reality; Published by: Fingerprint! Publishing

b) Frederick-Kuratko (2010). *Entrepreneurship-Theory-Process;* Published by: *Cengage Learning Australia Pty Limited.*

c) Building a Sustainable Business (2010) Developed by: the Minnesota Institute for Sustainable Agriculture Saint Paul, MN Published by: *Sustainable Agriculture Research and Education (SARE), College Park, MD.*

d) Anna Kennedy (2015) *Business Development For Dummies,* Published by: John Wiley & Sons, Ltd.

e) Verne Harnish (2014); *Scaling Up;* Published by: Gazelles, Inc.

11) Instructions:

Assignment- Development of a strategic business plan and its growth strategies

Individual assignment submission is must for every student.

OR

Presentation- Case Study solution on any entrepreneurial venture/ Interview of Successful Entrepreneurs/Field Visit of any Enterprise- Students have to solve a case study allotted by the faculty and present it in front of the class with possible alternatives/solutions of their own OR Interview of Successful Entrepreneurs should be conducted by the students by covering following

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aspects: Background of the entrepreneur, education and qualification, source of getting the business idea, his enterprise journey, Success mantras etc. OR Visit of any Enterprise firm and interaction with the owner of the business firm and prepare a field report on parameters like: type of business, scale of business, product/service dealing in, target customer, problems faced and measures to solve the faced challenges.

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Computing & IT

Bachelor of Science in Information Technology (Bsc.IT)

SUBJECT - Data Warehousing with SQL Server 2012

Semester - 6

CODE:

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	-	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 Data Warehousing.** • What Is a Data Warehouse? • Data Warehousing Today • Future Trends in Data Warehousing. • Data Warehouse Architecture • Data Flow Architecture	6
2	**Designing and Implementation of Data Warehousing.** • Logical Design for data warehouse • Physical Design for data warehouse • Design dimension table, fact table for data warehouse	4

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	• Design and implement effective physical data structure for data warehouse	
3	**Creating ETL Solutions with SSIS, Implementing Control Flow in SSIS.** • Introduction to ETL with SSIS • Exploring data sources • Implementing data flow using SSIS • Introduction to Control Flow • Creating Dynamic Packages Using Containers	8
4	**Enforcing Data Quality, Extending SQL Server Integration Services.** • Introduction to Data Quality • Using Data Quality Service to Cleanse data • Using Data Quality Service to match data • Using Scripts in SSIS • Using Custom components in SSIS	4
5	**Deploying and Configuring SSIS Packages, Consuming Data in Data Warehouse.** • Deploying SSIS Projects • Planning SSIS Package Execution • Introduction to Business Intelligence • Introduction to Reporting • Introduction to Data Analysis	6
	Total hours:	42

Reference Books:

(1) Implementing a Data Warehouse with Microsoft® SQL Server® 2012 Dejan Sarka Matija Lah Grega Jerkič

(2) Building a Data Warehouse: With Examples in SQL Server – Vincent Rainardi-Apress (2014)

(3) Data mining Explained A manager's guide to customer centric business intelligence by

(4) Data mining by Pieter Adriaans, Dolf Zantinge

(5) Data warehousing in the real world A practical guide for business DSS by Sam Anahory,

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Computing & IT

Bachelor of Science in Information Technology (Bsc.IT)

SUBJECT:- INTERNET OF THINGS (IOT)

Semester - 6

CODE:

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	2	4	4	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	**IOT AN OVERVIEW** Building an architecture, Main design principles and needed capabilities, An IoT architecture outline, standards considerations. M2M and IoT Technology Fundamentals- Devices and gateways, Local and wide area networking, Data management, Business processes in IoT, Everything as a Service(XaaS), M2M and IoT Analytics, Knowledge Management	6
2	**REFERENCE ARCHITECTURE**	4

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	IoT Architecture-State of the Art – Introduction, State of the art, Reference Model and architecture, IoT reference Model - IoT Reference Architecture Introduction, Functional View, Information View, Deployment and Operational View, Other Relevant architectural views. Real- World Design Constraints- Introduction, Technical Design constraintshardware is popular again, Data representation and visualization, Interaction and remote control.	
3	**IOT DATA LINK LAYER & NETWORK LAYER PROTOCOLS** PHY/MAC Layer(3GPP MTC, IEEE 802.11, IEEE 802.15), Wireless HART, Z-Wave, Bluetooth Low Energy, Zigbee Smart Energy, DASH7 - Network Layer-IPv4, IPv6, 6LoWPAN, 6TiSCH,ND, DHCP, ICMP, RPL, CORPL, CARP	8
4	**TRANSPORT & SESSION LAYER PROTOCOLS** Transport Layer (TCP, MPTCP, UDP, DCCP, SCTP)-(TLS, DTLS) – Session Layer-HTTP, CoAP, XMPP, AMQP, MQTT	4
5	**SERVICE LAYER PROTOCOLS & SECURITY** Service Layer -oneM2M, ETSI M2M, OMA, BBF – Security in IoT Protocols – MAC 802.15.4 , 6LoWPAN, RPL, Application Layer	6
	Total hours:	42

Reference Books:

1. Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, "From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence", 1 st Edition, Academic Press, 2014.

2. Bernd Scholz-Reiter, Florian Michahelles, "Architecting the Internet of Things", ISBN 978-3-642-19156-5 e-ISBN 978-3-642-19157-2, Springer

3. Vijay Madisetti and ArshdeepBahga, "Internet of Things (A Hands- onApproach)", 1 st Edition, VPT, 2014.

4. Bernd Scholz-Reiter, Florian Michahelles, "Architecting the Internet of Things", ISBN 978-3-642-19156-5 e-ISBN 978-3-642-19157-2, Springer.

5. Francis daCosta, "Rethinking the Internet of Things: A Scalable Approach to Connecting Everything", 1st Edition, Apress Publications, 2013 6. Peter Waher, "Learning Internet of Things", PACKT publishing, BIRMINGHAM – MUMBAI

Reference Links:

http://www.cse.wustl.edu/~jain/cse570-15/ftp/iot_prot/index.html

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Computing & IT

Bachelor of Science in Information Technology (Bsc.IT)

SUBJECT - Mobile Computing using Android

Semester - 6

CODE:

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
					Internal		External		Total
Th	Tu	Pr	Total		Th	Pr	Th	Pr	
3	-	2	4	4	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 Android Android Application Design** • The Open Handset Alliance • The Android Platform, Android SDK • Building a sample Android application • Anatomy of an Android applications • Android terminologies • Application Context, Activities, Services, Intents • Receiving and Broadcasting Intents • Android Manifest File and its common settings	6

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	• Using Intent Filter, Permissions • Managing Application resources in a hierarchy • Working with different types of resources	
2	**Android User Interface Design** • User Interface Screen elements o Button, EditText, TextView, DatePicker, TimePicker, ProgressBar, ListView, GridView, RadioGroup, ImageButton, Fragement • Designing User Interfaces with Layouts o Relative Layout, Linear Layout, Table Layout etc • Dialogs • Drawing and Working with Animation o Frame By Frame Animation o Twined Animation	4
3	**Database Connectivity Using SQLite and Content Provider** • Using Android Data and Storage APIs • Managing data using SQLite • Sharing Data Between Applications with Content Providers	8
4	**Location Based Services (LBS), Common Android API** • Using Global Positioning Services (GPS) • Geocoding Locations • Mapping Locations • Many more with location based services • Android networking API • Android web API • Android telephony API	4
5	**Notifications, Services, Deployment of applications** • Notifying the user, Notifying with the status bar • Vibrating the phone • Blinking the lights • Customizing the notifications Services	6
	Total hours:	42

Reference Books:

(1) Android Wireless Application Development By Lauren Darcey and Shane Conder, Pearson Education, 2nd ed. (2011)

(2) Beginning iOS 6 Development By David Mark , Jack Nutting , Jeff LaMarche , Fredrik Olsson Apress Publication.

(3) Using SQLite By Jay A. Kreibich, Publisher: O'Reilly Media

(4) Mobile Computing using Android and iPhone [ISBN: 978 - 93 - 81786 - 93 – 2] by Bharat & Company

(5) Professional Android 2 Application Development Reto Meier, Wiley India Pvt Ltd (2011) (6) Beginning Android Mark L Murphy, Wiley India Pvt Ltd

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Course: Start-Up Project **Semester –VI**

Course Code: 12300014

1) Introduction:

The course is directed towards students who want to initiate a new enterprise, management of family businesses and students who want to consider entrepreneurship as a career choice. The course compels them to finalize any one start-up idea and register a start-up on the same. Such applied learning will help them to make the course experiential. They can integrate classroom knowledge and theory with practical application and skills developed in professional or community settings. They can also bring a wealth of benefits for themselves, for other students as well as for the community while completing a degree and when seeking a career path after studies. The course opens up several gates of opportunities for the students.

2) The course has the following objectives:

- To finalise any one start-up idea and register it as start-up.
- To enhance the abilities of students to analyse market demand of the products and decision making process for product development and commercialization.
- To increase the industrial networking and collaborations.
- To enhance the abilities of students to design Financial and Marketing strategies of their start-up.
- To create, develop and strengthen a Brand using IPR.
- To design growth strategies for their Start-up.
- To encourage students for business incubation.

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- Market Research (Study area's demography, demand & supply, customer's survey outcome etc.)
- Institutional Support (Industry/ Government Collaborations)
- Prototype Development and its testing
- Business Plan Development
- Financial strategies (Source of funding, pricing & costing, projected revenue, profit margin etc.)
- Marketing Strategies (4P's, Branding and Promotional strategies)
- Start-up business model and Ecosystem
- IPR
- Growth Strategies
- Findings, future scopes and conclusion
- Bibliography

8) Instructions:

All the student teams have to check their project report for plagiarism, which indicates % similarity of the languages used during drafting, using a good plagiarism checking software. The plagiarism should be below or equivalent to 30%. The 1st page of the report generated after online plagiarism check is required to be signed by each of the team members as well as by the respective guide and it should be attached mandatorily in the copies delivered to the College and to the Faculty. The department should keep a copy of these in a file after collecting them from all the teams.

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3) Course Outcomes

Upon successful completion of this course, a student will be able to:

- Initiate a start-up in team.
- Register it as any form of business.
- Develop a team to run the venture.
- Collaborate with government and industry fraternity.
- Generate revenue for them and contribute to society with their problem solving product.

4) Teaching Methods and Course Materials:

- The course will include interaction with mentors, startups and venture capitalists, angel investors to strengthen and validate their business idea.

5) Study Material: Mentoring from industry fraternity and doubt solving sessions by project guide would suffice the purpose.

5) Assessment Components:

Sr. No.	Components	Weightage %
1.	Attendance and Class Participation	10%
2.	Mid-term Examination (Pitch Deck Presentation)	20%
3.	End-term Examination [Start-up Project Report Submission]	50%
4.	Viva-voce on Start-up Project Report	20%

7) Project Report Submission:

Project- Own Start-up Idea Generation and Business Plan Development

Outline: Start-up Project Report should include-

- Introduction of the start-up idea (Problem and solution)
- SWOT Analysis
- Competitive Scenario Analysis

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B.O.S. Records

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SWARNIM STARTUP & INNOVATION UNIVERSITY

Swarnim School of Computing and IT

Board of Examination Constitution

Sr. No.	Members Name	Designation
1	Prof.Vikas Chandra Sharma	Chairperson
2	Dr. Chetan gondaliya	Chairperson
3	Dr. Hardik Rayjada	Faculty Member
4	Prof.Pritee Solanki	Faculty Member
5	Prof. Apeksha Dave	Faculty Member
6	Prof. Nirav Dave	Faculty Member
7	Prof. Hardik Parmar	Faculty Member
8	Prof. Hiren Kukadiya	Faculty Member

Swarnim Startup & Innovation University
Swarnim School of Computing & IT
Gandhinagar

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SWARNIM STARTUP & INNOVATION UNIVERSITY

Swarnim School of Computing and IT

Minutes of First Board of Examination meeting of Swarnim School of Computing and IT held on August 14, 2023

Members Present:

Sr. No.	Members Name	Designation
1	Prof.Vikas Chandra Sharma	Chairperson
2	Prof. Hardik Parmar	Faculty Member
3	Dr. Hardik Rayjada	Faculty Member
4	Prof.Pritee Solanki	Faculty Member
5	Prof. Apeksha Dave	Faculty Member
6	Prof. Nirav Dave	Faculty Member

Agenda 1: Welcome by Chairman

The Chairman, the Board of Examinations heartily welcomed all the members to the first meeting of the newly constituted Board of Examinations. He hoped that he would receive cooperation & suggestions from each of the distinguished members of the Board.

Agenda 2: Introduction of Members

The Chairman introduced the members to each other.

Agenda 3: To Grant Leave of Absence of Members

Leave of absence was granted to the following members:

1. Prof. Vikash Chandra Sharma

Agenda 4: To appraise the members about the examination policy

The Chairman explained the examination policy to the members. The various parameters relating to examination and assessment components, assessment criteria, evaluation pattern, and details about the procedure of backlogs were appraised. Moreover, rules & procedures for grant of leave, the conduct of students during an examination, the nature of punishment for malpractices during the exam, and rules for writers were been briefed. The members were been informed to communicate the details to the students.

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A copy of examination policy was also been distributed to all the members present.

