Programme Outcomes (PO) of Bachelor of Computer Application (H) with effect from Academic year 2023-2024

PO 1. 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 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 teamwork 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.

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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, greenwashing, 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.

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.

Vikas Chandra Sharma

HoD- SSCIT

BCA (H)
SEMESTER-I

Swarrnim School of Computing & IT

BCA (Honours) Programme

Semester I

Course Title: Fundamentals of Computers

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
Core	BCA230101	4	60	20%	30%	-	30%	20%

Course Outcomes(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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CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	Medium	Low	Low		Low		Medium	Low
CO2	High	High	Medium	Medium	Low			Medium		Low
CO3	High	High	High	Low					Medium	Low
CO4	Medium	Medium	High	Medium	Medium	Low	Low			High
CO5		Medium		High	Medium	Low	Medium	Medium		Medium

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)

- 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.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	Medium	Low	Low		Low		Medium	Low
CO2	High	High	Medium	Medium	Low			Medium		Low
CO3	High	High	High	Low					Medium	Low
CO4	Medium	Medium	High	Medium	Medium	Low	Low			High
CO5		Medium		High	Medium	Low	Medium	Medium		Medium

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	20%	30%	-	30%	20%

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.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	High	Medium	Medium	Medium	Low	Low	Low	Medium	Low
CO2	High	High	High	Medium	Medium	Low		Medium		Medium
CO3	High	High	Medium	Medium	Low			Medium	Low	Medium
CO4	Medium	High	High	Medium	Low				Medium	High
CO5	Medium	Medium	High	Medium	Medium	Low			Medium	Medium

Swarrnim School of Computing & IT

BCA (Honours) Programme

Semester I

Course Title: Mathematical Foundation

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
Core	BCA230104	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.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Medium	Low				Low	Low
CO2	High	High	Medium	Medium	Low					Medium
CO3	High	Medium	High	Medium	Low				Medium	Low
CO4	Medium	High	Medium	Low	Low		Low	Medium		Medium
CO5	High	Medium	Medium	Medium	Low				Medium	Medium

Swarrnim School of Computing & IT

BCA (Honours) Programme

Semester I

Course Title: Communication Skills

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
AEC	AEC230101	2	30	Theory	Continuous Assessment	Practical	Theory	Practical
				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.

CO-PO MAPPING:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	Medium	Medium	High	High	Medium	Low			Low	Medium
CO2	Medium	High	High	High	Medium			Medium	Low	High
CO3	High	High	Medium	Medium	Low				Medium	Medium
CO4	Medium	Medium	Medium	High	Low				Medium	Medium
CO5	High	Medium	Medium	Medium	Medium					High

Swarrnim School of Computing & IT

BCA (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	SEC230101	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

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	High	Medium	Medium	Medium	Low	High		Medium	Medium
CO2	Medium	High	High	Medium	Medium	Low	High		Medium	High
CO3	High	High	Medium	Medium	Medium	Medium	High		Medium	High
CO4	Medium	Medium	Medium	High	Medium	Low	High		Medium	Medium

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
Core	IKS230101	2	30	20%	30%	-	50%	

Course Outcomes(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.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	Medium	Medium	Medium	Low	Low	Medium	Low	Medium
CO2	High	High	Medium	High	Medium	Low	Low	Medium	Medium	Medium
CO3	Medium	High	Medium	Medium	Low			Medium	Medium	High
CO4	High	Medium	Medium	Medium	Medium	Low		Medium	Medium	Medium
CO5	Medium	Medium	Medium	High	Medium	Low			Low	Medium

BCA (H)
SEMESTER-II

Swarrnim School of Computing & IT

BCA (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	BCA230201	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.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Medium	Medium		Low		Medium	Medium
CO2	High	High	High	Medium	Low		Low			Medium
CO3	High	High	Medium	Medium	Medium	Low		Medium	Low	Medium
CO4	Medium	High	Medium	Low	Medium	Low		Medium	Low	Medium
CO5	High	Medium	Medium	Medium	Medium	Low			Medium	Low

Swarrnim School of Computing & IT

BCA (Honours) Programme

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:

- Understand the fundamental concepts of Object-Oriented Programming (OOP) and grasp C++ basics, including operators, data types, and identifiers.
- Master control flow structures like if-else, loops, and learn about classes, objects, encapsulation, constructors, and memory allocation.
- Acquire proficiency in working with arrays, strings, functions (overloading, inline), and operator overloading.

- Develop a solid understanding of pointers, inheritance, class hierarchy, and abstract classes.
- Gain knowledge of file handling, exception handling, namespaces, and stream operations.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	High	Medium	Medium	Low				Low	Medium
CO2	High	High	High	Medium	Medium	Low		Medium	Low	Medium
CO3	High	Medium	Medium	Low	Low	Low		Medium	Medium	Medium
CO4	High	High	Medium	Medium	Medium	Low	Low	Medium	Medium	High
CO5	Medium	Medium	Medium	Medium	Medium	Low	Low	Low	Medium	Medium

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BCA (Honours) Programme

Semester II

Course Title: Core Java

Category 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):

- Proficiently apply Java programming concepts including data types, control structures, arrays, strings, inheritance, packages, and exception handling.
- Proficiently apply Java programming concepts of lasses and multithreading
- Design interactive Java applets using AWT controls, layout managers, and event listeners while mastering string handling.

- Gain expertise in networking with datagram and TCP/IP server sockets, and learn to establish JDBC connections and utilize connection pooling.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Medium	Low		Low	Medium	Medium	Medium
CO2	High	High	Medium	Medium	Medium		Medium			Medium
CO3	High	High	High	Medium	Low	Low	Low	Medium	Medium	Medium
CO4	Medium	Medium	Medium	Low	Medium			Low	Low	Medium
CO5	Medium	Medium	High	Medium	Medium	Low		Medium	Medium	High

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BCA (Honours) Programme

Semester II

Course Title: Foundation in Statistical Methods

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

Course Outcomes(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.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	High	Medium	Medium	Low			Medium	Low	Medium
CO2	High	High	Medium	Medium	Low		Medium	Medium		Medium
CO3	High	Medium	High	Low	Medium	Low	Low	Medium	Medium	Medium
CO4	Medium	Medium	Medium	Medium	Medium			Medium	Low	Medium
CO5	Medium	Medium	Medium	Medium	Low	Low	Low	Low	Medium	High

Swarrnim School of Computing & IT

BCA (Honours) Programme

Semester II

Core Course Title: Identifying Entrepreneurial Opportunities

Category ofCourse	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
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

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	High	Medium	Medium	Medium		High	Medium	Low	Medium
CO2	High	High	High	Medium	Medium	Low	High		Medium	Medium
CO3	High	High	Medium	Medium	Medium	Low	High	Medium	Medium	High
CO4	Medium	Medium	Medium	High	Medium	Low	High		Medium	Medium

Swarrnim School of Computing & IT

BCA (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.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Medium	Low		Low		Medium	Medium
CO2	High	High	Medium	Medium	Low	Low	Medium	Medium	Low	Medium
CO3	High	High	Medium	Medium	Medium	Low	Medium	Medium	Medium	Medium
CO4	Medium	Medium	Medium	Medium	Low	Low	Low	Low	Medium	High

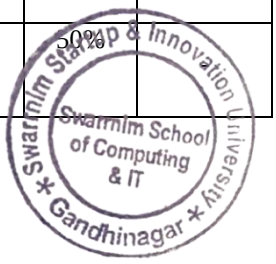
Swarrnim School of Computing & IT

BCA (Honours) Programme

Semester II

Course Title: Environmental Studies

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
VAC	VAC230201	2	30	Theory	Continuous Assessment	Practical	Theory	Practical
				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.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	Medium	Medium	Medium	Low		Medium	Medium	Medium
CO2	High	High	Medium	High	Medium	Low		Medium	Medium	High
CO3	Medium	High	Medium	Medium	Low	Low		Medium	Medium	High
CO4	High	Medium	Medium	Medium	Medium	Low	Low	Medium	Medium	Medium

BCA (H)
SEMESTER-III

Swarrnim School of Computing & IT

BCA (Honours) Programme

BCA Semester III

Course Title: RELATIONAL DATABASE MANAGEMENT SYSTEM

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
Core	BCA230301	4	75	20%	10%	20%	30%	20%

Course Outcomes(COs)

1. Understand the fundamental concepts of database systems and their architecture.
2. Develop the ability to design and model databases using ER diagrams and normalization techniques.
3. Gain proficiency in SQL for managing and manipulating relational databases.
4. Understand transaction management, concurrency control mechanisms, and database recovery techniques.
5. Explore emerging database technologies and their applications.

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	Medium	Medium	Medium							Low
CO2	High	High	Medium		Low					Medium
CO3	High	High	High	Low					Low	Medium
CO4	Medium	Medium	High	Medium	Medium	Low		Low	Low	High
CO5		Medium		High	High	Medium	Low	Medium	Medium	

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BCA (Honours) Programme

BCA Semester III

Course Title: C# and DOT NET Framework

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
Core	BCA230302	4	75	20%	10%	20%	30%	20%

Course Outcomes (COs):

1. Master the fundamentals of C# programming including syntax, data types, and control structures.
2. Develop and deploy .NET applications using various .NET Framework libraries and tools.
3. Utilize object-oriented programming concepts effectively in C# to design reusable and maintainable code.
4. Implement data access solutions with ADO.NET and LINQ.
5. Understand and apply advanced features of C# and the .NET Framework including asynchronous programming, reflection, and more.
6. Develop web applications using ASP.NET MVC and understand the basics of web services and API development.

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CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	Medium	Low						Low
CO2	High	High	Medium	Medium			Low		Low	Medium
CO3	High	High	High	Medium	Medium			Low	Medium	Medium
CO4	Medium	Medium	High	Medium	Low		Low	Low	Medium	Low
CO5	Low	High	Low	High	Low	Medium	Medium		High	Medium
CO6	Low	High	Low	High	Low	Medium	Medium		High	Medium

Swarrnim School of Computing & IT

BCA (Honours) Programme

BCA Semester III

Course Title: Computer Communication and Networks

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
Core	BCA230303	4	60	20%	30%	-	50%	-

Course Outcomes (COs):

1. Understand the basics of computer networking including network topologies, protocols, and architectures.
2. Master the fundamentals of data communication including transmission media, encoding, and signaling.
3. Gain proficiency in the Internet Protocol suite, including IP addressing, subnetting, and routing protocols.
4. Implement network services and applications, understanding the workings of DNS, DHCP, FTP, and email protocols.
5. Analyze network security concepts, including cryptography, security protocols, and network vulnerabilities.
6. Design and simulate small to 2-sized networks using network simulation tools.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	Medium			Low				Low
CO2	High	High	High	Low				Low		Medium
CO3	High	Medium	Medium	Medium		Medium			Low	Medium
CO4	Medium	High	Medium	High	Medium	Low	Low		Low	Medium
CO5	Medium	Medium	High	Low		Low		High	High	Medium
CO6	Medium	High	Medium	Medium	High	Low	Medium	Low	Medium	High

Swarrnim School of Computing & IT

BCA (Honours) Programme

BCA Semester III

Course Title: Digital Marketing

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
MDC	BCA230303	4	75	20%	10%	20%	30%	20%

