

Program: B.Sc. – Information Technology (2024 - 25)		Semester: I	
Course: Notion of Operating Systems		Course Code:	
Teaching Scheme		Evaluation Scheme	
Lecture (Hours per week)	Credit	Continuous Assessment (CA) (Marks - 40)	Semester End Examinations (SEE) (Marks- 60 in Question Paper)
3	3	20+20	60
Learning Objectives: <ul style="list-style-type: none"> To learn the basic concepts of operating system To learn the concept of process, Threads Introduction to the basic commands in Linux 			
Course Outcomes: After completion of the course, learners would be able to: CO1: Students will be able to understand the basic concepts of operating system CO2: To understand the working of process and threads. CO3: Students will understand the Linux Command line environment			
Outline of Syllabus: (per session plan)			
Modules	Topics	Duration (Lecture)	
Module 1	Operating System, Process and Threads	15	
	Introduction: What is an operating system? History of operating system, computer hardware, different operating systems with examples, operating system concepts, system calls, operating system structure. Processes and Threads: Processes, threads, Synchronization and Inter-process Communication, scheduling		
Module 2	Memory Management, Deadlocks, File System	15	

	Memory Management – Paging, Segmentation, File System (Windows), Resources, Introduction to Deadlocks, The Ostrich Algorithm, Deadlock Detection with One Resource of Each Type, Recover from Deadlock	
Module 3	Linux	15
	Introduction to Linux Shell, Navigation, Exploring the System, Manipulating Files and Directories, Working with Commands, Redirection, Echo, Clear, History, Permissions, Processes	
Total Lectures		45

Reference books:

1. Modern Operating System by Andrew S. Tanenbaum, Fifth Edition, Oct 2022, Pearson Publication
2. The Linux Command Line, William Shotts , Fifth Internet Edition, 2019, No Starch Press

Details of Continuous Assessment (ICA)- 40 Marks

Continuous Assessment	Details	Marks
Component 1 (ICA-1)	Internal class test (online or offline) Fill in the blanks /Explain the concepts/Answer in brief/Case study or application-based questions.	20 marks
Component 2 (ICA-2)	Presentations/Project Work/ VivaVoce/ Book Review/ Field visit & its presentations/ Documentary filming/ Assignments/ Group	20 marks

	Discussions Etc.	
--	------------------	--

Details of Semester End Examination (TEE)- 60 Marks

	Particulars	Marks
Module 1	Answer in brief (Any 4 out of 6)	20 marks
Module 2	Answer in brief (Any 4 out of 6)	20 marks
Module 3	Answer in brief (Any 4 out of 6)	20 marks

Program: B.Sc. Information Technology				Semester: I	
Course: Programming Logic And Techniques				Course Code:	
Teaching Scheme				Evaluation Scheme	
Lecture (Hours per week)	Practical (Hours per week)	Tutorial (Hours per week)	Credit	Continuous Assessment (CA) (Marks - 20)	Semester End Examinations (SEE) (60 Marks)
3	-	-	3	20+20	60
Learning Objectives:					
<ol style="list-style-type: none"> 1. To understand the principles and practices of breaking down problems into small tasks and analyze them to design effective and efficient solutions 2. To cultivate logic building skills by acquiring the ability to think and reason logically, computationally, and algorithmically to design solutions to real-world problems 3. To understand significance of programming, develop strong foundation in programming concepts and basic data structures and incorporate problem-solving abilities 4. To gain understanding of best practices in programming and logic design and be able to write and execute basic programs in a high-level programming language 					
Course Outcomes:					
After completion of the course students will be able to					
<ol style="list-style-type: none"> 1. Understand and evaluate problems for their complexity and devise computationally well-structured solutions 2. Apply logical, computational, and structured problem-solving techniques to a variety of real-world problems 3. Implement programming fundamentals along with critical thinking and creativity for solving complex problems through application of programming principles <p style="text-align: center;">Apply best practices of programming and logic design while designing solutions in high-level language</p>					
Pedagogy:					
Classroom Learning					
Outline of Syllabus: (per session plan)					
Module	Description				No of Hours
1	Introduction to Programming and Problem Solving				9
2	Design Principles and Computational Thinking				14
3	Fundamentals of Programming and Its Techniques				13
Total					45

Practicals		-
MODULE NO	MODULE TOPICS	DURATION
I	<p>Introduction and Importance of Programming Introduction to programming paradigms, Overview of imperative, declarative, and procedural paradigms, Role and applications of programming in different fields, Programming as a tool for problem solving</p> <p>Foundations of Problem Solving General problem-solving concepts, Problem solving and decomposition, Using abstractions and patterns, A guided example</p>	11
II	<p>Introduction to Algorithms and Design Principles What are algorithms?, Defining and designing algorithms, Understanding the way algorithms are written. Introduction to basic data structures, Role of algorithms in computing</p> <p>Computational Thinking What is computational thinking?, Logic and algorithmic thinking, Logic programming paradigm</p>	13
III	<p>Input, Processing, and Output Output, input, and variables, Variable assignment, calculations, declaration, and data types, Named constants, Hand tracing a program, Documenting a program and designing your first program</p> <p>Decision Structures, Boolean Logic, and Repetition Structures Introduction to decision structures, Dual alternative decision structures, Comparing strings, Logical operators, Nested decision structures, The case structures, Boolean variables, Introduction to repetition structures, Condition and controlled loops, Count-controlled loops and the for statement, Nested loops</p> <p>Modules and Functions Introduction to modules, Defining and calling a module, Local variables, Passing arguments to modules, Global variables and global constants, Introduction to functions, Writing your own functions</p> <p>Evolution and overview of programming languages</p>	21

Reference Books:

1. Programming Languages: Principles and Paradigms, Springer, 2023
2. Programming Logic and Design, 10th Edition, Joyce Farrell, Cengage, 2023
3. Introduction to Algorithms, 4th Edition, Thomas Cormen, Charles Leiserson, Ronald Rivest, Clifford Stein, The MIT Press, 2022
4. Computational Thinking, Peter Denning, Matiti Tedre, MIT Press
5. Guide to Competitive Programming - Learning and Improving Algorithms through Contests, 2nd Edition, Springer, 2020

Details of Continuous Assessment (ICA)- 40 Marks

Continuous Assessment	Details	Marks
Component 1 (ICA-1)	Internal class test (online or offline) Fill in the blanks /Explain the concepts/Answer in brief/Case study or application-based questions.	20 marks
Component 2 (ICA-2)	Presentations/Project Work/ VivaVoce/ Book Review/ Field visit & its presentations/ Documentary filming/ Assignments/ Group Discussions Etc.	20 marks

Details of Semester End Examination (TEE)- 60 Marks

	Particulars	Marks
Module 1	Answer in brief (Any 4 out of 6)	20 marks
Module 2	Answer in brief (Any 4 out of 6)	20 marks
Module 3	Answer in brief (Any 4 out of 6)	20 marks

Program: Bachelor of Science Honours (Information Technology)					Semester: I		
Course: C Programming LAB					Code:		
Teaching Scheme				Evaluation Scheme			
Lecture	Practical	Tutorial	Credits	Theory		Practical	
				Internal	External	Internal	External
Nil	15X2	Nil	01	Nil	Nil	20	30
Internal Component							
MAchine Test Duration Mins			Assignment& projects			Class Participation	
30 Marks 2.5 Hours			Mini Project 20 Marks			Nil	
Pedagogy							
<ul style="list-style-type: none"> PPTs, Case studies, Group discussions, Classroom Activity, Videos, Research papers, News articles etc. 							

List of Practicals:

1. Programs based on basic structure.
2. Programs to implement different types of variables.
3. Programs to illustrate Conditional statements and loops(basic).
4. Programs to illustrate Conditional statements and loops(advanced).
5. Programs to display different patterns.
6. Programs to implement Arrays
7. Programs to implement functions
8. Programs to implement Recursive functions
9. Programs to implement Pointers
10. Programs to implement Structures and Unions

Details of Practical Examination - 50 Marks

Continuous Assessment	Details	Marks
Component 1 (ICA-1)	Machine Test	30 marks
Component 2 (ICA-2)	Presentations/Project Work/ /Mini project, Etc.	20 marks