Agenda 5: To appoint the centre co-ordinator for conducting exam

The Chairman appointed a centre-co-ordinator for smooth & fair conduct of the university examination. The instructions for the centre co-ordinator was been explained. A copy of the same was been given to the centre coordinator.

Agenda 6: To nominate panel for appointment of examination paper setters, moderators& practical examiners

The Chairman advised the members to recommend a panel of names for the appointment of examination paper setters, moderators & practical examiners .The list of the same was proposed to be submitted & discussed by the members in the next meeting to be scheduled in the month of September, 2022

The meeting ended with a vote of thanks to the chair.

Swarrnim Startup & Innovation University
Swarrnim School of Computing & IT
Gandhinagar

Dr.
Chairman
Board of Examination

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SWARNIM STARTUP & INNOVATION UNIVERSITY

Swarnim School of Computing and IT

Board of Studies

Attendance Record

November 16, 2022

Sr. No.	Members Name	Signature
1	Prof.Vikas Chandra Sharma	
2	Prof. Hardik Parmar	
3	Dr. Hardik Rayjada	
4	Prof.Pritee Solanki	
5	Prof. Apeksha Dave	
6	Prof. Nirav Dave	

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Swarnim School of Computing & IT
Gandhinagar

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SWARNIM STARTUP & INNOVATION UNIVERSITY

Swarnim School of Computing and IT

Minutes of the Board of Examination meeting of the School of Computing and IT held on October 13, 2023

Members Present:

Sr. No.	Members Name	Designation
1	Prof.Vikas Chandra Sharma	Chairperson
2	Dr. Chetan gondaliya	Chairperson
3	Dr. Hardik Rayjada	Faculty Member
4	Prof.Pritee Solanki	Faculty Member
5	Prof. Apeksha Dave	Faculty Member
6	Prof. Nirav Dave	Faculty Member
7	Prof. Hardik Parmar	Faculty Member
8	Prof. Hiren Kukadiya	Faculty Member

Agenda 1: To Grant Leave of Absence of Members

Leave of absence was granted to the following member:

1. Dr.

Agenda 2: To review the proposed list of paper setters

The centre coordinator proposed the list of paper setter's university examinations to be held in the month of December 2022. The members unanimously approved the appointment of paper-setters.

Agenda 3: To examine the proposed list of examiners & moderators

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The Chairman in consensus with the members approved the list of examiners & moderators for Semester-I university examinations to be held in the month of December, 2022.

Agenda 4: To decide the paper format (style) for the internal examination

The members along with Chairman discussed & decided on the paper style for examination. It was decided to include a mix of multiple choice questions, concept-based theoretical questions, practical-based questions and case lets/case studies.

Agenda 5: To discuss & decide the dates for internal & remedial examination

The members discussed the dates for internal the examination. It was decided by members to conduct internal examinations by the end of October, 2022 & remedial examinations in the month of November, 2022.

Agenda 6: To discuss the basic code of conduct during the exam

The Chairman along with the members decided on the basic code of conduct for the smooth functioning of exams. It included CCTV monitoring, prohibition of mobile or any gadgets, reporting time before the exam, checking of I-cards, etc.

Agenda 7: To appoint a senior supervisor

It was decided to appoint a senior supervisor to examine the smooth conduct of exams.

Agenda 8: To appoint a reliever

Relievers were appointed. They were suggested to relieve the supervisor for 15 minutes in the exam room.

The meeting ended with a vote of thanks to the chair.

Board of Examination

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SWARNIM STARTUP & INNOVATION UNIVERSITY

Swarnim School of Computing and IT

Board of Studies

Attendance Record

October 13, 2023, 4 pm

Sr. No.	Members Name	Signature
1	Prof.Vikas Chandra Sharma	
2	Dr. Chetan gondaliya	
3	Dr. Hardik Rayjada	
4	Prof.Pritee Solanki	
5	Prof. Apeksha Dave	
6	Prof. Nirav Dave	
7	Prof. Hardik Parmar	
8	Prof. Hiren Kukadiya	



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SWARRNIM
SCHOOL OF MANAGEMENT, COMMERCE & LIBERAL ARTS

SMCLA/MidSemExam/2023/071

Date: 18-10-2023

CIRCULAR

Dear Students,

As per Academic Calendar 2023-24 your mid semester examination is scheduled from **02nd November, 2023**. With reference to Mid Semester Examination the following instruction has to be taken into consideration:

1. Your reporting time at allotted class room will be at least before **20 Minutes** of commencement of examination.
2. You are not allowed to bring **electronic gadgets / smart devices / mobile phone/ Bluetooth device/ Ear birds** etc. in the examination hall.
3. You need to bring your **bag / purse /wallet other non-stationary** belongings outside the examination hall and **Exchange** of stationary will be strictly prohibited in the class.
4. Bio break is allowed only **after an hour that too 1 time** only post commencement of the examination.
5. Note **kind of communication** and **Unfair Means** will be entertained
6. Student are here by instructed to bring **College ID card/Adhar Card/any other govt. photo proof** document.
8. With consideration of atmosphere you are all requested to bring **water bottle.**

Note: Mid Sem Examination is scheduled for MBA Sem-1.

Regards,

School of Management, Commerce and Liberal Arts

Swarrnim Startup & Innovation University
Swarrnim School of Computing & IT
Gandhinagar

SWARRNIM SCHOOL OF MANAGEMENT
COMMERCE AND LIBERAL ARTS

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCHOOL OF COMPUTING & IT

UNIVERSITY EXAM TIME TABLE (REMEDIAL) (SUMMER 2023)

SEMESTER-3 REMEDIAL | YEAR:2022-23 | TIME:01:30 PM TO 04:00 PM

Date & Day	BCA-G	BCA DS	BCA CTIS	BCA MACT
23-05-2023 WEDNESSDAY	Entrepreneural Motivation 23000014			
25/05/2023 FRIDAY	Data and File Structure 13030301	Business Communication and Presentation Skills 14100307	Business Communication and Presentation Skills 14110307	Business Communication and Presentation Skills 14120307
29/05/2023 MONDAY	Relational Data Base Management System 13030302	Software Engineering 14100301	Software Engineering 14110301	Software Engineering 14120301
31/05/2023 WEDNESSDAY	Operating System 13030303	Machine Learning 14100302	Linux Administration 14110302	Linux Administration 14120302
2/06/2023 FRIDAY	Object Oriented Programming - I 13030304	Database Management Systems 14100303	Database Management Systems 14110303	Database Management Systems 14120303
6/06/2023 MONDAY	Software Engineering 13030305	Python programming 14100304	Python programming 14110304	Python programming 14120304
8/06/2022 WEDNESSDAY	******	Inferential Statistics 14100305	Network Security 14110305	Introduction to UI/UX 14120305
12/06/2023 FRIDAY	******	NoSQL Database 14100306	Fundamentals of Storage & Data Centres 14110306	Fundamentals of Storage & Data Centres 14120306

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SWARRNIM
SCHOOL OF BUSINESS

SMCLA/RepeaterRemedialMidSemExam/2023/070 Date: 18-10-2023

CIRCULAR

Dear Students,

It is hereby to inform that School of Business is conducting repeater remedial Mid-Semester examination for those students who failed in Mid-Semester components till summer 2023 examinations. With reference to Mid Semester Examination the following instruction has to be taken into consideration:

1. Your reporting time at allotted class room will be at least before **20 Minutes** of commencement of examination.

2. You are not allowed to bring **electronic gadgets / smart devices / mobile phone/ Bluetooth device/ Ear birds** etc. in the examination hall.

3. You need to keep your **bag / purse /wallet other non-stationary** belongings outside the examination hall and **Exchange** of stationary will be strictly prohibited in the class.

4. Bio break is allowed only **after an hour that too 1 time** only post commencement of the examination.

5. Note **kind of communication** and **Unfair Means** will be entertained

6. Student are here by instructed to bring **College ID card/Adhar Card/any other govt. photo proof** document.

8. With consideration of atmosphere you are all requested to bring **water bottle.**

Note: Repeater Remedial Mid Sem Examination is scheduled for BBA Sem-1, 2, 3, 4, 5, 6 B.Com Sem-1, 2, 3, 4, 5, 6 and MBA Sem-1, 2, 3, 4.

Regards,

School of Business

Swarrnim Startup & Innovation University
Swarrnim School of Computing & IT
Gandhinagar

SWARNIM SCHOOL OF
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SWARRNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCHOOL OF COMPUTING & IT

UNIVERSITY EXAM TIME TABLE (REGULAR) (SUMMER 2023)

SEMESTER-4 DEGREE REGULAR | YEAR:2022-23 | TIME:10:00 AM TO 12:30 PM

Date & Day	BCA-G	BCA DS	BCA CTIS	BCA MACT
23-05-2023 WEDNESSDAY	Intermediate Program in Entrepreneurship 12300012			
25/05/2023 FRIDAY	Object Oriented Programming - II 13030401	Big Data Analytics 14100401	Principles of Virtualization 14110401	Principles of Virtualization 14120401
29/05/2023 MONDAY	Open Source Technology 13030402	Advanced Machine Learning 14100402	IT Governance, risk, compliance and Information Security Audit 14110402	Introduction to Information Security 14120402
31/05/2023 WEDNESSDAY	Object Oriented Web Technology 13030403	Artificial Neural Networks 14100403	Ethical Hacking 14110403	Android Application Development 14120403
2/06/2023 FRIDAY	Data Communication and Network 13030404	Data Analytics using SQL 14100404	Openstack Cloud 14110404	Openstack Cloud 14120404
6/06/2023 MONDAY	Data Center Management 13030405	Data Visualisation 14100405	Windows Administration 14110405	Windows Administration 14120405
8/06/2022 WEDNESSDAY	*****	Logical Reasoning and Thinking 14100407	Logical Reasoning and Thinking 14110407	Logical Reasoning and Thinking 14120407

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SWARRNIM
SCHOOL OF BUSINESS

SMCLA/RemedialMidSemExam/2023/06| Date: 25-09-2023

CIRCULAR

Dear Students,

This is to inform you all that, **Remedial mid semester examination** is scheduled from **16th October, 2023**. With reference to Remedial Mid Semester Examination the following instruction has to be taken into consideration:

1. Your reporting time at allotted class room will be at least before **20 Minutes** of commencement of examination.

2. You are not allowed to bring **electronic gadgets / smart devices / mobile phone/ Bluetooth device/ Ear birds** etc. in the examination hall.

3. You need to bring your **bag / purse /wallet other non-stationary** belongings outside the examination hall and **Exchange** of stationary will be strictly prohibited in the class.

4. Bio break is allowed only **after an hour that too 1 time** only post commencement of the examination.

5. Note **kind of communication** and **Unfair Means** will be entertained

6. Student are here by instructed to bring **College ID card/Adhar Card/any other govt. photo proof** document.

8. With consideration of atmosphere you are all requested to bring **water bottle.**

Note: Remedial Mid Sem Examination is scheduled for the students of BBA Sem-1,3,5 B.Com Sem-3,5 BBA IN Sem-3,5 and MBA Sem-3. Students who failed or were absent during Regular mid sem exam or who took lateral admission in BBA Sem-1 are eligible to appear in remedial mid sem examination.

Regards,

School of Management, Commerce and Liberal Arts

Swarrnim Startup & Innovation University
Swarrnim School of Computing & IT
Gandhinagar

25/9

Dr. Varsha Patel
UG - HOD

Dr. Sourbhi Chaturvedi
Director

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

SWARRNIM SCHOOL OF COMPUTING & IT

UNIVERSITY EXAM TIME TABLE (REMEDIAL) (SUMMER 2023)

SEMESTER-5 REMEDIAL | YEAR:2022-23 | TIME:01:30 PM TO 04:00 PM

Date & Day	BCA-G	BCA DS	BCA CTIS	BCA MACT
24-05-2023 TUESDAY	Scaling up the Venture (Family Business) 23000020			
26/05/2023 THRUSDAY	Object Oriented Programming - III 13030501	Real-Time Data Processing 14100501	Digital Forensic & Investigation 14110501	Cloud Web Services 14120501
30/05/2023 MONDAY	Object Oriented Analysis and Desgin 13030502	Deep Learning 14100502	Cloud Web Services 14110502	IOS Application Development 14120502
01-06-2023 WEDNESSDAY	Android Programming 13030504	Natural Language Processing 14100503	Server Side Scripting 14110503	Server Side Scripting 14120503
05/06/2023 FRIDAY	*****	Information Security Fundamentals 14100505	Introduction to Internet of Things 14110504	Introduction to Internet of Things 14120504
07/06/2023 MONDAY	*****	Digital Image Processing 14100506	Information Security and Cryptography 14110506	Responsive Website Design 14120507

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Gandhinagar

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SWARRNIM
SCHOOL OF BUSINESS

SMCLA/MidSemExam/2023/57 **Date: 05-09-2023**

CIRCULAR

Dear Students,

As per Academic Calendar 2023-24 your mid semester examination is scheduled from **11th September, 2023**. With reference to Mid Semester Examination the following instruction has to be taken into consideration:

1. Your reporting time at allotted class room will be at least before **20 Minutes** of commencement of examination.

2. You are not allowed to bring **electronic gadgets / smart devices / mobile phone/ Bluetooth device/ Ear birds** etc. in the examination hall.

3. You need to bring your **bag / purse /wallet other non-stationary** belongings outside the examination hall and **Exchange** of stationary will be strictly prohibited in the class.