Course Outcomes (COs):

1. Understand the fundamentals of digital marketing and its role in the modern business environment.
2. Master the use of social media platforms for marketing and brand building.
3. Develop skills in creating, managing, and optimizing online advertising campaigns across various channels.
4. Gain proficiency in SEO techniques and content marketing strategies.
5. Understand the principles of email marketing and affiliate marketing.
6. Analyze and utilize web analytics for improving marketing strategies.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	High	Medium	Medium		Medium	Medium		Low	Medium
CO2	Medium	High	Medium	High	High	High	Medium		Medium	Medium
CO3	High	High	High	Medium	Medium	Medium	High	Low	Medium	Medium
CO4	Medium	High	High	Medium		Medium	Medium	Low	Medium	High
CO5	Medium	Medium	Medium	High	Medium	Low	Medium		High	Medium
CO6	Medium	High	High	Medium	Low	Medium	Low	Low	High	High

Swarrnim School of Computing & IT

BCA (Honors) Programme

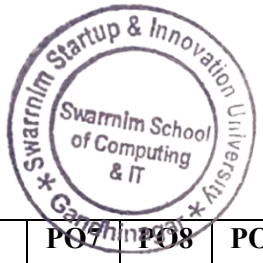
BCA Semester III

Course Title: Financial Literacy

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
AEC	AEC230303	2	30	Theory	Continuous Assessment	Practical	Theory	Practical
				20%	30%	-	50%	-

Course Outcomes(COs)

1. Increasing familiarities with financial literacy and its different aspects.
2. Leading them towards financial wellbeing by teaching to manage their money.
3. Making them literate about the personal tax structure of India
4. Enable them to understand the process of tax e filing



CO-PO Mapping:

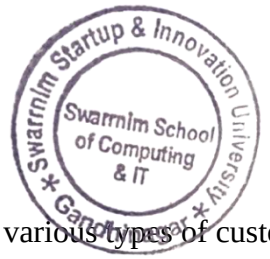
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	Low	Low	Low	Low	Low	Low	Low	High
CO2	High	Medium	Low	Low	Low	Low	Low	Low	Low	High
CO3	High	Medium	Medium	Low	Low	Low	Low	Low	Low	High
CO4	High	High	High	Low	Low	Low	Low	Low	Low	High

Swarrnim School of Computing & IT
BCA (Honors) Programme

BCA Semester III

Course Title: Marketing Strategies for Start Ups

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
SEC	SEC230303	2	30	Theory	Continuous Assessment	Practical	Theory	Practical
				20%	30%	-	50%	-



Course Outcomes (COs)

1. Exploration of Marketing basics in real world
2. Understanding customer ways of reacting to marketing and various types of customers.
3. Understanding Brand and its importance as well as various techniques of Integrated marketing
4. Exploration of the new buzz social marketing basics

CO PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	Medium	High	Medium	High	High	High	High	Medium	Medium	High
CO2	Medium	Medium	Low	Low	High	Medium	Medium	High	High	High
CO3	High	High	Low	Low	Medium	High	Medium	High	High	High

Swarrnim School of Computing & IT
BCA (Honors) Programme

BCA Semester III

Course Title: Understanding India

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
IKS	IKS230303	2	30	Theory	Continuous Assessment	Practical	Theory	Practical
				20%	30%	-	50%	-

Course Outcomes (COs)

1. To understand the meaning and important of Indian Knowledge System
2. To identify the Actual foundational concepts for science and technology.
3. To understand the values of Humanities and Social Science.

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CO PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	Medium	High	Medium	High	High	High	High	Medium	Medium	High
CO2	Medium	Medium	Low	Low	High	Medium	Medium	High	High	High
CO3	High	High	Low	Low	Medium	High	Medium	High	High	High

BCA (H)
SEMESTER-IV

Swarrnim School of Computing & IT

BCA (Honours) Programme

BCA Semester IV

Course Title: Python Programming

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
Core	BCA230401	4	75	20%	10%	20%	30%	20%

Course Outcomes (COs):

1. Grasp the basics of Python syntax, data types, and control structures to solve problems.
2. Utilize Python's extensive library set to develop various applications.
3. Apply object-oriented programming principles in Python for creating reusable and maintainable code.
4. Implement data handling using Python's file operations and understand database connectivity.
5. Develop web applications using Flask/Django and explore REST API development.
6. Understand the application of Python in data analysis, machine learning, and artificial intelligence.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	High	Medium	Low						Medium
CO2	Medium	High	Medium			Low	Medium			Medium
CO3	High	High	High	Medium	Medium		Low		Low	Medium
CO4	Medium	High	High	Medium		Low	Low	Low	Medium	Medium
CO5	Low	High	Medium	High	Low	Medium	Medium		Medium	Medium
CO6	Low	High	High			Medium	Medium	Medium	High	High

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Swarrnim School of Computing & IT

BCA (Honours) Programme

BCA Semester IV

Course Title: Computer Multimedia and Animation

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
Core	BCA230402	4	75	20%	10%	20%	30%	20%

Course Outcomes (COs):

1. Understand the fundamentals of computer graphics, multimedia, and animation.

2. Master various software and tools used in multimedia and animation.

3. Create and manipulate digital images and videos.

4. Design effective multimedia presentations integrating text, images, audio, and video.

5. Develop basic animations using principles of animation and contemporary animation software.

6. Explore the application of multimedia and animation in various domains such as web design, game development, and virtual reality.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	Medium	Low		Low				Medium
CO2	Medium	High	Medium	Medium	Low	Low	Medium			Medium
CO3	Medium	High	Medium	High	Low	Medium	Low		Low	Medium
CO4	Medium	Medium	Medium	High	Medium	Low	Low		Low	Medium
CO5	Low	High	Medium	Medium	Low	Medium	Medium	Low	Medium	Medium
CO6	Low	Medium	Medium	Low		High	High	Low	Medium	High

Swarrnim School of Computing & IT

BCA (Honours) Programme

BCA Semester IV

Course Title: Operating System

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
Core	BCA230403	4	60	**Theory**	**Continuous Assessment**	**Practical**	**Theory**	**Practical**
				20%	**30%**	**-**	**50%**	**-**

Course Outcomes (COs):

1. Understand the fundamental concepts and architecture of operating systems.
2. Gain knowledge of process management including process scheduling, synchronization, and communication.
3. Master memory management techniques and understand the concepts of virtual memory.
4. Explore file systems, file management, and I/O systems.
5. Study system security measures, including authentication, malware, and security policies.
6. Analyze case studies of popular operating system.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High			Low			Low	Medium
CO2	High	High	High	Medium	Medium		Low			Medium
CO3	High	High	High			Low		Low	Medium	Medium
CO4	High	Medium	High	Medium	Low		Low		Low	Medium
CO5	Medium	Medium	High	High		Medium		High	High	Medium
CO6	Medium	High	Medium	Low	Low	High	Medium		Medium	High

Swarrnim School of Computing & IT

BCA (Honours) Programme

BCA Semester IV

Course Title: E-Commerce

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
Minor	BCA230404	4	60	20%	30%	-	50%	-

Course Outcomes (COs):

1. Understand the fundamental concepts, technologies, and business models of e-commerce.
2. Analyze the impact of e-commerce on business strategies and operations.
3. Gain proficiency in designing and managing e-commerce platforms.
4. Explore digital marketing strategies and tools for e-commerce.
5. Understand the legal, ethical, and security issues in e-commerce.
6. Develop skills in e-commerce analytics for data-driven decision-making.

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CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	Medium	Low		Low	Medium		Low	Medium
CO2	Medium	High	High	Medium	Medium	Medium	High		Low	Medium
CO3	Medium	High	Medium	High	Medium	Low	High		Medium	Medium
CO4	Low	High	Medium	High	Low	Medium	Medium	Low	Medium	Medium
CO5	Low	Medium	High	Medium		Low	Low	High	High	Medium
CO6	Low	High	High	Medium	Low	Medium	Medium	Low	Medium	High

Swarrnim School of Computing & IT

BCA (Honours) Programme

BCA Semester IV

Course Title: Soft Skills

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
Core	AEC23040	2	30	20%	30%	-	50%	-

Course Outcomes (COs):

1. Learners should understand the nuance of communication at workplace
2. The learners will be able to create various forms of business letters
3. The learners will be able to create various forms of business reports

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CO PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	Medium	High	Medium	High	High	High	High	Medium	Medium	High
CO2	Medium	Medium	Low	Low	High	Medium	Medium	High	High	High
CO3	High	High	Low	Low	Medium	High	Medium	High	High	High

Swarrnim School of Computing & IT

BCA (Honours) Programme

BCA Semester IV

Course Title: Emerging Technologies

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
VAC	VAC230404	2	30	-	20%	30%	-	50%

Course Outcomes (COs)

1. Learners should be able to understand the concept and application..
2. Learners should be able to apply the tools, functions in Power BI and Tableau at the beginners level
3. Learners should be able to create a dashboard.

CO PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	High	High	Medium	Low	High	Low	Low	Low	High
CO2	Medium	Medium	Medium	Medium	Medium	High	Medium	Low	Low	High
CO3	High	High	High	High	Medium	High	Low	Low	Low	High

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B.Sc.-IT (H) 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.

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

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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, greenwashing, 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.

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.

Vikas Chandra Sharma

HoD- SSCIT

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BSC-IT (H)
SEMESTER-I

Swarrnim School of Computing & IT

BSCIT (Honours) Programme

Semester I

Course Title: Fundamentals of Computers

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

Course Outcomes(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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CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	Medium	Low	Low		Low		Medium	Low
CO2	High	High	Medium	Medium	Low			Medium		Low
CO3	High	High	High	Low					Medium	Low
CO4	Medium	Medium	High	Medium	Medium	Low	Low			High
CO5		Medium		High	Medium	Low	Medium	Medium		Medium

Swarrnim School of Computing & IT

BSCIT (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	BSCIT230102	4	60	20%	30%	-	30%	20%

Course Outcomes(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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CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	Medium	Low	Low		Low		Medium	Low
CO2	High	High	Medium	Medium	Low			Medium		Low
CO3	High	High	High	Low					Medium	Low
CO4	Medium	Medium	High	Medium	Medium	Low	Low			High
CO5		Medium		High	Medium	Low	Medium	Medium		Medium

Swarrnim School of Computing & IT

BSCIT (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	BSCIT230103	4	60	20%	30%	-	30%	20%

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.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO 6	PO 7	PO8	PO9	PO10
CO1	High	High	Medium	Medium	Medium	Low	Low	Low	Medium	Low
CO2	High	High	High	Medium	Medium	Low		Medium		Medium
CO3	High	High	Medium	Medium	Low			Medium	Low	Medium
CO4	Medium	High	High	Medium	Low				Medium	High
CO5	Medium	Medium	High	Medium	Medium	Low			Medium	Medium

Swarrnim School of Computing & IT

BSCIT (Honours) Programme

Semester I

Course Title: Mathematical Foundation

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
Core	BSCIT230104	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.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Medium	Low				Low	Low
CO2	High	High	Medium	Medium	Low					Medium
CO3	High	Medium	High	Medium	Low				Medium	Low
CO4	Medium	High	Medium	Low	Low		Low	Medium		Medium
CO5	High	Medium	Medium	Medium	Low				Medium	Medium

