



SYLLABUS

for

B.Sc., INFORMATION TECHNOLOGY

SEMESTER PATTERN-CBCS

FROM THE ACADEMIC YEAR

2023-2024

TAMIL NADU STATE COUNCIL FOR HIGHER EDUCATION

CHENNAI – 600 005

INTRODUCTION

B.Sc., INFORMATION TECHNOLOGY

Education is the key to development of any society. Role of higher education is crucial for securing right kind of employment and also to pursue further studies in best available world class institutes elsewhere within and outside India. Quality education in general and higher education in particular deserves high priority to enable the young and future generation of students to acquire skill, training and knowledge in order to enhance their thinking, creativity, comprehension and application abilities and prepare them to compete, succeed and excel globally. Learning Outcomes-based Curriculum Framework (LOCF) which makes it student-centric, interactive and outcome-oriented with well-defined aims, objectives and goals to achieve. LOCF also aims at ensuring uniform education standard and content delivery across the state which will help the students to ensure similar quality of education irrespective of the institute and location.

Information Technology is the study of quantity, structure, space and change, focusing on problem solving, application development with wider scope of application in science, engineering, social sciences etc. throughout the world in last couple of decades and it has carved out a space for itself like any other disciplines of basic science and engineering. Information Technology is a discipline that spans theory and practice and it requires thinking both in abstract terms and in concrete terms. Nowadays, practically everyone is a computer user, and many people are even computer programmers. Information Technology can be seen on a higher level, as a science of problem solving and problem solving requires precision, creativity, and careful reasoning. The ever-evolving discipline of Information Technology also has strong connections to other disciplines. Many problems in science, engineering, health care, business, and other areas can be solved effectively with computers, but finding a solution requires both computer science expertise and knowledge of the particular application domain. Information Technology / Computer science has a wider range of specialties. These include Computer Architecture, Software Systems, Graphics, Artificial Intelligence, Computational Science, and Software Engineering. Drawing from a common core of computer science knowledge, each specialty area focuses on specific challenges. Information Technology / Computer Science is practiced by mathematicians, scientists and engineers. Mathematics, the origins of Computer Science, provides reason and logic. Science provides the methodology for learning and refinement. Engineering provides the techniques for building hardware and software.

The Students completing this programme will be able to present Software application clearly and precisely, make abstract ideas precise by formulating them in the Computer languages. Completion of this programme will also enable the learners to join teaching profession, enhance their employability for government jobs, jobs in software industry, banking, insurance and investment sectors, data analyst jobs and jobs in various other public and private enterprises.

LEARNING OUTCOMES-BASED CURRICULUM FRAMEWORK GUIDELINES BASED REGULATIONS FOR UNDER GRADUATE PROGRAMME	
Programme:	B.Sc. INFORMATION TECHNOLOGY
Programme Code:	129
Duration:	3 years [UG]
Programme Outcomes:	PO1: Disciplinary knowledge: Capable of demonstrating comprehensive knowledge and understanding of one or more disciplines that form a part of an undergraduate Programme of study PO2: Communication Skills: Ability to express thoughts and ideas effectively in writing and orally; Communicate with others using appropriate media; confidently share one's views and express herself/himself; demonstrate the ability to listen carefully, read and write analytically, and present complex information in a clear and concise manner to different groups. PO3: Critical thinking: Capability to apply analytic thought to a body of knowledge; analyse and evaluate evidence, arguments, claims, beliefs on the basis of empirical evidence; identify relevant assumptions or implications; formulate coherent arguments; critically evaluate practices, policies and theories by following scientific approach to knowledge development. PO4: Problem solving: Capacity to extrapolate from what one has learned and apply their competencies to solve different kinds of non-familiar problems, rather than replicate curriculum content knowledge; and apply one's learning to real life situations. PO5: Analytical reasoning: Ability to evaluate the reliability and relevance of evidence; identify logical flaws and holes in the arguments of others; analyze and synthesize data from a variety of sources; draw valid conclusions and support them with evidence and examples, and addressing opposing viewpoints. PO6: Research-related skills: A sense of inquiry and capability for asking relevant/appropriate questions, problem arising, synthesising and articulating; Ability to recognise cause-and-effect relationships, define problems, formulate hypotheses, test hypotheses, analyse, interpret and draw conclusions from data, establish hypotheses, predict cause-and-effect relationships; ability to plan, execute and report the result of an experiment or investigation. PO7: Cooperation/Team work: Ability to work effectively and respectfully with diverse teams; facilitate cooperative or coordinated effort on the part of a group, and act together as a group or a team in the interests of a common cause and work efficiently as a member of a team.

	PO8: Scientific reasoning: Ability to analyse, interpret and draw conclusions from quantitative/qualitative data; and critically evaluate ideas, evidence and experiences from an open-minded and reasoned perspective. PO9: Reflective thinking: Critical sensibility to lived experiences, with self awareness and reflexivity of both self and society. PO10 Information/digital literacy: Capability to use ICT in a variety of learning situations, demonstrate ability to access, evaluate, and use a variety of relevant information sources; and use appropriate software for analysis of data. PO 11 Self-directed learning: Ability to work independently, identify appropriate resources required for a project, and manage a project through to completion. PO12Multiculturalcompetence:Possessknowledgeofthevaluesandbeliefs ofmultipleculturesandaglobalperspective;andcapabilitytoeffectivelyengage in a multicultural society and interact respectfully withdiverse groups. PO 13: Moral and ethical awareness/reasoning: Ability to embrace moral/ethical values in conducting one’s life, formulate a position/argument aboutanethicalissuefrommultipleperspectives,anduseethicalpracticesin all work. Capable of demon starting the ability to identify ethical issues relatedto one’s work, avoid unethical behaviour such as fabrication, falsification or misrepresentation of data or committingplagiarism, not adheringto intellectual property rights; appreciating environmental and sustainability issues; and adopting objective, unbiased and truthful actions in all aspects of work. PO 14: Leadership readiness/qualities: Capabilityfor mapping out the tasks of a team or an organization, and setting direction, formulating an inspiring vision,buildingateamwhocanhelpachievethenvision,motivatingandinspiring teammemberstoengagewiththatvision,andusingmanagement skillstoguide people to the right destination, in a smooth and efficient way. PO15:Lifelonglearning:Abilitytoacquireknowledgeandskills, including „learninghowtolearn“,thatarenecessaryforparticipatinginlearningactivities throughout life, through self-paced and self-directed learning aimed atpersonal development, meetingeconomic, social andculturalobjectives,and adaptingto changing trades and demands of work place through knowledge/skill development/reskilling.
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Programme Specific Outcomes:	
PSO1	Demonstrate and apply basic knowledge of information technology to the scientific issues and problems being faced in society and the industry.
PSO2	Analyze critical problems and provide computer-based solutions by applying appropriate tools and technology.
PSO3	Equip with technical ability, problem-solving skills, creative talent and power of communication necessary for various forms of employment. Develop a range of generic skills helpful in employment, internships & societal activities.
PSO4	Graduates will possess the skills to effectively plan, execute, and manage IT projects from initiation to completion. They will be proficient in project management methodologies.
PSO5	Bachelor of Information Technology gives a number of opportunities like software programmer, system and network administrator, web designer, Researcher/faculty for Information Technology, computer science and computer applications/etc.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
PSO1	Y	Y	Y	Y	Y	Y	Y	Y
PSO2	Y	Y	Y	Y	Y	Y	Y	Y
PSO3	Y	Y	Y	Y	Y	Y	Y	Y
PSO4	Y	Y	Y	Y	Y	Y	Y	Y
PSO5	Y	Y	Y	Y	Y	Y	Y	Y

3– Strong, 2-Medium, 1-Low

Highlights of the Revamped Curriculum:

- Student-centric, meeting the demands of industry & society, incorporating industrial components, hands-on training, skill enhancement modules, industrial project, project with viva-voce, exposure to entrepreneurial skills, training for competitive examinations, sustaining the quality of the core components and incorporating application oriented content wherever required.
- The Core subjects include latest developments in the education and scientific front, advanced programming packages allied with the discipline topics, practical training, devising mathematical models and algorithms for providing solutions to industry/real life situations. The curriculum also facilitates peer learning with advanced mathematical topics in the final semester, catering to the needs of stakeholders with research aptitude.
- The General Studies and Mathematics based problem solving skills are included as mandatory components in the Training for Competitive Examinations' course at the final semester, a first of its kind.
- The curriculum is designed so as to strengthen the Industry-Academia interface and provide more job opportunities for the students.
- The Internship during the second year vacation will help the students gain valuable work experience, that connects classroom knowledge to real world experience and to narrow down and focus on the career path.
- Project with viva-voce component in the sixth semester enables the student, application of conceptual knowledge to practical situations. The state of art technologies in conducting a Explain in a scientific and systematic way and arriving at a precise solution is ensured. Such innovative provisions of the industrial training, project and internships will give students an edge over the counterparts in the job market.
- State-of Art techniques from the streams of multi-disciplinary, cross disciplinary and inter disciplinary nature are incorporated as Elective courses, covering conventional topics to the latest - Artificial Intelligence.

Value additions in the Revamped Curriculum:

Semester	Newly introduced Components	Outcome/Benefits
I	Foundation Course To ease the transition of learning from higher secondary to higher education, providing an overview of the pedagogy of learning Literature and analysing the world through the literary lens gives rise to a new perspective.	➤ Instill confidence amongst students ➤ Create interest for the subject
I, II, III, IV	Skill Enhancement papers (Discipline centric / Generic / Entrepreneurial)	➤ Industry ready graduates ➤ Skilled human resource ➤ Students are equipped with essential skills to make them employable
		➤ Training on language and communication skills enable the students gain knowledge and exposure in the competitive world.
		➤ Discipline centric skill will improve the Technical knowhow of solving real life problems.
I, II, III, IV	Generic Elective (Allied)	➤ Exposure to combining or involving more than one discipline or field of study. ➤ Generates Industry ready graduates ➤ Employment opportunities enhanced
V Semester	Elective papers	➤ Self-learning is enhanced ➤ Application of the concept to real situation is conceived resulting in tangible outcome
VI Semester	Elective papers	➤ Enriches the study beyond the course. ➤ Developing a research framework and presenting their independent and intellectual ideas effectively.
Extra Credits: For Advanced Learners/Honors degree		➤ To cater to the needs of peer learners / research aspirants
Skills acquired from the Courses		Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill

ALAGAPPAUNIVERSITY,KARAIKUDI
NEW SYLLABUS UNDER CBCS PATTERN (w.e.f.2023-24)
B.Sc. INFORMATION TECHNOLOGY 2023-2024 PROGRAMME STRUCTURE

Sem.	Part	Course Code	Courses Type	Title of the Paper	T/P	Credit	Hours/ Week	Max. Marks		
								Int.	Ext.	Total
I	I	2311T	T/OL	தமிழ் இலக்கிய வரலாறு-I /Other Languages -I		3	6	25	75	100
	II	2312E	E	General English-I		3	6	25	75	100
	III	23BIT1C1	CC-I	Programming in C		4	5	25	75	100
		23BIT1P1	CC-II	Practical: Programming in C Lab		4	4	25	75	100
		-	Generic Elective (Allied)	Allied-I-B.Sc.Computer Science / BCA / B.Sc. Data Science / Artificial Intelligence/ Software / Electronics/Mathematics/-Theory		3	3	25	75	100
				Allied Lab-Respective Allied Theory-Practical		2	2	25	75	100
	IV	23BIT1S1	SEC-I	Office Automation		2	2	25	75	100
		23BIT1F C	Foundation Course-	Fundamentals of Computers		2	2	25	75	100
				Total		23	30	200	600	800
II	I	2321T	T/OL	தமிழ் இலக்கிய வரலாறு-2 /Other Languages-II		3	6	25	75	100
	II	2322E	E	General English-II		3	6	25	75	100
	III	23BIT2C1	CC-III	Java Programming		4	5	25	75	100
		23BIT2P1	CC-IV	Practical: Java Programming Lab		4	4	25	75	100
		-	Generic Elective (Allied)	Allied-I-B.Sc.Computer Science / BCA / B.Sc. Data Science / Artificial Intelligence/ Software / Electronics/Mathematics/-Theory		3	3	25	75	100
				Allied Lab-Respective Allied Theory-Practical		2	2	25	75	100
	IV	23BIT2S1	SEC-II	Basics of Internet		2	2	25	75	100
		23BIT2S2	SEC-III	Problem Solving Techniques		2	2	25	75	100
				Naan Mudhalvan Course						
				Total		23	30	200	600	800
III	I	2331T	T/OL	தமிழக வரலாறும் பண்பாடும் /Other Languages-III		3	6	25	75	100
	II	2332E	E	General English-III		3	6	25	75	100
	III	23BIT3C1	CC-V	PHP Programming		4	5	25	75	100
		23BIT3P1	CC-VI	Practical: PHP Programming Lab		4	4	25	75	100
		-	Generic Elective (Allied)	Allied-I-B.Sc.ComputerScience / BCA / B.Sc. Data Science / Artificial Intelligence/ Software / Electronics/Mathematics/-Theory		3	3	25	75	100
				Allied Lab-Respective Allied Theory-Practical		2	2	25	75	100
	IV	23BIT3S1	SEC-IV	Cyber Forensics		2	2	25	75	100
		233AT/ 23BIT3S2	SEC-V	Adipadai Tamil/ Enterprise Resource Planning		2	2	25	75	100
				Naan Mudhalvan Course						
				Total		23	30	100	600	800

IV	I	2341T	T/OL	தமிழும் அறிவியலும் /Other Languages -IV	3	6	25	75	100
	II	2342E	E	General English-IV	3	6	25	75	100
	III	23BIT4C1	CC-VII	Python Programming	4	4	25	75	100
		23BIT4P1	CC-VIII	Practical: Python Programming Lab	4	4	25	75	100
		-	Generic Elective (Allied)	Allied-I-B.Sc.Computer Science / BCA / B.Sc. Data Science / Artificial Intelligence/ Software / Electronics/Mathematics/-Theory	3	3	25	75	100
				Allied Lab-Respective Allied Theory-Practical	2	2	25	75	100
	IV	23BIT4S1	SEC-VI	Robotics and Its Applications	2	2	25	75	100
		234AT/ 23BIT4S2	SEC-VII	Adipadai Tamil / Organizational Behaviour	2	2	25	75	100
		23BES4	E.V.S	Environmental Studies	2	2	25	75	100
				Naan Mudhalvan Course					
				Total	25	30	225	675	900