Program: B.Sc. – Information Technology (2024 - 25)		Semester: I	
Course: Electronics & Communication Technology I		Course Code:	
Teaching Scheme		Evaluation Scheme	
Lecture (Hours per week)	Credit	Continuous Assessment (CA) (Marks - 40)	Semester End Examinations (SEE) (Marks- 60 in Question Paper)
2	2	10+10	30
<p><i>CLOs</i></p> <p><i>CLO 1. To familiarize with the concepts of Different Number System, Electronics Gates, Electronic Circuits and Boolean Logic</i></p> <p><i>CLO 2. To apply and analyze the Boolean Equations, circuit implementation with minimal number of gates.</i></p> <p><i>CLO 3. To design and construct basic electronics circuits, sequential and combinational circuits.</i></p> <p><i>CLO4. To design and implement code convertors</i></p>			
<ol style="list-style-type: none"> <i>Students will be able to comprehend the concepts of Electronics Gates, Electronic Circuits, Boolean Logic and different number systems with conversions.</i> <i>Students will be able to solve Boolean equations and reduce and realize them.</i> <i>Students will be able to compare different number systems with interconversions, sequential and combinational circuits</i> <i>Students will be able to integrate the knowledge of electronics components and number systems to design and implement electronics circuits</i> 			
Outline of Syllabus: (per session plan)			
Modules	Topics	Duration (Lecture)	
Module 1	<p>Introduction to Electronics: Analog Vs Digital Signal</p> <p>Number Systems and Codes Introduction to number system and conversions: Binary, Octal, Decimal and Hexadecimal Number Systems</p> <p>Codes: Gray Code, BCD Code, Excess-3 code, ASCII Code</p> <p>Arithmetic Operations : Binary arithmetic: addition, subtraction (1's and 2's complement). Octal and Hexadecimal arithmetic: Addition and Subtraction (7's and 8's complement method for octal) and (15's and 16's complement method for Hexadecimal).</p>	10	

Module 2	Basic Digital gates: NOT , AND , OR , NAND , NOR , EXOR , EXNOR, positive and negative logic, NAND-NOR Realization (Implementation of other gates using universal gates). K-map method 2 variable, 3 variable, 4 variable, Don't care condition Introduction, Half and Full Adder, Half and Full Subtractor	10
Module 3	Combinational Logic Design : Code conversion - BCD to 7 segment decoder Decimal to BCD Encoder. Sequential Logic Design : Flip Flops : Concept of Flipflop, Types of flipflop , Designing a flipflop circuit	10
Total Lectures		30

Text Book

R. P. Jain and K. Sarawadekar, *Modern Digital Electronics / 5th Edition*, Standard Edition. McGraw Hill, 2022.

Reference Book/Chapters/Links

1. R. Kories and H. Schmidt-Walter, "Digital Electronics," in *Electrical Engineering*, Berlin, Heidelberg: Springer Berlin Heidelberg, 2003, pp. 392–468. doi: 10.1007/978-3-642-556296_8.
2. A. K. Maini, *Digital electronics: principles, devices and applications*. Chichester, England ; Hoboken, NJ: J. Wiley, 2007.

Details of Continuous Assessment (ICA)- 20 Marks

Continuous Assessment	Details	Marks
Component 1 (ICA-1)	Internal class test (online or offline) Fill in the blanks /Explain the concepts/Answer in brief/Case study or application-based questions.	10 marks

Component 2 (ICA-2)	Presentations/Project Work/ VivaVoce/ Book Review/ Field visit & its presentations/ Documentary filming/ Assignments/ Group Discussions Etc.	10 marks

Details of Semester End Examination (TEE)- 30 Marks

	Particulars	Marks
Module 1	Answer in brief (Any 2 out of 3)	10 marks
Module 2	Answer in brief (Any 2 out of 3)	10 marks
Module 3	Answer in brief (Any 2 out of 3)	10 marks

Program: Bachelor of Science Honours (Information Technology)				Semester: I			
Course: Electronics & Communication Technology I LAB				Code:			
Teaching Scheme				Evaluation Scheme			
Lecture	Practical	Tutorial	Credits	Theory		Practical	
				Internal	External	Internal	External
Nil	15X2	Nil	01	Nil	Nil	20	30
Internal Component							
Machine Test Duration Mins		Assignment& projects			Class Participation		
30 Marks 2.5 Hours		20 Marks Mini Project			Nil		
Pedagogy							
<ul style="list-style-type: none"> PPTs, Case studies, Group discussions, Classroom Activity, Videos, Research papers, News articles etc. 							

List of Practical

1. Study of Basic Logic gates and their ICs:

- Study of AND, OR, NOT
- 7408,7432,7404

2. Study of Universal gates and their ICs:

- NAND and NOR
- 7400, 7402

3. Study of XOR and XNOR (7486,74266)

4. Universality of NAND

5. Universality of NOR

6. Implement the given Boolean expressions using minimum number of gates.

- Implement other given expressions using minimum number of gates.
- Implement other given expressions using minimum number of ICs.

7. Verifying De Morgan's laws.

8. Implement combinational circuits.

Design and implement combinational circuit based on the problem given and minimizing using K-maps.

9. Implement code converters.

- a. Design and implement Binary – to – Gray code converter.
- b. Design and implement Gray – to – Binary code converter.
- c. Design and implement Binary – to – BCD code converter
- d. Design and implement Binary – to – XS-3 code converter

10. Implement Adder and Subtractor Arithmetic circuits.

- a. Design and implement Half adder and Full adder.
- b. Design and implement BCD adder.
- c. Design and implement XS – 3 adder.
- d. Design and implement binary subtractor.
- e. Design and implement BCD subtractor.
- f. Design and implement XS – 3 subtractor.

11. Implement Encode and Decoder and Multiplexer and Demultiplexers.

- a. Design and implement 8:3 encoder.
- b. Design and implement 3:8 decoder.
- c. Design and implement 4:1 multiplexer. Study of IC 74153, 74157
- d. Design and implement 1:4 demultiplexer. Study of IC 74139
- e. Implement the given expression using IC 74151 8:1 multiplexer.
- f. Implement the given expression using IC 74138 3:8 decoder.

12. Study of flip-flops and counters.

- a. Study of IC 7473.
- b. Study of IC 7474.
- c. Study of IC 7476.
- d. Conversion of Flip-flops.
- e. Design of 3-bit synchronous counter using 7473 and required gates.
- f. Design of 3-bit ripple counter using IC 7473.

Details of Practical Examination - 50 Marks

Continuous Assessment	Details	Marks
Component 1 (ICA-1)	Machine Test	30 marks
Component 2 (ICA-2)	Presentations/Project Work/ /Mini project, Etc.	20 marks

Programme : B. Sc. IT (Information Technology)				Semester : I			
Course : Discrete Mathematics				Code : NMUBSCIT307			
Suggested Lectures per week				02			
Teaching Scheme				Evaluation Scheme			
Lecture	Practical	Tutorial	Credits	Theory		Practical	
				Internal	External	Component 1	Component 2
30	0	Nil	2	20 Marks	30 Marks	NA	NA
Internal Component							
Class Test Duration 20 Mins				10 Marks			
Assignments				10 Marks			
External Component: Examination (1 hr.)				30 Marks			
Total				50 Marks			
Learning Objectives:							
<ol style="list-style-type: none"> 1. Able to learn concepts of sets, proper notation, calculations using truth table giving a logical implication, and its related statements – converse, inverse, and contrapositive. 2. Able to understand the basic concept, types, operation and relations of the function. 3. Able to understand and apply concepts of graphs and trees in different shortest path algorithm. 							

<p>Learning Outcomes:</p> <ol style="list-style-type: none"> 1. Students will be able to define, and explain the basic sets operations. They will also be able to apply formal methods of symbolic propositional logic, such as calculating validity of formulae and computing normal forms. 2. Students will be able to understand the concept of the domain and range of a function and types of function and relations. They will also be able to write the explicit formula for a given sequence express the nth term as a function of n. 3. Students will be able to distinguish between different types of graphs (directed, undirected, weighted) and trees (binary, n-ary) and understand their basic properties. They will also be able to find shortest path minimum spanning tree using Kruskal's, Prim's, Dijkstra's algorithm.
<p>Pedagogy: Classroom learning , Discussion, Presentation.</p>

Module	Module Content	Module wise Pedagogy Used	Duration of Module
Module I	<p>Set Theory: Set and operations on sets Union, Intersection, De-Morgan's law, Set Difference, symmetric difference, Cartesian product power of a set.</p> <p>Mathematical Logic: Propositional logic, Propositional equivalence, Predicates and Quantifiers, Nested Quantifier. Methods of proofs: Direct proof, proof by contradiction, method of counter example.</p>	Classroom learning	10

Module II	<p>Functions: Functions Defined on General Sets, domain codomain, range, types of function: linear, polynomial, exponential, logarithmic, floor & ceiling function, One-to-One and Onto, Inverse Functions, Composition of Functions, algebra of function. Induction and Recursion: Principal of Mathematical induction. Defining sequences recursively, solving recurrence relations by iteration, Second order linear homogenous recurrence relations with constant coefficients.</p>	Classroom learning	10
Module III	<p>Relation: Relations on Sets, Reflexivity, Symmetry, and Transitivity, Equivalence Relations, Partial Order Relations, representation of relation using matrix ,diagraph.</p> <p>Graphs and Trees: Definitions and Basic Properties, graph and subgraph, Directed and undirected graph, Trails, Paths, and Circuits, degree of vertex Handshaking theorem, Matrix Representations of Graphs, Spanning trees (Kruskal's and Prim's algorithm) and shortest paths(Dijkstra's algorithm).</p>	Classroom learning	10

References:

1. C. L. Liu, —Elements of Discrete Mathematics, TMH, ISBN 10:0-07-066913-9.
2. N. Biggs, --“Discrete Mathematics”, 3rd Ed, Oxford University Press, ISBN 0 –19-850717–8
3. Bernard Kolman, Robert C. Busby and Sharon Ross, —Discrete Mathematical Structures, Prentice-Hall of India /Pearson, ISBN: 0132078457, 9780132078450.
4. Narsingh Deo, “Graph with application to Engineering and Computer Science”, Prentice Hall of India, 1990, 0 – 87692 – 145 – 4.
5. Eric Gossett, “Discrete Mathematical Structures with Proofs”, Wiley India Ltd, ISBN:978-81- 265-2758-8.
6. Sriram P & Steven S., “Computational Discrete Mathematics”, Cambridge University Press, ISBN 13: 978-0-521-73311-3.
7. Kenneth H. Rosen, —Discrete Mathematics and its Applications, Tata McGraw-Hill, ISBN 978- 0-07-288008-3.