4. Bio break is allowed only **after an hour that too 1 time** only post commencement of the examination.

5. Note **kind of communication** and **Unfair Means** will be entertained

6. Student are here by instructed to bring **College ID card/Adhar Card/any other govt. photo proof** document.

8. With consideration of atmosphere you are all requested to bring **water bottle.**

Note: Mid Sem Examination is scheduled for BBA Sem-1,3,5 B.Com Sem-3,5 BBA IN Sem-3,5 and MBA Sem-3.

Kindly find Time Table of Mid Semester Examination attached

Dr. Sourbhi Chaturvedi
Director,
School of Management, Commerce and Liberal Arts

Dr. Varsha Patel
HOD, UG
School of Management and Commerce

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COMMERCE AND LIBERAL ARTS

SWARNIM SCHOOL OF
BUSINESS

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SWARRNIM SCHOOL OF COMPUTING & IT

UNIVERSITY EXAM TIME TABLE (REGULAR) (SUMMER 2023)

SEMESTER-6 DEGREE **YEAR:2022-23** **TIME: 10:00 AM TO 12:30 PM**

Date & Day	BCA-G	BCA DS	BCA CTIS	BCA MACT
24-05-2023 TUESDAY	Cyber Security 13030601	Cloud Web services 14100601	Cloud Scripting Using PASS 14110601	Cloud Scripting Using PASS 14120601
26/05/2023 THRUSDAY	Cloud Computing 13030602	ML using Cloud 14100602	Cloud Security 14110602	Cross-Platform Application Development 14120602
30/05/2023 MONDAY	Data Warehousing and Data Mining 13030605	Infrastructure Solutions on Cloud 14100604	Private Cloud Architecture 14110603	Private Cloud Architecture 14120603

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SOB/CIRCULAR/2023/023 Date: 14/06/2023

CIRCULAR

This is to inform all the students of MBA Semester-4 that Viva voce of grand project was arranged on 13th June, 2023 in which only few students has appeared for viva voce.

Students who have not appeared in viva voce on above mentioned date are here by informed that the viva voce of grand project has been rescheduled on 21st June, 2023. The 2nd chance is hereby given to you all because of end semester of MBA program, with kind consideration of career.

This to instruct you all that, if you are not remaining present as per revised scheduled i.e **21st June, 2023 09:00 AM** at campus, then your result will be withheld for grand project viva voce.

Note: Students who will not remain present will be in need to appear remedial viva voce in May, 2024

14/6

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School of Business
Swarrnim Startup & Innovation University

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Gandhinagar

Copy to:

1. The Registrar, Swarrnim Startup and Innovation University
2. The Academic Dean, Swarrnim Startup and Innovation University
3. The Controller of Examination, Swarrnim Startup and Innovation University

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SWARRNIM
SCHOOL OF BUSINESS

Ref: SWARRNIM/SMCL/CIRCULAR/2023/002 28/04/2023

CIRCULAR

This is to inform all the students of SWARRNIM School of Management, Commerce & Liberal Arts that **Mid Semester Remedial Examination** is scheduled between 08/05/2023 to 11/05/2023 2023. Students who have failed to appear in regular Mid Semester Examination are here by informed to appear mandatorily in Mid Semester Remedial Examination.

This is to bring notice to you all that if any student fails to appear in MID SEMESTER REMEDIAL EXAMINATION, She / He will unable to appear for University FINAL Examination.

Note: Kindly find Mid Semester Remedial Examination Time Table

28/4/23

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SWARRNIM
SCHOOL OF BUSINESS

Ref: SWARRNIM/SMCL/CIRCULAR/2023/001

18/04/2023

CIRCULAR

This is to inform all the students of SWARRNIM School of Management, Commerce & Liberal Arts that every student needs to remain present in their MID SEM as well as FINAL examination. It has been observed that many students are not appearing in the MID SEM examination which has been started from 17th April, 2023. This is to bring notice to you all that if any student fails to appear in MID SEM examination, She / He will unable to appear for University FINAL Examination.

Swarrnim Startup & Innovation University
Swarrnim School of Computing & IT
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18/4/23

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SYSTEM OF EVALUATION, AWARD OF CLASS AND CONVERSION TO PERCENTAGE

Grading: The total of the internal evaluation marks and Final University Marks in each course will be converted into a letter grade as well as to a 10 point scale as per following scheme:-

Total Marks (%)	80 and above	75- 79	66- 74	56-65	46-55	40-45	35-39	Less than 35
Corresponding Letter Grade	AA	AB	BB	BC	CC	CD	DD	FF
Numerical Point (Grade Point) corresponding to letter grade	10	9	8	7	6	5	4	0

SGPA/CGPA: The student's performance in any semester will be assessed by the Semester Grade Point Average (SGPA). Similarly, his/her performance at the end of two or more consecutive semesters will be denoted by the Cumulative Grade Point Average (CGPA). The SGPA and CGPA are calculated as follows:-

(i) SGPA=$\sum$ CiGi/$\sum$Ci, where Ci is the number of Credits of course i

Gi is the Grade point earned by student for course i

& i =1 to n, n = number of courses in semester

(ii) CGPA= $\sum$ CiGi/$\sum$Ci, where Ci is the number of Credits of course i

Gi is the Grade point earned by student for course i

& i =1 to n, n = number of courses of all semesters upto which CGPA is calculated.

Award of Class: The class awarded to a student in the programme is decided by the final CGPA as per the following scheme:

Distinction:	CGPA ≥ 8.0
First Class:	CGPA ≥7.0 <8.0
Second Class:	CGPA ≥5.0 < 7.0
Pass Class:	CGPA ≥ 4.0 < 5.0
Fail:	CGPA less than 4

Formula for Conversion of SGPA/ CGPA to Percentage: An equation to find equivalency between SGPA/CGPA may be obtained as:

Percentage Marks = (SGPA/CGPA - 0.5) x 10

Prepared By

Verified By

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

EXAMINATION POLICY
EFFECTIVE FROM (2023-2024)



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1. Introduction:

The Teaching – Learning processes, Research & Innovation are the most important characteristics of a University. It includes Curriculum Development, Curriculum Transaction and Curriculum Assessment. All the three activities are interlinked and are of equal importance. This manual is prepared with a focus on the Curriculum Assessment.

The faculties are at the forefront of Teaching-Learning process. A faculty's duty is to ensure that learning for the student is framed well by following the right curriculum, correct pedagogy and meticulous assessment.

As per the Gujarat Private University Act 2009, one of the mandates of Swarnim Startup & Innovation University is to confer Doctorate, Degree, Diploma, Grant Certificates and other Academic Distinctions based on the conduction of **Examination or any other Process of Evaluation** in accordance with UGC guidelines. This mandate is the prime component of the University System and widely seen as the principle yardstick evaluating the performance of the University in terms of fulfilling the purpose of its establishment and for accomplishing its long-term Vision and Mission.

The Administration and Conduct of the University Examination need to be very particular, transparent and accurate in executing the entire process taking into consideration every small detail. Considering this requirement, we have prepared this Examination manual to be used as a Guideline/ Reference Document for everyone who are part of various components of the University Examination Process.

Scope:

The scope of this manual includes Planning, Administration & Conduct of Examination, Preparation of all the University Examination's Results (Theory & Practical), Procedure for Degree Conferment (Convocation) and Procedures for enrolment generation and enrolment cancellation for all the candidates enrolled in various courses at the University.

2. MANUAL FOR CONDUCTING EXAMINATIONS AT SWARRNIM STARTUP & INNOVATION UNIVERISTY

We are in the system where the society at large believes that for the advancement of the career, the result of the examinations are the main source. It is also the duty of the University in this context that in addition to imparting the knowledge in the best possible manner, the knowledge gained by the students is assessed in terms of merit most judiciously and in a systematic way.

The University follows a regress system of assessment through multiple methods of assessment to monitor students' academic performance. The assessment is done to measure the knowledge, skills and application ability identified as integrated learning outcomes. The Course component assesses understanding of concepts, theories, practices, applications and discussion in respective courses.

One of the most important functions of the university is to hold examinations and confer the degrees and other distinction on students who fulfill the academic requirements / conditions. The entire work of examinations being governed by provisions in the regulations of Swarrnim Startup & Innovation University.

Therefore, it is very important at every stage right from registering the students to awarding the Degree to them, utmost care is required to be taken and the people working in the administration of conducting the examination should be guided in a organized way.

It is hoped that the adoption of practices in the manual which provides a level of constituency in various procedures in conduct of examinations and assessment practices that results in both quality and university standards.

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2.1 PROCESSES OF EXAMINATIONS:

The whole administration of conducting the examinations at the University level can be bifurcated into four different following processes:

2.1.1. Processes to be undertaken before the conduct of Examinations, which may be named as Pre Examination Processes (PEP).

2.1.2. Processes to be undertaken during the Examinations, which may be named as Concurrent Examination Processes (CEP).

2.1.3 Processes to be undertaken after the Examination, which may be named as Post Examination Processes (POEP).

2.1.4. Processes to be undertaken after the Declaration of Result, which may be named as Post Declaration Result Processes (PDRP).

Further, all sections are bifurcated into sub points as under:

2.1.1. Pre Examination Processes (PEP)

The Pre-Examination Processes are conducted by observing following procedures:-

i. **Getting the required stationary i.e. Main Answer Books, Additional Answer Sheets (4 pages), Question Paper Bags, Manuscript Cover, Mark sheet Cover, Cloth Cover for keeping Answer Books and other stationeries like Registers, Red Pens, Cello Tapes etc. for Assessment Cell.**

Three months before the commencement of First Semester End Examination, the Deputy Registrar (Examination) will ensure himself about the sufficient stock available for main answer books, additional answer sheets, question paper bags, manuscript cover, mark-sheet cover, cloth cover for answer books with and without gudder. If he feels that the new answer books are to be printed then he will immediately send the indent for getting this answer books along with additional answer sheets printed so that it will be available one month before the date of commencement of First Semester End Examination. For these answer books also the Stationary Stock Register will be maintained. Each main answer book and the additional answer sheet will have the number printed and when the answer books are supplied for the Semester End Examinations in to different Institutes, the entry of this will have to be made in the Stationary Stock Register mentioning the number of answer books supplied along with the additional answer sheet.

While issuing the Main answer books and additional answer sheets (4 pages) from the Control Room of the Institute to the Jr. Supervisor, the acknowledgement from the Jr. Supervisor should be obtained and the Jr. Supervisor will also receive these answer books duly verified. The Jr. Supervisor will prepare the report at the end of the Examination and will mention the number of main answer books and additional answer sheets (4 pages) issued to the students concerned against the number of students appeared in the Examination and the same will be cross verified by Sr. Supervisor before Submitting the report to the Control Room of the Institute and ensure that all the answer books supplied to the students are received back.

ii. **Examination schedules to be prepared for the Semester / Year End Examinations.**

The Concern Institute Head will notify the date of Semester/Year End Examination for respective concerned programmes of as per Academic Calendar provided by the Institute, 60 days before the commencement of the examination. Simultaneously in the same manner, the detailed examinations programme will be prepared and published one month before the date of commencement of the examination and it will be notified duly signed by the Deputy Registrar (Examination). While preparing the programme, he has to verify holidays. This examination programme will be in conformity with the Examination Scheme prescribed under the Regulations of different Faculties and for different programmes.

iii. **Calling a meeting of the Paper Setters and Examiners Committee for appointment of Paper Setters and Examiners from the approved panel of Paper Setters and Examiners and issuance of the Appointment order for Paper Setters/Examiners along with Guidelines/Instructions for preparing the question paper.**

As required under regulation for the appointment of the paper setters and examiners, the Deputy Registrar (Examination) will call meetings of all Institutes of such committee 45 days before the date of commencement of respective examinations.

The invitation is sent to the members who are duly notified for the purpose and the appointment of paper setters and examiners are made only from the panel approved by the Board of Studies concerned. At the end of the meeting minutes will be prepared which will be signed by all the members present in the meeting. This deliberation in the meeting and the list will be considered absolutely confidential and such list should be kept only with Deputy Registrar (Examination) and the appointments will be issued in the prescribed Proforma, and only one or two staff members should be identified from the Examination Section for getting these appointments printed so that the accountability can be established. These appointments should be issued 45 days before the date of commencement of the Examination along with the instructions to be observed by them as given in the appointment order.