V	III	23BIT5C1	CC-IX	Data Communications and Networking	4	5	25	75	100
		23BIT5C2	CC-X	.NET Programming	4	5	25	75	100
		23BIT5P1	CC-XI	Practical: .NET Programming Lab	4	5	25	75	100
		23BIT5C3	CC-XII	E-commerce and Digital Marketing	4	5	25	75	100
		23BIT5E1/ 23BIT5E2	DSE-I	Relational Database Management System/Data Mining	3	4	25	75	100
		23BIT5E3/ 23BIT5E4	DSE-II	Artificial Intelligence/Machine Learning	3	4	25	75	100
	IV	23BVE5		Value Education	2	2	25	75	100
		23BIT5IV		Internship/Industrial Visit/Field Visit	2	-	25	75	100
				NaanMudhalvan Course					
				Total	26	30	200	600	800
VI		23BIT6C1	CC-XIII	Software Project Management	4	6	25	75	100
		23BIT6D	CC-XIV	Dissertation	8	12	50	150	200
		23BIT6E1/ 23BIT6E2	DSE-III	Internet of Things and Its Applications/Cloud Computing	3	5	25	75	100
		23BIT6E3/ 23BIT6E4	DSE-IV	Introduction to Data Science/Big Data Analytics	3	5	25	75	100
				Extension Activity/ Industrial Visit	1	-	-	-	-
		23BIT6S1		Quantitative Aptitude	2	2	25	75	100
				Naan Mudhalvan Course					
				Total	20	30	150	450	600
				GrandTotal	140	--	1175	3525	4700

- TOL-Tamil/OtherLanguages,
- E- English
- CC-Core course
- GenericElective(Allied)
- SEC-SkillEnhancementCourse
- FC-FoundationCourse
- DSE-DisciplineSpecific Elective

FIRSTYEAR –SEMESTER – I

SUBJECT NAME				CORE–I:PROGRAMMING IN C				
SUBJECT CODE				23BIT1C1				
L	T	P	S	Credits	Inst. Hours	Marks		
						CIA	External	Total
5	-	-	-	4	5	25	75	100
Learning Objectives								
LO1	To familiarize the students with the understanding of code organization							
LO2	To improve the programming skills							
LO3	Learning the basic programming constructs.							
Prerequisites:								
Contents								
Unit I	Studying Concepts of Programming Languages- Language Evaluation Criteria - Language design - Language Categories - Implementation Methods –Programming Environments - Overview of C: History of C- Importance of C- Basic Structure of C Programs-Executing a C Program-Constants, Variables and Data types- Operators and Expressions-Managing Input and Output Operations.							
Unit II	Decision Making and Branching: Decision Making and Looping-Arrays- Character Arrays and Strings							
Unit III	User Defined Functions: Elements of User Defined Functions- Definition of Functions- Return Values and their Types- Function Call- Function Declaration- Categories of Functions- Nesting of Functions-Recursion							
Unit IV	Structures and Unions: Introduction- Defining a Structure- Declaring Structure Variables Accessing Structure Members- Structure Initialization- Arrays of Structures- Arrays within Structures- Unions-Size of Structures.							
Unit V	Pointers: Understanding Pointers- Accessing the Address of a Variable- Declaring Pointer Variables- Initializing of Pointer Variables-Accessing a Variable through its Pointer-Chain of Pointers- Pointer Expressions- Pointer and Scale Factor- Pointer and Arrays- Pointers and Character Strings- Array of Pointers- Pointer as Function Arguments- Functions Returning Pointers- Pointers to Functions- File Management in C							
TOTAL	75 Hrs							

Course Outcomes	
CO1	Outline the fundamental concepts of C programming languages, and its features
CO2	Demonstrate the programming methodology.
CO3	Identify suitable programming constructs for problem solving.
CO4	Select the appropriate data representation, control structures, functions and concepts based on the problem requirement.
CO5	Evaluate the program performance by fixing the errors.
Textbooks	
☐	Robert W. Sebesta, (2012), —Concepts of Programming Languages I, Fourth Edition, Addison Wesley (Unit I: Chapter– 1)
☐	E. Balaguruswamy, (2010), —Programming in ANSI C, Fifth Edition, Tata McGraw Hill Publications
Reference Books	
1.	Ashok Kamthane, (2009), —Programming with ANSI & Turbo C, Pearson Education
2.	Byron Gottfried, (2010), —Programming with C, Schaums Outline Series, Tata McGraw Hill Publications
NOTE: Latest Edition of Textbooks May be Used	
Web Resources	
1.	http://www.tutorialspoint.com/cprogramming/
2.	http://www.cprogramming.com/
3.	http://www.programmingsimplified.com/c-program-examples
4.	http://www.programiz.com/c-programming
5.	http://www.cs.cf.ac.uk/Dave/C/CE.html
6.	http://fresh2refresh.com/c-programming/c-function/

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	2	3	2	2
CO2	3	3	2	3	2	2
CO3	3	3	3	3	2	2
CO4	3	3	2	3	2	2
CO5	3	3	2	3	2	2
Weightage of course contributed to each PSO	15	14	11	15	10	10

SUBJECTNAME				CORE–II: Programming in C Lab				
SUBJECTCODE				23BIT1P1				
L	T	P	S	Credits	Inst. Hours	Marks		
						CIA	External	Total
-	-	4	-	4	4	25	75	100
Learning Objectives								
LO1	The Course aims to provide exposure to problem-solving through C programming							
LO2	It aims to train the student to the basic concepts of the C-Programming language							
LO3	Apply different concepts of C language to solve the problem							
Prerequisites:								
Contents (Minimum 2 programs from each content)								
1. Programs using Input /Output functions 2. Programs using Operators 3. Programs on conditional structures 4. Programs using Looping statements. 5. Programs using Arrays 6. Programs using String Manipulations 7. Programs using Functions & Recursive Functions 8. Programs using Structures & Unions 9. Programs using Pointers 10. Files								
CO	Course Outcomes							
CO1	Demonstrate the understanding of syntax and semantics of C programs.							
CO2	Identify the problem and solve using C programming techniques.							
CO3	Identify suitable programming constructs for problem solving.							
CO4	Analyze various concepts of C language to solve the problem in an efficient way.							
CO5	Develop a C program for a given problem and test for its correctness.							

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	2	3	2	2
CO2	3	3	2	3	2	2
CO3	3	3	3	3	2	2
CO4	3	3	2	3	2	2
CO5	3	3	2	3	3	2
Weightage of course contributed to each PSO	15	14	11	15	11	10

SEC-I-Skill Enhancement Course

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst.Hours	Marks		
									CIA	External	Total
23BIT1S1	OFFICE AUTOMATION	Skill Enhancement Course	-	Y	-	-	2	2	25	75	100
Course Objective											
C1	Understand the basics of computer systems and its components.										
C2	Understand and apply the basic concepts of a word processing package.										
C3	Understand and apply the basic concepts of electronic spread sheet software.										
C4	Understand and apply the basic concepts of database management system.										
C5	Understand and create a presentation using Power Point tool.										
	Details									No.of Hours	
UNIT I	Introductory concepts: Memory unit– CPU-Input Devices: Keyboard, Mouse and Scanner. Output devices: Monitor, Printer. Introduction to Operating systems & its features: DOS– UNIX–Windows. Introduction to Programming Languages.									6	
UNIT II	Word Processing: Open, Save and close word document; Editing text – tools, formatting, bullets; Spell Checker - Document formatting – Paragraph alignment, indentation, headers and footers, numbering; printing–Preview, options, merge.									6	
UNIT III	Spreadsheets : Excel–opening, entering text and data, formatting, navigating; Formulas–entering, handling and copying; Charts–creating, formatting and printing, analysis tables, preparation of financial statements, introduction to data analytics.									6	
UNIT IV	Database Concepts: The concept of data base management system; Data field, records, and files, Sorting and indexing data; Searching records. Designing queries, and reports; Linking of data files; Understanding Programming environment in DBMS; Developing Menu drive applications in query language (MS–Access).									6	
UNIT V	Power point: Introduction to Power point-Features–Understanding slide typecasting & viewing slides – creating slide shows. Applying special object – including objects & pictures – Slide transition– Animation effects, audio inclusion, timers.									6	
	Total									30	
Course Outcomes							Programme Outcomes				
CO	On completion of this course, students will										

1	Possesstheknowledgeonthebasicsofcomputers and its components	PO1,PO2,PO3,PO6,PO8
2	GainknowledgeonCreatingDocuments,spreadsheet and presentation.	PO1,PO2,PO3,PO6
3	LearntheconceptsofDatabaseandimplementthe Query in Database.	PO3,PO5,PO7
4	Demonstratetheunderstandingofdiffernt automation tools.	PO3,PO4,PO5,PO7
5	Utilizetheautomationtoolsfordocumentation, calculation and presentation purpose.	PO4,PO6,PO7,PO8
TextBook		
1	PeterNorton,“IntroductiontoComputers”–TataMcGraw-Hill.	
ReferenceBooks		
1.	JenniferAckermanKettel,GuyHat-Davis,CurtSimmons,“Microsoft2003”,Tata McGrawHill.	
WebResources		
1.	https://www.udemy.com/course/office-automation-certificate-course/	
2.	https://www.javatpoint.com/automation-tools	

Mapping with Programme Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	M	S	M			M		L
CO2	S	M	S			M		
CO3		S	S		M		L	
CO4			S	L	M		M	
CO5				M		S	M	S

S-Strong M-Medium L-Low

SUBJECT NAME				Foundation Course-I Fundamentals of Computers				
SUBJECT CODE				23BIT1FC				
L	T	P	S	Credits	Inst. Hours	Marks		
						CIA	External	Total
2	-	-	-	2	2	25	75	100
Learning Objectives								
LO1	To analyze a problem with appropriate problem solving techniques							
LO2	To understand the main principles of imperative, functional and logic oriented programming languages and							
LO3	To increase the ability to learn new programming languages.							
Pre requisites: Basic knowledge about programming concepts								
	Contents						No.of Hours	
Unit I	Introduction: Characteristics of Computers - Evolution of Computers Basic Computer Organization: I/O Unit - Storage Unit – Arithmetic Logic Unit-Control Unit-Central Processing Unit						6	
Unit II	Computer Software: Types of Software-System Architecture Computer Languages: Machine Language-Assembly Language- High Level Language - Object Oriented Languages						6	
Unit III	Problem Solving Concepts: Problem Solving in Everyday life - Types of Problems - Problem solving with computers - Difficulties with Problem Solving						6	
Unit IV	Problem Solving concepts for the computer: Constant Variables - Data Types - Functions -Operators - Expressions and Equations – Organizing the Solution: Analyzing the problem-Algorithm- Flowchart-Pseudocode						6	
Unit V	Programming Structure: Structuring a solution-Modules and their function-Local and Global variables-Parameters-Return values-Sequential Logic Structure – Problem solving with Decision - Problem Solving with Loops						6	
TOTAL							30	

Course Outcomes	
CO1	Outline the Computer fundamentals and various problem solving concepts in Computers
CO2	Describe the basic computer organization, software, computer languages, software development life cycle and the need of structured programming in solving a computer problem
CO3	Identify the types of computer languages, software, computer problems and examine how to set up expressions and equations to solve the problem.
CO4	Choose most appropriate programming languages, constructs and features to solve the problems in diversified domains.
CO5	Analyze the design of modules and functions in structuring the solution and various Organizing tools in problem solving.
Textbooks	
□	Pradeep K. Sinha and Priti Sinha, (2004) — Computer Fundamentals I, Sixth Edition, BPB Publications. (Unit I: Chapter 1 & 2, Unit II: Chapter 10 & 12)
□	Maureen Sprankle and Jim Hubbard, (2009) — Problem Solving and Programming Concept, Ninth Edition, Prentice Hall. (Unit III: Chapter 1, 2 & 3) Unit IV : Chapter 3, Unit V: Chapter 4, 5, 6, 7 & 8)
Reference Books	
1.	R.G. Dromey, (2007), — How to Solve it by Computer I, Prentice Hall International Series in Computer Science.
2.	C.S.V. Murthy, (2009), — Fundamentals of Computers I, Third Edition, Himalaya Publishing House.
NOTE: Latest Edition of Textbooks May be Used	
Web Resources	
1.	http://www.tutorialspoint.com/computer_fundamentals/
2.	http://www.comptechdoc.org/basic/basicitut/
3.	http://www.homeandlearn.co.uk/
4.	http://www.top-windows-tutorials.com/computer-basics/
5.	https://www.programiz.com/article/flowchart-programming(Algorithm and flow chart)

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	2	2	2	3
CO2	3	2	2	2	3	2
CO3	3	3	3	3	2	2
CO4	3	2	2	2	2	3
CO5	3	3	2	2	3	2
Weightage of course contributed to each PSO	15	12	11	11	12	12

FIRSTYEAR – SEMESTER – II

SUBJECT NAME					CORE–III:JAVAPROGRAMMING			
SUBJECT CODE					23BIT2C1			
L	T	P	S	Credits	Inst. Hours	Marks		
						CIA	External	Total
5	-	-	-	4	5	25	75	100
Learning Objectives								
LO1		- To provide fundamental knowledge of object-oriented programming. - To equip the student with programming knowledge in Core Java from the basics up.						
LO2		To enable the students to use AWT controls, Event Handling.						
Pre requisites: Basic knowledge about programming concepts								
Contents								
Unit I		Fundamentals of Object- Oriented Programming: Introduction– Object Oriented Paradigm – Concepts of Object – Oriented Programming – Benefits of OOP – Evolution: Java History- Java Features-DiffersfromCandC++-OverviewofJavaLanguage:JavaProgram-Structure–Tokens–Java Statements–Java Virtual Machine–Command Line Arguments						
Unit II		Constants,Variables and Data Types–Operators and Expressions–Decision making and Branching – Looping –Arrays-Strings–Collection Interfaces and classes						
Unit III		Classes objects and methods: Introduction–Defining a class–Method Declaration–Constructors -MethodOverloading–StaticMembers–Nestingofmethods–Inheritance–Overriding– Final variables and methods – Abstract methods and classes						
Unit IV		Multiple Inheritance: Defining Interfaces–Extending Interfaces–Implementing Interfaces– Packages: Creating Packages–Accessing Packages–Using a Package–Managing Errors and Exceptions-Multi threaded Programming						
Unit V		AWT Controls: The AWT class hierarchy - user interface components- Labels - Button - Text - Check Box - Check Box Group - Choice - List Box - Panels – Scroll Pane - Menu - Scroll Bar. Working with Frame class - Colour - Fonts and layout managers-Handling Mouse and Keyboard Events-Graphics Class – Lines and Rectangles – Circles and Ellipses – Drawing Arcs –Drawing Polygons – Line Graphs – Using Control Loops in Applets – Drawing Bar Charts.						