Swarrnim School of Computing & IT

BSCIT (Honours) Programme

Semester I

Course Title: Communication Skills

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
AEC	AEC230101	2	30	Theory	Continuous Assessment	Practical	Theory	Practical
				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.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	Medium	Medium	High	High	Medium	Low			Low	Medium
CO2	Medium	High	High	High	Medium			Medium	Low	High
CO3	High	High	Medium	Medium	Low				Medium	Medium
CO4	Medium	Medium	Medium	High	Low				Medium	Medium
CO5	High	Medium	Medium	Medium	Medium					High

Swarrnim School of Computing & IT

BSCIT (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	SEC230101	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

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	High	Medium	Medium	Medium	Low	High		Medium	Medium
CO2	Medium	High	High	Medium	Medium	Low	High		Medium	High
CO3	High	High	Medium	Medium	Medium	Medium	High		Medium	High
CO4	Medium	Medium	Medium	High	Medium	Low	High		Medium	Medium

Swarrnim School of Computing & IT

BSCIT (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
Core	IKS230101	2	30	20%	30%	-	50%	

Course Outcomes(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.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	Medium	Medium	Medium	Low	Low	Medium	Low	Medium
CO2	High	High	Medium	High	Medium	Low	Low	Medium	Medium	Medium
CO3	Medium	High	Medium	Medium	Low			Medium	Medium	High
CO4	High	Medium	Medium	Medium	Medium	Low		Medium	Medium	Medium
CO5	Medium	Medium	Medium	High	Medium	Low			Low	Medium

BSC-IT (H)
SEMESTER-II

Swarrnim School of Computing & IT

BSCIT (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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CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Medium	Medium		Low		Medium	Medium
CO2	High	High	High	Medium	Low		Low			Medium
CO3	High	High	Medium	Medium	Medium	Low		Medium	Low	Medium
CO4	Medium	High	Medium	Low	Medium	Low		Medium	Low	Medium
CO5	High	Medium	Medium	Medium	Medium	Low			Medium	Low

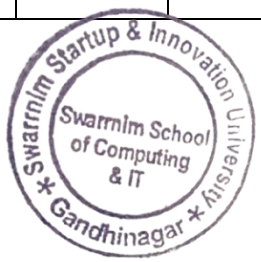
Swarrnim School of Computing & IT

BSCIT (Honours) Programme

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	BSCIT230202	4	60	20%	30%	-	30%	20%



Course Outcomes(COs)

Here are concise course outcomes for the syllabus:

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

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	High	Medium	Medium	Low				Low	Medium
CO2	High	High	High	Medium	Medium	Low		Medium	Low	Medium
CO3	High	Medium	Medium	Low	Low	Low		Medium	Medium	Medium
CO4	High	High	Medium	Medium	Medium	Low	Low	Medium	Medium	High
CO5	Medium	Medium	Medium	Medium	Medium	Low	Low	Low	Medium	Medium

Swarrnim School of Computing & IT

BSCIT (Honours) Programme

Semester II

Course Title: Core Java

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

Course Outcomes(COs):

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

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Medium	Low		Low	Medium	Medium	Medium
CO2	High	High	Medium	Medium	Medium		Medium			Medium
CO3	High	High	High	Medium	Low	Low	Low	Medium	Medium	Medium
CO4	Medium	Medium	Medium	Low	Medium			Low	Low	Medium
CO5	Medium	Medium	High	Medium	Medium	Low		Medium	Medium	High

Swarrnim School of Computing & IT

BSCIT (Honours) Programme

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	BSCIT230204	3+1	60	20%	30%	-	50%	2

Course Outcomes(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.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	High	Medium	Medium	Low			Medium	Low	Medium
CO2	High	High	Medium	Medium	Low		Medium	Medium		Medium
CO3	High	Medium	High	Low	Medium	Low	Low	Medium	Medium	Medium
CO4	Medium	Medium	Medium	Medium	Medium			Medium	Low	Medium
CO5	Medium	Medium	Medium	Medium	Low	Low	Low	Low	Medium	High

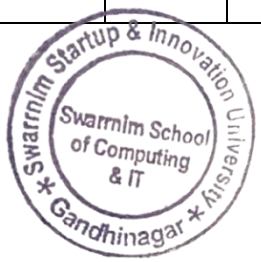
Swarrnim School of Computing & IT

BSCIT (Honours) Programme

Semester II

Core Course Title: Identifying Entrepreneurial Opportunities

Category ofCourse	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
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

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	High	Medium	Medium	Medium		High	Medium	Low	Medium
CO2	High	High	High	Medium	Medium	Low	High		Medium	Medium
CO3	High	High	Medium	Medium	Medium	Low	High	Medium	Medium	High
CO4	Medium	Medium	Medium	High	Medium	Low	High		Medium	Medium

Swarrnim School of Computing & IT

BSCIT (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.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Medium	Low		Low		Medium	Medium
CO2	High	High	Medium	Medium	Low	Low	Medium	Medium	Low	Medium
CO3	High	High	Medium	Medium	Medium	Low	Medium	Medium	Medium	Medium
CO4	Medium	Medium	Medium	Medium	Low	Low	Low	Low	Medium	High

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BSCIT (Honours) Programme

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.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	Medium	Medium	Medium	Low		Medium	Medium	Medium
CO2	High	High	Medium	High	Medium	Low		Medium	Medium	High
CO3	Medium	High	Medium	Medium	Low	Low		Medium	Medium	High
CO4	High	Medium	Medium	Medium	Medium	Low	Low	Medium	Medium	Medium

BSC-IT (H)
SEMESTER-III

Swarrnim School of Computing & IT

B. Sc.-IT (Honours) Programme

B. Sc.-IT Semester III

Course Title: RELATIONAL DATABASE MANAGEMENT SYSTEM

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
Core	BSCIT2High0 High01	4	75	20%	10%	20%	30%	20%

Course Outcomes(COs)

1. Understand the fundamental concepts of database systems, including data models, database architecture, and data independence.
2. Gain proficiency in SQL for data definition, manipulation, and query operations in a relational database.
3. Design database schemas using normalization principles and ER modeling.
4. Implement transaction processing, concurrency control mechanisms, and ensure database security.
5. Analyze performance tuning concepts and apply optimization techniques for efficient query processing.

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CO-PO Mapping for Database Management System:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	3	1		1			1	2
CO2	2	3	3	2			1		2	2
CO3	3	3	3	2	2	1	2	1	2	3
CO4	2	2	3	3	2		1	2	3	2
CO5	1	3	3	2	1	2	1	1	2	3

Swarrnim School of Computing & IT

B. Sc.-IT (Honours) Programme

B. Sc.-IT Semester III

Course Title: OPERATING SYSTEM

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
Core	BSCIT230302	4	75	20%	10%	20%	30%	20%

Course Outcomes(COs) :

1. Understand the core concepts and functio:nalities of operating systems including processes, threads, and memory management.
2. Analyze different scheduling algorithms and their application in managing processes and system resources.
3. Master the implementation and management of memory, including virtual memory and paging mechanisms.
4. Explore file system architecture, management, and disk scheduling algorithms.
5. Evaluate different operating systems such as Windows, UNIX, and Linux, understanding their internal operations and design principles.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	3	1						1
CO2	2	3	3	1	1		1			2
CO3	2	3	3	1				1	1	2
CO4	2	2	2	2	1		1			2
CO5	2	2	1	3	1	2	2		1	3

Swarrnim School of Computing & IT

B. Sc.-IT (Honours) Programme

B. Sc.-IT Semester III

Course Title: PYTHON PROGRAMMING

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
Core	BSCIT230303	4	75	20%	10%	20%	30%	20%

Course Outcomes(COs):

1. Acquire comprehensive knowledge of Python syntax, semantics, and its application in solving real-world problems.

2. Develop proficiency in using Python's data structures, functions, and modules to create efficient programs.

3. Apply object-oriented programming principles in Python to design robust and reusable software.

4. Utilize Python libraries and frameworks for web development, data analysis, and machine learning.

5. Implement error handling and debugging techniques to develop reliable and error-free code.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	3	1						2
CO2	3	3	2	1	1					2
CO3	2	3	3	2	2		1		1	3
CO4	2	3	2	2	1	2	2	1	1	3
CO5	2	3	3	3		1	1	1	2	3

Swarrnim School of Computing & IT

B. SC.- IT (Honors) Programme

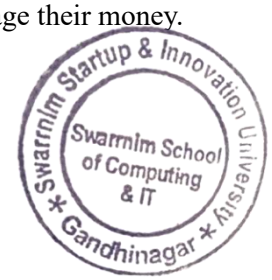
B. SC.- IT Semester III

Course Title: Financial Literacy

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
AEC	AEC230303	2	30	Theory	Continuous Assessment	Practical	Theory	Practical
				20%	30%	-	50%	-

Course Outcomes(COs)

1. Increasing familiarities with financial literacy and its different aspects.
2. Leading them towards financial wellbeing by teaching to manage their money.
3. Making them literate about the personal tax structure of India
4. Enable them to understand the process of tax e filing



CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	1	1	1	1	1	1	1	3
CO2	3	2	1	1	1	1	1	1	1	3
CO3	3	2	2	1	1	1	1	1	1	3
CO4	3	3	3	1	1	1	1	1	1	3

Swarrnim School of Computing & IT

B. Sc.-IT (Honours) Programme

B. Sc.-IT Semester III

Course Title: Computer Organization

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
MDC	BSCIT230304	4	60	20%	30%	-	50%	-

Course Outcomes(COs):

1. Understand the basic structure and operation of modern computers.

2. Grasp the function and design of the central processing unit (CPU) and memory hierarchy.

3. Explain the concepts of input/output (I/O) systems and data communication between system components.

4. Analyze and design simple digital circuits and understand how they form the building blocks of computer systems.

5. Develop assembly level programs and comprehend the interface between hardware and software.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	3	2		1				2
CO2	3	3	3	2	2	1			1	2
CO3	2	3	3	3	1	2		1	2	2
CO4	3	3	3	2	2	1	1		2	3
CO5	2	3	2	3	1	2	2		2	3

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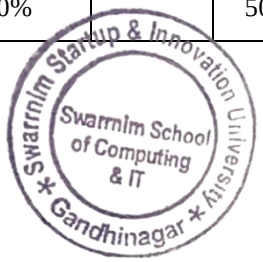
Swarrnim School of Computing & IT
B. Sc.- IT (Honors) Programme

B. Sc.- IT Semester III

Course Title: Marketing Strategies for Start Ups

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
SEC	SEC230303	2	30	20%	30%	-	50%	-



Course Outcomes (COs)

5. Exploration of Marketing basics in real world
6. Understanding customer ways of reacting to marketing and various types of customers.
7. Understanding Brand and its importance as well as various techniques of Integrated marketing
8. Exploration of the new buzz social marketing basics

CO PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2	3	2	3	3	3	3	2	2	3
CO2	2	2	1	1	3	2	2	3	3	3
CO3	3	3	1	1	2	3	2	3	3	3

Swarrnim School of Computing & IT
B. Sc.- IT (Honors) Programme

B. Sc.- IT Semester III

Course Title: Understanding India

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
IKS	IKS230303	2	30	Theory	Continuous Assessment	Practical	Theory	Practical
				20%	30%	-	50%	-

Course Outcomes (COs)

4. To understand the meaning and important of Indian Knowledge System

5. To identify the Actual foundational concepts for science and technology.

6. To understand the values of Humanities and Social Science.

CO PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2	3	2	3	3	3	3	2	2	3
CO2	2	2	1	1	3	2	2	3	3	3
CO3	3	3	1	1	2	3	2	3	3	3

BSC-IT (H)
SEMESTER-IV

Swarrnim School of Computing & IT

B. Sc.-IT (Honours) Programme

B. Sc.-IT Semester IV

Course Title: Cloud Computing

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
Core	BSCIT230401	4	75	20%	10%	20%	30%	20%

Course Outcomes(COs):

1. Understand the basic concepts and architecture of cloud computing including different service models (IaaS, PaaS, SaaS) and deployment models (public, private, hybrid, community).