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The University Examination Question Paper Set Committee – General Guidelines & Procedure:

- The faculty who is appointed by the Question Paper Setting Committee will prepare the question paper for end semester / year. The question paper setting committee comprises of the Chairman of Board of Studies, Head of Institute and Controller of Examination.
- Paper Setter Committee is formed at the start of every end semester / year examination. In the committee meeting, following agendas are discussed and included in its minutes of meeting:

1. Approval of the list of faculties submitted to the committee by the head of institute for the duty of paper setter by the committee. The list includes both, the faculty from the same institute and an external faculty. For each subject, two faculties from the submitted list will be appointed for setting of a question paper. Out of the two received question papers, one will be selected at random by the Exam Section on the day of exam.
2. Approving the invitation for the external faculties for setting of question paper as per the guidelines of Board of Studies or the Governing Council for concerned Institute.
3. Approving the question paper format as per the teaching scheme and the format of Duty Order for setting of question paper.
4. Finalizing the guidelines for setting of question paper. The guidelines will be included with the appointment order sent to the faculties, both internal and external.

iv. **Collection of Question Papers from the Paper setters in sealed cover.**

The Deputy Registrar (Examination) will also see that once the appointments are issued 2 sets of question paper are submitted in sealed cover dully signed by the paper setters for the respective examination and of the respective course at least **25 days** before the date of Examination. Out of these two sets of question papers, one set will be selected jointly by the Registrar & Controller of Examination on the previous day of Examination. The selected question paper in sealed cover will be signed by both the officials and it will be kept in custody of Deputy Registrar (Examination).

v. **Course wise and semester wise list of eligible students will be prepared for appearing in the Semester End Examination.**

An enrolled candidate shall be considered eligible for appearing in the end semester / year examination subject to the fulfillment of the following conditions:

1. A candidate has satisfactorily completed the semester if,
   a. The attendance is at least 75% in the semester / year of the course, unless otherwise recommended by the Exam Section and approved by the Provost.
   b. He/she has carried out the planned lab work, term-work and other curricular assignment satisfactorily during the semester / year.
2. A candidate has paid the complete Tuition Fees and Examination Fees for the current Semester / Year in stipulated time period as per the Fee Structure approved by the Regulatory Authority of the State or the University.
3. Candidate have filled in the examination form within the stipulated time period.
4. After the student have filled in the exam form, the student should have hall ticket bearing his/her name, enrollment number, photograph and authorized signature along with a Photo Identity Proof to appear in the Examination Hall. In absence of any of the mentioned document, the student will not be allowed to appear in examination.

- Head of institute will provide the list of eligible students to the exam committee within the time frame decided by the exam committee.

Block and Room wise Seating arrangement of the students will be prepared by the concerned Institute for appearing in the Examination.

Course wise and Semester wise data of the eligible students for appearing in the examinations will be prepared and verified by the Office Superintendent and signed by the Deputy Registrar (Examination) and same will be sent to the Institute Examination Coordinator for making arrangement of Block wise seating and supervision. These data will also useful to the Examination Section of the University in deciding the number of question papers to be printed in the different courses.

vi. **Appointment of Senior and Junior Supervisors.**

15 days before the date of commencement of Examinations, the Deputy Registrar (Examination) in consultation with the Head of the Institution of the respective Institute will list out the names of the faculty to be appointed as Senior and Junior Supervisor and 10 days before the date of commencement of examination, the appointment will be issued. The duties & responsibilities should be followed by the Senior Supervisor and same will be sent to him along with the appointment order. The instructions should be followed by the Junior Supervisor and same will be sent to him along with the appointment order. For every 05 blocks of 30 students each, there will be one Senior Supervisor and for each block of 30 students, there will be one Junior Supervisor. For each 10 Junior Supervisor, there will be one more Junior Supervisor who will be the reliever and two more Jr. Supervisor will be appointed to take care about emergency. So there will be three additional Junior Supervisors appointed for every 300 students.

vii. **Getting the marks and grades obtained by the students in component examinations (CE and LPW/PW) from the Institute before commencement of Semester End Examination.**

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Students are normally assessed course wise based on the following components as approved by the Academic Council from time to time:

a) Continuous Evaluation (CE)

b) Mid semester Examination/Laboratory Project Work (LPW) / Project Work (PW)

c) Annual/Semester /Year End Examinations

- In the beginning of the semester, course faculty will plan and inform the concerned students about different types of assessment components of a course under continuous evaluation (CE) like Class Test, Term Assignments, Oral, Quiz etc. with its inter-se weightage. The course faculty will continuously evaluate each unit of assessment components of a course and marks will be given accordingly. At the end of the Semester / Year , the respective faculty will aggregates the marks obtained in each component Based on the interse weightage of different sub-components of CE to arrive at the overall percentage of marks under continuous evaluation and it will be submitted to the Examination coordinator of the Institute.
- During every semester, there will be at least one internal exam with continuous evaluation for all the subject/courses. The weightage of this Internal Exam and Continuous Evaluation will be 50%. This will also be a part of internal evaluation.
- The duration of the internal examination will be of two hours with a maximum of 5 questions and 50 marks.
- The internal exam will be compulsory. However, for those students who miss the internal examination for any reason, a remedial examination will be arranged. The student will have to pay Rs. 200 per paper/subject for the remedial examination. The score obtained in this test will be considered as final.
- The internal and continuous evaluation marks will be shown separately in the internal result issued by respective Department. These marks will be added to the semester/annual examination marks for determining SGPA/CGPA of the student.
- Internal Exam Seating Arrangements should be decided by the Dean/HOD of the institute and all rights reserved with HOD/Deans for the internal examination.
- Each institute will submit its internal evaluation marks with continuous evaluation at least one week before the University Examination to the Exam Section.

viii. **Getting the detention list from the Institute.**

Those students who are not meeting with the academic requirements for appearing in the Semester End Examination are detained and the **Institute has to provide** the list of such students to the Dy. Registrar (Examinations) before commencement of the Semester End Examination. Detained students are not eligible to appear in the Semester End Examination.

ix. **Appointment of Observers.**

For smooth conduct of examination, appointment of Observers will be made from the panel approved by the Registrar. One Observer will be appointed for 300 students (10 Blocks) appearing in the examination. Observer will have to visit twice during the examination in the assigned blocks and at the end of the examination, he / she has to submit the report to the Dy. Registrar (Examination) in prescribed format. Based on the Observer's report the Dy. Registrar (Examination) will take action if required for the smooth conduct of examination. Normally it will be the duty of the Sr. Supervisor to observe the smooth conduct of examinations.

x. **Provision for providing a writer to the student in case of inability for writing the answers in the examinations.**

In case of inability for writing the answers in the examination student has to apply to the Head of Institute with application as per guidelines of the University for getting the writer and Head of Institute will forward the application to the Examination Section.

Guidelines to provide a writer to the examinee in case of inability for writing the answers in the examination.

- The Concerned examinee who has inability of 40% or more, if so desires to have a writer in the examination then he/she shall make an application before 48 hours of the date of the commencement of the examination, to the Head of the Institutions (HoI) in the prescribed format for allowing him/her to take the help of a writer in any of the examinations.
- The Head of the Institute concerned will carefully examine the following documents and if found in order, will permit the examinee to take the help of a writer.
- Documents required:

1) Medical Certificate (showing 40% or more inability of the student concerned) from the duly registered recognized Doctor in the concerned specialization i.e. related to the disease due to which the help of the writer is requested for.

2)Name and credentials of the proposed writer along with his/her authorized identity proof and also the qualifications he/she has, as per the satisfaction of the HoI concerned.

3) Respective Head of the Institute will examine an application of such student and approve the same and forward its intimation with supporting papers to the Examination section of the University.

4) Student with such inability can arrange for a writer on his own with his full details and submits the details to the HOI before 48 hours of starting of examinations. Alternatively, student can also seek an assistance of providing a

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Writer from Institute concerned. In case of a writer provided by the institute, student will be allowed to meet such person before a day to get acquaintance. Student can have more than one writers as may be required for different examinations especially for languages.

5) On satisfaction of the HOI, an order of permitting/allowing for a writer to respective student will be issued by the HoI under intimation to the concerned department, student section of the institute, Sr. Supervisor/Jr, Supervisor/invigilator and to the Dy. Registrar (Examination)
6) Institute will make a separate seating arrangement of such student and arrangement for Invigilator etc.
7) Student with such inability will be provided 20 minutes extra time per hour (i.e. 04 hours in case of 03 hours).
8) Answer-books of such students will be required to seal in separate envelope and to send the same to the Dy. Registrar (Examination) with remarks in the Jr. Supervisor reports along with a copy of letter of permission given for writer.

xi. **Multiplication of copies of the question papers depending upon the number of eligible students in examination. Course wise and Block wise sealed packets of question paper will be prepared for holding examinations.**

After proof reading the question paper same will be given to the senior person of the Examination Section for getting the multiple copies of question paper. Till the time the question papers are distributed in the Examination Hall, the person / persons who is / are involved in getting these question papers ready will be kept comfortable in the Examination Section under the prohibited area. The multiplied copies of the question papers are sealed in the question paper bags by the Office Superintendent himself with the help of the staff of Examination Section. It will also be the duty of the concerned Proof Reader to verify the content printed to avoid any kind of last minute mistake. This process will be a continuous process every day until the Examinations are over. A Register in this respect will be maintained in the Examination Section where the Special Supervisor and Proof Readers will make entry in the Register about the arrival in the Examination Section in terms of time and the date and the departure duly signed by them.

2.1.2. Concurrent Examination Processes (CEP)

The Concurrent Examination Processes are conducted by observing following procedures:-

i. **Sealed packets of question paper will be handed over to Sr. Supervisor for distribution in the Examination Hall.**

Sealed packets of the question papers will be handed over to the Control Room of the concerned Institute ½ hour before the commencement of the Examination and then the same will be given to the concerned Sr. Supervisor for distributing to Jr. Supervisor Block wise. Before distributing the same it will be the responsibility of the Senior Supervisor to verify whether the packets of question papers supplied to them by the Control Room are in sufficient number required and then they will distribute the question papers to the Junior supervisor block wise. The Junior Supervisor will open sealed cover five minutes before the commencement of the Examination, verify whether the question paper is of the same course for which the examination is scheduled, and start distributing the question papers sharp at the time of commencement of the examination. If any discrepancy arises, he / she has to report to the Deputy Registrar (Examination) immediately through Senior Supervisor and will not distribute the Question Papers.

ii. **Reporting of the Unfair-means cases noticed during the examination.**

All cases of the Unfair-means during the Examination are immediately reported to the Dy. Registrar (Examination). There can be two kinds of cases with regard to unfair-means used in the Examination. One which can be detected by the Junior Supervisor / Senior Supervisor / Observer in the Examination Hall itself and the second may be detected while assessing the answer books by the Examiner.

Unfair Means Practice by student In Examination:

- If the Invigilator notices that any candidate is indulging in copying or possessing a manuscript or Answer Booklet other than that of the candidate, any written material on Calculator, Geometry Box, Scale/ Electronic Gadgets, he/ she shall immediately take in his/ her possession the candidate's Answer Booklet, question paper, and the materials which he / she has used or intended to use for copying and immediately report to the senior supervisor.
- Malpractices are recorded in the appropriate form along with a statement from the candidate in the presence of the senior supervisor.
- Invigilator should ensure that if a candidate is asked to give a statement in connection with suspected or proven malpractice or use of unfair means but is unwilling to do so, she/he shall not be forced to give the statement. The fact of his/her having refused to make a statement shall be recorded by the Invigilator in the

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presence of the senior supervisor on duty, at the time of occurrence or detection of the incident or immediately thereafter.

- The senior Supervisor of the examination block will take related proof of unfair means and along with the prescribed format and that will be handed over to the controller of examinations.
- **Verification of Answer Books with the report of the Junior Supervisors by the Senior Supervisor(s).**

  While receiving the answer books from the Senior Supervisor the senior person of the Examination Section will again verify the number of answer books received and compare it with the total number of answer books of the course mentioned in the Senior Supervisor's report.

iii. **Collection of Answer Books from the Senior Supervisor in the prescribed format every day after completion of the Examination.**

Every day at the end of the Examination the Senior Supervisor will collect the answer books from the Junior Supervisor and verify the same in terms of number of students appeared in the examination. After verification, the Senior Supervisor will submit the Answer Books to the responsible staff members of the Examination Section of the University. The unused answer books will also be returned to the Institute Examination Coordinator by the Senior Supervisor on the same day and it will also be reported in the format to be submitted to the Institute Examination Coordinator.

iv. **Dealing with the discrepancies if found while receiving the Answer Books etc., from the Senior Supervisors or Examiners.**

If any discrepancy arises while receiving the answer books either from the Senior Supervisor or from the Examiner, the said should be recorded and conveyed immediately to the Senior Supervisor or Examiner and the Senior Supervisor or Examiner should give clarifications in this respect without any waste of time on the spot. In case he wants to verify the same after getting confirmation from the Junior Supervisor then he has to call the Junior Supervisor immediately and if the Junior Supervisor is not available, then the Senior Supervisor will sign the discrepancies pointed out and then on the next day he will submit the clarifications.

v. **Arrangements to be made for the assessment of answer books at Central Assessment Cell on the campus.**

As per decided schedule Coordinator of Central Assessment Cell will call the examiners in the Assessment Cell for assessing the answer books. Sealed answer book packets will be given to the concerned examiner along with the Instructions for Assessing answer books. Coordinator Central Assessment Cell will maintain the Register of issuing answer books to the examiner. Every day at the end complete or incomplete packets of answer books will be taken back in sealed position to avoid any kind of discrepancy. In cases of External Examiners, the Remuneration, Traveling Allowance and Dearness Allowance will be paid as per University Norms. Remuneration bill will be available with the Central Assessment Cell for External Examiners. After the assessment work of External Examiner is over, he will fill - in the bill of remuneration and send it to Concern department through COE approval & file of All External Examiners remunerations sent for payment to the Account Section by the Concern Department. Furthermore in this case summary of Approved TA, DA bill has to be submitted to the Examination Section by the Department.

vi. **Observer will submit the Observer's Report to the Deputy Registrar (Examination) everyday at the end of examination.**

Wherever the observers are appointed for the Examination, the said observers are supposed to submit the report in the prescribed format appended as Appendix – L everyday evening to the Examination Section. If they do not find any discrepancy or any kind of untoward procedure while examining the examinations system, they would at least report that the "Examination was conducted smoothly". The observers will have right to catch the students who is using unfair means and give that case to the Junior Supervisor to deal with the cases further as per the procedure. However such observers while submitting the report to the Examination Section will mention these kind of cases in its report i.e. the number of students, the subject under which the case is caught, time and date of catching the student and the brief description about the unfair means used.