Course Outcomes	
CO1	Understand the basic Object-oriented concepts.
CO2	Implement the basic constructs of Core Java.
CO3	Implement Method, classes and inheritance of Core Java.
CO4	Implement Packages, Managing Errors and Exceptions, multi-threading of Core Java.
CO5	Understand and use the components of AWT and Event handling.
Textbooks	
•	ProgrammingwithJava-SixthEdition-EBalagurusamy-McGraw-HillEducation,2019
•	Java The Complete Reference-EleventhEdition-HerbertSchildt-Paperback–McGrawHill,2020
Reference Books	
•	IntroductiontoProgrammingwithJava:AProblemSolvingApproach -ThirdEdition-JohnDean,Ray Dean-McGraw-Hill Education, 2020
•	J2EE:TheCompleteReference ,JimKeogh—TataMcGrawHillEdition.
NOTE:LatestEditionofTextbooksMaybeUsed	
WebResources	
•	http://www.w3schools.com/java
•	http://www.tutorialspoint.com/java/
•	http://beginnersbook.com/java-tutorial-for-beginners-with-examples/
•	http://www.javatpoint.com/awt-program-in-java
•	http://www.javatpoint.com/java-awt

MappingwithProgrammeOutcomes:

	PO1	PO2	PO3	PO4	PO5	PO6
CO 1	L	M	S	M	M	S
CO 2	S	L	S	M	S	L
CO 3	M	S	L	M	M	S
CO 4	L	S	S	L	S	M
CO 5	S	M	M	S	L	S

S-Strong M-Medium L-Low

SUBJECT NAME				CORE-IV:JAVA PROGRAMMING LAB				
SUBJECT CODE				23BIT2P1				
L	T	P	S	Credits	Inst. Hours	Marks		
						CIA	External	Total
-	-	4	-	4	4	25	75	100
LO1		To design and develop applications using different Java programming language techniques						
LO2		To become proficient in the use of AWT, Event Handling						
Contents								
1. Write a program to find the bigger of two numbers using command line argument.								
2. Write a program to find the sum and average of the N numbers using Command line argument								
3. Write a mark list program to find the total, average, result and grade.								
4. Write a program to prepare the EB Bill calculation.								
5. Write a program to find the factorial value of the given number.								
6. Write a program to print the Multiplication Table.								
7. Write a program to print the Fibonacci Series.								
8. Write a program to find the given number is prime number or not.								
9. Write a program to find the given number is perfect number or not.								
10. Write a program to find the given number is Armstrong or Not.								
11. Write a program to Reverse the Given Number.								
12. Write a program to find the Sum of Digit.								
13. Write a program to arrange the numbers in Descending order.								
14. Write a program to find the Sum of each Row in the given matrix.								
15. Write a program for Matrix Addition.								
16. Write a program for Matrix Subtraction.								
17. Write a program to perform the following string operations using String class: a. String Concatenation b. Search as substring c. To extract substring from given string								
18. Write a program to find the given string is Palindrome or Not.								
19. Write a program to Count the no of Vowels in the given string.								
20. Write a program to arrange the String in Ascending order.								
21. Write a program to calculate Area of Square, Rectangle using Method Overloading.								

22. Write a program using Single Inheritance.
23. Write a program to handle the Exception using try and multiple catch block.
24. Write a program to generate Prime and Perfect number using thread.
25. Write a program to implement a Mark List program using package.
26. Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -, *, % operations. Add a text field to display the result. Handle any possible exceptions like divide by zero.
27. Write a Java program that simulates a traffic light. The program lets the user select one of three lights: red, yellow, or green with radio buttons. On selecting a button, an appropriate message with “stop” or “ready” or “go” should appear above the buttons in a selected color. Initially there is no message shown.
28. Write a program to draw a human face.
29. Write a program to draw our national flag.
30. Write a program to draw a Bar-chart.

Course Outcomes	
CO1	Use appropriate software development environment to write, compile and execute object-oriented Java programs
CO2	Analyze and identify necessary mechanisms of Java needed to solve real-world problem
CO3	Implement Inheritance, package.
CO4	Implement multi-threading and exception-handling.
CO5	Execute GUI, AWT and apply event handling.

Mapping with Programme Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6
CO 1	L	M	S	M	L	S
CO 2	S	S	L	M	L	M
CO 3	M	L	M	L	M	L
CO4	L	L	S	M	L	S
CO 5	M	M	S	S	L	M

S-Strong M-Medium L-Low

SEC-II-Skill Enhancement Course

Subject Code	SubjectName	Category	L	T	P	S	Credits	Marks		
								CIA	External	Total
23BIT2S1	BASICS OF INTERNET	Skill Enhancement Course	2	-	-		2	25	75	100
LearningObjectives										
LO1	Knowledgeof Internetmedium									
LO2	Internetasamass medium									
LO3	FeaturesofInternetTechnology,									
LO4	Internetassourceof infotainment									
LO5	Studyofinternetaudiences andaboutcybercrime									
UNIT	Contents								No.Of. Hours	
UNIT I	The emergence of internet as a mass medium–the world of _ world wide web‘.								6	
UNIT II	Features of internet as a technology.								6	
UNIT III	Internet as a source of infotainment–classification based on content and style.								6	
UNIT IV	Demographic and psychographic descriptions of internet _ audiences‘ – effect of internet on the values and life-styles.								6	
UNIT V	Present issues such as cybercrime and future possibilities.								6	
TOTALHOURS								30		
CO	CourseOutcomes									
CO1	Knowsthe basicconceptin HTMLConceptof resourcesinHTML									
CO2	KnowsDesignconcept.ConceptofMetaData Understand the concept of save the files.									
CO3	Understandthepageformatting.Concept of list									
CO4	CreatingLinks.-Knowtheconceptofcreatinglinktoemailaddress									
CO5	Conceptofaddingimages-Understandthetable creation.									

Textbooks	
1	Mastering HTML5 and CSS3 Made Easy!, Teach U Comp Inc.,.
2	Thomas Michaud, “Foundations of Web Design: Introduction to HTML & CSS”
Web Resources	
1.	https://www.teachucomp.com/samples/html/5/manuals/Mastering-HTML5-CSS3.pdf
2.	https://www.w3schools.com/html/default.asp

SEC-III-Skill Enhancement Course

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
23BIT2S2	PROBLEM SOLVING TECHNIQUES	Skill Enhancement Course	Y	-	-	-	2	2	25	75	100
Course Objective											
C1	Understand the systematic approach to problems solving.										
C2	Know the approach and algorithm to solve specific fundamental problems.										
C3	Understand the efficient approach to solve specific factoring-related problems.										
C4	Understand the efficient array-related techniques to solve specific problems.										
C5	Understand the efficient methods to solve specific problems related to text processing. Understand how recursion works.										
UNIT	Details										No. of Hours
UNIT I	Introduction: Notion of algorithms and programs – Requirements for solving problems by computer – The problem-solving aspect: Problem definition phase, Getting started on a problem, The use of specific examples, Similarities among problems, Working backwards from the solution – General problem-solving strategies - Problem solving using top-down design – Implementation of algorithms – The concept of Recursion.										6
UNIT II	Fundamental Algorithms: Exchanging the values of two variables – Counting - Summation of a set of numbers - Factorial computation - Sine function computation - Fibonacci Series generation - Reversing the digits of an integer – Base Conversion.										6
UNIT III	Factoring Methods: Finding the square root of a number – The smallest divisor of an integer – Greatest common divisor of two integers - Generating prime numbers – Computing the prime factors of an integer – Generation of pseudo-random numbers - Raising a number to a large power – Computing the n th Fibonacci number.										6
UNIT IV	Array Techniques: Array order reversal – Array counting or histogramming – Finding the maximum number in a set - Removal of duplicates from an ordered array - Partitioning an array – Finding the k^{th} smallest element – Longest monotone subsequence.										6
UNIT V	Text Processing and Pattern Searching: Text line length adjustment – Left and right justification of text – Keyword searching in text – Text line editing – Linear pattern search. Recursive algorithms: Towers of Hanoi – Permutation generation.										6
	Total										30
Course Outcomes								Programme Outcome			
CO	On completion of this course, students will										
1	Understand the logic of problem and analyses implementation of algorithm and Top Down approach and concept of Recursion							PO1, PO6			

2	Able to understand the Sequence of Numbers and Series Fibonacci, Reversing ,Base Conversion.	PO2
3	Able to do Algebraic operations	PO2,PO4
4	Coverage of Arrays and its Logics	PO6,PO8
5	Text Processing and Pattern Searching Approach	PO7
Text Book		
1	R.G.Dromey, <i>How to Solve it by Computer</i> , Pearson India, 2007	
Reference books		
1.	George Polya, Jeremy Kilpatrick, <i>The Stanford Mathematics Problem Book: With Hints and Solutions</i> , Dover Publications, 2009 (Kindle Edition 2013).	
2.	Greg W. Scragg, <i>Problem Solving with Computers</i> , Jones & Bartlett 1st edition, 1996.	
Web resources		
1.	https://www.studytonight.com/	
2.	https://www.w3schools.com/	

Mapping with Programme Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	M					S		
CO2		M						
CO3		S		L				
CO4						S		M
CO5							M	

S-Strong M-Medium L-Low

SECOND YEAR–SEMESTER– III

SUBJECT NAME				CORE–V:PHP PROGRAMMING				
SUBJECTCODE				23BIT3C1				
L	T	P	S	Credits	Inst. Hours	Marks		
						CIA	External	Total
5	-	-	-	4	5	25	75	100
LearningObjectives								
LO1	Toprovidethe necessaryknowledgeon basicsof PHP.							
LO2	TodesignanddevelopdynamicwebapplicationsusingPHP.							
LO3	Tolearnthenecessaryconceptsforworkingwiththefilesusing PHP							
Prerequisites:								
Contents								
Unit I	Introductionto PHP: Introduction to PHP -Scope of PHP -XAMPP / WAMP Installation, Basic Syntax, Defining variable and constant, Data type, Operator and Expression. Introduction to Control Structures – Conditional and Looping Statements. HandlingHtmlFormwithPHP-CapturingForm,GET-POSTmethodand redirectingaformafter submission.							
Unit II	Array: Anatomy of an Array, Creating index based and Associative array, Modifying Array Elements - Processing Arrays with Loops. String: StringSearching&ReplacingString,FormattingString,StringRelatedLibrary Function and regular expression.							
Unit III	Function: Definefunction,userdefinedfunction,CallbyvalueandCallbyreference, Recursive function, Date and Time Function, Working with file and Directories: Understanding file & directory, Opening and closing a file, Reading andWritingFiles–Reading DatafromaFile,Copying,renaminganddeletingafile, working with directories, Creating and deleting folder,							
Unit IV	Exception Handling: UnderstandingExceptionanderror,Try,catch,throw.Errortrackinganddebugging. Oops - Security tags.							
Unit V	Session and Cookie: Introduction to Session Control, Session Functionality, What is a Cookie, Setting Cookies, Storing Data in Cookies, Deleting Cookies, , Destroying the variables and Session.							
TOTAL	75 Hrs							
CourseOutcomes								

CO1	ToimplementPHPscriptusingDecisionsandLoops
CO2	TodevelopPHPApplicationsusingArrays & Strings
CO3	Manipulatefilesanddirectories.
CO4	ToimplementPHPscriptusing ExceptionHandlingandloops
CO5	TodevelopPHPApplicationsusingSessionandCookie
Textbooks	
1.	PHP:TheCompleteReference-StevenHolzner-McGrawHillEducation-2017
2.	PHPProgramming-TheCompleteGuide-CodeAcademy-2022
ReferenceBooks	
1.	HeadFirstHTML 5Programming-EricFreeman-O'Reilly
2.	LearningPHP,MySQL&JavaScript-5th Edition-RobinNixon-O'ReillyMedia,Inc.
NOTE:LatestEditionof TextbooksMaybeUsed	
WebResources	
1.	https://www.w3schools.com/php/
2.	https://www.geeksforgeeks.org/php-tutorial/
3.	https://www.javatpoint.com/php-tutorial
4.	https://www.tutorialspoint.com/php/index.htm
5.	https://www.guru99.com/php-tutorials.html
6.	https://www.w3resource.com/php-exercises/php-basic-exercises.php

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	2	3	2	2
CO2	3	3	2	3	2	2
CO3	3	3	3	3	2	2
CO4	3	3	2	3	2	2
CO5	3	3	2	3	2	2
Weightageof course contributedtoeach PSO	15	14	11	15	10	10

SUBJECT NAME				CORE-VI:PHP PROGRAMMING LAB				
SUBJECT CODE				23BIT3P1				
L	T	P	S	Credits	Inst. Hours	Marks		
						CIA	External	Total
-	-	4	-	4	4	25	75	100
Learning Objectives								
LO1	To design and develop web applications using PHP elements.							
LO2	Tobecomeproficientindynamicpagecreation&redirectingapageandformvalues after submission							
Prerequisites:								
Contents								
1. Write a Program to design a web page with links to different pages and allow navigation between web pages. 2. Write a Program to design a webpage with a form that uses all types of controls. 3. WriteaProgramtcreateapageusingfunctionsforcomparingthreeintegersandprinthelargest number. 4. Write a function to calculate the factorial of a number(non-negativeinteger).The function accept the number as an argument. 5. Write a Program to convert Number into Word. 6. Write a Program to check whether the given number is prime or not. 7. Write a Program that checks whether a passed string is palindrome or not. 8. Write aProgram tocreate aPHP page whichacceptsnamefrom user.After submissionthat pagewilldisplaygoodmorningorgoodeveningmessagealongwithusernamebasedontime functions. 9. WriteaProgramtcreateasimple'birthdaycountdown'script,thescriptwillcountthenumber of days between current day and birth day. 10. Writeaprogram tocheck theemail-idisvalidornotusingregular expression. 11. WriteaProgram topreparethe Marklist usingFile Handling. 12. WriteaProgramtoprepare theEBBill usingFile Handling. 13. WriteaProgramtoprepare the SalaryBillusingFile Handling. 14. WriteaProgram tocopyafile&implementwithexceptionhandlingtechniques. 15. WriteaProgram toimplementtheSessionManagement. 16. WriteaProgramtoimplementtheCOOKIES concepts.								
CO	CourseOutcomes							
CO1	Demonstratesimple programsusingPHPscript-Toimplementusing Decisions andLoops							