Details of Continuous Assessment (ICA)- 20 Marks

Continuous Assessment	Details	Marks
Component 1 (ICA-1)	Internal class test (online or offline) Fill in the blanks /Explain the concepts/Answer in brief/Case study or application-based questions.	10 marks
Component 2 (ICA-2)	Presentations/Project Work/ VivaVoce/ Book Review/ Field visit & its presentations/ Documentary filming/ Assignments/ Group Discussions Etc.	10 marks

Details of Semester End Examination (TEE)- 30 Marks

	Particulars	Marks
Module 1	Answer in brief (Any 2 out of 3)	10 marks
Module 2	Answer in brief (Any 2 out of 3)	10 marks
Module 3	Answer in brief (Any 2 out of 3)	10 marks

Programme : Bachelor of Science (Information Technology)					Semester : I		
Course : Digital Marketing					Code :		
Suggested Lectures per week				2			
Practical Session per week (per Batch)				-			
Teaching Scheme				Evaluation Scheme			
Lecture	Practical	Tutorial	Credits	Theory		Practical	
				Internal	External	Component 1	Component 2
30	-	Nil	02	20	30	Nil	Nil
Internal Component (Theory Break up)							
Class Test				Assignments			
10 Marks 20 Mins				10 Marks			
Learning Objectives :							
<ul style="list-style-type: none"> • To understand significance of Digital Marketing and its applications in Business and Various Sectors • To provide an insight on Digital Marketing activities on various Social Media platforms and its emerging significance in Business • To understand Latest Trends and Practices in E-Commerce and Digital Marketing, along with its Challenges and Opportunities for an Organization 							
Learning Outcomes :							
<ol style="list-style-type: none"> 1. Core concept about e-commerce, m-commerce, e business and digital marketing and Search Engine Optimization 2. Ability to design Email and Mobile marketing concepts in Digital marketing 3. Birds Eye view and future view of DM 							
Pedagogy :							
<input type="checkbox"/> PPTs, Case studies, Group discussions, Classroom Activity, Videos, Research papers, News articles etc.							

Module 1**(10) Introduction to**

marketing concepts: definition & objectives of marketing, understanding marketing activities, P's of marketing & marketing mix

Introduction to digital Marketing. Technology Behind DM. Concept of E-Commerce, M-Commerce and EBusiness. Electronic Data Interchange (EDI)

Digital Marketing Strategy: Need, Defining. 4 Ps of Marketing and 10 Ps of Digital Marketing. Role of Web development in Digital Marketing.

Module 2**(10)**

Search: Being found online. Search Engine Basics, Optimizing your website for SEO. Advertising on search engines, Mobile Search

Understanding social media:

Different forms of social media, social media dashboards.

Understanding e-mail marketing: Planning, measurement of success.

Understanding mobile marketing: Market size, Mobile gaming and applications. Mobile privacy, Mobile data. Building Multichannel Marketing Strategy

Module 3**(10)**

Various Software tools for Digital Marketing: Marketo, Vocus, HubSpot, Yesware, Sailthru,

Optimove, LocalVox, MailChimp. Mind Mapping in Digital Marketing. Digital Marketing Process.

Future of Digital Marketing: Commercial Advantage, Censorship and privacy issues. Power of voice and thought Life without Google.

References:

Understanding Digital Marketing: Marketing Strategies for Engaging the Digital Generation

Author: Damian Ryan

Digital Marketing for Dummies

Authors: Russ Henneberry, Ryan Deiss

Details of Continuous Assessment (ICA)- 20 Marks

Continuous Assessment	Details	Marks
Component 1 (ICA-1)	Internal class test (online or offline)	10 marks

	Fill in the blanks /Explain the concepts/Answer in brief/Case study or application-based questions.	
Component 2 (ICA-2)	Presentations/Project Work/ VivaVoce/ Book Review/ Field visit & its presentations/ Documentary filming/ Assignments/ Group Discussions Etc.	10 marks

Details of Semester End Examination (TEE)- 30 Marks

	Particulars	Marks
Module 1	Answer in brief (Any 2 out of 3)	10 marks
Module 2	Answer in brief (Any 2 out of 3)	10 marks
Module 3	Answer in brief (Any 2 out of 3)	10 marks

Program: Bachelor of Science Honours (Information Technology)				Semester: I			
Course: Cyber Crime and Laws				Code:			
Teaching Scheme				Evaluation Scheme			
Lecture	Practical	Tutorial	Credits	Theory		Practical	
				Internal	External	Internal	External
30	Nil	Nil	2	20	30	Nil	Nil
Course Objectives							
<ol style="list-style-type: none"> 1. To acquaint the students with general Cyber Laws 2. To acquaint the students with the legal framework influencing Cyber related decisions and operations 3. To enable the students to apply the provisions of cyber laws in business activities. 4. To acquaint students with different types of cyber crimes 							
Course Outcomes:							
After completion of the course, learners would be able to:							
<ol style="list-style-type: none"> 1. The student will know and understand the existing cyber crime laws and its applications. 2. The learner would learn the cyber crimes. 3. The student would understand the different aspects of Cyber Laws and Cyber Crime 							
Pedagogy							
<input type="checkbox"/> PPTs, Case studies, Group discussions, Classroom Activity, Videos, Research papers, News articles etc.							

Unit	Topic	No. Of Hours/Credits
Module 1	<p data-bbox="389 331 959 360">CYBER CRIME AND ITS CLASSIFICATION</p> <ol data-bbox="389 412 1062 629" style="list-style-type: none"> 1. Introduction 2. History and Evolution of Cybercrime 3. Doctrine of Mens Rea & Actus Reus in Cyber Crime 4. Characteristics of Cyber Crime 5. Cyber Pornography 6. Cyber Terrorism 	10
Module 2	<p data-bbox="389 824 699 853">MONEY LAUNDERING</p> <ol data-bbox="485 898 1126 1122" style="list-style-type: none"> 1. Meaning of Money Laundering 2. Stages of Money Laundering 3. Anti-Money laundering (AML) using Technology 4. Financing of Terrorism 	10
Module 3	<p data-bbox="373 1272 855 1301">INFORMATION TECHNOLOGY ACT</p> <p data-bbox="373 1346 1114 1413">Key Provisions of IT Act Some of key provisions of IT related offences as impacting the banks are given here.</p> <p data-bbox="389 1491 1139 1559">Section 43: Penalty and compensation for damage to computer, Computer system, etc.</p> <p data-bbox="389 1570 1034 1599">Section 43A: Compensation for failure to protect data.</p> <p data-bbox="389 1610 1086 1639">Section 65: Tampering with Computer Source Documents.</p> <p data-bbox="389 1650 868 1680">Section 66: Computer Related Offences.</p> <p data-bbox="389 1691 1070 1758">Section 66B: Punishment for dishonestly receiving stolen computer resource or communication device.</p> <p data-bbox="389 1769 900 1798">Section 66C: Punishment for identity theft.</p> <p data-bbox="389 1809 1134 1877">Section 66D: Punishment for cheating by personation by using computer resource.</p> <p data-bbox="389 1888 979 1917">Section 66E: Punishment for violation of privacy.</p>	10

Reference Book

Essential Reading:

Title: "Cyber Crimes and Laws: An Introduction" by Dr. Pavan Duggal, Publisher: Universal Law Publishing , 2022 edition.

Supplementary Reading:

Title: "Cyber Crime and Cyber Laws" by: V. K. Ahuja , Publisher: Taxmann Publications
2021 edition

Title: "Cyber Laws: A Comprehensive Guide" by Rohas Nagpal , Publisher: McGraw Hill Education , 2020 edition.

Title: "Cyber Crime and the Law: Challenges, Issues, and Response" by Yogesh K. Dwivedi, Himanshu Gupta, and Matthew K. O. Lee , Publisher: Springer India , 2019 edition.