2. Analyze the benefits and challenges of cloud computing including scalability, reliability, and security concerns.

3. Gain practical experience in using major cloud platforms such as AWS, Azure, and Google Cloud for deploying applications.

4. Understand and apply cloud storage, computing, and networking services in real-world applications.

5. Evaluate the impact of cloud computing on business transformation and IT infrastructure.

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CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	2	1	1	1	1			2
CO2	2	3	3	2	2	2	1	1	1	2
CO3	1	3	2	2	1	2	2		2	3
CO4	2	3	3	3	2	2	2	1	2	3
CO5	2	3	2	1	3	2	3	1	2	3

Swarrnim School of Computing & IT

B. Sc.-IT (Honours) Programme

B. Sc.-IT Semester IV

Course Title: Information Security

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
Core	BSCIT230402	4	75	Theory	Continuous Assessment	Practical	Theory	Practical
				20%	10%	20%	30%	20%

Course Outcomes(COs):

1. Understand the fundamental principles of information security including confidentiality, integrity, and availability.

2. Identify security threats, vulnerabilities, and countermeasures.

3. Implement cryptographic techniques for securing data both at rest and in transit.

4. Design and enforce security policies and procedures to protect information assets.

5. Evaluate the impact of ethical, legal, and regulatory issues on information security.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	3	1					1	2
CO2	2	3	3	2	1				1	2
CO3	2	3	3	2		1		1	1	3
CO4	2	3	3	3	2		2	1	2	2
CO5	1	2	3	3		1		2	3	3

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B. Sc.-IT (Honours) Programme

B. Sc.-IT Semester IV

Course Title: Software Testing

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
Core	BSCIT230403	4	60	20%	30%	-	50%	-

Course Outcomes (COs):

1. Understand the principles and methodologies of software testing, including static and dynamic testing techniques.

2. Develop test cases and test plans for software applications to ensure functionality, reliability, and robustness.

3. Apply various testing tools and environments to perform unit testing, integration testing, system testing, and acceptance testing.

4. Analyze software testing automation, learn scripting for automated tests, and use of automation tools.

5. Evaluate software quality and the effectiveness of testing through metrics and software quality assurance practices.

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CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	3	1					1	2
CO2	2	3	3	2	2				1	2
CO3	2	3	2	3	1	1	1		2	3
CO4	1	3	3	2	1		2		2	3
CO5	2	2	3	1	2		1	1	3	3

Swarrnim School of Computing & IT

B. Sc.-IT (Honours) Programme

B. Sc.-IT Semester IV

Course Title: Data Science

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
Minor	BSCIT230404	4	75	20%	10%	20%	30%	20%

Course Outcomes(COs):

1. Understand the foundational concepts of data science and its significance in extracting meaningful insights from data.

2. Develop skills in data manipulation, cleaning, and visualization using tools like Python, R, and SQL.

3. Apply statistical methods and machine learning algorithms to solve predictive modeling problems.

4. Master the use of big data technologies for handling large datasets efficiently.

5. Evaluate ethical, legal, and social implications of data science in various sectors.

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CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	3	1		1			1	2
CO2	2	3	2	3	1				1	3
CO3	2	3	3	2	1	2			2	3
CO4	2	3	2	2	1	2	2	1	1	3
CO5	1	2	3	3		1		3	3	2

Swarrnim School of Computing & IT
B. Sc.- IT (Honors) Programme

B. Sc.- IT Semester

IV

Course Title: Soft Skills

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
Core	AEC23040	2	30	20%	30%	-	50%	-

Course Outcomes (COs)

1. Learners should understand the nuance of communication at workplace
2. The learners will be able to create various forms of business letters
3. The learners will be able to create various forms of business reports

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CO PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2	3	2	3	3	3	3	2	2	3
CO2	2	2	1	1	3	2	2	3	3	3
CO3	3	3	1	1	2	3	2	3	3	3

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B. Sc.- IT (Honours) Programme

B. Sc.- IT Semester IV

Course Title: Emerging Technologies

Category of Course	Course Code	Credit	Contact Hours	Internal			External	
				Theory	Continuous Assessment	Practical	Theory	Practical
VAC	VAC230404	2	30	-	20%	30%	-	50%

Course Outcomes (COs)

4. Learners should be able to understand the concept and application..
5. Learners should be able to apply the tools, functions in Power BI and Tableau at the beginners level
6. Learners should be able to create a dashboard.

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CO PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	3	2	1	3	1	1	1	3
CO2	2	2	2	2	2	3	2	1	1	3
CO3	3	3	3	3	2	3	1	1	1	3

Programme Outcomes (PO) of MCA with effect from (Academic year 2021-2022)

PO 1. Acquire and apply fundamental knowledge of computer applications, theories, and principles to solve complex problems.

PO 2. Foster creative thinking, critical analysis, and problem-solving skills for real-world application in the field of computer science.

PO 3. Enhance the ability to critically evaluate assumptions, arguments, and data to generate effective solutions in IT-based environments.

PO 4. Develop proficiency in verbal, non-verbal, and written communication skills in a technological and business context.

PO 5. Understand and apply leadership and teamwork dynamics in the realm of IT and business organizations.

PO 6. Develop a global perspective on emerging technologies and appreciation of cultural diversity in IT practices.

PO 7. Cultivate entrepreneurial skills and attitudes to identify, assess, and pursue business opportunities in the IT sector.

PO 8. Promote sustainable practices and an understanding of the environmental impact of technology on society.

PO 9. Recognize ethical practices, social responsibilities, and professional conduct in the field of IT.

PO 10. Commit to continuous learning and professional development to stay current with advancing technologies and business practices.

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Gandhinagar

B. SC.-IT Program Outcomes (PO)

PO 1: Acquire and apply fundamental knowledge of theories and principles in Information Technology.

PO 2: Foster innovative thinking and problem-solving skills using various techniques and tools in IT.

PO 3: Develop the ability to analyze assumptions, business problems, and IT solutions with critical thinking.

PO 4: Enhance communication skills, both written and verbal, specific to the IT field.

PO 5: Understand leadership styles and the importance of teamwork in an IT environment.

PO 6: Recognize global challenges in IT and appreciate cross-cultural management.

PO 7: Identify entrepreneurial opportunities in IT and contribute to innovation and startups.

PO 8: Develop an understanding of environmentally sustainable practices in IT.

PO 9: Address ethical issues and responsibilities in IT practices with a focus on societal benefits.

PO 10: Foster a mindset for continuous learning to adapt to evolving technologies and IT trends.

MEGHA PATEL

BCA Program Outcomes (PO)

PO 1. Acquire and apply fundamental knowledge of theories and principles of management in the field of computer applications.

PO 2. Foster innovative thinking and problem-solving skills by utilizing various problem- solving theories in the context of computer applications.

PO 3. 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. Develop effective communication skills and soft skills specific to the field of computer applications, encompassing different styles and types of communication.

PO 5. Comprehend the impact of leadership and teamwork 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. 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. 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. Learn about environmental protection and sustainable practices relevant to computer applications. Develop an understanding of techniques related to climate change, water crisis/management, greenwashing, pollution control, and other environmental concerns within the field.

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

PO 10. 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.

MEGHA PATEL

MEGHA PATEL

HoD- SSCIT

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SWARNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Master in Computer Application (MCA)

Year 1 – (Semester-1)

Subject Name: Basic Computer Science – 1(Applications of Data Structures and Applications of SQL)

Subject Code: 16110102

1. Course Objectives:

- The Main objective of this course is to develop proficiency in the specification, representation, and implementation of Data Types and Data Structures.
- Demonstrate a familiarity with the logic development algorithm.
- Analyze various algorithms for space and time complexity
- To compare various searching and sorting techniques
- To apply appropriate data structures to solve different problems.
- Design and implement SQL databases and Understand and use the Structured Query Language - DDL, DML and DCL.

CO-PO MAPPING:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO 1	Low	High	Medium	High	High	Medium	Low	Low	Medium	High
CO 2	Low	Medium	High	High	Medium	Low	Medium	High	Medium	High
CO 3	Medium	Low	Medium	High	High	Medium	High	Medium	Low	Medium
CO 4	High	Medium	Low	Medium	High	High	Medium	Medium	Low	Medium
CO 5	Medium	Medium	High	Medium	Low	Medium	High	High	Medium	Low
CO 6	Low	Medium	High	Medium	Medium	Medium	High	Low	Low	Medium

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Gandhinagar

SWARNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Master of Computer Applications

Year 1 – (Semester-1)

Subject Name: Basic Computer Science – 2: Applications of Operating Systems andApplications of Systems Software

Subject Code: 16110103

1. Course Objectives:

- Understand the fundamentals of system software, language processing activities, and the role of programming languages in system software.
- Demonstrate knowledge of scanning and parsing techniques, including the application of programming language grammars and different parsing methodologies.
- Gain proficiency in the concepts of assemblers, including assembly language processing, and the design and implementation of two-pass assemblers.
- Analyze the concepts of compilers, including memory allocation, code optimization, and the process of compiling expressions using various techniques such as postfix notation.
- Understand the core functionalities and objectives of operating systems, including process control, memory management, concurrency, and deadlock prevention mechanisms.
- Apply scheduling algorithms, memory management techniques like paging and segmentation, and comprehend the importance of uni-processor scheduling in operating system design.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	Medium	Low				Low		Medium
CO2	Medium	High	High	Medium						Medium
CO3	High	High	High	Medium	Medium				Medium	High
CO4	Medium	Medium	High	Low				Low	Medium	Medium
CO5	High	Medium	High	Low	Medium	Low		Low	Medium	High
CO6	Medium	High	High	Medium	Medium	Low	Low		Medium	High

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Swarrnim School of Business

Master in Computer Application (MCA)

Year 1 – (Semester-1)

Subject Name: Basic Mathematics

Subject Code: 16110101

Course Outcomes (COs):

1. Understand the fundamental concepts of set theory, propositional logic, and predicate logic.
2. Apply the principles of recursion, natural numbers, and matrices in problem-solving.
3. Analyze relations and functions and their applications in various computational problems.
4. Explore the concepts of graph theory and trees, and apply them in resource allocation and deadlock detection.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Low						Medium
CO2	Medium	High	High	Medium				Low	Medium	High
CO3	High	High	High	Medium	Low				Low	High
CO4	Medium	Medium	High	Low			Low	Low	Medium	High