CO2	TodevelopPHPApplicationsusingArrays& Strings
CO3	TodevelopPHPApplicationsusingFunctions,fileandDirectories
CO4	ToimplementPHPscriptusing ExceptionHandlingandoops
CO5	TodevelopPHPwebapplicationsusingSessionandCookie

Mappingwith Programme Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6
CO 1	L	M	S	M	L	S
CO 2	S	S	L	M	L	M
CO3	M	L	M	L	M	L
CO 4	L	L	S	M	L	S
CO 5	M	M	S	S	L	M

S-Strong M-Medium L-Low

SEC-IV-Skill Enhancement Course

Subject Code	SubjectName	Category	L	T	P	S	Credits	Inst.Hours	Marks		
									CIA	External	Total
23BIT3S1	Cyber Forensics	Skill Enhancement Course	Y	-	-	-	2	2	25	75	100
CourseObjective											
C1	Understandthedefinitionofcomputerforensicsfundamentals.										
C2	Tostudyabout theTypesof ComputerForensicsEvidence										
C3	Understandand applytheconceptsofDuplicationandPreservationofDigital Evidence										
C4	UnderstandtheconceptsofElectronicEvidenceandIdentificationof Data										
C5	TostudyabouttheDigitalDetective, NetworkForensicsScenario, Damaging ComputerEvidence.										
UNIT	Details							No.of Hours	Course Objective		
UNIT I	Overview of Computer Forensics Technology: Computer Forensics Fundamentals: Whatis Computer Forensics? Use of Computer Forensics in Law Enforcement, Computer Forensics Assistance to Human Resources/Employment Proceedings, Computer Forensics Services, Benefits of professional Forensics Methodology, Steps taken by Computer Forensics Specialists. Types of Computer. Forensics Technology: Types of Business Computer Forensic, Technology–Types of Military Computer Forensic Technology–Types of Law Enforcement– Computer Forensic. Technology–Types of Business Computer Forensic Technology.							6	C1		
UNIT II	Computer Forensics Evidence and capture: Data Recovery: Data Recovery Defined, Data Back–up and Recovery, TheRole of Back –up in Data Recovery,TheData – Recovery Solution. Evidence Collection and Data Seizure: Collection Options, Obstacles, Types of Evidence, The Rules of Evidence, Volatile Evidence, General Procedure, Collection and Archiving, Methods of Collections, Artefacts, Collection Steps, Controlling Contamination: The chain of custody.							6	C2		

UNIT III	Duplication and Preservation of Digital Evidence: Processing steps, Legal Aspects of collecting and Preserving Computer forensic Evidence. Computer image Verification and Authentication: Special needs of Evidential Authentication, Practical Consideration, Practical Implementation.	6	C3
UNIT IV	Computer Forensics Analysis: Discovery of Electronic Evidence: Electronic Document Discovery: A Powerful New Litigation Tool. Identification of Data: Time Travel, Forensic Identification and Analysis of Technical Surveillance Devices.	6	C4
UNIT V	Reconstructing Past Events: How to Become a Digital Detective, Useable File Formats, Unusable File Formats, Converting Files. Networks: Network Forensics Scenario, a technical approach, Destruction Of E-Mail, Damaging Computer Evidence, Documenting The Intrusion on Destruction of Data, SystemTesting.	6	C5
	TOTAL	30	
CourseOutcomes		ProgrammeOutcomes	
CO	Oncompletionofthiscourse,studentswill		
1	Understandthedefinitionofcomputerforensics fundamentals.	PO1	
2	Evaluatethedifferenttypesofcomputerforensics technology.	PO1,PO2	
3	Analyzevariouscomputerforensicssystems.	PO4,PO6	
4	Applythethodsfordatarecovery,evidence collection and data seizure.	PO4,PO5, PO6	
5	Gainyourknowledgeofduplicationandpreservation of digital evidence.	PO3,PO8	
TextBook			

1	CyberForensicsbyDejey,Murugan(Author)-OxfordUniversityPress-June2018
2	CyberForensicsbyJr.Marcella,AlbertJ.-CRCPress;1stedition(September2021)

ReferenceBooks

1.	JohnR.Vacca,—ComputerForensics:ComputerCrimeInvestigation,3/E,Firewall Media, New Delhi, 2002.
2.	Nelson, Phillips Enfinger, Steuart,—Computer Forensics and Investigations, Enfinger, Steuart, CENGAGE Learning, 2004.
3.	AnthonySammesandBrianJenkinson,ForensicComputing:APractitioner’s Guidel, Second Edition, Springer–Verlag London Limited, 2007.
4.	.RobertM.Slade,SoftwareForensics CollectingEvidencefromtheSceneof aDigital Crime, TMH 2005.

WebResources

1.	https://www.hackingarticles.in/best-of-computer-forensics-tutorials/
2.	https://intellipaat.com/blog/what-is-cyber-forensics/
3.	https://www.vskills.in
4.	https://alison.com/tag/computer-forensics

MappingwithProgrammeOutcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	S							
CO2	M	S						
CO3				S		S		
CO4				S	S	M		
CO5		S-Strong	S	M-Medium	L-Low			S

SEC-V-Skill Enhancement Course

Subject Code	SubjectName	Category	L	T	P	S	Credits	Inst.Hours	Marks		
									CIA	External	Total
23BIT3S2	Enterprise Resource Planning	Skill Enhancement Course	Y	-	-	-	2	2	25	75	100
CourseObjectives											
CO1	To understand the basic concepts, Evolution and Benefits of ERP.										
CO2	To know the need and Role of ERP in logical and Physical Integration.										
CO3	Identify the important business functions provided by typical business software such as enterprise resource planning and customer relationship management										
CO4	To train the students to develop the basic understanding of how ERP enriches the business organizations in achieving a multidimensional growth										
CO5	To aim at preparing the students technological competitive and make them ready to self-upgrade with the highest technical skills										
UNIT	Details									No.of Hours	
UNIT I	ERP Introduction, Benefits, Origin, Evolution and Structure: Conceptual Model of ERP, the Evolution of ERP, the Structure of ERP, Components and needs of ERP, ERP Vendors; Benefits & Limitations of ERP Packages.									6	
UNIT II	Need to focus on Enterprise Integration/ERP; Information mapping; Role of common shared Enterprise database; System Integration, Logical vs. Physical System Integration, Benefits & limitations of System Integration, ERP's Role in Logical and Physical Integration. Business Process Reengineering, Data Warehousing, Data Mining, Online Analytic Processing (OLAP), Product Life Cycle Management (PLM), LAP, Supply chain Management.									6	
UNIT III	ERP Marketplace and Marketplace Dynamics: Market Overview, Market place Dynamics, the Changing ERP Market. ERP-Functional Modules: Introduction, Functional Modules of ERP Software, Integration of ERP, Supply chain and Customer Relationship Applications. Cloud and Open Source, Management, Material Management, Financial Module, CRM and Case Study.									6	
UNIT IV	ERP Implementation Basics, , ERP implementation Strategy, ERP Implementation Life Cycle ,Pre- Implementation task, Role of SDLC/SSAD, Object Oriented Architecture, Consultants, Vendors and Employees.									6	
UNIT V	ERP & E-Commerce, Future Directives- in ERP, ERP and Internet, Critical success and failure factors, Integrating ERP into organizational culture. Using ERP tool: either SAP or ORACLE									6	

SECOND YEAR–SEMESTER– IV

SUBJECT NAME				CORE–VII:PYTHON PROGRAMMING				
SUBJECT CODE				23BIT4C1				
L	T	P	S	Credits	Inst. Hours	Marks		
						CIA	External	Total
5	-	-	-	4	5	25	75	100
LearningObjectives								
LO1	UnderstandtheconceptsofPythonprogramming.							
LO2	Illustratetheprocessofstructuringthedatausinglists,dictionaries,tuplesandsets.							
LO3	ToapplythefileconceptinPython programming							
Prerequisites:								
Contents								
Unit I	Introduction to Python: History of Python- Futures of Python-Application of Python-Installation of Python-Key words-Identifiers-Statements-Indentation-Data types-Literal Variable-Operators and Expression-Input/Output Statements. ControlFlowstatements: ConditionalandLooping Statements.							
Unit II	Sequences –Lists-Methods-Slicing-Cloning-NestedList-Mutability-Creatingtuple-Accessing/Updating/Deleting elements in Tuple- Nested Tuples– Making a Dictionary-Adding and Modifying an Item in a Dictionary-Sorting Items-Looping over a Dictionary-Sets							
Unit III	Functions -Defining a Function-Calling Function – Type of Arguments –return statement -Recursive functions-Modules-Importing-Creating Modules-Name spacing- Reloading- Installing Packages. Strings and Regular Expressions-Files andDirectoryAccess-Openingafilemodes-Reading/WritingOperationsona File-File Position-Renaming and Deleting File-Directory methods.							
Unit IV	Object Oriented Programming -Class–Methods-Self variable-Data Hiding-Constructor-Method Over loading-In heritance-Operator Over loading. Errors and Exceptions -Handling Exceptions-Try-Finally-With and Except-Statements-Assert Statement-Custom Exceptions.							
Unit V	GUI Programming with Tkinter: Widget-Label-Button-Text-Checkbutton-Entry-Listbox-Combobox - Scrollbar –Radio Button- Container -Frame-Menu-Message-Scale-Canvas-Events-Key board and Mouse Events-Graphics using Turtle.							
TOTAL	75Hrs							

Course Outcomes	
CO1	Outline the basic concepts in python language. Interpret different looping and conditional Statements in python language.
CO2	Work with List, tuples and dictionary, Write program using list, tuples and dictionary.
CO3	Concept of function, Implementing the concept strings in various application, Significance of Modules, Concept of reading and writing files.
CO4	To implement Exception Handling and loops.
CO5	To develop GUI applications using Tkinter, Turtle.
Textbooks	
1.	Python Programming - Ch Satyanarayana, MRadhika Mani, BN Jagadesh - Universities Press.
2.	Programming and Problem Solving with Python - Ashok Namdev Kamthane - Amit Ashok Kamthane - Second Edition - 2020.
Reference Books	
1.	Python Programming Using Problem Solving Approach - Reema Thareja - Oxford University Press
2.	Vamsi Kurama, — Python Programming: A Modern Approach I, Pearson Education.
NOTE: Latest Edition of Textbooks May be Used	
Web Resources	
1.	https://www.w3schools.com/python/
2.	https://www.geeksforgeeks.org/python-programming-language/
3.	https://www.tutorialspoint.com/python/index.htm
4.	https://www.programiz.com/python-programming
5.	https://www.guru99.com/python-tutorials.html
6.	https://www.learnpython.org/

MAPPING TABLE						
CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	2	3	2	2
CO2	2	3	2	3	2	2
CO3	2	3	2	2	3	1
CO4	1	2	2	1	3	2
CO5	2	2	2	1	3	3
Weightage of course contributed to each PSO	10	12	10	10	13	10

SUBJECT NAME				CORE-VIII:PYTHON PROGRAMMING LAB				
SUBJECT CODE				23BIT4P1				
L	T	P	S	Credits	Inst. Hours	Marks		
						CIA	External	Total
-	-	4	-	4	4	25	75	100
Learning Objectives								
LO1	Understand the fundamental of programming using Python, such as variables, data types, control structures, and functions.							
LO2	Learn how to use Python libraries and modules to solve problems.							
Prerequisites:								
Contents								
1. Write a Python Program for checking whether the given number is an odd or even number.								
2. Write a Python Program to check leap year.								
3. Write a Python Program to Check the given number is Prime Number or not.								
4. Write a Python Program to Check the given number is Perfect Number or not.								
5. Write a Python program to generate list of Fibonacci number upto n numbers.								
6. Write a Python program to generate multiplication table.								
7. Write a Python program to print the Armstrong number between the two range.								
8. Write a python program to create, append and remove lists in python.								
9. Write a program to demonstrate working with tuples in python.								
10. Write a program to demonstrate working with dictionaries in python.								
11. Write a python program to define a module to find Factorial Numbers and import the module to another program.								
12. Write a Python program to find the given string is Palindrome or Not								
13. Write a python program by using exception handling mechanism.								
14. Write a python to Implement python script to accept line of text and find the number of characters, number of vowels and number of blank spaces in it.								
15. Write a program to copy file contents from one file to another.								
16. Write a program to prepare the marklist using files.								
17. Write a program to prepare the eb bill using files.								
18. Create a graphical application in Python Tkinter to prepare the salary bill using widgets.								
19. Write a program to drawing a cartoon or house using turtle.								
20. Write a program to drawing a colouring shapes turtle.								

CO	CourseOutcomes
CO1	Understandthesignificanceofcontrolstatements,loopsandfunctionsincreating Simpleprograms.
CO2	Interpretthecoredatastructuresavailableinpythontostore,processandsortthedata.
CO3	Developtherealtimeapplicationsusingpythonprogramming language.
CO4	Analyzetherealtimeproblemusingsuitablepythonconcepts.
CO5	AssesstheGUIapplicationusingappropriateconceptsinpython.