Details of Continuous Assessment (ICA)- 20 Marks

Continuous Assessment	Details	Marks
Component 1 (ICA-1)	Internal class test (online or offline) Fill in the blanks /Explain the concepts/Answer in brief/Case study or application-based questions.	10 marks
Component 2 (ICA-2)	Projects / Moot Court/Assignments/Presentations/Seminar	10 marks

Details of Semester End Examination (TEE)- 30 Marks

	Particulars	Marks
Module 1	Answer the following Questions: (Module 1) a) Theory Question-Long Answer OR b) Case Law/Case lets /short notes	10 marks
Module 2	Answer the following Questions: (Module 2) a) Theory Question-Long Answer OR b) Case Law/Case lets /short notes	10 marks
Module 3	Answer the following Questions: (Module 3) a) Theory Question-Long Answer OR b) Case Law/Case lets /short notes	10 marks

Program: Bachelor of Science (Information Technology)				Semester: I			
Course: Organizational Behavior				Code:			
Teaching Scheme				Evaluation Scheme			
Lecture	Practical	Tutorial	Credits	Theory		Practical	
				Internal	External	Internal	External
30	Nil	Nil	2	20	30	Nil	Nil
Internal Component							
Class Test Duration Mins			Assignment& projects			Class Participation	
10 Marks 20 mins			10 Marks			Nil	
<p>Learning Objectives :</p> <ul style="list-style-type: none"> To build self-awareness among the learner To enable the learner to identify and acknowledge individual and group differences To introduce the learner to group behaviour, group processes, team work & team conflicts To acquaint the learner with motivation theories at workplace, familiarize him with modern age workplace stress & impart skills to handle stress <p>• Learning Outcomes : After completion of the course, learners would be able to:</p> <ul style="list-style-type: none"> The learner studies the self-awareness theories, gets well versed with aspects of Personality, Perception, Attitude, Thinking & Learning The learner understands group dynamics, their effects on the individual, Powers & Politics at workplace. He acquires skills to resolve conflicts, survive & excel at work. The learner discusses & deliberates the motivation theories & concludes their application at workplace. The learner examines the causes & consequences of workplace stress & learns ways to cope with it. The learner comprehends ways to manage change in organization, reasons ways to creative problem solving 							
<p>Pedagogy</p> <p><input type="checkbox"/> PPTs, Case studies, Group discussions, Classroom Activity, Videos, Research papers, News articles etc.</p>							

Modules at a glance:

Module	Description	No of Hours
--------	-------------	-------------

1	Introduction to Organisational Behaviour	8
2	Individual Dimensions of Organisational Behaviour	8
3	Motivation at workplace & dealing with Work Stress	8
4	Introduction to Group Behaviour	6
	Total	30

Detailed Syllabus:

Modu	Content le	Pedagogy used	Duration	Reference Books
I	Introduction to Organisational Behaviour : Concept of Organisational Behaviour, definition, Models of Organisational Behaviour, Disciplines that contribute to the Organisational Behaviour field, Challenges and Opportunities for Organisational Behaviour.	PPT Theory Notes Assignments Case Study	8	<ul style="list-style-type: none"> ● Prasad L M, Organizational Behaviour, Sultan Chand ● Koontz, Harold, Cyril O'Donnell, and Heinz Wehrich: Essentials of management, Tata McGraw-Hill, New Delhi. ● Organisational behaviour, S.Robbins, Prentice Hall

				<ul style="list-style-type: none"> ● Prasad L M, Organizational Behaviour, Sultan Chand ● Aswathappa, Organizational behaviour Micheol T. Matheson: Organizational Behaviour and Management, Business Publication Inc., Texas
II	<p>Individual Dimensions of Organisational Behaviour :</p> <p>Self-Awareness: Individual differences, factors affecting individual differences.</p> <p>Concept of understanding self through Johari Window.</p> <p>Theories of learning – Classical conditioning, Operant conditioning and Social learning approaches,</p> <p>Intelligence, type (IQ, EQ, SQ, at work place)</p>	<p>Theory Notes</p> <p>PPT</p> <p>Assignment</p> <p>Case Study</p>	8	<ul style="list-style-type: none"> ● Prasad L M, Organizational Behaviour, Sultan Chand ● Koontz, Harold, Cyril O'Donnell, and Heinz Weirich: Essentials of management, Tata McGraw-Hill, New Delhi. ● Organisational behaviour, S.Robbins, Prentice Hall ● Prasad L M, Organizational Behaviour, Sultan Chand

				<ul style="list-style-type: none">● Aswathappa, Organizational behaviour● Luthans, Fred: Organizational Behaviour, McGraw-Hill, New York.● P.L. Rao- International Human Resource●
--	--	--	--	---

<p>III</p>	<p>Motivation at workplace & dealing with Work Stress :</p> <p>Motivation at workplace: Concept of motivation,</p> <p>Mc.Clelland's Needs theory, Motivation through carrot (positive reinforcement) and stick (negative reinforcement) at workplace.</p> <p>Dealing with work stress: Stress, types of stress, Stress Curve, Causes, Time Management</p>	<p>Theory Notes</p> <p>PPT</p> <p>Assignments</p> <p>Case study</p>	<p>8</p>	<ul style="list-style-type: none"> ● Prasad L M, Organizational Behaviour, Sultan Chand ● Koontz, Harold, Cyril O'Donnell, and Heinz Weihrich: Essentials of management, Tata McGraw-Hill, New Delhi. ● Organisational behaviour, S.Robbins, Prentice Hall
-------------------	--	---	----------	---

IV	<p>Introduction to Group Behaviour :</p> <p>Differences between groups and teams;</p> <p>Types of teams, Creating effective teams</p> <p>Power and politics: Bases of power Causes of organizational politics</p> <p>Jealousy/envy at workplace</p>	<p>Theory Notes</p> <p>PPT</p> <p>Assignments</p>	6	<ul style="list-style-type: none"> ● Prasad L M, Organizational Behaviour, Sultan Chand ● Koontz, Harold, Cyril O'Donnell, and Heinz Wehrich: Essentials of management, Tata McGraw-Hill, New Delhi. ● Organisational behaviour, S.Robbins, Prentice Hall ● Prasad L M, Organizational Behaviour, Sultan Chand ● Aswathappa, Organizational behaviour

Details of Continuous Assessment (ICA)- 40 Marks

Continuous Assessment	Details	Marks
Component 1 (ICA-1)	<p>Internal class test (online or offline)</p> <p>Fill in the blanks /Explain the concepts/Answer in brief/Case</p>	20 marks

	study or application-based questions.	
Component 2 (ICA-2)	Presentations/Project Work/ VivaVoce/ Book Review/ Field visit & its presentations/ Documentary filming/ Assignments/ Group Discussions Etc.	20 marks

Details of Semester End Examination (TEE)- 60 Marks

	Particulars	Marks
Module 1	Answer in brief (Any 3 out of 5)	15 marks
Module 2	Answer in brief (Any 3 out of 5)	15 marks
Module 3	Answer in brief (Any 3 out of 5)	15 marks
Module 4	Answer in brief (Any 3 out of 5)	15 marks

Program: B.Sc. – Information Technology (2024 - 25)		Semester: II	
Course: Object Oriented Concepts		Course Code:	
Teaching Scheme		Evaluation Scheme	
Lecture (Hours per week)	Credit	Continuous Assessment (CA) (Marks - 40)	Semester End Examinations (SEE) (Marks- 60 in Question Paper)
3	3	20+20	60
Learning Objectives: <ul style="list-style-type: none"> To understand basic concepts of Object Oriented Designing Applying OO concepts to real world and map real system to classes, objects and methods.. Analysing and evaluating the Relationships between classes <input type="checkbox"/> Creating different design structures in Object Oriented Design 			
Course Outcomes: After completion of the course, learners would be able to: CO1: Understand the Basic Concepts of Object Oriented Designing. CO2: Gain an insight into designing Classes and UML Diagrams. CO3: Analyze and implement different types of associations. CO4: Design and Create different structures of Object Oriented Design. <input type="checkbox"/>			
Outline of Syllabus: (per session plan)			
Modules	Topics	Duration (Lecture)	
Module 1	Introduction to Object Oriented Concepts	15	
	Introduction: What is Object-Oriented Development?, Key Concepts of Object-Oriented Design , Other Related Concepts , Modular Design and Encapsulation , Cohesion and Coupling , Modifiability and Testability, Benefits and Drawbacks of the Paradigm . A Notation for Describing Object-Oriented Systems : Class Diagrams ,Use Cases and Use Case Diagrams.		
Module 2	Basics of Object Oriented Design and Relationship between Classes	15	

	The Basics of Implementing Classes : (i)Constructors , (ii) Printing an Object , (iii) Static Members , Working with Multiple Classes, Interfaces , Abstract Classes , Comparing Objects for Equality.	
	Relationships Between Classes :Association, Characteristics of Associations , Inheritance, ,An Example of a Hierarchy, Inheriting from an Interface, Polymorphism and Dynamic Binding, Protected Fields and Methods, Genericity	
Module 3	Elementary Design Patterns and Analysis of a System	15
	<p>Elementary Design Patterns : Iterator, Iterator Implementation ,Singleton, Sub-classing Singletons , Adapter.</p> <p>Analyzing a System : Overview of the Analysis Phase, Stage 1: Gathering the Requirements, Functional Requirements Specification, Defining Conceptual Classes and Relationships, Using the Knowledge of the Domain</p> <p>Design : Major Subsystems, Creating the Software Classes, Assigning Responsibilities to the Classes, Class Diagrams , User Interface , Data Storage .</p>	
Total Lectures		45

Reference books:

1. Object-Oriented Analysis, Design and Implementation An Integrated Approach by Brahma Dathan and Sarnath Ramnath , Second Edition,2015, Springer Nature publication.
2. The Object-Oriented Thought Process (Developer's Library) by Matt Weisfeld, 4th Edition , 2013, Addison-Wesley publication.