2.1.3. Post Examination Processes (POEP)

The Post Examination Processes are conducted by observing following procedures:-

i. **Assessment of Answer Books by the appointed Examiners at the Central Assessment Cell on the campus.**

Assessment of Answer Books by the Examiner will be done section wise in the Central Assessment Cell. Course wise meeting will be arranged between the Convener and Co-Convener examiners after completing the assessment of the course, they will verify and ensure that the marks entered in each section are correctly carried forward from the answer books to the mark- sheet and also verify the totaling of marks of both the section. A brief minutes in the prescribed Proforma will be prepared where the process is undertaken by the Convener with the help of Co-convener examiner will be recorded and signed by both of them.

ii. **Payment of TA/DA and Remuneration to the External Examiner.**

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Immediately after the Assessment is over, the TA/DA and Examination Remuneration will be paid as per Remuneration Policy of University.

iii. **Calling a meeting of Examination Reforms Committee to deal with the cases of Unfair- means reported during examination and or assessment of penalty to be imposed on the students as per Swarrnim Startup & Innovation University norms.**

During examinations, the cases of the unfair means in examination are reported to the Deputy Registrar (Examination). As soon as the examinations are over the Dy. Registrar (Examination) should call the meeting of the Examination Reform Committee and deal with such cases as per the provision of the regulation i.e. issuing charge sheet to the students, calling them before the Examination Reform Committee, examine the relevant documents, showing them to the student concerned, preparation of minutes of such committee along with the recommendations, getting the recommendations approved by the Dean / Head of the Institution concerned and issue a letter of imposing penalty, make entry in such respect in the office register against the name of the student and declare the result of such student accordingly. As far as possible, this process should be completed simultaneously with the process of preparation of result of the respective semester. In case this particular procedure due to certain difficulties is not over before the date of declaration of the results then the result of such students involved in unfair means should be kept as withheld under the notification to be published and as soon as this procedure is over, a supplementary notification is supposed to be issued imposing penalty or declaring their result if they are found innocent and entry in this respect against his name should be made in the Office Register. Copies of this notification imposing penalty should also be sent to all the Institutions, all the Heads of the Department of this University as well as to all the Universities in the State.

iv. **Coordinator of Central Assessment Cell send the course wise Dummy sheets of Semester End Examinations to the Dy. Registrar (Examination).**

Co-ordinator of Assessment cell will send the course wise Dummy sheets of Semester End Examination and submit it along with answer books to at the end of each day of assessment.

Course wise entry of marks of Semester / Year End Examinations and merging with respective marks of CE, LPW/PW.

After receiving the course wise marks and Grades obtained by the students in component examinations i.e. CE, LPW / PW from the Institute in hard and soft copy and same will be verified by the senior staff of the Examination Section and transfer it into computer. Then after section wise and course wise marks obtained by the student in Semester End Examination will be entered in the Computer. One data entry operator enter the marks of Section I, another will enter the marks of Section II and the entry of totaling of marks of both the section will be made by the senior staff of the examination section so that any discrepancy arises due to typographical error by the previous data entry operator can be rectified.

v. **Consolidation of Marks of CE, LPW/PW & SEE according to its weightages and computation of percentage marks for each course.**

After completion of the above data entry of marks of CE, LPW / PW and SEE for a particular course, the Conversion Sheet will be prepared and Marks / Grades and weightages will be verified by the senior persons of the Examination Section.

vi. **Course wise Conversion of marks into letter grades should be prepared as per prescribed guidelines approved by the Academic Council.**

Aggregate marks of the entire group in the conversion sheet are taken into consideration to assign a Grade to the student based on his aggregate percentage viewed in relation to the overall performance of the group. The Co-ordinator / Head Of Institute / Head of Department will decide the cut off percentage of relative group subject to guidelines prescribed by the Academic Council.

vii. **Calling a meeting of the Examination Committee for approval of results.**

Once the above processes are over and the results are ready of all the course of a particular semester, then a meeting of the Examination Committee as envisaged under the Regulation will have to be called and the course wise data in terms of numbers of students appeared and the number of students getting different grades are to be submitted to the Examination Committee and based on the data, the committee will examine the result and decide to declare the same. However, if it is found that there is some abnormality in result then as per the provision of the regulation, the appropriate recommendations of the committee will be submitted to the Academic Dean & Registrar for their approval.

viii. **Withholding the result due to administrative / technical difficulty.**

In case of exigencies where the result of a particular student can not be declared due to some administrative / technical reasons then the result of such student can be withheld and the results of the remaining students should be declared. However, once the administrative / technical difficulty is removed or solved, the result of such student will be declared under a supplementary notification and the copy of this notification should be sent to all concerned and attached with the concerned office register. The entry in this respect will also be made against the student name in the Office Register Mentioning the notification number and date with signature of Dy. Registrar (Examination).

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ix. **Preparation of notification for declaration of result.**

Once the decision is taken by the Committee to declare the result, a notification of announcing the result course wise will be published and placed on the appropriate place on the campus at notice board and also a copy of the same will be sent to different HODs and Heads of the Institutions. Timeline for declaration of result is 30 days from last scheduled examination.* **(* - Date may vary due to Pending paper assessment & various circumstances approved by Registrar.)**

Result Declaration, Mark Sheet Printing & Mark Sheet Distribution Procedure:

- The exam committee will have in its Vigilance committee the members who will be exclusively monitoring the result declaration, mark sheet printing and mark sheet distribution process for the particular semester / year exam process. They may be given special task of critically analyzing any of the other semester / year examination process if required.
- The committee will comprise of Academic Dean & Professor Cadre faculty from the constituent institutes of the university. The Exam Committee will recommend the names of such faculty. The exam committee will submit the recommendation to the Registrar Office for further authorization and approval. The Registrar Office will be submitting their recommendations to the Provost. The Provost will approve the final list of faculties for the Vigilance Committee.
- After the final approval, exam committee will be issuing official duty orders to the concerned faculty.
- The member faculties of the vigilance committee will be monitoring result preparation process to maintain transparency and authenticity of the process. Once prepared, the members will be preparing a detailed analysis of the result and present it to the Provost and the Registrar Office for their approval.
- The committee will be incorporating the suggestions and recommendations made by the Provost and the Registrar before declaring the result amongst the students.
- Once the result is declared, the exam committee will be initiating the process of getting the mark sheets printed and distributed amongst the students.

• The detailed process will include the following points:

1. The exam committee will be preparing student data as per the format required for getting mark sheets printed. The committee will also prepare list of students whose data will be sent for mark sheet printing.
2. The list will be submitted to the vigilance committee for verification. The vigilance committee will be verifying the list with the result declared. The verification process can take up to maximum of **2 working days**. Once the verification is completed, the list is returned to exam committee with vigilance committee member signature.
3. The exam committee will submit this list to the Registrar Office for their verification and approval Once the exam committee receives the approval from Registrar Office, the same will be submitted to the Provost for final approval. Once the approval is received from the Provost, the data as per format will be sent to the vendor.
4. The formatted data is sent to the vendor through a single official e-mail ID which will only be accessed by the Controller of Examination (COE).
5. The approved list by the vigilance committee, Registrar Office and Provost will be submitted to the Registrar Office with a copy to exam committee for further verification of the printed mark sheets.
6. The COE will receive an approval copy of the mark sheet for verifying all the related details before confirming final printing. Once the approval copy is verified for all the mentioned details, COE will give an approval through the same mail for printing the final mark sheet.
7. The COE will receive the printed mark sheet from the vendor once the confirmation of printing completion will be received from the vendor.
8. COE will first submit the received mark sheets to Registrar Office for verifying the printed mark sheets received with the list of students approved initially.
9. The Registrar Office will verify and approve for:- **1.** Mark Sheet distribution and **2.** Payment to the vendor for the same.
10. Exam committee will be starting the distribution process by preparing list of received mark sheet department wise, institute wise.
11. Once the list is prepared, the exam assistant will be sending out the mark sheet with the list to the entire respective Institute. The head of institute will receive the mark sheet and put in the signature against receipt of the mark sheet.
12. The signature copy from all the respective head of institute is kept in exam section record room of the university under the authority of the exam committee.
13. At the institute the head of institute will hand over the mark sheet to the institute exam coordinator for distributing it amongst the students.
14. The institute exam coordinator will maintain the record of the received mark sheet and the signature sheet of the students against the receipt of their respective semester / year mark sheet.

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2.1.4. Post Declaration Result Processes (PDRP)

The Post Declaration Result Processes are conducted by observing following procedures:-

i. Rechecking Reassessment Process:

After the declaration of result of the term / semester end examinations as well as the sessional / internal test examinations, if any student has any grievance about the marks / grade obtained, he may apply in the prescribed proforma to the Deputy Registrar (Examination) of the University within a **three days** with the fees prescribed for the verification of marks and the said verification will be completed within **7 working days** from the date of the receipt of application and convey the final outcome of the verification to the student concerned. These verifications includes following:

- Whether all questions attempted by the candidate have been assessed and this assessment is included in the overall performance sheet of the candidate for assigning grade.
- Whether there is a totaling / calculation mistake in marks / grade.

ii. Preparation of Semester Grade Reports, Transcripts and Provisional Passing Certificates etc.

As far as possible along with the office register the individual student wise Semester Grade Report should also be prepared and sent to the Institution concerned for giving it to the student concerned. The Provisional Passing Certificate, Semester Grade Report and Transcript will be prepared for the students of final semester after declaration of result and sent to the **student section** of the University for distributing it to the students concerned.

iii. Process related to Award of Degrees.

(a) Preparation of the list of the students who are eligible for award of Degree.

As soon as the results are declared particularly for the final year at Under Graduate and Post Graduate level, a list of eligible students for awarding degree will be prepared. The list will be checked with the original record first by the Office Superintendent, then by the Dy. Registrar (Examination), COE and Dean of the concerned department.

(b) The list of the pass out students of the Programme will be prepared and put before Academic Council and Board of Governors for its approval.

The list of the pass out students of the Programme will be prepared and put before Academic Council and Board of Governors for its approval.

The list of pass-out students will have to be submitted to the Assistant Registrar (Academic) for putting it before the Academic Council and then the Board of Governors for approval.

(c) Inviting applications for conferment of Degree.

Along with the registration of courses of the final Semester / Year students, Convocation Form Appendix – O for conferment of Degree will also be got filled in from the student along with the convocation fee where the student will express his desire as to whether he wants to receive Degree in Presentia or Absentia. A separate list of students is prepared who want to receive their Degree in Presentia and Absentia. Depending on the list of the students receiving Degree in Presentia, a preparation of the conferment of Degree in the convocation will be arranged. The students who have desired to receive Degree in Absentia, the Degree Certificate will be posted by Registered A.D. Post Parcel on the address mentioned by the students in the Convocation Form.

(d) Printing of Degree Certificates and affixing Holograms on the Degree Certificates.

As soon as the list of awardees is prepared, simultaneously with the process of getting approval from Academic Council and Board of Governors, the Degree certificate will be printed. The Degree Certificate will be duly certified by using signature stamp of Director General and President. While preparing the degree certificates Hologram of the University will be affixed on the Degree certificate for security check. Such certificates will be handed over to the student in a good folder.

(e) Preparations for holding the Convocation.

The process of convocation will be decided separately and the preparations will be done accordingly

2.1.4.1.Convocation Procedure:

- The exam committee will form Convocation Committee. The committee will work out the date, time, dress code and venue for the convocation. The committee will shortlist names of prominent personalities for Chief Guest, Guests of Honour and other special invited guests. The committee will receive the list of students who will be awarded degree.
- The committee will submit these details before the Board of Management for their approval.
- The committee will start preparing for the convocation after the approval from the Board of Management.
- Once the approval is received, the committee will first send out convocation forms to the students through website, exam section notice board and institute bulletin boards. The students will be given a choice of receiving degree certificate either "In Person" or "In Absentia". Exam committee will be declaring circulars from time to time regarding

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details for the students to follow on the day of convocation along with the convocation fees to be paid.

- The committee will also send out the invites to the Chief Guest, Guests of Honor and all the guests approved by the Board of Management.
- The committee will notify the exam committee to prepare data of the eligible students as per format and send it for degree certificate printing to the designated vendor. Once printed, it will be procured by the exam committee and submitted to the convocation committee for further process.
- The exam committee will be submitting the request to the Registrar for carrying out the process of getting degree certificate printed.
- Firstly, the design of the degree certificate will be worked upon and approved by the Registrar, Provost and Members of the Board of Management. Once the design is finalized, the Registrar office will issue the authorization.
- Once the exam committee receives authorization from the Registrar Office, the same will be submitted to Provost for further approval. On receiving final approval from Provost, the exam committee will initiate the process of getting degree certificate printed.
- The convocation committee will form sub-committees for coordinating the convocation related tasks. The sub-committee will be carrying out all the tasks from selecting the vendor, work design, work plan to delegation of work under the direct supervision of the convocation committee chairperson.
- Sub-committees will be formed for arranging:
  a) Decoration of the venue selected for the convocation and seating arrangements for all the invitees for the convocation. The committee will take care of security and discipline throughout the convocation ceremony.
  b) Dress for University Officers, Members of Board of Management, Chief Guest and the students as per the dress code.
  c) Hospitality of the Chief Guest, Guest of Honour, Members of Board of Management, special invited guests, students getting degree and their family present for the convocation.
  d) Arrangement of the Medals to be awarded at the time of convocation.
  e) Preparation of the convocation flow, speech (by University Authorities, Chief Guest and Members of the Board of Management) and execution plan of the convocation ceremony.
  f) Managing the coming and receiving of the degree certificate and medal by the students and their taking back their seats.