MAPPINGTABLE						
CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	3	2	3	3
CO2	3	3	2	2	3	3
CO3	3	2	2	3	3	2
CO4	3	2	3	3	2	2
CO5	3	3	3	3	3	2
Weightageof course contributed to each PSO	15	12	13	13	14	12

SEC-VI-Skill Enhancement Course

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst.Hours	Marks		
									CIA	External	Total
23BIT4S1	Robotics and Its Applications	Skill Enhancement Course	Y	-	-	-	2	2	25	75	100
Course Objective											
C1	To understand the robotics fundamentals										
C2	Understand the sensors and matrix methods										
C3	Understand the Localization: Self-localizations and mapping										
C4	To study about the concept of Path Planning, Vision system										
C5	To learn about the concept of robot artificial intelligence										
UNIT	Details							No. of Hours	Course Objective		
UNIT I	Introduction: Introduction, brief history, components of robotics, classification, workspace, work-envelop, motion of robotic arm, end- effectors and its types, service robot and its application, Artificial Intelligence in Robotics.							6	CO1		
UNIT II	Actuators and sensors :Types of actuators, stepper-DC-servo-and brushless motors- model of a DC servo motor-types of transmissions- purpose of sensor-internal and external sensor-common sensors- encoders tachometers-strain gauge based force torque sensor- proximity and distance measuring sensors Kinematics of robots: Representation of joints and frames, frames transformation, homogeneous matrix, D-H matrix, Forward and inverse kinematics: two link planar (RR) and spherical robot (RRP). Mobile robot Kinematics: Differential wheel mobile robot							6	CO2		
UNIT III	Localization: Self-localizations and mapping - Challenges in localizations –IR based localizations –vision based localizations – Ultrasonic based localizations - GPS localization systems.							6	CO3		
UNIT IV	Path Planning: Introduction, path planning-overview-roadmap path planning-cell decomposition path planning potential field path planning-obstacle avoidance-case studies Vision system: Robotic vision systems-image representation-object recognition-and categorization-depth measurement- image data compression-visual inspection-software considerations							6	CO4		
UNIT V	Application: Ariel robots-collision avoidance robots for agriculture-mining-exploration-underwater-civilian- and military applications-nuclear applications-space Applications-Industrial robots-artificial intelligence in robots-application of robots in material handling-continuous arc welding-spot welding-spray painting-assembly operation-cleaning-etc.							6	CO5		

Course Outcomes		Programme Outcomes
CO	On completion of this course, students will	
1	Describe the different physical forms of robot architectures.	PO1
2	Kinematically model simple manipulator and mobile robots.	PO1, PO2
3	Mathematically describe a kinematic robot system	PO4, PO6
4	Analyze manipulation and navigation problems using knowledge of coordinate frames, kinematics, optimization, control, and uncertainty.	PO4, PO5, PO6
5	Program robotics algorithms related to kinematics, control, optimization, and uncertainty.	PO3, PO8
Text Book		
1	Introduction to Robotics, 4e by John Craig (Author) - Pearson Education - April 2022	
2	Robotics: Field of Applications: For Beginners by Dr. S. Uma (Author), Dr. V. Saranya (Author) December 2022	
3	Introduction to Robotics, 3ed, An Indian Adaptation by Saeed B. Niku (Author), Wiley Editorial Team - January 2024	
4	Richard D. Klafner, Thomas Achmielewski and Mickael Negin, Robotic Engineering and Integrated Approach, Prentice Hall India - New Delhi - 2001	
Reference Books		
1.	Industrial robotic technology-programming and application by M.P. Groover et al., McGraw Hill 2008	
2.	Robotic technology and flexible automation by S.R. Deb, THH-2009	
Web Resources		
1.	https://www.tutorialspoint.com/artificial_intelligence/artificial_intelligence_robotics.htm	
2.	https://www.geeksforgeeks.org/robotics-introduction/	

MappingwithProgrammeOutcomes:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S					
CO2	M	S				
CO3				S		S
CO4				S	S	M
CO5			S			
S-Strong M-Medium L-Low						

SEC-VII-SkillEnhancementCourse

Subject Code	SubjectName	Category	L	T	P	O	Credits	Inst.Hours	Marks		
									CIA	External	Total
23BIT4S2	Organizational Behaviour	Skill Enhancement Course	Y	-	-	-	2	2	25	75	100
LearningObjectives											
LO1	TohaveextensiveknowledgeonOBandthe scopeof OB.										
LO2	TocreateawarenessofIndividualBenaviour.										
LO3	ToenhancetheunderstandingofGroup Behaviour										
LO4	ToknowthebasicsofOrganisaitonalCultureandOrganisationalStructure										
LO5	TounderstandOrganisationalChange,ConflictandPower										
UNIT	Details										No.of Hours
UNIT I	INTRODUCTION:ConceptofOrganizationalBehavior(OB): Nature, Scope and Role of OB: Disciplines that contribute to OB; Opportunities for OB (Globalization, Indian workforce diversity, customer service,innovationandchange,networkedorganizations,work-lifebalance, peopleskills,positiveworkenvironment,ethics)										6
UNIT II	INDIVIDUALBEHAVIOUR: 1. Learning, attitude and Job satisfaction: Concept of learning, conditioning, shaping and reinforcement. Concept of attitude,components, behavior and attitude. Job satisfaction: causation; impact of satisfied employees on workplace. 2. Motivation : Concept; Theories (Hierarchy of needs, X and Y, Two factor, McClelland, Goal setting, Self-efficacy, Equity theory); Job characteristics model; Redesigning jobs, 3. Personality and Values : Concept of personality; Myers-Briggs Type Indicator (MBTI); Big Five model. Relevance of values; Linking personality and values to the workplace (person-job fit, person-organization fit) 4. Perception,DecisionMaking:PerceptionandJudgements; Factors;Linkingperceptiontoindividualdecision making:										6
UNIT III	GROUP BEHAVIOUR : 1. Groups and Work Teams : Concept : Five Stage model of group development; Group norms, cohesiveness ; Group think and shift ; Teams; types of teams; Creating team players from individuals and team based work(TBW) 2. Leadership : Concept; Trait theories; Behavioral theories(OhioandMichiganstudies);Contingencytheories(Fiedler,Hersey andBlanchard,Path-Goal);										6
UNIT IV	ORGANISATIONALCULTUREANDSTRUCTURE: Concept of culture; Impact (functions and liability); Creating andsustaining culture: Concept of structure, Prevalent organizationaldesigns: New design options										6

UNIT V	ORGANISATIONAL CHANGE, CONFLICT AND POWER: Forces of change; Planned change; Resistance; Approaches (Lewin's model, Organisational development); Concept of conflict, Conflict process; Types, Functional/Dysfunctional. Introduction to power and politics.	6
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Course Outcomes	On Completion of the course the students will
CO1	To define Organisational Behaviour, Understand the opportunity through OB.
CO2	To apply self-awareness, motivation, leadership and learning theories at workplace.
CO3	To analyze the complexities and solutions of group behaviour.
CO4	To impact and bring positive change in the culture of the organization.
CO5	To create a congenial climate in the organization.

Reading List	
1.	Neharika Vohra, Stephen P. Robbins, Timothy A. Judge, <i>Organizational Behaviour</i> , Pearson Education, 18 th Edition, 2022.
2.	Fred Luthans, <i>Organizational Behaviour</i> , Tata McGraw Hill, 2017.
3.	Ray French, Charlotte Rayner, Gary Rees & Sally Rumbles, <i>Organizational Behaviour</i> , John Wiley & Sons, 2011
4.	Louis Bevoe, Allison Shearsett, Rachael Collinson, <i>Organizational Behaviour Reference</i> , NutriNiche System LLC (28 April 2017)
5.	Dr. Christopher P. Neck, Jeffery D. Houghton and Emma L. Murray, <i>Organizational Behaviour: A Skill-Building Approach</i> , SAGE Publications, Inc; 2nd edition (29 November 2018).
References Books	
1.	Uma Sekaran, <i>Organizational Behaviour Text & cases</i> , 2 nd edition, Tata McGraw Hill Publishing CO. Ltd
2.	Gangadhar Rao, Narayana, V.S. PRao, <i>Organizational Behaviour</i> 1987, Reprint 2000, Konark Publishers Pvt. Ltd, 1 st edition
3.	S.S. Khanka, <i>Organizational Behaviour</i> , S. Chand & Co, New Delhi.
4.	J. Jayasankar, <i>Organizational Behaviour</i> , Margham Publications, Chennai, 2017.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	S							
CO2	M	S						
CO3				S		S		
CO4				S	S	M		
CO5			S					S

THIRDYEAR-SEMESTER – V

SUBJECT NAME				CC-IX-DATA COMMUNICATIONS AND NETWORKING				
SUBJECT CODE				23BIT5C1				
L	T	P	S	Credits	Inst. Hours	Marks		
						CIA	External	Total
5	-	-	-	4	5	25	75	100
Learning Objectives								
LO1	This course is to provide students with an overview of the concepts and fundamentals of data communication and computer networks							
LO2	To familiarize the student with the basic taxonomy and terminology of the computer.							
LO3	Student will be able to understand various types of transmission media, network devices; and parameters of evaluation of performance for each media and device.							
Prerequisites:								
Contents								
Unit I	Introduction: Data Communication-Networks: Distributed Processing-Network Criteria Physical Structures–Network Models-Categories of Network-Internetwork -The Internet Protocols and Standards–Network Models: Layers in the OSI Model - TCP/IP Protocol Suite.							
Unit II	Data and Signals: Analog and Digital Data - Analog and Digital Signals- Performance - Digital Transmission: Transmission Modes – Multiplexing: FDM - WDM-Synchronous TDM-Statistical TDM-Transmission Media: Guided media-Unguided Media							
Unit III	Switching: Circuit Switched Networks - Datagram Networks-Virtual Circuit Network - Error Detection and Correction: Introduction - Block Coding - Linear Block Codes - Cyclic Codes: Cyclic Redundancy Check - Checksum. Data Link Control: Framing-Flow Control and Error Control-Noiseless Channel: Stop-and-wait Protocol.							
Unit IV	Wired LANs: Standard Ethernet-GIGABIT Ethernet-Wireless LAN: Bluetooth Connecting LANs: Connecting Devices: Passive Hubs- Repeaters-Active Hubs-Bridges-Two Layer Switches-Routers-Three layer Switches-Gateway-Network Layer: Internet Protocol: IPv4–IPv6-Transition from IPv4 to IPv6.							
Unit V	Network Layer: Delivery, Forwarding and Routing- Unicast Routing Protocols: Distance Vector Routing-Link state routing- Future & Current Trends in Computer Networks: 5G Network: Salient Features- Technology-Applications-Advanced Features-Advantages&Disadvantages-Common Uses-Applications-WiFi-WiMax Lifi-Lifivs Wifi.							
TOTAL	75 Hrs							

CO	Course Outcomes
CO1	Understand the fundamental concepts of computer networks and its application areas
CO2	Identify and use various networking techniques and components to establish networking connection and transmission
CO3	Analyze the services performed by different network layers and recent advancements in networking
CO4	Compare various networking models, layers, protocols and technologies.
CO5	Select the appropriate networking mechanism to build a reliable network
Textbooks	
➤	Data Communications and Networking with TCP/IP Protocol Suite by Behrouz A. Forouzan (Author) - McGraw-Hill- 6th Edition- August 2022
➤	Communication Networks: A Concise Introduction, Second Edition by Jean Walrand, Shyam Parekh - Springer International Publishing AG-2018
Reference Books	
1.	Data Communication and Computer Networks- Ajit Pal- Phi Learning Pvt. Ltd..
NOTE: Latest Edition of Textbooks May be Used	
Web Resources	
1.	http://www.tutorialspoint.com/data_communication_computer_network/
2.	https://www.geeksforgeeks.org/computer-network-tutorials/
3.	https://www.guru99.com/data-communication-computer-network-tutorial.html
4.	http://www.slideshare.net/zafar_ayub/data-communication-and-network-11903853

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	2	3	3	2
CO2	3	3	2	3	3	2
CO3	3	3	3	3	3	2
CO4	3	3	2	3	3	2
CO5	3	3	2	3	3	2
Weightage of course contributed to each PSO	15	14	11	15	15	10

SUBJECT NAME				CC-X- .NET Programming				
SUBJECT CODE				23BIT5C2				
L	T	P	S	Credits	Inst. Hours	Marks		
						CIA	External	Total
5	-	-	-	4	5	25	75	100
Learning Objectives								
LO1	Understand the core principles of .NET Framework.							
LO2	To provide sufficient knowledge in developing windows/web applications using VB.NET and ASP.NET.							
LO3	Create a SQL Server database and utilize Entity Framework for data access.							
Prerequisites:								
Contents								
Unit I	Introduction to .NET – The .NET Framework – Benefits of .NET – Common Language Runtime – Features of CLR – Compilation and MSIL – The .NET Framework libraries – The Visual Studio Integrated Development Environment.							
Unit II	Introduction to VB.NET – VB.NET fundamentals – Branching and Looping Statements - Classes and Objects – Constructors – Overloading- Inheritance and Polymorphism – Interfaces – Arrays – Strings – Exceptions – Delegates and Events.							
Unit III	Building Windows Applications – Creating a Windows Applications using window controls- Windows Forms - Text Boxes - Rich Text boxes – Labels and link labels – Buttons - Check boxes - Radio buttons - Panels and Group Boxes - List Boxes - Checked List boxes - Combo boxes and Picture boxes - Scroll bars – Calendar control - Timer control – Handling Menus – Dialog boxes – Report Viewer- Graphics- Deploying an Application.							
Unit IV	ASP.NET Basics: Features of ASP.NET – ASP.NET Page directives - Building Forms with Web server Controls – Validation Server Controls – Rich Web Controls- Custom Controls – Collections and Lists.							
Unit V	Data Management with ADO.NET - Introducing ADO.NET - ADO.NET features – Using SQL Server with VB.NET – Using SQL Server with ASP.NET.							
TOTAL	75 Hrs							
CO	Course Outcomes							

CO1	Understand the concept of .Net Framework
CO2	Evaluate Arrays, Strings, Exceptions and OOPs concept.
CO3	Build and debug the Windows Forms with VB.NET Controls.
CO4	Identify the various stages in developing a web forms
CO5	Use ADO.NET Framework in a Windows/Web application to read, insert, and update data in a database.
Textbooks	
➤	Visual Studio 2019 In Depth-by Ockert J. du Preez (Author)-BPB Publications
➤	Programming with Microsoft Visual Basic-Diane Zak -Cengage Learning
➤	Programming ASP.NET Core By Dino Esposito-Pearson Education
➤	ADO.NET in a Nutshell-Bill Hamilton, Matthew MacDonald-O'Reilly
Reference Books	
1.	Visual Basic 2019-Dr. Liew Voon
2.	Kings ASP.NET Core in Action-Second Edition-Andrew Lock-Manning
NOTE: Latest Edition of Textbooks May be Used	
Web Resources	
1.	https://dotnet.microsoft.com/en-us/learn
2.	https://www.javatpoint.com/net-framework
3.	https://www.geeksforgeeks.org/introduction-to-net-framework/
4.	https://www.w3schools.com/asp/default.ASP