Details of Continuous Assessment (ICA)- 40 Marks

Continuous Assessment	Details	Marks
Component 1 (ICA-1)	Internal class test (online or offline) Fill in the blanks /Explain the	20 marks

	concepts/Answer in brief/Case study or application-based questions.	
Component 2 (ICA-2)	Presentations/Project Work/ VivaVoce/ Book Review/ Field visit & its presentations/ Documentary filming/ Assignments/ Group Discussions Etc.	20 marks

Details of Semester End Examination (TEE)- 60 Marks

	Particulars	Marks
Module 1	Answer in brief (Any 4 out of 6)	20 marks
Module 2	Answer in brief (Any 4 out of 6)	20 marks
Module 3	Answer in brief (Any 4 out of 6)	20 marks

Program: B.Sc. – Information Technology (2024 - 25)		Semester: II	
Course: C++ Programming LAB		Course Code:	
Teaching Scheme		Evaluation Scheme	
Lecture (Hours per week)	Credit	Continuous Assessment (CA) (Marks -)	Machine Test
2	1	20	30
Learning Objectives: <ul style="list-style-type: none"> • To understand basic concepts of Object Oriented Designing • Applying OO concepts to real world and map real system to classes, objects and methods.. • Analysing and evaluating the Relationships between classes <input type="checkbox"/> Creating different design structures in Object Oriented Design 			
Course Outcomes: After completion of the course, learners would be able to: CO1: Understand the use of software for developing programs in C++ CO2: Apply and implement the concept classes and objects CO3: Analyze and implement different types of associations CO4: Design and Develop complex programs using Object Oriented Concepts. <input type="checkbox"/>			
Outline of Syllabus: (per session plan)			
Modules	Topics	Duration (Lecture)	
Module 1	Introduction and Use of Software	10	
	<ul style="list-style-type: none"> • Introduce the learners to the Software in which they will be writing the code. • Simple programs to identify and implement operators in C++. • Simple programs to illustrate the different control structures in C ++. • Write a C++ program to display the following Binary Pyramid and different variations: <pre> 1 01 1 0 1 0 1 0 1 1 0 1 0 1</pre> • Write programs to demonstrate the use of functions in C++. 		

Module 2	Implementing Basic Concepts of Object Oriented Programming	10
	<ul style="list-style-type: none"> • Write a C++ programs to create classes and objects • Write programs in C++ to implement the concept of friend functions 	
	<ul style="list-style-type: none"> • Write programs in C++ to implement the concepts of Constructors and its type • Write programs in C++ to implement the concept of destructors in C++ • Write programs in C++ to implement the concept of method overloading • Write programs in C++ to implement the concept of operator overloading 	
Module 3	Advanced Concepts in C++	
	<ol style="list-style-type: none"> 1. Write programs to implement different types of inheritance. 2. Write programs to illustrate the concept of Exception Handling 3. Write programs to illustrate the concept of Run time polymorphism using virtual functions 	10
Total Lectures		30

Reference books:

1. Object Oriented Programming with C++ | 8th Edition, E.Balagurusamy September 2020 Tata McGraw Hill publications
2. C++ Programming Language, 4th edition –May 2022 by Bjarne Stroustrup, Pearson publications.
3. C++ Programming:An Object-Oriented Approach, May 2022,by Behrouz A. Forouzan, Richard F. Gilberg

Details of Practical Examination - 50 Marks

Continuous Assessment	Details	Marks
Component 1 (ICA-1)	Machine Test	30 marks
Component 2 (ICA-2)	Presentations/Project Work/ /Mini project, Etc.	20 marks

Program: B.Sc. – Information Technology (2024 - 25)		Semester: II	
Course: Web Technologies		Course Code:	
Teaching Scheme		Evaluation Scheme	
Lecture (Hours per week)	Credit	Continuous Assessment (CA) (Marks - 40)	Semester Examinations (SEE) (Marks- in Question Paper) 60
3	3	20+20	60
Learning Objectives: <ul style="list-style-type: none"> • Understand basic concepts of Internet, World Wide Web, HTML and static/dynamic web design. • Become familiar with concept of stylesheets, various CSS effects, JavaScript and PHP • Design a website static and dynamic for a given topic 			
Course Outcomes: After completion of the course, learners would be able to: CO1: Understand working of Internet. CO2: Gain an insight into designing web pages with HTML. CO3: Use different ways of styling web pages using CSS. CO4: Implement basic and complex functionalities of JavaScript in a web page. CO5: Employ PHP Scripts to execute dynamic tasks in a web page. CO6: Perform various database tasks using PHP. <input type="checkbox"/>			
Outline of Syllabus: (per session plan)			
Modules	Topics	Duration (Lecture)	
Module 1	Internet and the World Wide Web, HTML5, CSS, HTML Page Layout, HTML Media, Tables and Forms	15	

	<p>Internet and the World Wide Web: What is Internet? Applications of Internet, E-mail, Telnet, FTP, E-commerce and E-business. Internet Service Providers, Domain Name Server, Internet Address, World Wide Web (www), Uniform Resource Locator (URL), Common Features of Browsers, Search Engine, Web Server, HTTP Protocol.</p> <p>HTML5: Introduction, Formatting Text by using Tags, Using Lists, Creating Hyperlinks and Bookmarks, Metadata about an HTML Document, Redirecting to another URL.</p> <p>CSS:</p>	
	<p>Implementing Styles using CSS – Stylesheets for Formatting Text and Links using CSS, CSS Selectors, Changing Background, Adding Border, Margin and Padding. HTML Page Layout: Using Layout Elements, Semantic Elements, Creating, Positioning and Formatting Divisions, Floating Divisions, Inline Frames.</p> <p>HTML Media: Embedding Images, Creating Client-side and Server-side Image Map, Embedding audio and video on web page.</p> <p>HTML Tables: Creating Simple Table, Table Dimension, Merging Table Cells, Formatting Applying Borders, Background and Foreground fills, Changing Cell Padding, Spacing and Alignment</p> <p>HTML Forms: Collecting user input with HTML Forms, Additional Input Types in HTML5.</p>	
Module 2	JavaScript, Operators, Statements, JavaScript Objects, DOM, Browser BOM, Events and Event Handlers	15
	<p>JavaScript: Introduction, Difference between Client-side and Server-side Scripting, JavaScript Variables and Constants, Data Types, Statements, Comments, Functions, Variable Scope, JavaScript Objects, Dialog Boxes</p> <p>Operators: Arithmetic Operators, Assignment Operators, Comparison Operators, Logical Operators Statements: Conditional Statements – if else, switch, Loops – while, do while, for, for in, for of, Loop Control – break, continue, labels</p> <p>JavaScript Objects: User-defined Objects, with Keyword, Native Objects – Array, String, Date, Math, Number, RegExp</p> <p>Events and Event Handlers: HTML Events, DOM Events and Listener, onAbort, onBlur, onChange, onClick, onDbClick, onError, onFocus, onKeyDown, onKeyPress, onKeyUp, onLoad, onMouseDown, onMouseMove, onMouseOut, onMouseOver, onMouseUp, onReset, onResize, onSelect, onSubmit, onUnload</p>	

Module 3	PHP, Advanced PHP, PHP and MySQL	15
	<p>PHP: Introduction, Server-side Scripting, PHP Syntax and Comments, Variables and Constants, Data Types, Control Structures, Looping, Loop Termination, Functions, PHP Form Handling, Superglobals, PHP Arrays, PHP Strings, PHP RegEx, PHP Numbers, PHP Math, Basic PHP Errors</p> <p>Advanced PHP and MySQL: PHP Date and Time, PHP Include, PHP Cookies, PHP Sessions Why PHP and MySQL? Connect to MySQL, Creating Database and Tables, Addition and Manipulation of Data in Tables.</p>	
Total Lectures		45

Reference books:

1. Wilson, K. (2023). The absolute Beginner's guide to HTML and CSS: A Step-by-Step Guide with Examples and Lab Exercises. Apress.
2. PHP & MySQL Novice to Ninja by Tom Butler, SPD, 7th Edition (2022)

Details of Continuous Assessment (ICA)- 40 Marks

Continuous Assessment	Details	Marks
Component 1 (ICA-1)	Internal class test (online or offline) Fill in the blanks /Explain the concepts/Answer in brief/Case study or application-based questions.	20 marks
Component 2 (ICA-2)	Presentations/Project Work/ VivaVoce/ Book Review/ Field visit & its presentations/ Documentary filming/ Assignments/ Group Discussions Etc.	20 marks

Details of Semester End Examination (TEE)- 60 Marks

	Particulars	Marks
Module 1	Answer in brief (Any 4 out of 6)	20 marks
Module 2	Answer in brief (Any 4 out of 6)	20 marks
Module 3	Answer in brief (Any 4 out of 6)	20 marks