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Swarrnim School of Business

Master in Computer Application (MCA)

Year 1 – (Semester-1)

Subject Name :Information Security

Subject Code: 16110112

Course Outcomes (COs):

1. Understand the fundamental principles of information security, including confidentiality, integrity, and availability.
2. Analyze various types of attacks, such as malware, phishing, and DDoS, and learn countermeasures to mitigate them.
3. Explore different cryptographic techniques such as encryption, hashing, and digital signatures.
4. Understand the importance of cybersecurity laws and regulations, including the IT Act, and their role in mitigating cybercrimes.
5. Apply concepts of security mechanisms, such as firewalls, intrusion detection systems, and network security, to protect information systems.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Low						Medium
CO2	Medium	High	High	Medium				Low	Medium	High
CO3	High	High	High	Medium	Low				Low	High
CO4	Medium	Medium	High	Low			Low	Low	Medium	High
CO5	High	High	High	Medium	Low				Low	High

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SWARNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Master in Computer Application (MCA)

Year 1 – (Semester-1)

Subject Name : Programming in python

Subject Code: 16110106

Course Outcomes (COs):

1. Understand the basic elements of Python and write simple programs using variables, control structures, and functions.
2. Apply NumPy for efficient data manipulation and perform statistical operations.
3. Utilize Pandas for data analysis and manipulation in various data science applications.
4. Create visualizations using Matplotlib to present data insights and patterns.
5. Implement advanced data manipulation techniques using Pandas and NumPy for real-world problem-solving.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Low						Medium
CO2	Medium	High	High	Medium				Low	Medium	High
CO3	High	High	High	Medium	Low				Low	High
CO4	Medium	Medium	High	Low			Low	Low	Medium	High
CO5	High	High	High	Medium	Low				Low	High

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SWARNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Master in Computer Application (MCA)

Year 1 – (Semester-2)

Subject: Android Programming

Subject Code: 16110213(AP)

Course Outcomes (COs):

1. **Understand the basic concepts of Android development and Android SDK.**
2. **Design user interfaces using Android layout elements and create interactive apps.**
3. **Implement persistent storage using SQLite databases in Android applications.**
4. **Utilize Android services for background processing and handle internet resources efficiently.**
5. **Enhance the user experience with animations, hardware sensors, and location-based services.**
6. **Develop media-rich Android apps that use audio, video, and camera functionality.**

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	Medium	Low						Medium
CO2	Medium	High	High	Medium					Low	High
CO3	High	High	High	Medium					Low	High
CO4	Medium	High	High	Low	Low				Medium	High
CO5	Medium	High	Medium	Medium	Low				Low	High
CO6	High	Medium	High	Medium					Medium	High

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SWARNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Master of Computer Applications

Year 1 – (Semester-2)

Subject: Basic Computer Science 3 – Computer Networking

Subject Code: 16110202(BCS-3)

Course Outcomes (COs):

1. Understand the fundamentals of computer networks, including OSI and TCP/IP models.
2. Analyze the physical layer's role in communication, including wired and wireless technologies.
3. Learn the data link layer's responsibilities, including error detection and correction techniques.
4. Explore medium access control protocols and their implementation in wired and wireless environments.
5. Understand the network layer, routing algorithms, and congestion control mechanisms.
6. Gain insights into transport and application layer protocols and their role in network communication.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Low						Medium
CO2	Medium	High	High	Medium	Low					High
CO3	High	High	High	Medium					Low	High
CO4	Medium	High	High	Low	Low				Medium	High
CO5	High	High	High	Medium	Low				Low	High
CO6	Medium	High	High	Medium					Medium	High

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Master in Computer Application (MCA)

Year 1 – (Semester-2)

Subject: Basic Statistics

Subject Code: 16110201(BS)

Course Outcomes (COs):

1. Understand fundamental concepts of descriptive statistics and visualize data using various graphical techniques.
2. Apply probability theory and distributions in real-world scenarios.
3. Analyze data using sampling techniques and understand estimation methods.
4. Perform hypothesis testing for single and multiple populations.
5. Conduct regression analysis and apply it to real-world forecasting and decision-making tasks.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Low						Medium
CO2	Medium	High	High	Medium				Low	Medium	High
CO3	High	High	High	Medium					Low	High
CO4	Medium	High	High	Low			Low	Low	Medium	High
CO5	High	High	High	Medium	Low				Low	High

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Swarrnim School of Business

Master in Computer Application (MCA)

Year 1 – (Semester-2)

Subject: Network Security

Subject Code: 16110204(NS)

Course Outcomes (COs):

1. Understand the principles of OSI security architecture and analyze security attacks and mechanisms.
2. Apply symmetric and asymmetric encryption algorithms in securing data.
3. Explore the concepts of hashing, digital signatures, and message authentication codes.
4. Analyze key distribution mechanisms and implement network security protocols.
5. Understand wireless network security protocols and evaluate threats and countermeasures.
6. Design and implement firewalls and intrusion detection systems for enhanced network security.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Low						Medium
CO2	Medium	High	High	Medium				Low	Medium	High
CO3	High	High	High	Medium	Low				Low	High
CO4	Medium	High	High	Low	Low				Medium	High
CO5	High	High	High	Medium	Low				Low	High
CO6	Medium	High	High	Medium					Medium	High

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Swarrnim School of Business

Master in Computer Application (MCA)

Year 1 – (Semester-2)

Subject: Basic Computer Science 4 – Software Engineering

Subject Code: 16110203(BCS-4)

Course Outcomes (COs):

1. Understand the principles of software engineering and process models, including Waterfall, Agile, and Spiral models.
2. Gain knowledge of requirements engineering and create Software Requirement Specifications (SRS).
3. Apply design concepts in software development and create architectural and interface designs.
4. Explore software testing strategies, including white-box, black-box, and system testing.
5. Understand software project management principles, including estimation and scheduling.
6. Develop UML diagrams, including use case, activity, sequence, and class diagrams for software systems.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Low						Medium
CO2	Medium	High	High	Medium				Low	Medium	High
CO3	High	High	High	Medium					Low	High
CO4	Medium	High	High	Low	Low				Medium	High
CO5	High	High	High	Medium	Low				Low	High
CO6	Medium	High	High	Medium					Medium	High

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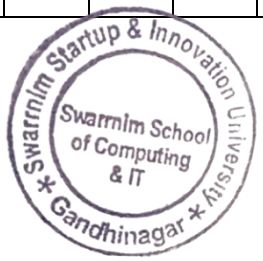

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Swarrnim School of Business

Master in Computer Application (MCA)

Year 1 – (Semester-3)

Subject: Big Data Analytics (BDA)

- **Subject Code**: 16110304(BDA)

Course Outcomes (COs):

1. Understand the fundamental concepts of big data, Hadoop, and NoSQL databases.
2. Apply MapReduce programming for solving big data problems.
3. Analyze different data mining techniques such as clustering, classification, and link analysis in large datasets.
4. Explore the concepts of data stream mining and its application in real-time data processing.
5. Implement recommendation systems and analyze social network graphs using big data techniques.
6. Use various big data tools to solve practical big data challenges.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	Medium	Low						Medium
CO2	Medium	High	High	Medium					Low	High
CO3	High	High	High	Medium					Low	High
CO4	Medium	High	High	Low	Low				Medium	High
CO5	Medium	High	Medium	Medium	Low				Low	High
CO6	High	Medium	High	Medium					Medium	High

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Swarrnim School of Business

Master of Computer Applications

Year 1 – (Semester-3)

ubject: Artificial Intelligence (AI)

- **Subject Code**: 16110302(AI)

Course Outcomes (COs):

1. Understand state space search and apply various search algorithms like DFS and BFS to solve AI problems.
2. Explore heuristic search techniques such as A*, hill climbing, and genetic algorithms for optimization problems.
3. Apply planning techniques in AI, including state space planning and goal stack planning.
4. Develop reasoning systems using logic and inference, including propositional and first-order logic.
5. Analyze natural language processing (NLP) and machine learning algorithms for AI applications.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Low						Medium
CO2	Medium	High	High	Medium	Low			Low		High
CO3	High	High	High	Medium				Low		High
CO4	Medium	High	High	Low	Low		Low		Medium	High
CO5	High	High	High	Medium	Low			Low	Low	High

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Swarrnim School of Business

Master in Computer Application (MCA)

Year 1 – (Semester-3)

Subject: Digital Technology Trends (DTT)

- **Subject Code**: 16110303(DTT)

Course Outcomes (COs):

1. Understand the concept of digital business, its opportunities, and barriers to adoption.
2. Analyze blockchain technology and its applications in various industries like finance and supply chain management.
3. Explore the Internet of Things (IoT) and its applications in disaster management, smart cities, and healthcare.
4. Understand the security implications of backdoors in systems and the influence of social media on society.
5. Apply virtual reality (VR) and augmented reality (AR) technologies in industries such as gaming and entertainment.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	Medium	Low						Medium
CO2	Medium	High	High	Medium					Low	High
CO3	High	High	High	Medium					Low	High
CO4	Medium	High	High	Low	Low				Medium	High
CO5	Medium	High	Medium	Medium	Low				Low	High

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Swarrnim School of Business

Master in Computer Application (MCA)

Year 1 – (Semester-3)

Subject: Cloud Computing (CC)

- **Subject Code**: 16110312(CC)

Course Outcomes (COs):

1. Understand the principles of cloud computing, its architecture, and deployment models.
2. Explore virtualization technologies, including VM migration and management, and its role in cloud computing.
3. Analyze the risks and costs associated with cloud computing and understand service-level agreements (SLA).
4. Design and develop cloud applications using client-server architecture and service-oriented architecture (SOA).
5. Implement cloud-based applications using platforms like Google App Engine and handle tasks such as data storage and query execution.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	Medium	Low						Medium
CO2	Medium	High	High	Medium					Low	High
CO3	High	High	High	Medium					Low	High
CO4	Medium	High	High	Low	Low				Medium	High
CO5	Medium	High	Medium	Medium	Low				Low	High

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Master in Computer Application (MCA)

Year 1 – (Semester-3)

Subject: Design and Analysis of Algorithms (DAA)

- **Subject Code**: 16110301(MCA DAA Syllabus)

Course Outcomes (COs):

1. Analyze algorithms for time and space complexity and design algorithms for problem-solving.
2. Apply divide-and-conquer techniques to solve algorithmic problems like matrix multiplication and recursion.
3. Understand dynamic programming concepts and apply them to problems like optimal binary search trees and rod cutting.
4. Implement greedy algorithms and amortized analysis for solving optimization problems.
5. Design algorithms for minimum spanning trees and shortest paths using algorithms like Kruskal, Prim, and Dijkstra.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	Medium	Low						Medium
CO2	Medium	High	High	Medium					Low	High
CO3	High	High	High	Medium					Low	High
CO4	Medium	High	High	Low	Low				Medium	High
CO5	Medium	High	Medium	Medium	Low				Low	High

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Swarrnim School of Business

Master in Computer Application (MCA)

Year 1 – (Semester-4)

Subject Name: Project

(Subject Code: 16110401)

Course Outcomes (COs) for Project:

1. **CO1**: Develop and demonstrate proficiency in identifying real-world problems and formulating appropriate solutions using technology.
2. **CO2**: Design, develop, and implement a complete project, demonstrating an understanding of the software development life cycle (SDLC).
3. **CO3**: Utilize appropriate methodologies and tools for analysis, design, and implementation of software systems.
4. **CO4**: Effectively document all stages of the project, from requirement gathering to implementation and testing.
5. **CO5**: Demonstrate project management skills, including planning, execution, and monitoring of the project within a set timeline.
6. **CO6**: Present and defend the project outcomes with clarity and professionalism in front of an audience.