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	2	3	3	3
CO2	3	3	2	3	3	3
CO3	3	3	3	3	3	3
CO4	3	3	2	3	3	3
CO5	3	3	2	3	3	3
Weightage of course contributed to each PSO	15	14	11	15	15	15

SUBJECT NAME				CC-XI-.NET Programming Lab				
SUBJECT CODE				23BIT5P1				
L	T	P	S	Credits	Inst. Hours	Marks		
						CIA	External	Total
-	-	5	-	4	5	25	75	100
LearningObjectives								
LO1	ToprovidesufficientknowledgeindevelopingWindows/Webapplications.							
LO2	To manipulatedata fromSQLServerusingMicrosoftADO.NET.							
Prerequisites:								
Contents								
1. WriteaprogramtocreatetheStudentMark Listusing VB.NET. 2. Writeaprogramto create theEB-Billusing VB.NET. 3. Designanddevelopa PuzzleGameusing VB.NET 4. DesignanddevelopaCalculatorusing VB.NET 5. Writean ImageScrollingprogramusing VB.NET. 6. Writeaprogramto ResizetheImageheightandWidthusingScrollbarin VB.NET 7. Writeaprogramto DrawaPictureusing mouse eventsinVB.NET 8. WriteaprogramtoDrawa Homeusinggraphics function in VB.NET 9. DesignanddevelopaTextEditorusing VB.NET. 10. Writea programtoMaintainthe Book Details UsingVB.NET&ADO.NET 11. Writea ASP.NET programusing AdRotator 12. Writea ASP.NET programusing Cookies 13. WriteaASP.NETprogramtofind thePageCountdetailsusingApplication Object. 14. WriteaASP.NET programto prepare the SalaryBill. 15. Writea ASP.NET programtofindthe AirwayTariff Details. 16. Writea ASP.NETprogramto displaythe price Listof theItem. 17. WriteaASP.NET programto design theBio dataformwithvalidation control. 18. Writeaprogramtocreatethewebpageusing MasterPage withnavigation control. 19. WriteaprogramtoDisplaytheSalesItemRecordsusinggridviewcontrolwithdata binding controls. 20. Writeaprogramtomaintainthe AddressBookusingASP.NET& ADO.Net.								

CO	CourseOutcomes
CO1	DemonstrateMSVisualStudio.NETIDEtoCreateapplications.
CO2	ApplyVB.NETandASP.NETconcepts todesign applications.
CO3	Buildawebapplicationconceptstosolvetheproblem
CO4	Evaluatetheapplicationtofixtheerrors.
CO5	UseADO.NetFrameworkinaWindows/Webapplicationtoread,insert,andupdate data in a database.

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	2	3	3	3
CO2	3	3	2	3	3	3
CO3	3	3	3	3	3	3
CO4	3	3	2	3	3	3
CO5	3	3	2	3	3	3
Weightage of course contributedtoeachPSO	15	14	11	15	15	15

SUBJECT NAME				CC-XII-E-Commerce and Digital Marketing				
SUBJECT CODE				23BIT5C3				
L	T	P	S	Credits	Inst. Hours	Marks		
						CIA	External	Total
5	-	-	-	4	5	25	75	100
Learning Objectives								
LO1	To Understand the fundamental of e-commerce and its significance in the modern business landscape.							
LO2	To understand the basic concepts of Digital marketing and the road map for successful Digital marketing strategies.							
LO3	Apply ethical and legal considerations in e-commerce and digital marketing practices.							
Prerequisites:								
Contents								
Unit I	Introduction to E-commerce: History of E-Commerce – E-commerce v/s Traditional Commerce-EDI – Importance, features & benefits of E-Commerce – E-Business & E-Commerce – Impacts, Challenges & Limitations of E-Commerce – Supply chain management & E-Commerce – E-Commerce Infra structure.							
Unit II	Business models of E-Commerce: Business to Business – Business to customers – Customers to Customers – Business to Government – Business to Employee – E-Commerce strategy – Influencing factors of successful E-Commerce.							
Unit III	Electronic Payment System : Introduction – Online payment systems – prepaid and postpaid payment systems – e-cash, e-cheque, Smart Card, Credit Card, Debit Card, Electronic purse – Security issues on electronic payment system – Solutions to security issues – Biometrics – Types of biometrics. Legal and ethical issues in E-Commerce: Security issues in E-Commerce – Regulatory framework of E-commerce.							
Unit IV	Fundamentals of Digital marketing & Its Significance-Traditional marketing Vs Digital Marketing, Evolution of Digital Marketing-Digital Marketing Landscape-Digital marketing Strategy- Consumer Decision journey-POEM Framework, Segmenting & Customizing messages-Digital advertising Market in India-Skills In Digital Marketing-Digital marketing Plan.							
Unit V	Terminology used in Digital Marketing-PPC and online marketing through social media-Social Media Marketing-SEO techniques-Key word advertising-Google web-master and analytics overview-Affiliate Marketing-Email Marketing-Mobile Marketing, Display advertising-Buying Models-different type of ad tools-Display advertising terminology-types of display ads-different ad formats-Ad placement techniques-important ad terminology-Programmatic Digital Advertising.							
TOTAL	75 Hrs							
CO	Course Outcomes							

CO1	Understand the fundamental concepts and principles of e-commerce, including its evolution, types, and business models.
CO2	Gain knowledge of managing e-commerce platforms, payment gateways, and security measures.
CO3	Help to identify core concepts of marketing and the role of marketing in society.
CO4	Explore the role of digital marketing in sales for e-commerce businesses.
CO5	Gain insights into the ethical and legal considerations in e-commerce and digital marketing practices, including privacy, data protection, and regulatory compliance.

Textbooks

➤	E-Commerce 2021: Business, Technology, and Society-by Carol Guercio Traver Kenneth C. Laudon-Pearson Education.
➤	E-Commerce: An Indian Perspective-by S.J.P.T. Joseph-6th Edition-PHILearning Pvt. Ltd.
➤	Digital Marketing-Nitin Kamat and Chinmay Nitin Kamat-Himalaya Publishing House.
➤	Digital Marketing-Seema Gupta-McGraw-Hill

Reference Books

1.	E-Business & E-Commerce– Dr.P.Rizwan Ahmed- Margham Publication
2.	Quickwin Digital Marketing, H. Annmarie, A. Joanna, Paperback edition

NOTE: Latest Edition of Textbooks May be Used

Web Resources

1.	https://www.tutorialspoint.com/e-commerce/index.htm
2.	https://www.javatpoint.com/e-commerce-definition
3.	https://www.hostinger.in/tutorials/what-is-ecommerce
4.	https://skillshop.exceedlms.com/student/collection/654330-digital-marketing
5.	https://www.tutorialspoint.com/digital-marketing/index.htm

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	2	3	3	3
CO2	3	3	2	3	3	3
CO3	3	3	3	3	3	2
CO4	3	3	2	3	3	3
CO5	3	3	2	3	3	2
Weightage of course contributed to each PSO	15	14	11	15	15	13

SUBJECT NAME				DSE-I- Relational Database Management System				
SUBJECT CODE				23BIT5E1				
L	T	P	S	Credits	Inst. Hours	Marks		
						CIA	External	Total
4	-	-	-	3	4	25	75	100
Learning Objectives								
LO1	To understand the basic DBMS models and architecture							
LO2	To learn how to query and normalize the database.							
LO3	To study the database design, transaction Processing and Management and Security Issues.							
Prerequisites:								
Contents								
Unit I	Introduction to Databases: Introduction – Characteristics of the Database Approach – Actors on the Scene – Workers behind the scene– Advantages of using DBMS Approach. Overview of database and Architectures: Data Models, Schemas, and Instances – Three-schema Architecture and Data Independence – Database languages & Interfaces– Database System Environment– Centralized & Client Server Architecture for DBMS- Classification of DBMS.							
Unit II	Basic Relational Model: Relational Model Concepts – Relational Model Constraints and Relational Database Schemas – Update Operations, Triggers, Dealing with Constraint Violations – Formal Relational Languages: Unary Relational Operations: SELECT and PROJECT – Relational Algebra Operations from Set Theory– Binary Relational Operations: JOIN and DIVISION– Examples of Queries in Relational Algebra.							
Unit III	Conceptual Data Modeling using the ER Model: Using High-Level Conceptual Data Models for Database Design – An example DB application – Entity Types, Entity Sets, Attributes, and Keys– Relationship Types, Relationship sets, Roles, and Structural Constraints – Weak entity types – Example- Mapping a Conceptual Design into Logical Design: Relational Database Design using ER-Relational Mapping– Mapping EER Model Constructs to Relations							
Unit IV	Functional Dependencies and Normalization for Relational Database: Functional Dependencies – Definition of Functional Dependency– Normal Forms based on Primary Keys – Normalization of Relations– First Normal Form – Second Normal Form– Third Normal Form– BCNF- Fourth Normal Form- Fifth Normal Form.							
Unit V	PL/SQL: Introduction to PL/SQL – More on PL/SQL – Error Handling in PL/SQL – Named Exception Handlers – Stored Procedures and Functions – Execution of Procedures and Functions – Advantages – Procedures Vs. Functions – Syntax for Creating Procedures and Functions– Deleting a Stored Procedure or Function– Packages – Database Triggers – Types Of Triggers – Deleting a Trigger – Raise-Application Error Procedure							
TOTAL	75 Hrs							

CO	Course Outcomes
CO1	Outline the fundamental RDBMS concepts and PL/SQL
CO2	Apply database operations, mapping, normalization, SQL and PL/SQL
CO3	Analyze the requirements to implement relational database concepts
CO4	Evaluate the database based on various models and normalization.
CO5	Design and construct normalized tables and manipulate it effectively using SQL and PL/SQL database objects

Textbooks

➤	Ramez Elmasri, Shamkant B. Navathe (2014), — Database Systems, Sixth edition, Pearson Education, New Delhi.
➤	SQL, PL/SQL The Programming Language Of Oracle By Ivan Bayross- VISIONIAS - 2020.

Reference Books

1.	Abraham Silberschatz, Henry F. Korth, S. Sudarshan, Database System Concepts, Tata McGraw Hill Publication, 7 th Edition.
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NOTE: Latest Edition of Textbooks May be Used

Web Resources

1.	https://www.javatpoint.com/dbms-tutorial
2.	https://www.tutorialspoint.com/dbms/index.htm
3.	https://www.tutorialspoint.com/sql/index.htm
4.	http://ecomputernotes.com/database-system/rdbms
5.	https://www.guru99.com/dbms-tutorial.html

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	2	3	3	3
CO2	3	3	2	3	3	3
CO3	3	3	3	3	3	2
CO4	3	3	2	3	3	3
CO5	3	3	2	3	3	2
Weightage of course contributed to each PSO	15	14	11	15	15	13

SUBJECT NAME				DSE-I-Data Mining				
SUBJECT CODE				23BIT5E2				
L	T	P	S	Credits	Inst. Hours	Marks		
						CIA	External	Total
4	-	-	-	3	4	25	75	100
Learning Objectives								
LO1	To identify the underlying concepts and the fundamental data mining methodologies with the ability to formulate and solve problems							
LO2	Understand the data sets, data preprocessing and demonstrate the working of algorithms for data mining tasks such as association rule mining, classification, clustering and regression.							
Prerequisites:								
Contents								
Unit I	Introduction: Data Mining – Kinds of Data and Patterns to be Mined – Technologies used – Kinds of Applications are Targeted - Major Issues – Data objects and Attribute types – Basic statistical Descriptions of Data- Data Preprocessing: Data Cleaning–Data Integration-Data Reduction-Data Transformation.							
Unit II	Association Rules Mining: Introduction – Frequent Itemset Mining Methods: Apriori Algorithm-Generating Association Rules from Frequent Itemsets-Improving the efficiency of Apriori-A Pattern–Growth-Approach for mining Frequent Itemsets-Pattern Evaluation Methods.							
Unit III	Classification: Introduction – Basic concepts – Logistic regression – Decision tree induction–Bayesian classification, Rule–based classification-Model Evaluation and selection.							
Unit IV	Cluster Analysis: Introduction-Requirements for Cluster Analysis - Partitioning Methods: The K-Means method - Hierarchical Method: Agglomerative method - Density based methods: DBSCAN- Evaluation of Clustering: Determining the Number of Clusters–Measuring Clustering Quality.							
Unit V	Outlier Detection: Outliers and Outlier Analysis – Outlier Detection Methods - Data Visualization: Pixel-oriented visualization – Geometric Projection visualization technique-Icon-based-Hierarchical visualization-Visualizing complex data and relations.							
TOTAL	60 Hrs							

CO	Course Outcomes
CO1	Outline the fundamentals and the principles of Data Mining
CO2	Apply suitable different preprocessing for data mining
CO3	Classify data-mining techniques based on the different applications
CO4	Analyze the various data mining algorithms with respect to functionality
CO5	Recommend appropriate data models for data mining techniques to solve real world problems
Textbooks	
➤	Data Mining: The Data Mining Guide for Beginners, Including Applications for Business, Data Mining Techniques, Concepts, and More by Herbert Jones 2020.
➤	Data Mining: Concepts and Techniques - Jiawei Han, Micheline Kamber & Jian Pei - Morgan Kaufmann - Edition: 2019
Reference Books	
1.	Ian H. Witten and Eibe Frank, (2005), — Data Mining: Practical Machine Learning Tools and Techniques (Second Edition), Morgan Kaufmann.
2.	Arun K Pujari, — Data Mining Techniques, 10th impression, University Press, 2008.
3.	Daniel T. Larose, Chantal D. Larose, "Data Mining and Predictive Analytics," Second Ed., Wiley Publication, 2015.
4.	G.K. Gupta, — Introduction to Data Mining with case studies, 2 nd Edition, PHI Private limited, New Delhi, 2011.