The sub-committees will comprise of the faculties appointed from all the concerned constituent institutes for the convocation.

(g) Correspondence with the pass out students of the Programme with regard to Convocation activities.

Once the date of convocation is decided, at the earliest a letter along with full instructions should be sent to such students through email so that they can come well prepared to attend the Convocation.

iv. Disposal of records & written Answer Books.

Normally the answer books of Semester End Examination will be kept in custody for 3 years and all the answer books after the said period is over can be given to a paper mill for crushing the same or given to the paper purchasing company and a certificate is obtained from such mill / company that it will crush the answer books and it will not be sold just as it is or will not be taken in use of any other kind. However, while disposing the answer books, care should be taken that if there are any disputed cases which are under inquiry, are not destroyed and they are separately taken out. Other records related to Examinations will be disposed off as per the circular of Registrar office.

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2.2. University Theory Examination – General guidelines and Procedures:

❖ Once the appointments are completed, exam committee will begin with additional procedures as follows:

1. The Exam Committee will call Question Paper Setter Committee Meeting and Answer book Assessment Committee meeting once the exam schedule has been declared and begin with the procedures involved.
2. The exam committee will prepare remuneration form to be filled by all the invited faculties for discharging exam duties allocated to them. Based on the details filled in the form, remuneration will be disbursed to the faculty.
3. Exam committee will receive the list of eligible students as per the aforementioned guidelines for appearing in the University Examinations from the Head of the Institute.
4. In case of any differently able candidate or a candidate having any major medical problem, exam committee will make provision for special seating arrangement and / or allow a writer during an examination. In such a case, an application is to be made by the candidate through Head of institute at least before 15 days of the examination. Only in case of any unexpected Medical Emergency, an immediate provision will be made with approval from Provost. The required documents to make such an application would be: -

   a. Application written by the candidate to exam committee undersigned by parent and head of institute.

   b. Official certificate mentioning the student to be differently able.

   c. A written statement from a Doctor working in a Government Hospital regarding medical problem.

   d. Supporting documents related to hospitalization and other medical procedures carried out.
5. Once the list is received, exam committee will begin the process of preparing hall ticket for the eligible students who have filled up the examination forms. Once completed, committee will distribute hall tickets amongst the students in coordination with the head of institute and institute exam coordinator.
6. The Exam Committee prepares the seating arrangement for the students going to appear in the exam. The students are divided equally amongst the exam halls. In each hall, 30 students are accommodated for maintaining confidentiality. Each exam hall is declared as a block. To each junior supervisor, a block is allotted during the examination. To each senior supervisor,5 such blocks are allotted during the examination.
7. Each examination hall will be under surveillance by CCTV camera installed in each of them. The access to the monitoring will be at the central examination. It will be used during the examination by the observer. The system comes with a video recording facility. The same can be utilized in case of any malpractice reported.
8. Exam committee will next begin with the preparation of all the documents required during the conduct of the theory examination. These documents include: -
   a. Student Signature Sheet
   b. Junior Supervisor Signature Sheet
   c. Junior Supervisor Signature Sheet
   d. Stationary usage report for maintaining the usage of the stationary and supporting materials allotted in Exam Hall. The junior supervisor in the exam hall will fill it in.
   e. Student attendance report for maintaining the number of students present in each of the examination hall during the examinations.
   f. Compilation report for stationary usage for maintaining compiled data of the stationary and supporting material usage for each day of the examination. The senior supervisor at the end of the examination will fill it in.
9. A circular is declared from the exam committee to head of institutes for submission of the marks of all the internal components as per the BOS approved teaching scheme. These marks are to be submitted by the head of the institute to the exam section within 7 working days from the date of completion of the academic term as per the academic calendar.
10. Exam committee will send marks entry formats to the head of institutes along with the circular. The formats will include: -

    1. Mark sheet to be filled by the head of institute.

    2. Mark sheet to be filled by the examiner conducting Practical and Viva-voce examination.
11. The same mark sheet formats will be further used by the exam committee to enter the marks of the university examinations for both theory and practical part. The marks entry begins for theory part after the completion of the answer book assessment and for practical part after the completion of practical and viva-voce.
12. For securing the identity of the student appearing for the exam, the university exam committee have put into effect a barcode printing facility. These barcodes are printed before the examinations for each and every student appearing for the examination and are included as a stationary to be carried to the Exam Hall by the Junior Supervisor.

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13. The exam committee does the coding of the barcode and its mapping with the actual student enrolment. It is kept confidential and is updated every exam session to avoid pattern or repetition. The coding of the barcode is done in such a manner that other than exam section no one can understand the encoded data. Hence, even if someone can read the barcode data, the number obtained will be of no use.
14. Exam Committee securely stores the received question papers from the appointed faculties. The Exam Committee has a dedicated infrastructure for safe storage of all the Exam related stationary & materials.
15. In case, if any appointed faculty is unable to discharge their duties due to any demanding situation, the exam section will immediately send out revised appointment to any of the faculty member from the list available to the exam committee after the approval from the Provost.

2.3. University Practical and Viva-voce Examination – General guidelines and Procedures

- The examination committee will conduct university practical and viva – voce examinations in coordination with the respective institutes.
- The conduct of University practical / viva examinations will be conducted in the institute laboratories. The laboratories will be selected by the head of institute as per the subject for which the examination is scheduled.

Appointment of the Faculties:

- The exam committee will be appointing an internal faculty in each course and each department for coordinating the practical and viva-voce examinations. Exam committee will hold a meeting with head of institute to receive names of the internal and external faculty for conducting practical and viva-voce.
- The faculty will be appointed from the list recommended by the head of the institute. The Provost will approve the faculty appointment from the list submitted by the exam committee.
- The exam committee will be inviting a faculty from other Institute or University as an external faculty for conducting practical / viva examination as per the guidelines of BOS or the Governing Council for concerned Institute.
- The conduction of the examination by an internal or external faculty will be defined based on the guidelines of BOS for the particular course. Accordingly, faculties will be appointed following the procedure mentioned.
- Once an approval is received, exam committee will send out request invitation to the external faculties for conducting the practical and viva – voce mentioning date, time and location of conducting the examination. On receiving the confirmation from the faculty, an appointment order is sent to them.

2.4. Duties and Responsibilities of Sr. Supervisor for conducting Semester End Examination of the University.

- Prepare it list of Jr. Supervisors before two days of commencement of examination.
- Appointment of Jr. Supervisors should be made at least before two days of commencement of examination and pass on the necessary instructions regarding their duties by calling their meeting.
- Appointment of stationery clerk, peons etc should be made as services required.
- Seating arrangement should be prepared as per examination programme and display it on the notice board before one day of the commencement of examination.
- Receive the sealed packets of question papers before 20 minutes of commencement of examination from the Examination Section of the University.
- Hand over the sealed packets of question papers to Jr. Supervisor in their respective block before 10 minutes of the commencement of examination and instruct them to open before 5 minutes for distribution and if they have ally query, immediately they should report to the Sr. Supervisor only.
- Vigilance should be kept intact during examination hours by constant round of the blocks where examinations are conducted.
- After half an hour collect the remaining unused question papers and main answer books from each block and keep it with the Sr. Supervisor. upto the end of the examination session.
- At the end of each examination session, fill-in Senior Supervisor's Report attached herewith and submit it to the Deputy Registrar (Examination) along with remaining question papers and main Answer books.
- Every day at the end of the examinations, the Sr. Supervisor will collect the answer books along with Jr. Supervisor's Reports from the Jr. Supervisor, verify the same in terms of number of students appeared in the examination and after verification, Sr. Supervisor will submit the answer books to the Examination Section on the same day immediately after the examination is over.

2.5. Duties and Responsibilities of Jr. Supervisor for conducting Semester End Examination of the University.

- Any sort of material, books, mobile phone, programmable calculator, etc. irrespective of whether it is related to subject or not should not be allowed in the examination hall.
- It is compulsory to check the examination fee receipt I identity card of the students in the examination hall.
- Before five minutes of the commencement of the examination open the sealed cover of question papers and count it and then distribute it to the examinees and unused remaining question papers and main Answer Books should be kept with you for initial

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half an hour of the examination and then band over it to Sr. Supervisor only. when he comes to collect it.

- The Jr. Supervisor should instruct the students to write down their Examination/Roll Number on their question papers and answer books. While. giving the main answer book and additional supplementaries, the Jr. Supervisor should ensure that all the columns of the information including Examination / Roll Number are properly written and then sign.
- The Jr. Supervisor should ensure that the supplementaries given to the students are complete and intact.
- The Jr. Supervisor should check that incomplete or tom supplementary are not provided to the students.
- The Jr. Supervisor should ensure that at the time of receiving the written answer book from the student on completion of the examination, the main answer book plus supplementaries as shown on the main answer book are in proper order and all columns are dully filled in and signed by you.
- The Jr. Supervisor should fill-in Jr. Supervisor's Report during examination and submit it to the Sr Supervisor.
- Sr. Supervisor at the end of examination along with written answer books after cross verification of all the entries made in the report by other Jr. Supervisor.
- The Jr. Supervisor should observe following provision of regulations in case of any student involving in misconduct or using unfair means in the examination.
- In .case involving misconduct, the candidate concerned be forthwith expelled with the approval of the Senior Supervisor or an Officer in Charge of the conduct of Examination or by Heads of the Institution concerned from the Examination hall and the matter describing the incident will be reported to the Deputy Registrar (Examination).
- In cases involving malpractice, the Senior Supervisor or an Officer in Charge of the conduct of examination shall seize the answer books and all incriminating material/evidence from the candidate, and then obtain a written statement, duly signed by the candidate. Senior Supervisor or Officer-in charge will then issue a new answer book and allow the student to continue to write his/her answers for the remaining period of that examination. The matter shall also be reported to the Deputy Registrar (Examination) with all relevant documents on the same day.
- The candidate reported as then will be allowed to appear in subsequent examinations of that session. However, in .case the same candidate is again found guilty of indulging in misconduct or malpractice during any of the subsequent examinations of that session, he/she will be expelled from all remaining examinations of that session after taking appropriate action for the second act of misconduct or malpractice.

- The cases of impersonification, violence or intimidation involving outsiders shall immediately be reported to the Senior Supervisor or the Officer in Charge and action as per the concern law including filing a police complaint will be taken.
- The person who has been given the duty of supervision should adhere to their duty positively unless there is absolute genuine case where Head of the Institution has given permission for nonattendance otherwise it will be viewed very seriously and will be considered as gross misconduct.
- For any query regarding examination immediately call to Sr. Supervisor only.
- Jr. Supervisor shall announce the following instructions in the examination hall before distributing the question paper:

1) All the students are required to keep receipt and identity card during examination hours.
2) Any type of talk or gossiping with other students in examination hall or outside the examination hall i.e. in water room or toilet is prohibited during the examination hours.
3) The students are not allowed to carry the question paper / answer book / supplementary / graph paper or any exam related documents etc. outside the examination hall during examination hours.
4) Students must bring their own instruments required for examination as they will not be allowed to borrow from / give it to other student under any circumstances.
5) The programmable calculator, mobile phone, electronic devices / written or printed material etc. in any form are strictly prohibited in the examination hall.
6) Exchange of answer book, supplementary, question paper etc. are strictly prohibited.
7) Any type of verbal or non-verbal communication is prohibited in the examination hall.
8) Students are not allowed to leave the examination hall during the last ten minutes of the examination hours.

Any kind of indiscipline or breach of the above instructions will invite appropriate punishment as provided under the regulations of University.