CO-PO Mapping for Project:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	High	High	Medium	Medium				Medium	High
CO2	High	High	High	Medium	High		Medium			High
CO3	Medium	High	High	Medium	Medium		Medium	Low		High
CO4	High	Medium	High	Low					Medium	High
CO5	Medium	Medium	Medium	Medium	High		High			High
CO6	High	High	High	Medium					High	High

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Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Bachelor of Science in Information Technology (Bsc.IT)

Technical communication skill

Semester 1

Teaching & Evaluation Scheme:-

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

Course Outcomes (COs):

1. Understand the basic concepts of communication and its significance in IT.
2. Improve verbal and non-verbal communication skills for professional environments.
3. Apply language skills in presentations, group discussions, and interviews.
4. Analyze and improve written communication skills in technical and business documents.
5. Demonstrate soft skills such as active listening, problem-solving, and teamwork in IT contexts.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	High						Medium
CO2	Medium	High	Medium	High	Low				Low	High
CO3	High	High	Medium	High	Medium					High
CO4	Medium	Medium	High	High	Low				Medium	High
CO5	High	Medium	High	Medium	Medium	Low			Low	High

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Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Bachelor of Science in Information Technology (Bsc.IT)

Discrete Mathematics

Semester 1

Teaching & Evaluation Scheme:-

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

Course Outcomes (COs):

1. Understand fundamental mathematical concepts such as sets, relations, and functions.
2. Apply logic and proof techniques to solve mathematical and computational problems.
3. Analyze combinatorial problems and apply principles of counting, permutation, and combination.
4. Explore graph theory concepts and their applications in networking and IT.
5. Apply mathematical reasoning to solve problems related to discrete structures in computer science.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	High	High	Low						Medium
CO2	Medium	High	High	Medium	Low			Low		High
CO3	High	High	High	Medium	Low				Medium	High
CO4	Medium	High	High	Medium	Low				Low	High
CO5	High	High	High	Medium	Low				Low	High

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Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Bachelor of Science in Information Technology (Bsc.IT)

Networking & internet environment

Semester 1

Teaching & Evaluation Scheme:-

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

Course Outcomes (COs):

1. Understand the basic concepts of networking and the Internet, including OSI and TCP/IP models.
2. Learn the principles of networking protocols and technologies for communication.
3. Gain proficiency in designing and developing simple web pages using HTML.
4. Explore various networking tools and software for troubleshooting and monitoring networks.
5. Understand the fundamentals of website design and apply scripting languages for dynamic content.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	High	High	Medium						Medium
CO2	Medium	High	High	Medium	Low					High
CO3	High	High	High	Medium					Low	High
CO4	Medium	High	High	Low	Low				Medium	High
CO5	High	High	High	Medium	Low				Low	High

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Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Bachelor of Science in Information Technology (Bsc.IT)

Computer fundamentals and emerging technology

Semester 1

Teaching & Evaluation Scheme:-

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

Course Outcomes (COs):

1. Understand the fundamentals of information technology and its role in data processing.
2. Analyze data storage techniques and their importance in IT applications.
3. Explore emerging trends in information technology, including cloud computing, AI, and IoT.
4. Understand the societal impacts of IT and the ethical considerations in data storage and processing.
5. Apply IT solutions to address real-world problems in business and society.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Low						Medium
CO2	Medium	High	High	Medium	Low			Low	Medium	High
CO3	High	High	High	Medium					Low	High
CO4	Medium	High	High	Low	Low		Low	Low	Medium	High
CO5	High	High	High	Medium	Low				Low	High

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Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Bachelor of Science in Information Technology (Bsc.IT)

Problem solving methodologies and programming in c

Semester 1

Teaching & Evaluation Scheme:-

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

Course Outcomes (COs):

1. Understand the basics of the C programming language and its structure.
2. Develop algorithms for problem-solving and implement them using C programming.
3. Apply various programming constructs such as loops, functions, and arrays to solve problems.
4. Explore file handling and pointer concepts in C for dynamic memory management.
5. Design and implement structured programs using advanced features of C, such as structures and unions.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Low						Medium
CO2	Medium	High	High	Medium	Low			Low	Medium	High
CO3	High	High	High	Medium					Low	High
CO4	Medium	High	High	Low	Low		Low	Low	Medium	High
CO5	High	High	High	Medium	Low				Low	High

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Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Bachelor of Science in Information Technology (Bsc.IT)

Web Programming

Semester 2

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

Course Outcomes (COs):

1. Understand the fundamental concepts of HTML5 and its new elements to create web pages.
2. Apply CSS to design and format web pages for styling, layout, and positioning.
3. Develop interactive web applications using JavaScript and handle browser events.
4. Understand the structure and validation of XML documents for data storage and communication in web technologies.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Low						Medium
CO2	Medium	High	High	Medium	Low				Low	High
CO3	High	High	High	Medium					Low	High
CO4	Medium	High	High	Low	Low				Medium	High

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Bachelor of Science in Information Technology (Bsc.IT)

DATA STRUCTURE USING C LANGUAGE

Semester 2

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

Course Outcomes (COs):

1. Understand the fundamentals of data structures such as arrays, structures, and unions.
2. Apply pointers for dynamic memory allocation and linked list management in C.
3. Develop and implement algorithms using various data structures like linked lists, stacks, and queues.
4. Understand the concepts of file management in C and apply file handling operations for data storage.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Low						Medium
CO2	Medium	High	High	Medium	Low				Low	High
CO3	High	High	High	Medium					Low	High
CO4	Medium	High	High	Low	Low				Medium	High

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Department of Bachelor of Computer Application (BCA)

Bachelor of Science in Information Technology (Bsc.IT)

MATHAMATICAL AND STATASTICALS FOUNDATION OF COMPUTER SCIENCE

Semester 2

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

Course Outcomes (COs):

1. Understand the fundamentals of graph theory and its applications in IT.
2. Apply partial derivatives and the chain rule in optimization problems.
3. Explore integration techniques and apply them to solve real-world computational problems.
4. Understand eigenvalues, eigenvectors, and apply the Cayley-Hamilton theorem to matrix operations.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Low						Medium
CO2	Medium	High	High	Medium	Low				Low	High
CO3	High	High	High	Medium					Low	High
CO4	Medium	High	High	Low	Low				Medium	High

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Department of Bachelor of Computer Application (BCA)

Bachelor of Science in Information Technology (Bsc.IT)

COMPUTER ORGANIZATION AND ARCHITECTURE

Semester 2

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

Course Outcomes (COs):

1. Understand the basic structure of a computer system and its architectural components.
2. Analyze the working principles of CPU, memory hierarchy, and I/O operations.
3. Explore various data representation formats and computer arithmetic operations.
4. Apply knowledge of digital logic circuits and memory management techniques in computer systems.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Low						Medium
CO2	Medium	High	High	Medium	Low				Low	High
CO3	High	High	High	Medium					Low	High
CO4	Medium	High	High	Low	Low				Medium	High

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CO-PO Mapping for B.Sc.-IT Program (Semester 3)

Subject: Software Quality Assurance and Testing

- **Subject Code**: 16110301

Course Outcomes (COs):

1. Understand the principles of software quality assurance (SQA) and its role in software development.
2. Analyze different types of software testing techniques, including black-box and white-box testing.
3. Apply verification and validation techniques to ensure software meets quality standards.
4. Utilize automated testing tools and understand their role in the software testing lifecycle.
5. Manage project economics and apply software project management techniques.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Low						Medium
CO2	Medium	High	High	Medium					Low	High
CO3	High	High	High	Medium					Low	High
CO4	Medium	High	High	Low	Low				Medium	High
CO5	High	Medium	High	Medium	Medium	Low			Low	High

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Subject: C++ and Object-Oriented Programming

- **Subject Code**: 16110302

Course Outcomes (COs):

1. Understand the principles of object-oriented programming (OOP) and its advantages over procedural programming.
2. Apply the concepts of classes, objects, inheritance, and polymorphism in C++ programming.
3. Implement operator overloading and dynamic memory allocation using pointers in C++.
4. Explore advanced OOP concepts such as virtual functions, templates, and exception handling.
5. Design and develop programs in C++ using OOP concepts to solve real-world problems.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Low						Medium
CO2	Medium	High	High	Medium	Low				Low	High
CO3	High	High	High	Medium					Low	High
CO4	Medium	High	High	Low	Low				Medium	High
CO5	High	High	High	Medium	Medium	Low			Low	High

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Gandhinagar

Subject: Relational Database Management System (RDBMS) Using Oracle

- **Subject Code**: 16110303

Course Outcomes (COs):

1. Understand the fundamentals of relational database management systems (RDBMS) and SQL.
2. Apply SQL queries to manage and manipulate database tables.
3. Explore advanced SQL features such as joins, subqueries, and transaction control.
4. Understand PL/SQL concepts and develop database procedures, functions, and triggers.
5. Implement database administration tasks such as backups, recovery, and user management in Oracle.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Low						Medium
CO2	Medium	High	High	Medium	Low				Low	High
CO3	High	High	High	Medium					Low	High
CO4	Medium	High	High	Low	Low				Medium	High
CO5	High	High	High	Medium	Medium	Low			Low	High

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Subject: Content Management System (CMS) Using WordPress

- **Subject Code**: 16110304

Course Outcomes (COs):

1. Understand the concept of content management systems (CMS) and their significance in web development.
2. Develop and manage websites using WordPress, including theme and plugin management.
3. Apply customization techniques to design responsive and interactive web pages in WordPress.
4. Explore database handling in WordPress and perform content updates.
5. Understand the security aspects of WordPress and apply best practices for web security.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Low						Medium
CO2	Medium	High	High	Medium	Low				Low	High
CO3	High	High	High	Medium					Low	High
CO4	Medium	High	High	Low	Low				Medium	High
CO5	High	High	High	Medium	Medium	Low			Low	

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Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Bachelor of Science in Information Technology (Bsc.IT)

Subject–Programming with JAVA

Semester - 4

Teaching & Evaluation Scheme:-

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

Course Outcomes (COs):

1. Understand the fundamental concepts of object-oriented programming using Java.
2. Apply control statements, loops, and operators to solve problems in Java.
3. Develop Java applications using arrays, strings, and command-line arguments.
4. Implement inheritance, polymorphism, and interfaces in Java programs.
5. Work with Java I/O streams and handle exceptions effectively in Java programs.
6. Apply multithreading concepts and synchronization mechanisms in Java programs.