Program: B.Sc. – Information Technology (2024 - 25)		Semester: I	
Course: Web and Assembly LAB		Course Code:	
Teaching Scheme		Evaluation Scheme	
Lecture (Hours per week)	Credit	Continuous Assessment (CA) (Marks -)	Machine Test
2	1	20	30
Learning Objectives: <ul style="list-style-type: none"> <input type="checkbox"/> Design a website with static and dynamic functionality <input type="checkbox"/> 			
Course Outcomes: After completion of the course, learners would be able to: CO1: Design static web pages using Hyper Text Markup Language (HTML). CO2: Enhance the look of web pages by implementing CSS. CO3: Collect information from the user with HTML Forms. CO4: Design interactive webpages using client-side script (JavaScript). CO5: Implement Document Object Model and events in web pages using JavaScript. CO6: Write and deploy basic PHP code to simplify web development. CO7: Store and retrieve data from a server using PHP. <input type="checkbox"/>			
Outline of Syllabus: (per session plan)			
Modules	Topics	Duration (Lecture)	
Module 1	Use of Basic Tags, Use of CSS, Layout and Media, Tables and Forms, JavaScript	15	

	<ul style="list-style-type: none"> • Design a web page using different formatting tags and link different pages allowing navigation between web pages. • Design a web page that automatically redirects the user to another page. • Design a web page demonstrating different stylesheet types. □ Design a web page demonstrating grouping selectors • Design a web page demonstrating different semantics. • Design a web page embedding image, audio and video. • Design a web page with Imagemaps. • Design a web page with different tables. • Design a web page with a form that uses all types of controls. 	
	<ul style="list-style-type: none"> • Using JavaScript, design a web page to accept a number from the user and print its Factorial. • Using JavaScript, a web page that prints Fibonacci series/any given series. • Write a JavaScript program to display all the prime numbers between 1 and 100. • Write a JavaScript program to accept a number from the user and display the sum of its digits. 	
Module 2	JavaScript Objects and Events, Basic PHP, Advanced PHP, PHP and MySQL	15

	<ul style="list-style-type: none"> • Using JavaScript, design a web page demonstrating different native objects of JavaScript. • Write a program in JavaScript to accept a sentence from the user and display the number of words in it. (Do not use split () function). • Write a JavaScript program to design simple calculator. • Design a form and validate all the controls placed on the form using JavaScript. • Write a PHP code to find the greater of 2 numbers. Accept the no. from the user. • Write a PHP Program to accept a number from the user and print it factorial. • Write a PHP program to accept a number from the user and print whether it is prime or not. □ Write a PHP program to display the following Binary Pyramid: <ul style="list-style-type: none"> 1 01 1 0 1 0 1 0 1 1 0 1 0 1 • Write a PHP program to demonstrate different string functions. • Write a PHP program to demonstrate different array functions. • Write a PHP program to demonstrate use of sessions and cookies. • Write a PHP program to create: <ul style="list-style-type: none"> o Create a database College o Create a table Department (Dname, Dno, Number_of_faculty) • Write a PHP program to create a database named “College”. Create a table named “Student” with following fields (sno, sname, percentage). Insert 3 records of your choice. Display the names of the students whose percentage is between 35 to 75 in a tabular format. • Write a PHP program to <ul style="list-style-type: none"> o Update rows in a table o Delete rows from a table 	
Total Lectures		30

Programme : B. Sc. IT (Information Technology)				Semester : II			
Course : Basic Statistics				Code : NMUBSCIT207			
Suggested Lectures per week				02			
Teaching Scheme				Evaluation Scheme			
Lecture	Practical	Tutorial	Credits	Theory		Practical	
				Internal	External	Component 1	Component 2
30	0	Nil	2	20 Marks	30 Marks	NA	NA
Internal Component:							
Class Test Duration 20 Mins				10 Marks			
Assignments				10 Marks			
External Component: Examination (1 hr.)				30 Marks			
Total				50 Marks			
Learning Objectives:							
<ol style="list-style-type: none"> 1. Able to learn to describe, recognize and calculate the measures of descriptive statistics. 2. Able to compute the probability of events using discrete and continuous probability distribution. 3. Able to understand and discuss the concepts of correlation, linear regression and curve fitting. 							

Learning Outcomes :

1. Students will be able to apply and compute the concepts of the descriptive statistics: mean, median, mode, variance, and standard deviation of a discrete random variable.
2. Students will be able to apply and evaluate Binomial, Bernoulli, Poisson and Normal distribution.
3. Students will be able to apply and estimate correlation, regression and curve fitting concepts in practice.

Pedagogy : Classroom learning , Discussion, Presentation.

Module	Module Content	Module wise Pedagogy Used	Duration of Module (lectures)
Module I	Types of data: Primary and Secondary, Measure of Central Tendency: Arithmetic Mean, Combined and Weighted arithmetic mean, median, and Mode for raw data, Ungrouped frequency distribution, grouped frequency distribution. Quartiles, Deciles and Percentiles. Measures of dispersion: Various measures of dispersion such as Range, Quartile deviation, Mean Deviation from mean, Standard Deviation and corresponding coefficients, combined standard deviation, Introduction of Skewness and kurtosis.	Classroom learning	10
Module II	Random variable, probability distribution and mathematical Expectation. Distributions: Discrete distributions: Bernoulli, Binomial, Poisson. Continuous distribution: Normal distribution all the properties and its applications. (No derivations).	Classroom learning.	10

Module III	<p>Correlation Theory: Concept of correlation, Types of correlation, Karl Pearson correlation, Spearman rank correlation, properties of correlation with examples.</p> <p>Regression Analysis: Least-Squares, Regression coefficients, Regression line y on x and x on y, types of regression: simple, multiple (definition only) and logistic (definition only).</p> <p>Curve fitting: The method of least square, straight line, nonlinear relationship: parabola, exponential curve, $y=ab^x$, $y=ax^b$.</p>	Classroom learning	10
------------	---	--------------------	----

References

- [1] Fundamental of Mathematical Statistics by S.C.Gupta ,V.K. Kapoor, S.Chand publication, 12th Ed. 2018.
- [2] Dasgupta, A. (2010) Fundamentals of Probability: A First Course, Springer
- [3] Ross, S. (2014). Introduction to Probability Models, 11th Edn. Academic Press.
- [4] Doing Data Science by Rachel Schutt & Cathy O’Neil, O’REILLY Publication 7th Ed .Year 2019.

Details of Continuous Assessment (ICA)- 20 Marks

Continuous Assessment	Details	Marks
Component 1 (ICA-1)	Internal class test (online or offline) Fill in the blanks /Explain the concepts/Answer in brief/Case study or application-based questions.	10 marks
Component 2 (ICA-2)	Presentations/Project Work/ VivaVoce/ Book Review/ Field visit & its presentations/ Documentary filming/ Assignments/ Group Discussions Etc.	10 marks

Details of Semester End Examination (TEE)- 30 Marks

	Particulars	Marks
Module 1	Answer in brief (Any 2 out of 3)	10 marks
Module 2	Answer in brief (Any 2 out of 3)	10 marks
Module 3	Answer in brief (Any 2 out of 3)	10 marks

Programme : Bachelor of Science (Information Technology)				Semester : II			
Course : Geographic Information System				Code :			
Suggested Lectures per week				2			
Practical Session per week (per Batch)				-			
Teaching Scheme				Evaluation Scheme			
Lecture	Practical	Tutorial	Credits	Theory		Practical	
				Internal	External		
				20 Marks	30 Marks	Nil	Nil
30	-	Nil	02				
Internal Component (Theory Break up)							
Class Test				Assignments			
10 Marks				10 Marks			
Learning Objectives :							
<ul style="list-style-type: none"> • To understand basic knowledge of GIS • To examine the motive of Vector Data Model • To summarize the design of Raster Data Model • To apply knowledge of spatial interpolation and data exploration 							
Learning Outcomes :							
<ol style="list-style-type: none"> 1. Define key concepts of GIS 2. Examine various aspects of data inputs and exploration 3. Demonstrate understanding of vector and raster data model, spatial interpolation, etc 							
Pedagogy :							
<input type="checkbox"/> PPTs, Case studies, Group discussions, Classroom Activity, Videos, Research papers, News articles etc.							

Introduction to GIS, geographically referenced data, Geographic, projected and planer coordinate system, Map projections, Plane coordinate systems, Vector data model, Raster data model **Data Input, Geospatial data:**

Geo Existing GIS data, Metadata, Conversion of existing data, Creating new data, Geospatial data-types, benefits of using Geospatial data, Applications by industry

Datums and geodetic systems

Introducing the Global Positioning System, GPS signals and data

Module 2

(10)

Attribute data input and data display:

Attribute data in GIS, Relational model, Data entry, Manipulation of fields and attribute data, cartographic symbolization, types of maps, typography, map design, map production **Data exploration:**

Exploration, attribute data query, spatial data query, raster data query, geographic visualization

Module 3

(10)

Vector data analysis: Introduction, buffering, map overlay, Distance measurement and map manipulation.

Raster data analysis: Data analysis environment, local operations, neighbourhood operations, zonal operations, Distance measure operations.