NOTE: Latest Edition of Textbooks May be Used	
Web Resources	
1.	https://www.javatpoint.com/data-mining
2.	https://www.geeksforgeeks.org/what-is-data-mining-a-complete-beginners-guide/
3.	https://www.guru99.com/data-mining-tutorial.html

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	2	2	2	3	3
CO2	3	3	2	3	3	2
CO3	2	3	3	2	3	3
CO4	3	3	2	2	3	3
CO5	3	3	2	2	3	3
Weightage of course contributed to each PSO	13	14	11	11	15	14

SUBJECT NAME				DSE-II- Artificial Intelligence				
SUBJECT CODE				23BIT5E3				
L	T	P	S	Credits	Inst. Hours	Marks		
						CIA	External	Total
4	-	-	-	3	4	25	75	100
Learning Objectives								
LO1	To learn various concepts of AI Techniques & Algorithm.							
LO2	To learn probabilistic reasoning and models in AI.							
LO3	To learn various types of Reinforcement learning.							
Prerequisites:								
Contents								
Unit I	Overview: foundations, scope, problems, and approaches of AI. Intelligent agents: reactive, deliberative, goal-driven, utility-driven, and learning agents, Artificial Intelligence programming techniques.							
Unit II	Problem Spaces / Problem solving methods: problem solving through Search: State space search- Strategies for search space- Data driven, goal driven, breadth first, depth first. Heuristic Searches: "Best" first searches. Heuristic in Games: The MinMax procedure-Alpha-Beta procedure.							
Unit III	Knowledge Representation: Principles of KR using predicate logic - Overview of KR using other logics Structured representations of knowledge.							
Unit IV	Planning and Construction: planning as search, partial order planning, construction and use of planning graphs, Representing and Reasoning with Uncertain Knowledge: probability, connection to logic, independence, Bayes rule, Bayesian networks, probabilistic inference, sample applications.							
Unit V	Decision Making: Decision-Making: basics of utility theory, decision theory, sequential decision problems, elementary game theory, sample applications. Machine Learning and Knowledge Acquisition: learning from memorization, examples, explanation, and exploration.							
TOTAL	60 Hrs							

CourseOutcomes		ProgrammeOutcome
CO	Oncompletionofthiscourse,studentswill	
1	UnderstandthevariousconceptsofAITechniques.	PO1
2	Understandvariousproblemsolving methodinAI.	PO1,PO2
3	Understandthelogicprediction inAI.	PO4,PO6
4	UnderstandPlanningConstructioninAI.	PO4,PO5, PO6
5	UnderstandvarioustypeofDecisionMaking techniques.	PO3,PO8
TextBook		
1	ArtificialIntelligence:AModernApproach-byRussell/Norvig-4thEdition-Pearson Education	
2.	ArtificialIntelligencebyKevinKnight(Author),ElaineRich (Author),ShivashankarB. Nair(Author)-3rdEdition-McGrawHillEducation	
ReferenceBooks		
1.	ArtificialIntelligence 10 - byShivani(2024 Edition)-KipsLearning PvtLtd	
2.	Saroj Kaushik,—Artificial Intelligence℄,Cengage LearningIndia,2011	
3.	Trivedi,M.C.,—AClassicalApproachtoArtificialIntelligence℄,KhannaPublishing House, Delhi.	
WebResources		
1.	NPTEL&MOOCcoursestitledArtificialIntelligenceandExpert Systems	
2.	https://nptel.ac.in/courses/106106140	
3.	https://nptel.ac.in/courses/106106126	
4.	https://www.javatpoint.com/artificial-intelligence-ai	

Mapping with Programme Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	S							
CO2	S	S						
CO3				S		S		
CO4				S	S	S		

SUBJECT NAME				DSE-II- Machine Learning				
SUBJECTCODE				23BIT5E4				
L	T	P	S	Credits	Inst. Hours	Marks		
						CIA	External	Total
4	-	-	-	3	4	25	75	100
LearningObjectives								
LO1	Tocomprehendtheraw dataandtodesignthesamewiththeappropriate machine learningalgorithmsfora meaningfulrepresentationofdata..							
LO2	Understandhowtoevaluatemodelsgeneratedfrom data							
LO3	Understanda widevarietyof learningalgorithms							
Prerequisites:								
Contents								
UnitI	Introduction: Machine Learning – Examples of Machine Learning Applications. Supervised Learning: Learning a Class from Examples–Vapnik-Chervonenkis (VC)Dimension–Probably Approximately Correct(PAC)Learning–Noise– Learning Multiple Classes–Regression –Model Selection and Generalization– Dimensions of a Supervised Machine Learning Algorithm. Bayesian Decision Theory: Introduction–Classification–Losses and Risks–Discriminant Functions – Association Rules.							
UnitII	Parametric Methods: Maximum Likelihood Estimation – Evaluating anEstimator: Bias and Variance – The Bayes’ Estimator – Parametric Classification – Regression – Tuning Model Complexity: Bias/Variance Dilemma – Model Selection Procedures. Nonparametric Methods: Nonparametric Density Estimation – Generalization toMultivariate Data – Nonparametric Classification – CondensedNearestNeighbor–Distance-BasedClassification–OutlierDetection –NonparametricRegression:SmoothingModels							
UnitIII	Linear Discrimination – Generalizing the Linear Model – Geometry ofthe Linear Discriminant–PairwiseSeparation –GradientDescent– LogisticDiscrimination – Discrimination by Regression – Learning to Rank. Multilayer Perceptrons: The Perceptron – Training a Perceptron–Learning Boolean Functions– Multilayer Perceptrons–MLPaas a Universal Approximator – Backpropagation Algorithm							
UnitIV	Combining Multiple Learners: Generating Diverse Learners – ModelCombinationSchemes–Voting–Bagging–Boosting–Stacked Generalization – Fine-Tuning an Ensemble – Cascading Reinforcement Learning: Elementsof ReinforcementLearning–Model-BasedLearning– TemporalDifferenceLearning–Generalization–PartiallyObservable States							
UnitV	Machine Learning with Python: Data Pre-processing, Analysis & Visualization - Training Data and Test Data – Techniques – Algorithms:List of Common Machine LearningAlgorithms-DecisionTreeAlgorithm-NaïveBayesAlgorithm-K-Means-Random Forest- Dimensionality Reduction Algorithm- Boosting Algorithms – Applications:SocialMedia-RefinementofSearchEngineResults- Product Recommendations-Detection of Online frauds.							
TOTAL	60 Hrs							

CO	CourseOutcomes
CO1	Outline the importance of machine learning in terms of designing intelligent machines
CO2	Identify suitable machine learning techniques for the real-time applications
CO3	Analyze the theoretical concepts and how they relate to the practical aspects of machine learning.
CO4	Assess the significance of principles, algorithms and applications of machine learning through a hands-on approach
CO5	Compare the machine learning techniques with respective functionality
Textbooks	
➤	(Unit I–Unit IV): Introduction to Machine Learning–Ethem Alpaydın—PHI Learning (Unit V : Machine learning with python tutorial) https://www.tutorialspoint.com/machine_learning_with_python/machine_learning_with_python_tutorial.pdf
Reference Books	
1.	Designing Machine Learning Systems: An Iterative Process for Production-Ready Applications–by Chip Huyen–Shroff/O'Reilly–2022
2.	Machine Learning in Data Science Using Python–by Dr. R. Nageswara Rao–Dreamtech Press–2022
3.	Machine Learning: Hands-On for Developers and Technical Professionals–Jason Bell–Wiley Publication, 2015.
NOTE: Latest Edition of Textbooks May be Used	
Web Resources	
1.	https://www.expertsystem.com/machine-learning-definition/
2.	https://searchenterpriseai.techtarget.com/definition/machine-learning-ML

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	2	2	2	2
CO2	2	3	3	3	3	2
CO3	2	2	3	3	3	3
CO4	3	2	2	3	2	3
CO5	3	3	3	2	3	3
Weightage of course contributed to each PSO	13	12	13	13	13	13

Subject Code	SubjectName	Category	L	T	P	S	Credits	Inst.Hours	Marks		
									CIA	Ext	Total
23BIT5IV	Internship / IndustrialVisit/ Visit	Field	-	-	-	-	2	-	25	75	100

THIRDYEAR –SEMESTER – VI

SUBJECT NAME				CC-XIII-Software Project Management				
SUBJECT CODE				23BIT6C1				
L	T	P	S	Credits	Inst. Hours	Marks		
						CIA	External	Total
4	-	-	-	4	6	25	75	100
Learning Objectives								
LO1	To define and highlight importance of software project management.							
LO2	To formulate and define the software management metrics & strategy in managing projects							
LO3	Understand to apply software testing techniques in commercial environment							
Prerequisites:								
Contents								
Unit I	Evaluation and project planning-Importance of software project management-Activities-Methodologies-Categorization of software projects-setting objectives-Management principles-Management control-Project portfolio management-Cost benefit evaluation technology-Risk Evaluation-Strategic program management-Step wise project planning.							
Unit II	Project life cycle and effort estimation-Software process and process models-Choice of process models-Rapid application development-Agile methods-Dynamic system development methods-Extreme Programming-Managing interactive processes-Basics of software estimation-Effort and cost estimation techniques-cosmic full function points.							
Unit III	Objectives of activity planning-Project schedule Activities-Sequencing and Scheduling-Network planning models-Formulating network model-Forward pass and backward pass techniques-Critical path method-Risk identification-Risk Planning-Risk management-PERT technique-Monte Carlo Simulation-Resource Allocation-Creation of critical paths-Cost Schedules.							
Unit IV	Framework for management and control-Collection of data-Visualizing progress-Cost monitoring-Earned value analysis-Prioritizing monitoring-Project tracking-change control-Software configuration management-Managing contracts-Contract management,							
Unit V	Staffing in software projects-Managing people-organizational behavior-best methods of staff selection-motivation-The Oldham-Hackman job characteristics model-stress-health and safety-ethical professional concerns-working in teams-Decision making-organizational structures-communication genres-communication plans-Leadership.							
TOTAL	90 Hrs							

CO	Course Outcomes
CO1	Understand the principles and concepts of project management
CO2	Knowledge gained to train software project managers
CO3	Apply software project management methodologies
CO4	Able to create comprehensive project plans
CO5	Evaluate and mitigate risks associated with software development process
Textbooks	
➤	Software Project Management - Bob Hughes, Mike Cotterell, Rajib Mall - TMH 6th - 2018
➤	Project Management and Tools & Technologies: An overview - Shailesh Mehta SPD 1st 2017
Reference Books	
1.	Software Project Management: A Unified Framework - Walker Royce - Pearson
2.	Effective software project management - Robert K. Wysocki, Wiley Publications
NOTE: Latest Edition of Textbooks May be Used	
Web Resources	
1.	NPTEL & MOOC courses titled Software Project Management
2.	https://www.studocu.com/in/document/anna-university/software-project-management/software-project-management-notes-1st-unit/19435686
3.	https://www.geeksforgeeks.org/software-engineering-software-project-management-spm/

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	2	3	3	3
CO2	3	3	2	3	3	3
CO3	3	3	3	3	3	2
CO4	3	3	2	3	3	3
CO5	3	3	2	3	3	2
Weightage of course contributed to each PSO	15	14	11	15	15	13

Subject Code	SubjectName	Category	L	T	P	S	Credits	Inst.Hours	Marks		
									CIA	External	Total
23BIT6D	CC-XIV-Dissertation	Core-XIV	-	-	12	-	8	12	50	150	200
Course Objective											
LO1	The students will be allowed to work on any project based on the concepts studied in core/elective courses.										
LO2	The project work should be compulsorily done in the college only under the supervision of the department staff.										
LO3	The combined projects shall be undertaken by the students as a team of two.										
LO4	The number of teams should be equally assigned to existing Staff members.										
LO5	The following list of parameters taken into account for the evaluation of Project work and Viva-voce. Total Marks: 200 (Internal: 50 marks, External: 150 Marks)										
Contents										No. of Hours	
Parameters: For Internal Marks: Two review meetings-2×10=20 Marks Debugging =10 Marks Execution =10 Marks Output =10 Marks Total =50 Marks										180	
For External Marks: Project Report =50 Marks Project demo & Presentation =50 Marks Viva-Voce =50 Marks Total =150 Marks											
Total											
180											
Course Outcomes											
CO	On completion of this course,										
CO1	Students will demonstrate creativity and innovation in the design and implementation of IT solutions, and in the exploration of new ideas and approaches within the field..										
CO2	Students will gain knowledge about technological components of the software's										
CO3	Identifying, analyzing, and designing systems to solve information technology problems										

SUBJECT NAME				DSE-III-Internet of Things and Its Applications				
SUBJECT CODE				23BIT6E1				
L	T	P	S	Credits	Inst. Hours	Marks		
						CIA	External	Total
5	-	-	-	3	5	25	75	100
Learning Objectives								
LO1	To gain knowledge on Industry Internet of Things							
LO2	To Learn about the privacy and Security issues in IoT							
LO3	To Implement basic IoT applications							
Prerequisites:								
Contents								
Unit I	IoT & Web Technology, The Internet of Things Today, Time for Convergence, Towards the IoT Universe, Internet of Things Vision, IoT Strategic Research and Innovation Directions, IoT Applications, Future Internet Technologies, Infrastructure, Networks and Communication, Processes, Data Management, Security, Privacy & Trust, Device Level Energy Issues, IoT Related Standardization, Recommendations on Research Topics.							
Unit II	M2M to IoT – A Basic Perspective– Introduction, Some Definitions, M2M Value Chains, IoT Value Chains, An emerging industrial structure for IoT, The international driven global value chain and global information monopolies. M2M to IoT-An Architectural Overview– Building an architecture, Main design principles and needed capabilities, An IoT architecture outline, standards considerations.							
Unit III	IoT Architecture -State of the Art – Introduction, State of the art, Architecture. Reference Model- Introduction, Reference Model and architecture, IoT reference Model, IoT Reference Architecture- Introduction, Functional View, Information View, Deployment and Operational View, Other Relevant architectural views.							
Unit IV	IoT Applications for Value Creations Introduction, IoT applications for industry: Future Factory Concepts, Brownfield IoT, Smart Objects, Smart Applications, Four Aspects in your Business to Master IoT, Value Creation from Big Data and Serialization, IoT for Retailing Industry, IoT for Oil and Gas Industry, Opinions on IoT Application and Value for Industry, Home Management.							
Unit V	Internet of Things Privacy, Security and Governance Introduction, Overview of Governance, Privacy and Security Issues, Contribution from FP7 Projects, Security, Privacy and Trust in IoT-Data-Platforms for Smart Cities, First Steps Towards a Secure Platform, Smartie Approach. Data Aggregation for the IoT in Smart Cities, Security.							
TOTAL	75 Hrs							