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2.6. Action for Malpractices and lapses on the part of Paper Setter, Examiner, and any other person connected with the conduct of University/College/Institution Examination

Sr No.	Nature of Malpractices/Lapses	Action/Punishment
1	Paper Setter found responsible for leakage of the question set in the University/College/Institution Examination/s whether intentionally or due to the negligence before the time of examination.	Disqualification from any examination work+ disciplinary action by concerned authorities as per the rules applicable + no remuneration to be paid in respect of paper setting.
2	Leakage of question/question paper set in the university/College/Institution Examination before the time of examination at the University/College/Institution or examination centre by any person/s connected with the conduct of the examination	Disciplinary action against the guilty/responsible person/s as per the prevailing rules/standard code by the concerned authorities and no remuneration paid for the task
3	Favoring the Examinee by examiner, moderator, in assessment of answer books/dissertation/project report/practical examination/team work/thesis by assigning the student marks to which the student is not entitled at the University/College/Institution examination.	Disqualification from any examination work + no remuneration to be paid and Disciplinary action taken by the authorities
4	Examiner/Moderator intentionally/negligently not assigning the student in assessment of his/her answer books/dissertation/project work, the marks to which the student is entitled to at the University/College/Institute Examination	Disqualification from any examination work + no remuneration to be paid in respect of the number of answer papers/dissertation/Project work so assessed and Disciplinary action taken by the authorities
5	Paper –setter/Chairperson setting question outside the scope of the syllabus.	Disqualification from any examination work for a period of three years + no remuneration to be paid in respect of setting the question paper.
6	Guiding Teacher showing negligence in supervision of dissertation/project work(e.g. use of manipulated data)	As decided by the competent authorities of the university/College/Institution.
7	While assessing answer book examiner showing negligence in detecting malpractices used by the student/s	As decided by the authorities of the University/College/Institution.
8	Senior Supervsior/Chief Conductor Showing apathy in carrying out duties related to examination (e.g. not taking round to the examination hall at examination Center during examination period or opening the packet of question paper before prescribed time)	As decided by the competent authorities of the University/College/Institution.
9	Jr. Supervisor helping student in copying answers while in the examination or showing negligence in reporting cases of copying answer by students when on supervision duty.	As decided by the competent authorities of the University/College/Institution.
10	Negligence of the supervising staff in discharging their duties, causing unrest in the smooth conduct of examination	A report to take disciplinary action will be sent to the University
11	Jr. Supervisor helping student (Examinee) in mass-copying while on examination duty.	Permanent disqualification from any examination work + disciplinary action b the concerned authorities as per the rule if he/she is a University/College/Institution employee.

2.7. RULES FOR OBSERVING CENTRAL ASSESSMENT ON THE CAMPUS

Centralized Answer book Assessment:

- Answer book assessment at the university is centralized. Appointed faculties have to come to the centralized assessment hall for discharging their duties. No answer book will be handed over to the faculty outside central assessment hall.
- Each faculty will be given 15 days* are for completion of the assessment process. If in any case a faculty needs more days, the faculty has to immediately report to the Answer Book Assessment Committee for its recommendation and approval of the Provost of the University.
- Procedure for centralized answer book assessment:

1. The appointed faculty will begin the assessment from the next day of the date of the examination and complete the assessment within 15 days. The faculty will inform the exam committee about the time slot (hourly) in which he/she will utilize the central assessment hall of the university. The exam committee will make the time slots available to respective institutes head. The respective institute heads will forward the same to the appointed faculties of their institute.
2. At the time of faculty coming to the assessment hall, firstly they will be putting down the details in the register available at the hall for maintaining the record of the assessment on day-to-day basis.
3. The faculty will be counting the answer books handed over to them for assessment and put down the number of answer books received and number of answer books assessed for the day in the register.
4. During the assessment, the exam committee will provide a sheet for entering marks by the faculty. The faculty will be putting a random code on each of the answer book they are assessing. The code can be in form as A1, A2, B1, B2 and so on randomly as determined by the faculty. The faculty have to put the marks obtained by the students in the sheet provided against the random number as per the code.
5. At the time of marks entry, a faculty of the cadre of Professor will be appointed by the exam committee for verification of the marks entered by the exam committee.

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6. The faculty will be recommended by head of institute and will be approved by Provost. The faculty will match the entered marks with the marks awarded by the faculty using the mark sheet provided by the faculty after assessment.
7. The random coding is used to maintain confidentiality of the student and transparency of marks entry process.
8. The faculty will daily receive the bunch of answer books of the subject for which he/she is appointed and the faculty will daily return the same to exam committee after assessing the answer books for the day.
9. Daily during the assessment, the faculty will put down the code and respective marks in the mark sheet given. The mark sheet will always be kept on top of the bunch of the answer books.
10. During the assessment the faculty have to also check for any malpractice committed by the student in the answer book. In such a case, the faculty will immediately report the same to the exam committee for further Unfair Mean action.

The Central assessment procedure has to be followed by both, the internal and the external faculty appointed for the duty of assessing the answer books.

The Central assessment procedure can be vary as per the rules regulations of apex body of concerned institute.

3. Academic Regulations for admission to the University, Eligibility Criteria, Conduct of Examination, Institution of Faculties, Dean of Faculties etc.

Admission Criteria:

- Every candidate for admission as a student of this University for different courses shall have to pass the qualifying examinations prescribed for the respective courses in the University including such other test of fitness if prescribed for a particular course.
- No student seeking admission to this University shall be admitted to any Course of this university after expiry of one month from the date of commencement of any term / semester / Year as the case may be Provided, however, that if the Director General is satisfied that there was sufficient reason for delay on the part of the student seeking admission as aforesaid, he may admit the student to the institution notwithstanding anything contained the expiry of one month, if he has a reason to believe that the student would be able to meet with the academic requirements.

Eligibility Criteria:

- No student from other University or a Board of Secondary or Higher Secondary of outside Gujarat or any examining body seeking admission to any course of this University shall be admitted without eligibility certificate.
- Such student shall apply in the prescribed form to the Executive Registrar of this University for a certificate of eligibility and shall submit the required documents including migration certificate or transfer certificate from the University or a Board or any examining body he intends to leave and shall at the same time pay the fee prescribed from time to time.
- Notwithstanding anything contained above, so far as it relates to the Migration Certificate/ Transfer Certificate, the same will not be required for the students admitted to Executive Diploma Programmes under the Institute of Management.

Provided, however, that-

The Registrar may issue a provisional certificate of eligibility, if he is satisfied that the applicant is prima-facie eligible for admission to this University. Such certificate shall entitle a student for admission to this University on his own risk and on condition that he obtains a final certificate of eligibility before the closure of the first term / semester in which the student is provisionally admitted to the University.

The issuance of eligibility certificate does not give guarantee for admission to the respective course;

If the Director General is satisfied that the student admitted in a course is not in a position to provide provisional eligibility certificate before admission for no fault of his own he may allow the student to attend the classes for the number of days which the Director General determines and on production of the provisional eligibility certificate direct that the said eligibility certificate shall have retrospective effect from the date on which the student commenced to attend the course concern so that the days on which such student kept attendance before the Issuance of the certificate can be taken into account; If the Director General is satisfied for the delay on the part of the student to apply for final eligibility certificate was not due to fault of his own, he may condone such delay and grant reasonable extension for which the Director General will be the sole judge for the production of final eligibility certificate.

Attendance Criteria:

The minimum attendance required for the different courses will be prescribed under the scheme of teaching and curriculum for each course/ institution and the students shall attend for these prescribed number of days in the respective course / institutions. However, the minimum attendance requirement in each course shall not in any case be less than 70% of the scheduled classes / practicals etc.

Notwithstanding anything contained above on account of bonafide illness or any other reason deemed sufficient by the Head of the Institution concern, such Head of the Institution can condone the attendance upto 10% in the course or courses. For beyond 10% in any genuine cases, the decision to condone the attendance will be taken by the Director General.

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Date of Examinations:

Within two weeks from the date of the commencement of each academic term / semester, each faculty shall prepare and publish a schedule of examinations - both sessional and term end for each and every course conducted under it.

4. STANDARD OPERATING PROCEDURE FOR EXTERNAL EXAMINATION

- All Concerned departments are requested to appoint one Exam coordinator to discuss exam related matters, submit the name, Email and contact no by mail on or 60 days before commencement of External Examination.
- Plan the date/duration/slot of Examination and discuss it with Exam Coordinator in the Examination office. (Principal and Coordinator both)
- Take Pre Approval of Time Table (Designed and Discussed with Exam Coordinator) at least 45 days Prior from the start date of Examination.
- After getting final approval from the Registrar office, collect Exam forms from the examination section.
- Submit the Examination forms of concerned students before the deadline strictly to make sure Each and Every student must have paid Tuition fees. If Student has not paid current semester/year tuition fees, he or she is not allowed to appear in University Examination. If any student has not paid tution fees and appeared in the examination then Institute Exam coordinator and Principal is responsible.
- Submit the list of Paper setter and Paper Evaluator and External Practical Examiners as per format given by Exam Section hard copy with Institute seal and sign and Soft copy within 5 days from the date of Approval of Time table from Registrar office strictly.
- Submit the list of Sr. Supervisors, Jr. Supervisors, and Relievers if any before 30 days from the start date of Examination.

5. University Enrolment procedure:

All the concerned department has to follow below mentioned procedure for enrolment of students in university.

STEPWISE STUDENT ENROLMENT PROCEDURE

Step-I

Collection of all admission forms of students along with all required documents from Admission cell by the concerned department after due date of admission.

Step-II

Verification of collected documents by the concerned department.

Step- III

Submission of Admission file along with forwarding letter dully signed by concern departmental head to the registrar office for the Purpose of Enrolment.

Step-IV

Collection of Enrolment forms from the Examination Section by concerned department.

Step-IV

Submission of filled Enrolment forms hard copies along with list of Students to be enrolled in soft copy & forwarding letter dully signed by concerned department to the Examination section.

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6. Course Evaluation Pattern of Examination:

Students are normally assessed course wise based on the following components as approved by the Academic Council from time to time:

a) **Continuous Evaluation (CE)**

b) **Mid semester Examination/Laboratory Project Work (LPW) / Project Work (PW)**

c) **Annual/Semester /Year End Examinations**

In the beginning of the semester, course faculty will plan and inform the concerned students about different types of assessment components of a course under continuous evaluation (CE) like Class Test, Term Assignments, Oral, Quiz etc. with its inter-se weightage. The course faculty will continuously evaluate each unit of assessment components of a course and marks will be given accordingly. At the end of the Semester / Year , the respective faculty will aggregates the marks obtained in each component Based on the intense weightage of different sub-components of CE to arrive at the overall percentage of marks under continuous evaluation and it will be submitted to the Examination coordinator of the Institute.

The assessment of students for the curricula they are studying will broadly be done in two categories: -

- Category 1: Continuous Evaluation* ⇒ 30% continuous Part
  ⇒ 20% Mid semester Theory Part
- Category 2: End Semester Examination/ End of the year Examination

* It may vary as per Apex body of the Institute/Council if Applicable

- During every semester, there will be at least one internal exam with continuous evaluation for all the subject/courses.
- The weightage of this Internal Exam and Continuous Evaluation will be 50%. This will also be a part of internal evaluation.
- The duration of the internal examination will be of two hours with a maximum of 5 questions and 50 marks.
- **The internal exam will be compulsory. However, for those students who miss the internal examination for any reason, a remedial examination will be arranged. The student will have to pay Rs. 200 per paper/subject for the remedial examination. The score obtained in this test will be considered as final.**
- The internal and continuous evaluation marks will be shown separately in the internal result issued by respective Department. These marks will be added to the semester/annual examination marks for determining SGPA/CGPA of the student.
- Each institute will submit its internal evaluation marks with continuous evaluation at least one week before the University Examination to the Exam Section.

Scheme of Course Evaluation

The respective teaching faculties and end semester / year examination by the University will evaluate the performance of every student in each course during their academic tenure. In general, the scheme of evaluation for various courses will be -

Continuous Evaluation 50%*

University Examination 50%*

*** Course evaluation may vary as per rules & Regulation of Apex body of concerned department & Institute.**

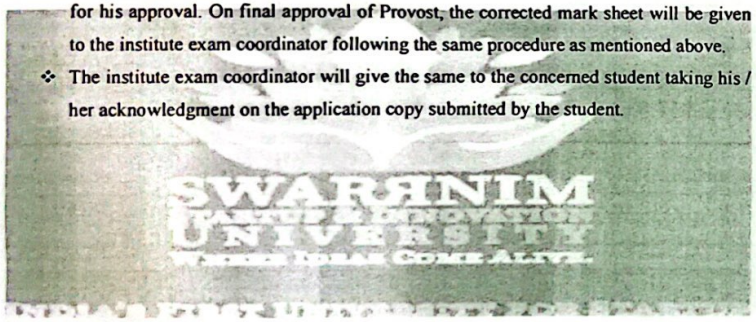
Sr. No.	Segment	Conduction duration	Components	Responsibility	Weightage*
1	Continuous Evaluation	Throughout the Semester	Written tests, MCQs, Quiz, Projects, Assignment, Presentation, Case study, Practical tests, Viva-voce, any other as per Apex body of the Institute	Dean/Principals are responsible for the smooth conduct, timely results and fairness. He/She shall assign responsibility to HODs/ Faculties.	Overall 50% including all internal components
2	End Semester/Year University Examination	End of the Semester/Year	University Theory Examination, University Practical Examination if Applicable	Dean/Principals/ HOIs/University Examination Department shall be responsible for Smooth conduct, fairness and timely declaration of result.	Overall 50% including Theory Practical components

7. Procedure for applying for correction in Mark Sheet & issuing any academic university related documents:

- In case of any correction in the mark sheet, following will be the procedure:-
- If at the time of receipt of the mark sheet, a student finds out any mistake in the name printed, be it first name, middle name or the last name, the student need to fill in an application form and submit it to the institute exam coordinator. The student will very clearly mention the correction in the mark sheet with the proof of the corrected data and attach a School Leaving Certificate with the application.
- The student will also return the mark sheet with error to the institute exam coordinator.