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CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Medium						Medium
CO2	Medium	High	High	Medium	Low				Low	High
CO3	High	High	High	Medium					Low	High
CO4	Medium	High	High	Low	Low				Medium	High
CO5	High	High	High	Medium	Medium	Low			Low	High
CO6	Medium	High	High	Medium	Low				Medium	High

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

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	
2	-	-	2		30	-	70	-	100

Course Outcomes (COs):

1. Understand the basic networking concepts, network models, and topologies.
2. Explore transmission media and switching techniques for efficient data communication.
3. Analyze various networking devices and protocols used for communication in networks.
4. Implement routing techniques and configure a Windows 2008 server.
5. Understand the fundamentals of network security, including encryption, authentication, and VPN.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Medium						Medium
CO2	Medium	High	High	Medium	Low				Low	High
CO3	High	High	High	Medium					Low	High
CO4	Medium	High	High	Low	Low				Medium	High
CO5	High	High	High	Medium	Medium	Low			Low	High

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SWARRNIM STARTUP & INNOVATION UNIVERSITY

Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

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	
2	-	-	2		30	-	70	-	100

Course Outcomes (COs):

1. Understand the basic concepts of operating systems and process management.
2. Explore memory management techniques, including paging and segmentation.
3. Apply Unix commands and manage file systems in Unix-based environments.
4. Develop shell scripts and manage processes in Unix/Linux.
5. Configure and manage the Linux operating system for both GUI and CUI environments.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Medium						Medium
CO2	Medium	High	High	Medium	Low				Low	High
CO3	High	High	High	Medium					Low	High
CO4	Medium	High	High	Low	Low				Medium	High
CO5	High	High	High	Medium	Medium	Low			Low	High

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Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Bachelor of Science in Information Technology (Bsc.IT)

Subject – Programming withC#

Semester - 4

CODE:

Teaching & Evaluation Scheme:-

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

Course Outcomes (COs):

1. Understand the .NET Framework and its components, including CLR, CTS, and FCL.
2. Apply object-oriented programming principles in C# to develop applications.
3. Develop Windows-based applications using various controls and forms.
4. Implement database programming using ADO.NET for connected and disconnected architecture.
5. Create user controls, generate reports using Crystal Reports, and develop setup projects for software deployment.

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CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Medium						Medium
CO2	Medium	High	High	Medium	Low				Low	High
CO3	High	High	High	Medium					Low	High
CO4	Medium	High	High	Low	Low				Medium	High
CO5	High	High	High	Medium	Medium	Low			Low	High

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Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Bachelor of Science in Information Technology (Bsc.IT)

Subject - Programming with ASP.Net

Semester - 5

Teaching & Evaluation Scheme:-

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

Course Outcomes (COs):

1. Understand the ASP.NET framework and its control features to develop web applications.
2. Develop web forms using ASP.NET controls such as Text Box, Label, and Buttons.
3. Implement form validation on both client and server sides using validation controls.
4. Create and manage a connected and disconnected database using ADO.NET and LINQ.
5. Develop web applications using XML and web services for remote method calls.
6. Manage web application configuration, error handling, and authentication using ASP.NET.

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CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Low						Medium
CO2	Medium	High	High	Medium					Low	High
CO3	High	High	High	Medium					Low	High
CO4	Medium	High	High	Low	Low				Medium	High
CO5	High	High	High	Medium	Medium	Low			Low	High
CO6	Medium	High	High	Medium	Low				Medium	High

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Swarrnim School of Business

Department of Bachelor of Computer Application (BCA)

Bachelor of Science in Information Technology (Bsc.IT)

Subject - Advanced Java Programming

Semester - 5

Teaching & Evaluation Scheme:-

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

Course Outcomes (COs):

1. Understand the principles of distributed computing using RMI and database programming with JDBC.
2. Apply servlet programming to handle client requests, manage form data, and generate server responses.
3. Implement listeners and filters to handle client requests and manage session data.
4. Develop JSP-based web applications and integrate JavaBeans for data management.
5. Apply MVC architecture in web applications using servlets and JSP.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Low						Medium
CO2	Medium	High	High	Medium	Low				Low	High
CO3	High	High	High	Medium					Low	High
CO4	Medium	High	High	Low	Low				Medium	High
CO5	High	High	High	Medium	Medium	Low			Low	High

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Swarrnim School of Business

Bachelor of Science in Information Technology (Bsc.IT)

Subject - Search Engine Techniques and Digital Technology Trends

Semester - 5

Teaching & Evaluation Scheme:-

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

Course Outcomes (COs):

1. Understand the basics of search engines, their impact on web commerce, and search algorithms.
2. Analyze searcher intent and optimize web content using SEO techniques for raw traffic and e-commerce.
3. Develop an SEO-friendly website by optimizing domain names, URLs, and content management.
4. Conduct keyword research and optimize for vertical search, including local, image, and video search.
5. Understand and apply emerging digital technology trends such as blockchain, VR, and AR in business applications.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Low						Medium
CO2	Medium	High	High	Medium	Low				Low	High
CO3	High	High	High	Medium					Low	High
CO4	Medium	High	High	Low	Low				Medium	High
CO5	High	High	High	Medium	Medium	Low			Low	High

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Swarrnim School of Business

Bachelor of Science in Information Technology (Bsc.IT)

SUBJECT - Data Warehousing with SQL Server 2012

Semester - 6

Teaching & Evaluation Scheme:-

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

Course Outcomes (COs):

1. Understand the fundamental concepts of data warehousing and its architecture.
2. Design and implement logical and physical data structures for data warehouses.
3. Use SQL Server Integration Services (SSIS) to create ETL solutions for data warehousing.
4. Enforce data quality using Data Quality Services (DQS) and extend SSIS with custom components.
5. Deploy SSIS packages and utilize Business Intelligence tools for reporting and data analysis.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Low						Medium
CO2	Medium	High	High	Medium					Low	High
CO3	High	High	High	Medium					Low	High
CO4	Medium	High	High	Low	Low				Medium	High
CO5	High	High	High	Medium	Medium	Low			Low	High

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Swarrnim School of Business

Bachelor of Science in Information Technology (Bsc.IT)

SUBJECT - INTERNET OF THINGS (IOT)

Semester - 6

Teaching & Evaluation Scheme:-

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

Course Outcomes (COs):

1. Understand the architecture and fundamental concepts of IoT, including M2M communication.
2. Analyze IoT protocols at the data link, network, transport, and session layers.
3. Explore IoT data management and business processes, including XaaS (Everything as a Service).
4. Implement security protocols in IoT applications and manage data representation and visualization.
5. Understand real-world constraints in IoT design, including hardware and remote control interactions.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Low						Medium
CO2	Medium	High	High	Medium					Low	High
CO3	High	High	High	Medium					Low	High
CO4	Medium	High	High	Low	Low				Medium	High
CO5	High	High	High	Medium	Medium	Low			Low	High

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Bachelor of Science in Information Technology (Bsc.IT)

SUBJECT - Mobile Computing using Android

Semester - 6

Teaching & Evaluation Scheme:-

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

Course Outcomes (COs):

1. Understand the basics of Android application development and its architecture.
2. Develop user interfaces in Android using layouts, views, and event handlers.
3. Implement database connectivity in Android using SQLite and manage content providers.
4. Apply location-based services and networking APIs in Android applications.
5. Explore notification services and deploy Android applications for different devices.

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	High	Medium	High	Low						Medium
CO2	Medium	High	High	Medium					Low	High
CO3	High	High	High	Medium					Low	High
CO4	Medium	High	High	Low	Low				Medium	High
CO5	High	High	High	Medium	Medium	Low			Low	High

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COs-POs/PSOs matrices of courses

Explanation of table to be ascertained The Mapping Level Contribution between COs-POs/PSOs are Categorized as follows:

3: High, 2: Medium, 1: Low, - : No correlation

Communication Skills (13030105)													
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO 1	1	2	3	3	3	2	2	1	3	2	2	3	2
CO 2	2	2	1	3	3	2	3	2	1	3	2	3	3
CO 3	3	1	2	2	2	1	3	3	3	2	3	2	1
CO 4	3	2	1	3	2	3	1	3	2	3	3	2	3
CO 5	1	2	3	3	3	2	2	1	3	2	2	3	2
CO 6	1	3	2	2	3	1	2	3	2	1	2	2	3
CO 7	2	3	3	2	1	2	2	1	1	2	3	3	2
CO 8	2	3	2	1	1	2	2	2	3	2	2	1	2
CO 9	2	3	2	1	2	1	2	1	2	2	3	1	3

Discrete Mathematics (13030104)													
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO 1	3	2	1	3	2	3	1	3	2	3	3	2	3
CO 2	1	2	3	3	3	2	2	1	3	2	2	3	2
CO 3	2	2	1	3	3	2	3	2	1	3	2	3	3
CO 4	3	1	2	2	2	1	3	3	3	2	3	2	1
CO 5	3	2	1	3	2	3	1	3	2	3	3	2	3
CO 6	1	2	3	3	2	1	2	3	1	2	3	2	1
CO 7	2	3	2	3	3	2	1	2	3	3	2	1	2
CO 8	2	3	1	2	2	2	3	2	1	1	2	1	3

Internet Web Designing-I (13030103)													
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO 1	2	2	1	3	3	2	3	2	1	3	2	3	3
CO 2	3	1	2	2	2	1	3	3	3	2	3	2	1
CO 3	3	2	1	3	2	3	1	3	2	3	3	2	3
CO 4	1	2	3	3	3	2	2	1	3	2	2	3	2
CO 5	2	2	1	3	3	2	3	2	1	3	2	3	3
CO 6	1	3	2	3	3	3	2	1	1	2	1	2	3
CO 7	2	3	1	1	2	1	2	3	2	1	2	3	3
CO 8	1	3	1	1	2	3	2	3	2	2	1	2	2
CO 9	3	2	1	2	1	2	3	2	1	2	3	3	2

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Introduction to Computer & Emerging Technologies (13030101)													
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO 1	3	1	2	2	2	1	3	3	3	2	3	2	1
CO 2	3	2	1	3	2	3	1	3	2	3	3	2	3
CO 3	1	2	3	3	3	2	2	1	3	2	2	3	2
CO 4	2	2	1	3	3	2	3	2	1	3	2	3	3
CO 5	3	1	2	2	2	1	3	3	3	2	3	2	1
CO 6	2	2	1	3	3	2	3	2	1	3	2	3	3
CO 7	3	1	2	2	2	1	3	3	3	2	3	2	1
CO 8	3	2	1	3	2	3	1	3	2	3	3	2	3
CO 9	1	2	3	3	3	2	2	1	3	2	2	3	2
CO 10	3	2	1	3	2	3	1	3	2	3	3	2	3

Programming in C (13030102)													
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO 1	1	2	3	3	3	2	1	3	2	2	2	3	2
CO 2	2	2	1	3	3	2	3	2	1	3	2	3	3
CO 3	3	1	2	2	2	1	3	3	3	2	3	2	1
CO 4	3	2	1	3	2	3	1	3	2	3	3	2	3
CO 5	1	2	3	3	3	2	2	1	3	2	2	3	2
CO 6	2	2	1	3	3	2	3	2	1	3	2	3	3
CO 7	3	1	2	2	2	1	3	3	3	2	3	2	1
CO 8	3	2	1	3	2	3	1	3	2	3	3	2	3
CO 9	1	2	3	3	2	1	2	3	1	2	3	2	1