Spatial Interpolation: Elements, Global methods, local methods, Kriging, Comparisons of different methods

References

1. Reddy, A. Textbook of Remote Sensing and Geographical Information Systems, B.S. Publication.
2. Demers, M. Fundamentals of GIS, John Wiley & Sons Inc.
3. Goodchild. M.F, et.al.:Environmental Modeling with GIS
4. Arnoff,S.:Geographic Information Systems: A Management Perspective
5. Burrough, P, and Frank, A. U., (1996): Geographic Objects with indeterminate Boundaries, Taylor and Francis, London, UK
6. Cromley, R. (1992):Digital Cartography, Prentice Hall, Englewood Cliffs, New Jersey
7. Iliffe,J, (2006): Datums and Map Projections for Remote Sensing , GIS and Surveying, Whittles Publishing, London.

8. Jones, Christopher B. (1997): Geographical Information Systems and Computer Cartography, Addison Wesley Longman Limited, UK.

9. Kang Tsung Chang (2018), Introduction to Geographic Information Systems, Mcgraw Hill Education

Details of Continuous Assessment (ICA)- 20 Marks

Continuous Assessment	Details	Marks
Component 1 (ICA-1)	Internal class test (online or offline) Fill in the blanks /Explain the concepts/Answer in brief/Case study or application-based questions.	10 marks
Component 2 (ICA-2)	Presentations/Project Work/ VivaVoce/ Book Review/ Field visit & its presentations/ Documentary filming/ Assignments/ Group Discussions Etc.	10 marks

Details of Semester End Examination (TEE)- 30 Marks

	Particulars	Marks
Module 1	Answer in brief (Any 2 out of 3)	10 marks
Module 2	Answer in brief (Any 2 out of 3)	10 marks
Module 3	Answer in brief (Any 2 out of 3)	10 marks

Program: Bachelor of Science (Information Technology)				Semester: II			
Course: Patents and Copyrights				Code:			
Teaching Scheme				Evaluation Scheme			
Lecture	Practical	Tutorial	Credits	Theory		Practical	
				Internal	External	Internal	External
30	-	Nil	02	20	30	Nil	Nil
Internal Component							
Class Test Duration Mins			Assignment & projects			Class Participation	
10 Marks			10 Marks			Nil	
Learning Objectives							
<ul style="list-style-type: none"> To understand the fundamental concepts and principles of patents and copyrights including historical development Analyse and evaluate the requirements for patentability, including novelty, nonobviousness and for copyright protection Identify and analyse the infringement of patent and copyright rights Comprehend international issues for IPR, patents and copyrights 							
Learning Outcomes							
<ol style="list-style-type: none"> Analyse patentability law and apply to assess the inventions Critically analyze landmark patent and copyright cases, applying legal principles and reasoning to interpret and evaluate the outcomes Use ethical awareness and understanding of professional responsibilities in the field of patents and copyrights 							
Pedagogy							
<input type="checkbox"/> PPTs, Case studies, Group discussions, Classroom Activity, Videos, Research papers, News articles etc.							

Module 1: Introduction to Intellectual Property and Patent Law

(10)

- **Introduction to Intellectual Property**
 - o Overview of intellectual property rights
 - o Distinction between patents and copyrights
 - o Historical development and significance of patents and copyrights

- **Patent Law Basics** o Understanding patent system and its role in fostering patent system o Patentable subject matter
 - o Patentability criteria (novelty, non-obviousness, utility) o Patent application process o Patent examination, prosecution, and granting of patents o Legal fundamentals of patent protection for useful inventions
- **Patent Infringement and Defenses** o Infringement of patent rights o Defenses against patent infringement o Remedies for patent infringement

Module 2: Copyright Law

(10)

- **Copyright Law Basics** o Originality and authorship in copyright law o Rights and limitations of copyright owners o Copyright registration process o Legal fundamentals of copyright protection
- **Copyright Infringement and Fair Use** o Infringement of copyright
 - o Copyright infringement distinguished from plagiarism o Fair use doctrine
 - o Digital Millennium Copyright Act (DMCA)

Module 3

(10)

- **Contemporary Issues in Intellectual Property** o Digital rights management (DRM) o Open source and Creative Commons licensing
 - o Patent trolls and copyright trolls
- **Emerging Trends in Intellectual Property** o Patentability of algorithms, software, business methods, medical treatments and human genes o Patent and copyright issues in emerging technologies (e.g., AI, blockchain) o Impact of artificial intelligence on patent and copyright law o Future directions in intellectual property protection

References:

1. Goldstein, P. (2020). *Copyright: Principles, Law, and Practice* (5th ed.). West Academic Publishing.
2. Janis, M. D., & Nard, C. A. (2020). *Patent Law* (6th ed.). Wolters Kluwer.
3. Merges, R. P., Menell, P. S., & Lemley, M. A. (2020). *Intellectual Property in the New Technological Age* (6th ed.). Wolters Kluwer.
4. Shamnad Basheer, "The Oxford India Handbook of Intellectual Property Law" (Oxford University Press, 2015).
5. P. Narayanan, "Copyright Law in India" (Wadhwa Publications, 2018).
6. V. K. Ahuja, "Patents, Designs, and Trade Marks: A Manual of Practice and Procedure" (LexisNexis, 2019).

7. Indian Patent Office: Official website providing information on patents, patent application process, and patent laws in India. (<https://www.ipindia.nic.in/>)
8. Copyright Office India: Official website offering resources on copyright registration, copyright law, and copyright infringement in India. (<http://copyright.gov.in/>)
9. Intellectual Property India: Website of the Indian government's intellectual property office, providing resources and information on patents, copyrights, and trademarks in India. (<https://www.ipindia.gov.in/>)

Details of Continuous Assessment (ICA)- 20 Marks

Continuous Assessment	Details	Marks
Component 1 (ICA-1)	Internal class test (online or offline) Fill in the blanks /Explain the concepts/Answer in brief/Case study or application-based questions.	10 marks
Component 2 (ICA-2)	Presentations/Project Work/ VivaVoce/ Book Review/ Field visit & its presentations/ Documentary filming/ Assignments/ Group Discussions Etc.	10 marks

Details of Semester End Examination (TEE)- 30 Marks

	Particulars	Marks
Module 1	Answer in brief (Any 2 out of 3)	10 marks
Module 2	Answer in brief (Any 2 out of 3)	10 marks
Module 3	Answer in brief (Any 2 out of 3)	10 marks

Program: Bachelor of Science (Information Technology)				Semester: II			
Course: Content Creation and Design				Code:			
Teaching Scheme				Evaluation Scheme			
Lecture	Practical	Tutorial	Credits	Theory		Practical	
				Internal	External	Internal	External
30	-	Nil	02	20	30	Nil	Nil
Internal Component							
Class Test Duration		Mins	Assignment& projects			Class Participation	
10 Marks			10 Marks			Nil	
Learning Objectives							
<ul style="list-style-type: none"> • To understand the importance of content creation and design in modern communication and marketing • Optimize visual content for different platforms and channels • Write engaging and effective content for different platforms, considering audience needs and storytelling techniques 							
Learning Outcomes							
<ol style="list-style-type: none"> 1. Develop comprehensive content strategies and editorial calendars that align with the goals and objectives of organization 2. Create engaging and compelling content across various platforms, utilizing effective writing techniques, storytelling methods, and visual design principles 3. Tailor content for specific social media platforms and audience reach 							
Pedagogy							
<input type="checkbox"/> PPTs, Case studies, Group discussions, Classroom Activity, Videos, Research papers, News articles etc.							

Module 1: Introduction to Content Creation and Design

10

- Overview of user interface (UI) and user experience (UX) and its importance in design
- Understanding the significance of content creation and design in modern communication and marketing
- Exploring the different types of content and their applications
- Identifying the target audience and their needs
- Introduction to content creation and design tools and platforms professionals use for design – InDesign, Affinity Designer, Word, PowerPoint, Pages, Keynote, easel.ly, Canva, etc
- Practical in-class exercises to develop basic content creation and design skills

Module 2: Content Creation and Design Techniques

10

- Planning and research for content creation and design
- Conducting audience research and analysis
- Setting goals and objectives for content creation and design
- Developing a content strategy and editorial calendar

- Writing engaging and effective content
- Principles of effective writing for different platforms
- Crafting attention-grabbing headlines and introductions
- Structuring content for readability and flow
- Incorporating storytelling techniques into content

- Text generation with Generative AI
- Using generative AI models to create text-based content
- Applications and challenges of generative AI in generating high quality text-based content

Module 3: Visual Techniques

10

- Visual content creation and design
- Basics of graphic design for content creation and design
- Creating visually appealing images and infographics
- Introduction to video editing, typography, and layout design
- Optimizing visual content for different platforms
-
- Visual art generation with Generative AI
- Using generative AI models to create visual art designs
- Ethical considerations in modifying text, images or videos with AI
- Impacts of generative AI on the field of visual arts and creative design

References:

1. Kristina Halvorson, "Content Strategy for the Web", New Riders, 2010
2. Ann Handley, "Everybody Writes – Your Go-To Guide to Creating Ridiculously Good Content", Wiley
3. Adobe Creative Cloud (<https://www.adobe.com/creativecloud.html>)
4. Generative AI – ChatGPT for Text Based Content Generation <https://chat.openai.com/>
5. Generative AI – Visual ChatGPT Online for Visual Content Generation <https://stablediffusionweb.com/#demo>
6. Alex W. White, "The Elements of Graphic Design", Second Edition, AllWorthPress Newyork, 2011
7. William Strunk Jr. and E. B. White, "The Elements of Style", 4th Edition, 2000
8. Robin Williams, "The Non-Designer's Design Book – Design and Typographic Principles for the Visual Novice", 4th Edition, Peachpit Press Berkeley California, 2014
9. Andrew Richardson, "Data-Driven Graphic Design – Creative Coding for Visual Communication", Bloomsbury Publishing, 2016
10. Lon Safko, "The Social Media Bible – Tactics, Tools and Strategies for Business Success", John Wiley & Sons, 2012

Details of Continuous Assessment (ICA)- 20 Marks

Continuous Assessment	Details	Marks
-----------------------	---------	-------

Component 1 (ICA-1)	Internal class test (online or offline) Fill in the blanks /Explain the concepts/Answer in brief/Case study or application-based questions.	10 marks
Component 2 (ICA-2)	Presentations/Project Work/ VivaVoce/ Book Review/ Field visit & its presentations/ Documentary filming/ Assignments/ Group Discussions Etc.	10 marks

Details of Semester End Examination (TEE)- 30 Marks

	Particulars	Marks
Module 1	Answer in brief (Any 2 out of 3)	10 marks
Module 2	Answer in brief (Any 2 out of 3)	10 marks
Module 3	Answer in brief (Any 2 out of 3)	10 marks

Program: B.Sc. – Information Technology (2024 - 25)		Semester: II	
Course: Electronics & Communication Technology II		Course Code:	
Teaching Scheme		Evaluation Scheme	
Lecture (Hours per week)	Credit	Continuous Assessment (CA) (Marks - 40)	Semester End Examinations (SEE) (Marks- 30 in Question Paper)
2	2	10+10	30
Learning Objectives <ol style="list-style-type: none"> To understand advanced concepts in Electronic circuits To equip students with the fundamental knowledge and basic technical competence in the field of Microprocessors. <ul style="list-style-type: none"> To prepare students for higher processor architectures and embedded systems 			
Learning Outcomes <ol style="list-style-type: none"> Understanding applications of code convertors Describe core concepts of 8086 microprocessor. Appraise the architecture of advanced processors 			
Outline of Syllabus: (per session plan)			
Modules	Topics	Duration (Lecture)	
Module 1	Combinational Logic Design : Multiplexers and Demultiplexers Sequential Logic Design : Flip Flops : SR, JK, D, T, master slave flip flop, Truth Table, excitation table and conversion Register: Shift register, SISO, SIPO, PISO, PIPO, Bi- directional and universal shift register. Counters: Design of synchronous and asynchronous, Modulo Counter, Up Down counter IC 74193, Ring and Johnson Counter.	10	
Module 2	8086CPU Architecture, Programmer’s Model, Functional Pin Diagram, Memory Segmentation, Banking in 8086, Demultiplexing of Address/Data bus, Functioning of 8086 in Minimum mode and Maximum mode, Timing diagrams for Read and Write operations in minimum and maximum mode, Interrupt structure and its servicing	12	

Module 3	Pentium Architecture, Superscalar Operation, Integer & Floating-Point Pipeline Stages, Branch Prediction Logic, Cache Organization Comparative study of 8085, 80385, Pentium I, Pentium II and Pentium III, Pentium 4: Net burst micro architecture. Instruction translation look aside buffer and branch prediction	8
Total Lectures		

Reference books:

R. P. Jain and K. Sarawadekar, *Modern Digital Electronics / 5th Edition*, Standard Edition. McGraw Hill, 2022.

Barry B. Brey, "Intel Microprocessors", 8th Edition, Pearson Education India

Details of Continuous Assessment (ICA)- 20 Marks

Continuous Assessment	Details	Marks
Component 1 (ICA-1)	Internal class test (online or offline) Fill in the blanks / Explain the concepts/ Answer in brief/ Case study or application-based questions.	10 marks
Component 2 (ICA-2)	Presentations/ Project Work/ Viva Voce/ Book Review/ Field visit & its presentations/ Documentary filming/ Assignments/ Group Discussions Etc.	10 marks

Details of Semester End Examination (TEE)- 30 Marks

	Particulars	Marks

Module 1	Answer in brief (Any 2 out of 3)	10 marks
Module 2	Answer in brief (Any 2 out of 3)	10 marks
Module 3	Answer in brief (Any 2 out of 3)	10 marks

Program: B.Sc. Information Technology				Semester: III	
Course: Business Analytics				Course Code:	
Teaching Scheme				Evaluation Scheme	
Lecture (Hours per week)	Practical (Hours per week)	Tutorial (Hours per week)	Credit	Continuous Assessment (CA) (Marks - 20)	Semester End Examinations (SEE) (Marks - 30 in Question Paper)
2	-	-	2		
Learning Objectives:					
<ol style="list-style-type: none"> 1. Understand fundamental concepts and techniques of business analytics and its role in decision making 2. Gain proficiency in using data warehousing, visualization and performance management tools to analyze business data effectively 3. Explore emerging trends and technologies in data analytics and their applications in various industries 					
Course Outcomes:					
After completion of the course, learners would be able to:					
CO1: Differentiate between types of analytics and apply appropriate techniques to solve business problems					
CO2: Demonstrate the ability to collect, preprocess, and analyze data using warehousing and visualization tools to derive meaningful insights					
CO3: Identify and evaluate emerging trends and technologies to critically assess the potential impact of analytics on business operations					
Pedagogy:					
Classroom based learning					
Outline of Syllabus: (per session plan)					
Module	Description				No of Hours
1	Foundations and Decision Making				10
2	Descriptive Analytics				10
3	Big Data and Future Directions for Business Analytics				10
Total					30
					-

Unit	Topic	Duration
Module 1	<p>Foundations of Business Analytics and Decision Making</p> <p>Introduction to Business Analytics What is Business Analytics, Evolution of Business Analytics, Why is Business Analytics Important, Models in Business Analytics (Descriptive, Predictive, Diagnostics and Prescriptive Analytics), Problem Solving with Analytics, Important Business Analytics Applications</p> <p>An Overview of Business Intelligence, Analytics, and Decision Support Changing Business Environments and Computational Decision Support, Information Systems for Decision Making, Early Framework for Computerized Decision Support, The Concept of Decision Support Systems, Framework for Business Intelligence, Phases of Decision Making, How Decisions are Supported, DSS Capabilities, Components of Decision Support Systems</p>	10
Module 2	<p>Warehousing and Descriptive Analytics</p> <p>Data Warehousing Definitions and Concepts. Data Warehousing Process Overview, Data Warehousing Architectures, Data Integration and the Extraction, Transformation, and Load Processes, Data Warehouse Development Implementation Issues, Administration, Security Issues and Future Trends</p> <p>Business Reporting, Visual Analytics, and Business Performance Management Business Reporting Definitions and Concepts, Data and Information Visualization, Different Types of Charts, Emergence of Data Visualization and Visual Analytics, Performance Dashboards, Performance Measurement, Six Sigma as a Performance Measurement System</p>	10
Module 3	<p>Big Data and Future Directions for Business Analytics</p> <p>Data and Big Data Analytics What is Data and Why is it Important, Types of Data, Variables and Scales of Measurements, Data Sources and File Formats, Data Inspection, Data Preparation, Introduction and Definition of Big Data, Fundamentals of Big Data Analytics, Big Data Technologies</p> <p>Business Analytics: Emerging Trends and Future Location-Based Analytics for Organizations, Analytics Applications for Customers, Recommendation Engines, Web 2.0 and Online Social Networking</p>	10

Important Note:

1. Case examples for specific problem solutions given in the reference books must be discussed with students
2. Students must be given exposure to Microsoft PowerBI for Business Analytics as Internal Assignment or Project

Reference Books:

- [1] James R. Evans, “Business Analytics – Methods, Models, and Decisions”, Third Edition, Pearson, 2020
- [2] Sanjiv Jaggi, Kevin Lertwachara, Alison Kelly, Leida Chen, “Business Analytics: Communicating with Numbers”, 2nd Edition, Mc Graw Gill, 2023

Details of Continuous Assessment (ICA)- 20 Marks

Continuous Assessment	Details	Marks
Component 1 (ICA-1)	Internal class test (online or offline) Fill in the blanks /Explain the concepts/Answer in brief/Case study or application-based questions.	10 marks
Component 2 (ICA-2)	Presentations/Project Work/ VivaVoce/ Book Review/ Field visit & its presentations/ Documentary filming/ Assignments/ Group Discussions Etc.	10 marks

Details of Semester End Examination (TEE)- 30 Marks

	Particulars	Marks
Module 1	Answer in brief (Any 2 out of 3)	10 marks
Module 2	Answer in brief (Any 2 out of 3)	10 marks
Module 3	Answer in brief (Any 2 out of 3)	10 marks