CO	Course Outcomes
CO1	Understand the basics of IoT.
CO2	Interpret the impact and challenges by IoT.
CO3	Compare different Application protocols for IoT.
CO4	Analyze applications of IoT in real-time scenario.
CO5	Understand the Privacy and Security Issues.
Textbooks	
➤	Internet of Things - A hands-on Approach - Arshdeep Bahga, Vijay Madisetti Publisher: Universities press.
➤	Internet of Things by Shriram K Vasudevan, Abhishek S Nagarajan, RMD Sundaram - Wiley - 2020
Reference Books	
1.	Internet of Things - Srinivasa K.G., Siddesh G.M. Hanumantha Raju R. Publisher: Cengage Learning India Pvt. Ltd (2018)
NOTE: Latest Edition of Textbooks May be Used	
Web Resources	
1.	NPTEL & MOOC courses titled Internet of Things and Its Applications.
2.	https://www.tutorialspoint.com/internet_of_things/index.htm
3.	https://www.tutorialsfreak.com/internet-of-things-iot-tutorial

MappingwithProgrammeOutcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	S							
CO2	M	S						
CO3				S		S		
CO4				S	S	M		
CO5			S					S
	S-Strong			M-Medium		L-Low		

JECTNAME				DSE-III-Cloud Computing				
SUBJECT CODE				23BIT6E2				
L	T	P	S	Credits	Inst. Hours	Marks		
						CIA	External	Total
5	-	-	-	3	5	25	75	100
LearningObjectives								
LO1	Toearnthefundamentalsandessentials ofCloudComputing.							
LO2	TolearnaboutArchitectureandApplicationdesignofCloudComputing.							
Prerequisites:								
Contents								
UnitI	Understanding Cloud Computing: Origins and Influences – Basic Concepts And Terminology – Goals And Benefits – Risks And Challenges. Fundamental Concepts And Models: Roles And Boundaries– Cloud Characteristics – Cloud Delivery Models – Cloud Deployment Models.							
UnitII	Cloud – Enabling Technology: Broadband Networks And Internet Architecture – Data Center Technology – Virtualization Technology – Web Technology – Multitenant Technology –Service Technology. Cloud Infrastructure Mechanisms: Logical Network Perimeter– Virtual Server – Cloud Storage Device – Cloud Usage Monitor – Resource Replication – Readymade Environment.							
UnitIII	Cloud Architecture, Services and Storage: Layered Cloud Architecture Design – NIST Cloud Computing Reference Architecture – Public, Private and Hybrid Clouds – IaaS – PaaS– SaaS – ArchitecturalDesign Challenges – Cloud Storage – Storage-as-a-Service – Advantages of Cloud Storage – Cloud Storage Providers – S3.							
UnitIV	Cloud Resource Management : Inter Cloud Resource Management – Resource Provisioning and Resource Provisioning Methods – Global Exchange of Cloud ResourcesCloudSecurity Mechanism:Encryption–Hashing–Digitalsignature– Public key Infrastructure – Identity and Access Management – single Sign – On(SSO) – Cloud – Based Security Groups – Hardened Virtual server Images.							
UnitV	Working With Clouds : Cloud Delivery Models :The Cloud Provider Perspective: Building IaaS Environments – Equipping PaaS Environments – Optimizing SaaS Environments. Cloud Delivery Models :The Cloud Consumer Perspective : Working With IaaS Environments –Working WithPaaS Environments – Working WithSaaS Services.							
TOTAL	75 Hrs							

CO	Course Outcomes
CO1	Explain the core concepts of the cloud computing paradigm.
CO2	Outline the virtualization technology and determine their uses.
CO3	Apply the fundamental concepts in data centers to understand the tradeoffs in power, efficiency and cost.
CO4	Identify resource management fundamentals, i.e. resource abstraction, sharing and sandboxing and outline their role in managing infrastructure in cloud computing.
CO5	Analyze various cloud programming models and apply them to solve problems on the cloud.
Textbooks	
➤	Cloud Computing: Implementation, Management and Security- Rittinghouse, John W., and James F. Ransome- CRC Press, 2017.
➤	Cloud Computing by Sunilkumar Manvi, Gopal Shyam -CRC Press-2021
Reference Books	
1.	The Cloud Computing Book by Douglas Comer- Chapman and Hall/CRC-2021
2.	Cloud Computing for Dummies by Judith Hurwitz, Daniel Kirsch -Wiley-2020
NOTE: Latest Edition of Textbooks Maybe Used	
Web Resources	
1.	NPTEL & MOOC courses titled cloud computing.
2.	https://www.javatpoint.com/cloud-computing
3.	https://k2lacademy.com/cloud-blogs/cloud-fundamentals/

Mapping with Programme Outcomes:

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	2	2	2	2
CO2	2	3	3	3	3	2
CO3	2	2	3	3	3	3
CO4	3	2	2	3	2	3
CO5	3	3	3	2	3	3
Weightage of course contributed to each PSO	13	12	13	13	13	13

SUBJECT NAME				DSE-IV-Introduction to Data Science				
SUBJECT CODE				23BIT6E3				
L	T	P	S	Credits	Inst. Hours	Marks		
						CIA	External	Total
5	-	-	-	3	5	25	75	100
Learning Objectives								
LO1	Identify and describe the methods and techniques commonly used in data science.							
LO2	To learn about Model development.							
Prerequisites:								
Contents								
Unit I	Introduction to Data Science – Evolution of Data Science – Data Science Roles – Stages in a Data Science Project – Applications of Data Science in various fields – Data Security Issues.							
Unit II	Data Collection and Data Pre-Processing – Data Collection Strategies – Data Pre-Processing Overview – Data Cleaning – Data Integration and Transformation – Data Reduction – Data Discretization.							
Unit III	Exploratory Data Analytics Descriptive Statistics – Mean, Standard Deviation, Skewness and Kurtosis – Box Plots – Pivot Table – Heat Map – Correlation Statistics – ANOVA.							
Unit IV	Model Development Simple and Multiple Regression – Model Evaluation using Visualization – Residual Plot – Distribution Plot – Polynomial Regression and Pipelines – Measures for In-sample Evaluation – Prediction and Decision Making.							
Unit V	Model Evaluation Generalization Error – Out-of-Sample Evaluation Metrics – Cross Validation – Overfitting – Under Fitting and Model Selection – Prediction by using Ridge Regression – Testing Multiple Parameters by using Grid Search.							
TOTAL	75 Hrs							

CO	Course Outcomes
CO1	Understand the basics in Data Science .
CO2	Understand overview and building process in Data Science.
CO3	Understand Data Collection and Data Pre-Processing .
CO4	Understand the Data Analytics/ Statistics.
CO5	Analyze various Model Development/Evaluation.
Textbooks	
➤	“Doing Data Science”-Cathy O’Neil and Rachel Schutt-O’Reilly, 2015
➤	Managing Data Science Effective Strategies to Manage Data Science Projects and Build a Sustainable Team By Kirill Dubovikov-Packt Publishing-2019
➤	An introduction to Data Science by Jeffrey Stanton.
Reference Books	
1.	Introduction to Data Science Essential Concepts By Peters Morgan-CreateSpace Independent Publishing Platform
2.	The Elements of Data Analytic Style by Jeff Leek
NOTE: Latest Edition of Textbooks May be Used	
Web Resources	
1.	NPTEL & MOOC courses titled Data Science.
2.	https://www.simplilearn.com/tutorials/data-science-tutorial
3.	https://www.w3schools.com/datascience/

Mapping with Programme Outcomes:

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	2	2	2	2
CO2	2	3	3	3	3	2
CO3	2	2	3	3	3	3
CO4	3	2	2	3	2	3
CO5	3	3	3	2	3	3
Weightage of course contributed to each PSO	13	12	13	13	13	13

SUBJECT NAME				DSE-IV-DSE-IV-Big Data Analytics				
SUBJECT CODE				23BIT6E4				
L	T	P	S	Credits	Inst. Hours	Marks		
						CIA	External	Total
5	-	-	-	3	5	25	75	100
Learning Objectives								
LO1	To know the fundamental concepts of big data and analytics.							
LO2	To explore tools and practices for working with big data.							
Prerequisites:								
Contents								
Unit I	Introduction to Big Data Analytics – Data Analytics – Analytics Terminology – Types of Analytics – Analytics Life Cycle - Data Store – Getting Started with R – Data Exploration – Data Preparation							
Unit II	Introduction to machine learning – Dimensionality reduction – Hardware Acceleration for Machine Learning and Big Data Analytics – Social Network Analytics. Descriptive analytics.							
Unit III	Market Basket Analysis – Kernel Density Estimation – Regression – Relational Logistics Regression – Relational Neighbor Classifiers – Bigraphs – Collective Inferencing.							
Unit IV	Common predictive Modeling Techniques: RFM – Regression – Generalised Linear Models – Neural Network – Decision and Regression trees – Support vector Machines – Bayesian Methods Network Classification – Ensemble Methods.							
Unit V	Segmentation and Hadoop – Cluster Analysis – Distance Measures – Evaluating Clustering – Number of Clusters – K-means Algorithm – Hierarchical Clustering – Introduction to Neural Networks – Support Vector Machines - K Nearest Neighbor classification - Ensemble learning. Hadoop concepts - Hadoop distributed file system (HDFS) basics.							
TOTAL	75 Hrs							

CO	CourseOutcomes
CO1	UnderstandBigDataanditsanalyticsin therealworld.
CO2	ExposuretoDataAnalyticswith R.
CO3	Understandtheusage ofMachineLearningin BigData Analytics.
CO4	UnderstandCommonpredictiveModeling Techniques.
CO5	AnalyzetheBigDataframeworklikeHadoop .
Textbooks	
➤	AnalyticsinaBigDataWorld-BartBaesens-Wiley
➤	BigDataandAnalytics bySubhashiniChellappanSeemaAcharya -Wiley-2019
➤	Hadoop2Quick-StartGuide:LearntheEssentialsofBigDataComputingintheApache Hadoop 2 Ecosystem- Douglas Eadline-Addison-Wesley Educational Publishers Inc
ReferenceBooks	
1.	BigData,DataMining,MachineLearning-JaredDean-Wiley
2.	BigDataAnalytics: Introduction toHadoop,Spark, andMachine-Learning-by Raj Kamal,PreetiSaxena-McGrawHillEducation-2019
3.	BigDataAnalytics-LakshmiPrasad.Y-NotionPress.
NOTE:LatestEditionofTextbooksMaybeUsed	
WebResources	
1.	NPTEL&MOOCcourses titledBigData Analytics.
2.	https://www.simplilearn.com/tutorials/big-data-tutorial
3.	https://www.tutorialspoint.com/big_data_analytics/index.htm
4.	https://intellipaat.com/blog/big-data-tutorial-for-beginners/
5.	https://www.edureka.co/blog/big-data-tutorial

MappingwithProgrammeOutcomes:

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	2	2	2	2
CO2	2	3	3	3	3	2
CO3	2	2	3	3	3	3
CO4	3	2	2	3	2	3
CO5	3	3	3	2	3	3
Weightageofcourse contributedtoeach PSO	13	12	13	13	13	13

SEC-VIII-Skill Enhancement Course

Subject Code	SubjectName	Category	L	T	P	S	Credits	Inst.Hours	Marks		
									CIA	External	Total
23BIT6S1	Quantitative Aptitude	Professional Competency Skill	Y	-	-	-	1	2	25	75	100
CourseObjective											
C1	Tounderstandthebasicconcepts ofnumbers										
C2	Understandand applytheconceptofpercentage,profit&loss										
C3	Tostudythe basicconceptsoftime and work, interests										
C4	Tolearntheconceptsof permutation,probability,discounts										
C5	Tostudyaboutthe conceptsof datarepresentation, graphs										
UNIT	Details										
UNIT I	Numbers-HCFandLCMofnumbers-Decimalfractions-Simplification-Squarerootandcuberoots-Average-problemsonNumbers.										
UNIT II	ProblemsonAges-SurdsandIndices-percentage-profitsandloss-ratio andproportion-partnership-Chainrule.										
UNIT III	Timeandwork-pipesandcisterns -TimeandDistance-problemson trains -Boatsandstreams-simpleinterest-compoundinterest-Logarithms- Area-Volume and surface area -races and Games of skill.										
UNIT IV	Permutationandcombination-probability-TrueDiscount-BankersDiscount –HeightandDistances-Oddmanout&Series.										
UNIT V	Calendar-Clocks-stocksandshares-Datarepresentation-Tabulation– BarGraphs-Piecharts-Linegraphs.										

CO	On completion of this course, students will	
1	understand the concepts, application and the problems of numbers	PO1
2	To have basic knowledge and understanding about percentage, profit & loss related processing	PO1, PO2
3	To understand the concepts of time and work	PO4, PO6
4	Speaks about the concepts of probability, discount	PO4, PO5, PO6
5	Understanding the concept of problems solving involved in stocks & shares, graphs	PO3, PO8
Text Book		
1	Quantitative Aptitude for Competitive Examinations All Government and entrance Exams by R. S. Aggarwal (Banking, SSC, Railway, Police, Civil Service, etc.) Solved Examples 10000+ Practice Questions - April 2022	
Reference Books		
1.	Quantitative Aptitude For Competitive Examinations Latest questions Free video solution of each question on Youtube by Pinnacle publications - January 2024	
2.	Oswaal Objective Quantitative Aptitude For All Competitive Examinations Chapter-wise & Topic-wise, A Complete Book by Oswaal Editorial Board - June 2023	
Web Resources		
1.	https://www.javatpoint.com/aptitude/quantitative	
2.	https://www.toppr.com/guides/quantitative-aptitude/	
3.	https://www.geeksforgeeks.org/quantitative-aptitude/	
4.	https://nptel.ac.in	

Mapping with Programme Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	S							
CO2	M	S						
CO3				S		S		
CO4				S	S	M		
CO5			S					S

S-Strong

M-Medium

L-Low