Database Management System (13030203)													
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO 1	2	2	1	3	3	2	3	2	1	3	2	3	3
CO 2	3	1	2	2	2	1	3	3	3	2	3	2	1
CO 3	3	2	1	3	2	3	1	3	2	3	3	2	3
CO 4	1	2	3	3	3	2	2	1	3	2	2	3	2
CO 5	2	2	1	3	3	2	3	2	1	3	2	3	3
CO 6	1	2	3	3	3	2	1	3	2	2	2	3	2
CO 7	2	2	1	3	3	2	3	2	1	3	2	3	3
CO 8	3	1	2	2	2	1	3	3	3	2	3	2	1

Digital Electronics (13030205)													
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO 1	2	2	1	3	3	2	3	2	1	3	2	3	3
CO 2	1	2	3	3	3	2	2	1	3	2	2	3	2
CO 3	3	1	2	2	2	1	3	3	3	2	3	2	1
CO 4	3	1	2	2	2	1	3	3	3	2	3	2	1
CO 5	3	2	1	3	2	3	1	3	2	3	3	2	3
CO 6	1	2	3	3	3	2	2	1	3	2	2	3	2
CO 7	3	1	2	2	2	1	3	3	3	2	3	2	1
CO 8	3	2	1	3	2	3	1	3	2	3	3	2	3
CO 9	2	3	3	3	3	2	2	1	3	2	2	3	2

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Internet Web Designing – II (13030204)													
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO 1	3	1	2	2	2	1	3	3	3	2	3	2	1
CO 2	1	2	3	3	3	2	2	2	3	2	2	3	2
CO 3	3	2	1	3	2	3	1	3	2	3	3	2	3
CO 4	2	2	1	3	3	2	3	2	1	3	2	3	3
CO 5	2	3	3	3	3	2	2	1	3	2	2	3	2
CO 6	2	2	1	3	3	2	3	2	1	3	2	3	3
CO 7	3	1	2	2	2	1	3	3	3	2	3	2	1

Logic Development and Programming II (13030202)													
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO 1	1	2	3	3	3	2	2	1	3	2	2	3	2
CO 2	2	2	1	3	3	2	3	2	1	3	2	3	3
CO 3	2	3	3	3	3	2	2	1	3	2	2	3	2
CO 4	2	2	1	3	3	2	3	2	1	3	2	3	3
CO 5	3	2	1	3	2	3	1	3	2	3	3	2	3
CO 6	3	1	2	2	2	1	3	3	3	2	3	2	1
CO 7	1	2	3	2	3	2	3	2	1	2	3	2	3

2

Statistical Method and Operation Research (13030201)													
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO 1	3	1	2	2	2	1	3	3	3	2	3	2	1
CO 2	3	2	1	3	2	3	1	3	2	3	3	2	3
CO 3	2	3	3	3	3	2	2	1	3	2	2	3	2
CO 4	2	2	1	3	3	2	3	2	1	3	2	3	3
CO 5	2	3	2	1	2	1	2	2	3	2	1	2	2
CO 6	2	3	2	1	2	1	2	3	3	3	2	1	3
CO 7	1	3	2	1	2	1	2	2	3	2	1	2	3
CO 8	1	2	3	3	3	2	1	2	1	2	3	1	2

Data and File Structure (13030301)													
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO 1	2	2	1	3	3	2	3	2	1	3	2	3	3
CO 2	3	2	1	3	2	3	1	3	2	3	3	2	3
CO 3	3	1	2	2	2	1	3	3	3	2	3	2	1
CO 4	2	2	1	3	3	2	3	2	1	3	2	3	3
CO 5	1	2	3	3	3	2	2	2	3	2	2	3	2
CO 6	1	2	3	2	1	2	1	2	3	2	1	2	3
CO 7	2	1	3	2	1	2	3	2	3	2	1	2	3

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Object Oriented Programming – I (13030304)													
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO 1	2	2	1	3	3	2	3	2	1	3	2	3	3
CO 2	3	1	2	2	2	1	3	3	3	2	3	2	1
CO 3	3	2	1	3	2	3	1	3	2	3	3	2	3
CO 4	1	2	3	3	3	2	2	1	3	2	2	3	2
CO 5	2	2	1	3	3	2	3	2	1	3	2	3	3
CO 6	1	2	3	3	3	2	2	2	3	2	2	3	2
CO 7	1	2	3	2	1	2	1	2	3	2	1	2	3
CO 8	1	2	3	3	3	2	2	1	3	2	2	3	2

Operating System (13030303)													
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO 1	2	2	1	3	3	2	3	3	3	2	3	2	1
CO 2	3	2	1	3	2	3	1	3	2	3	3	2	3
CO 3	2	2	1	3	3	2	3	2	1	3	2	3	3
CO 4	1	2	3	3	3	2	2	1	3	2	2	3	2
CO 5	3	1	2	2	2	1	3	3	3	2	3	2	1
CO 6	1	2	3	3	2	3	2	1	2	3	2	1	3
CO 7	3	2	1	2	3	2	2	1	2	3	3	2	1
CO 8	3	2	1	2	3	2	1	2	3	2	1	2	3
CO 9	3	2	1	3	2	1	2	2	3	2	3	1	3

Relational Database Management System (13030302)													
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO 1	3	1	2	2	2	1	3	3	3	2	3	2	1
CO 2	1	2	3	3	3	2	2	2	3	2	2	3	2
CO 3	3	2	1	3	2	3	1	3	2	3	3	2	3
CO 4	2	2	1	3	3	2	3	2	1	3	2	3	3
CO 5	3	3	2	2	2	1	3	3	3	2	3	2	1
CO 6	1	2	3	2	3	2	1	1	2	3	2	1	2
CO 7	2	2	3	2	1	2	1	2	1	2	3	2	3

Software Engineering (13030305)													
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO 1	1	3	2	2	3	3	2	1	2	3	2	1	3
CO 2	3	1	2	2	2	1	3	3	3	2	3	2	1
CO 3	2	2	1	3	3	2	3	2	1	3	2	3	3
CO 4	3	2	1	2	2	3	3	3	2	1	2	3	1
CO 5	2	3	1	2	3	2	1	2	3	1	3	2	1
CO 6	2	3	2	2	3	2	3	3	1	2	2	3	1
CO 7	2	3	1	2	3	2	1	2	3	2	3	3	1

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Data Center Management (13030405)													
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO 1	2	1	3	3	3	2	2	1	2	1	3	1	2
CO 2	3	2	2	3	1	2	3	2	3	3	2	1	3
CO 3	3	2	1	3	2	1	2	2	3	2	3	1	3
CO 4	2	3	2	1	2	3	2	1	3	2	3	2	1
CO 5	1	2	1	1	2	2	3	3	3	2	1	2	3
CO 6	1	2	2	2	1	3	2	3	2	1	2	1	2
CO 7	2	3	2	1	2	3	2	1	2	2	3	2	1
CO 8	1	2	3	2	1	3	3	2	1	2	3	1	2
CO 9	3	2	1	2	2	2	3	3	2	3	3	2	2

Data Communication and Network (13030404)													
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO 1	3	2	2	3	1	2	3	2	3	3	2	1	3
CO 2	3	2	1	3	2	1	2	2	3	2	3	1	3
CO 3	2	3	2	1	2	3	2	1	3	2	3	2	1
CO 4	2	1	3	3	3	2	2	1	2	1	3	1	2
CO 5	1	2	1	1	2	2	3	3	3	2	1	2	3
CO 6	1	2	3	2	1	3	3	2	1	2	3	1	2
CO 7	3	2	1	3	2	1	2	2	3	2	3	1	3

Object Oriented Programming - II (13030401)													
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO 1	1	2	1	1	2	2	3	3	3	2	1	2	3
CO 2	2	2	3	3	2	2	3	3	2	1	2	3	2
CO 3	2	3	2	3	2	1	1	2	1	2	2	3	2
CO 4	3	2	2	3	3	2	2	1	2	3	3	2	1
CO 5	2	3	3	2	1	1	2	3	2	3	1	2	3
CO 6	3	2	1	3	2	1	2	2	3	2	3	1	3
CO 7	1	2	1	1	2	2	3	3	3	2	1	2	3
CO 8	1	2	3	2	1	3	3	2	1	2	3	1	2

Open Source Technology (13030402)													
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO 1	2	3	3	2	1	2	3	1	2	3	3	2	1
CO 2	3	2	2	3	1	2	3	2	3	3	2	1	3
CO 3	1	2	3	3	2	3	2	1	2	3	2	1	3
CO 4	3	2	1	2	3	2	2	1	2	3	3	2	1
CO 5	3	2	1	2	3	2	1	2	3	2	1	2	3
CO 6	3	2	2	2	3	3	2	2	1	2	3	2	1
CO 7	2	1	3	3	3	2	2	1	2	1	3	1	2

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Object Oriented Web Technology (13030403)													
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO 1	3	2	1	3	2	1	2	2	3	2	3	1	3
CO 2	2	3	2	1	2	3	2	1	3	2	3	2	1
CO 3	1	2	3	3	3	2	1	2	3	2	1	2	3
CO 4	3	2	2	2	3	3	2	2	1	2	3	2	1
CO 5	2	1	3	3	3	2	2	1	2	1	3	1	2
CO 6	3	2	1	3	2	3	1	3	2	3	3	2	3
CO 7	1	2	3	3	3	2	2	1	3	2	3	2	3
CO 8	3	1	2	2	2	1	3	3	3	2	3	2	1

Android Programming (13030504)													
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO 1	1	2	3	3	3	2	2	2	3	2	2	3	2
CO 2	2	2	3	3	3	2	3	2	1	3	2	3	3
CO 3	3	1	2	2	2	1	3	3	3	2	3	2	1
CO 4	3	2	1	3	2	3	1	3	2	3	3	2	3
CO 5	1	2	3	3	3	2	2	1	3	2	3	2	3
CO 6	1	2	3	3	3	2	2	1	3	2	3	2	3
CO 7	3	2	2	3	1	2	3	2	3	3	2	1	3
CO 8	1	2	3	3	3	2	3	2	1	2	3	2	1

Object Oriented Analysis and Design (13030502)													
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO 1	1	2	1	1	2	2	3	3	3	2	1	2	3
CO 2	2	1	3	3	3	2	2	1	2	1	3	1	2
CO 3	3	2	1	3	2	1	2	2	3	2	3	1	3
CO 4	3	1	2	2	2	1	3	3	3	2	3	2	1
CO 5	1	2	3	3	3	2	2	1	3	2	3	2	3
CO 6	3	2	2	3	1	2	3	2	3	3	2	1	3
CO 7	2	1	3	3	3	2	2	1	2	1	3	1	2
CO 8	3	2	1	3	2	1	2	2	3	2	3	1	3

Object Oriented Programming – III (13030501)													
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO 1	3	2	1	3	2	1	2	2	3	2	3	1	3
CO 2	2	3	2	1	2	3	2	1	3	2	3	2	1
CO 3	3	2	2	3	1	2	3	2	3	3	2	1	3
CO 4	2	1	3	3	3	2	2	1	2	1	3	1	2
CO 5	3	2	1	3	2	1	2	2	3	2	3	1	3
CO 6	1	2	3	3	3	2	2	1	3	2	3	2	3
CO 7	3	2	2	3	1	2	3	2	3	3	2	1	3
CO 8	1	2	3	3	2	2	3	2	1	2	1	2	3

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