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- The institute exam coordinator will further submit such any application to the exam committee for getting the mark sheet for re-printing. The application will be under-signed by the institute exam coordinator, head of department and head of institute before submitting it to the exam committee.
- If an error is noticed in any other mark sheet detail, like the name of institute, enrolment number, grade point average calculation, name of the subject, subject code or any such typographical or printing error, the exam committee will directly make application for re-printing of the mark sheet to the Registrar Office along with detailed Written justification and investigation report.
- The Registrar Office will put forward the request to the Provost for further approval. On the approval of the Provost, will the exam committee initiate the process of re-printing of the mark sheet.
- On receipt of the corrected mark sheet, the exam committee will submit it first to the Registrar Office for verification. After verification, it will be submitted to the Provost for his approval. On final approval of Provost, the corrected mark sheet will be given to the institute exam coordinator following the same procedure as mentioned above.
- The institute exam coordinator will give the same to the concerned student taking his / her acknowledgment on the application copy submitted by the student.



STEPWISE PROCEDURE TO ISSUE UNIVERSITY DOCUMENTS

Step-I

Each student of any department has to contact to Student Section Incharge Dr. Omprakash Pal for the collection of application form (Annexure-I) for issuing the documents mentioned in Annexure-II

Step-II

Collect the Application form of University document from the Student Section.

Step- III

Fill all necessary details mentioned in the Application Form.

Step-IV

Attach self-attested copy of all necessary documents (Eg. to issue Student Transcript – xerox copy of all the marksheets to attached with form as mentioned in Application form.

Step-V

Pay prescribed fees (Mentioned in the form) to the Account section

Step-VI

Collect paid fees receipt from Account section (in case online Transaction – take sign of Account section officer in the filled form)

Step-VII

Submit the dully filled and signed Application form along with all necessary documents to the student section

Step-VIII

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After Submission of the application, compulsory collect the acknowledgement receipt from the Student section

Step-IX

Collect the required documents from the student section after timeline due date as mentioned in Annexure-II

Note: If any required document is not available in the student section after timeline mentioned in Annexure -II, then Student can contact Registrar office.

Annexure-II

(Details of Timeline & fees to issue University Documents)

Sr. No.	Name of University/Departmental Documents	Prescribed Fees (INR)	Time line to collect the documents
1	Transcript	300 (Per copy)	10-12 working days from the date of application
2	Migration Certificate	1000	10-12 working days from the date of application
3	Provisional Degree certificate	500	10-12 working days from the date of application
4	No Backlog Certificate	500	10-12 working days from the date of application
5	Trial Certificate	500	10-12 working days from the date of application
6	Passing Certificate	1000	10-12 working days from the date of application
7	Rank certificate	500	4 working days
8	Language certificate	500	10-12 working days from the date of application
9	Scheme showing conversion of SGPA /CGPA / Grade to Percentage	500	10-12 working days from the date of application
10	Certificate of Grade sheet, marksheet Authentication	500	4 working days
11	Bonafide certificate	100	4 working days
12	Letter of Recommendation (LOR)	200	4 working days
13	No Objection Certificate	100	4 working days
14	Duplicate Mark sheet (Reprint Mark sheet, Degree certificate)	250 per Marksheet)	45 days
15	Any other documents	500	10-12 working days from the date of application

8. **Promotion and Passing Criteria & General guidelines for the students:**

- The students also have to appear in end- semester exam even if he/she secures 40% marks in their internal marks(i.e. Midsemester and CEC).Incase the students does not appear in end semester exam, he/she will be declared fail in the respective subjects and given ATKT in that subject.
- In case of failure student will have to take ATKT exam for the entire course as and when exam are held by payment of prescribed fees, as per University rules applicable from time to time.
- In case of ATKT, the marks secured in regular exam (i.e. Mid Term, CEC, End Term) for particular subject shall not be carry forward and marks obtained in ATKT exam shall be consider for the announcement of grade in that particular subject.
- A minimum cumulative Grade Point Average of 5.00 is required for obtaining the degree. The total time (including the period of withdrawal, if any) (for award of the degree/to earn the degree) is limited to 8 years for 4-year Program, 6 years for 3-years Program and 04 years for 2-years Program.
- Passing criteria may vary as per Apex body of concern institute or department.
- Institute has to provide the list of Detained students as per below mentioned criteria for detention & it may vary detention rule as per Apex body of concern institute or department.

Sr. No.	Component	Passing Criteria	Remarks
1	Internal Evaluation	40%*	Overall Passing Criteria is 40%
2	External Evaluation	40%*	

* Note: Student must have to secure minimum 40% in individual components.

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Admission in Semester	ATKT Rule
Semester - I	Not Applicable
Semester - II	Student will be promoted to **Semester – II** from Semester – I irrespective of subjects failed in **semester – I.** He/she is allowed to appear in failed subjects at the end of second semester ATKT exam to clear them.
Semester – III	Students can have maximum backlog of four subjects of **Semester – I.** **If backlog is more than four, he/she will not be promoted to semester – III.** (Failed subjects of semester – II will not be counted for the detention in semester – III).
Semester - IV	**Student can have maximum backlog of four subjects of semester – I and Semester – II.** He/she can either have backlog of four subjects of semester – I or semester – II or combine of both. It is restricted to four only. **If number of backlog of semester – I and Semester – II is more than four, he/she will not be promoted to semester – IV.** (Failed subjects of semester – III will not be counted for the detention in semester – IV).
Semester – V	He / She must have cleared all the backlogs of semester – I and II to get promoted to semester – V. **He/she can have maximum four backlogs of semester – III; if it is more than four he / she will not be promoted to semester - V.** (Failed subjects of semester – IV will not be counted for the detention in semester – V).
Semester - VI	**He / She can have maximum four backlogs of semester – III and IV combined to get promoted in semester – VI.** (Failed subjects of semester – V will not be counted for the detention in semester – VI).
Semester - VII	**He / She must have cleared all the backlogs of semester – III and IV.** However, maximum four backlog in semester – V is allowed to get promoted in semester – VII. If it is more than four backlogs of semester-V, he/she will not be promoted to semester – VII. (Failed subjects of semester – VI will not be counted for the detention in semester – VII).
Semester - VIII	He/She can have maximum four backlogs of semester – V and VI to get promoted in semester – VIII. **If it is more than four backlog of semester – V and VI, he / she will not be promoted to semester - VIII.** (Failed subjects of semester – VII will not be counted for the detention in semester – VIII).

University UFM Policy & Guideline:

- If the Invigilator notices that any candidate is indulging in copying or possessing a manuscript or Answer Booklet other than that of the candidate, any written material on Calculator, Geometry Box, Scale/ Electronic Gadgets, he/ she shall immediately take in his/ her possession the candidate's Answer Booklet, question paper, and the materials which he / she has used or intended to use for copying and immediately report to the senior supervisor.
- Malpractices are recorded in the appropriate form along with a statement from the candidate in the presence of the senior supervisor.
- Invigilator should ensure that if a candidate is asked to give a statement in connection with suspected or proven malpractice or use of unfair means but is unwilling to do so, she/he shall not be forced to give the statement. The fact of his/her having refused to make a statement shall be recorded by the Invigilator in the presence of the senior supervisor on duty, at the time of occurrence or detection of the incident or immediately thereafter.
- There shall be not less than four members and not more than seven members in the committee and the Controller of Examinations is authorized to formulate the committee in consultation with the Vice Chancellor as and when necessary.
- The unfair means enquiry committee will call the student involved in unfair means practice and enquire about the same and recommend the action against student based on following; Once the recommended final action against student by the unfair means enquiry committee is approved by the Registrar , it is informed to examinee.
  - Controller of Examinations will formulate the structure of Unfair Means inquiry Committee under the guidance of Hon'ble Vice-Chancellor to recommend actions against the students who are caught in Unfair Means Practices in the Examinations as follows:

    Chairman- Preferably Senior Professor from constituent institutions from which no student is booked for malpractice.

    Members- Deans/Principals of the institutions from which the students are booked for malpractice.

    Member Secretary- Controller of Examinations
  - There shall be not less than four members and not more than seven members in the committee and the Controller of Examinations is authorized to formulate the committee in consultation with the Vice Chancellor as and when necessary.
  - The unfair means enquiry committee will call the student involved in unfair means practice and enquire about the same and recommend the action against student based on following; Once the recommended final action against student by the

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unfair means enquiry committee is approved by the Vice-Chancellor, it is informed to examinee.

Table : Nature of malpractice & Quantum of Punishment

Sr No	Nature of Malpractice	Quantum of Punishment
I	Possession of copying material. (Copying Material in any form)	Annulment/ Cancellation of the performance of the student at the University / College examination in full * (Note: - This quantum of punishment shall apply also to the following nature of malpractices at Sr. No.(II) to Sr.No.(XII) in addition to the punishment prescribed Thereat).
II	Actual copying from the Copying material.	Exclusion of the student from University / College examination for one additional examination.
III	Possession of another student's answer book	Exclusion of the student from University / College for one additional examination. (Both the students)
IV	Possession of another student's answer-book + actual evidence of copying there from.	Exclusion of the student/s from Deemed to be University/ College examination for two additional examinations (Both the students)
V	Mutual/Mass copying	Exclusion of the students from Deemed to be University/ College examination for two additional examinations.
VI	Smuggling-out or smuggling in of answer book as copying material.	Exclusion of the student from Deemed to be University /College exam for two additional exams.
	Smuggling-in of written answer book based on the question paper set at the examination.	Exclusion of the student from Deemed to be University / College examination for three additional examinations.
	Smuggling-in of written answer-book and forging signature of the invigilator there on.	Exclusion of the student from Deemed to be University / College examination for four additional examinations.
VII	Attempt to forge the signature of the invigilator on the answer-book or supplement.	Exclusion of the student from Deemed to be University / College examinations for four additional examinations.
VIII	Interfering with or counterfeiting of Deemed to be University /College seal, or answer-books or office Stationery used in the examinations.	Exclusion of the student from Deemed to be University /College examination for four additional examinations.
IX	Answer-book, main or supplement, written outside the examination hall or any other insertion in answer-book.	Exclusion of the student from Deemed to be University /College examination for four additional examinations
X	To bribe or attempting to bribe any of the person/s connected with the conduct of examinations.	Exclusion of the student from Deemed to be University /College examination for four additional examinations.
XI	Using obscene language /violence/ threat at the examination centre by a student at the Deemed to be University/ College examination to invigilators / Centre-in -charge or Examiners.	Exclusion of the student from Deemed to be University /College examinations for four additional examinations.
XII	(a) Impersonation at the Deemed to be University / College Examination.	Exclusion of the student from Deemed to be University /College examination for five additional examinations (both the students if impersonator is University /College student).
	(b)Impersonation examinations.	Exclusion of the Impersonator from Deemed to be University / College examination for five additional Examinations.
XIII	Revealing identity in any form in the answer written or in any other part of the answer-book by the student at the College or Institute examination.	Annulment of the performance of the student at the Deemed to be University / College examination in full.
XIV	Found having written on palms or on the body, or on the clothes while in the Examination.	Annulment of the performance of the student at the Deemed to be University / College examination in full.
XV	All other malpractice(s) not covered in the aforesaid categories.	Annulment of the performance of the student at the Deemed to be University /College Examination in full, and severe punishment depending upon the gravity of the offence.

*(Note: The Term "Annulment of Performance in full" includes performance of the student at the theory as well as annual Practical examination, but does not include performance at internal examinations, term work, project work with its term work, oral or practical & dissertation examinations unless malpractice is used there at. In view of Pharmacy council of India considering theory and practical of the same subject as separate entities to pass, it was resolved to annul the performance of the student at the Final examination in all theory papers if caught in theory malpractice and in all practicals if caught in practical malpractice and the other punishments accordingly depending on the nature of malpractice.)

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University Overall Grading Pattern*:

SYSTEM OF EVALUATION, AWARD OF CLASS AND CONVERSION TO PERCENTAGE

Grading: The total of the internal evaluation marks and Final University Marks in each course will be converted into a letter grade as well as to a 10 point scale as per following scheme:-

Total Marks (%)	>80	>75- 80	>70-75	60-70	>50 - <60	>45-50	40-45	<40	Absent
Corresponding Letter Grade	O	A+	A	B+	B	C	P	F	AB
Numerical Point (Grade Point) corresponding to letter grade	10	9	8	7	6	5	4	0	0

SGPA/CGPA: The student's performance in any semester will be assessed by the Semester Grade Point Average (SGPA). Similarly, his/her performance at the end of two or more consecutive semesters will be denoted by the Cumulative Grade Point Average (CGPA). The SGPA and CGPA are calculated as follows:-

(i) SGPA=$\sum$ CiGi/$\sum$Ci,

where Ci is the number of Credits of course i

Gi is the Grade point earned by student for course i

& i =1 to n, n = number of courses in semester

(ii) CGPA= $\sum$ CiGi/$\sum$Ci,

where Ci is the number of Credits of course is

Gi is the Grade point earned by student for course i

& i =1 to n, n = number of courses of all semesters upto which CGPA is calculated.

Award of Class: The class awarded to a student in the programme is decided by the final CGPA as per the following scheme:

Distinction:	**CGPA ≥ 8.0**
First Class:	**CGPA ≥7.0 <8.0**
Second Class:	**CGPA ≥5.0 < 7.0**
Pass Class:	**CGPA ≥ 4.0 < 5.0**
Fail:	**CGPA less than 4**

Formula for Conversion of SGPA/ CGPA to Percentage: An equation to find equivalency between SGPA/CGPA may be obtained as:

Percentage Marks = (SGPA/CGPA - 0.5) x 10

*** Grading pattern & award of class can be varied as per Apex body of Institute & council if applicable**



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