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 withinandoutsideIndia.Qualityeducationingeneralandhighereducationin 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, succeedandexcelglobally.LearningOutcomes-basedCurriculumFramework(LOCF)whichmakesitstudent-centric,interactiveandoutcome- oriented withwell-definedaims, objectives and goals toachieve. LOCFalso aims at ensuring uniformeducation standard and content deliveryacross the state which will helpthe 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 outaspaceforitselflikeanyotherdisciplines 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,andmanypeopleareevencomputerprogrammers.InformationTechnologycanbeseenonahigherlevel, as a science of problem solving and problemsolving 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 applicationdomain.InformationTechnology/Computersciencehasawiderangeofspecialties.Theseinclude Computer Architecture, Software Systems, Graphics, Artificial Intelligence, Computational Science, and Software Engineering. Drawing from a common core of computer science knowledge, each specialtyarea focuses on specific challenges. Information Technology / Computer Science is practiced by mathematicians, scientistsandengineers. 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 tojoin 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.

LEARNINGOUTCOMES-BASEDCURRICULUMFRAMEWORKGUIDELINESBASED REGULATIONS FOR UNDER GRADUATE PROGRAMME	
Programme:	**B.Sc.INFORMATIONTECHNOLOGY**
ProgrammeCode:	**129**
Duration:	**3years[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:** Abilityto 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;analyseandevaluateevidence,arguments,claims,beliefsonthe 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:Problemsolving:Capacity**toextrapolatefromwhatonehaslearnedand apply their competencies to solve different kinds of non-familiar problems, ratherthanreplicatecurriculumcontentknowledge;andapplyone'slearning to real life situations. **PO5: Analytical reasoning**: Ability to evaluate the reliability and relevance of evidence;identifylogicalflawsandholesintheargumentsofothers;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,formulatehypotheses,testhypotheses,analyse,interpretanddraw conclusions from data, establish hypotheses, predict cause-and-effect relationships;abilitytoplan, execute and reporttheresultsof anexperiment or investigation. **PO7: Cooperation/Team work:** Ability to work effectively and respectfully with diverse teams; facilitate cooperative or coordinatedeffort on the partofagroup,andacttogetherasagrouporateamintheinterestsofacommon 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,buildingateamwhocanhelpachievethevision,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.

	ProgrammeSpecificOutcomes:
PSO1	Demonstrateand applybasicknowledge ofinformation technologytothe scientificissues andproblems beingfacedin societyand the industry.
PSO2	Analyzecriticalproblemsandprovidecomputer-basedsolutionsbyapplyingappropriate toolsandtechnology.
PSO3	Equipwithtechnicalability,problemsolvingskills,creativetalentandpowerof communicationnecessaryforvariousformsofemployment.Developarangeofgeneric skillshelpfulinemployment,internships&societalactivities.
PSO4	Graduateswillpossesstheskillstoeffectivelyplan,execute, andmanageITprojects from initiationtocompletion.Theywillbeproficientinprojectmanagementmethodologies.
PSO5	BachelorofInformationTechnologygivesanumberofopportunitieslikesoftwareprogrammer,systemandnetworkadministrator,webdesigner,Researcher/facultyfor InformationTechnology,computerscienceand computerapplications/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

HighlightsoftheRevampedCurriculum:

➢ Student-centric, meeting the demands of industry & society, incorporating industrial components,hands-ontraining, skillenhancementmodules,industrialproject,projectwith 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 scientificfront, advancedprogrammingpackagesalliedwiththedisciplinetopics,practicaltraining,devising mathematicalmodelsandalgorithmsforprovidingsolutionstoindustry/reallifesituations. The curriculum also facilitates peer learning with advanced mathematical topicsinthefinal 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.

➢ ThecurriculumisdesignedsoastostrengthentheIndustry-Academiainterfaceandprovide 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 tonarrow 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 disciplinarynatureareincorporatedasElectivecourses,coveringconventionaltopicstothe latest - Artificial Intelligence.

ValueadditionsintheRevampedCurriculum:

Semester	NewlyintroducedComponents	Outcome/Benefits
I	**Foundation Course** To ease the transition of learning fromhighersecondarytohigher 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 amongstudents ➢ Createinterestforthe subject
I, II, III,IV	**Skill Enhancement papers** (Discipline centric / Generic / Entrepreneurial)	➢ Industryready graduates ➢ Skilledhumanresource ➢ Students are equippedwithessential skillsto make them employable
		➢ Training on language and communication skillsenablethestudents gainknowledge and exposure in the competitive world.
		➢ Discipline centric skill will improve the Technical knowhow of solving real life problems.
I, II, III,IV	**GenericElective(Allied)**	➢ Exposure to combiningorinvolvingmore than one discipline or field of study. ➢ Generates Industryreadygraduates ➢ Employmentopportunitiesenhanced
V Semester	**Electivepapers**	➢ Self-learning is enhanced ➢ Application of the concept to real situation isconceivedresultingintangible outcome
VI Semester	**Electivepapers**	➢ Enriches the studybeyond thecourse. ➢ Developing a research framework andpresentingtheirindependentand intellectual ideas effectively.
ExtraCredits: **ForAdvancedLearners/Honorsdegree**		➢ Tocatertotheneeds ofpeer learners / research aspirants
SkillsacquiredfromtheCourses		Knowledge, Problem Solving, Analyticalability, ProfessionalCompetency, ProfessionalCommunicationand 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	Int.	Ext.	Total
I	I	2311T	T/OL	தமிழ் இலக்கிய வரலாறு-l /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
		23BIT1FC	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

	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
IV	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.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	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

SUBJECT NAME	CORE–I:PROGRAMMINGINC							
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-BasicStructureofCPrograms-ExecutingaCProgram-Constants,Variables and Data types- Operators and Expressions-Managing Input and Output Operations.							
Unit II	**DecisionMakingandBranching**:DecisionMakingandLooping-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**							

CourseOutcomes	
CO1	Outlinethefundamental conceptsofCprogramminglanguages,anditsfeatures
CO2	Demonstratetheprogrammingmethodology.
CO3	Identifysuitableprogrammingconstructsforproblemsolving.
CO4	Selecttheappropriatedatarepresentation,controlstructures,functionsandconcepts basedontheproblemrequirement.
CO5	Evaluatetheprogramperformancebyfixingtheerrors.
Textbooks	
☐	RobertW.Sebesta,(2012),―ConceptsofProgrammingLanguages‖,FourthEdition, AddisonWesley(UnitI:Chapter– 1)
☐	E.Balaguruswamy,(2010),―ProgramminginANSIC‖,FifthEdition,TataMcGraw HillPublications
ReferenceBooks	
1.	AshokKamthane,(2009),―ProgrammingwithANSI&TurboC‖,Pearson Education
2.	ByronGottfried,(2010),―ProgrammingwithC‖,SchaumsOutlineSeries,Tata McGrawHillPublications
NOTE:LatestEditionof TextbooksMaybeUsed	
WebResources	
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
Weightageof course contributedtoeach PSO	15	14	11	15	10	10

	SUBJECTNAME	CORE–II: Programming in C Lab					
	SUBJECTCODE	23BIT1P1					
L	**T**	**P**	**S**	**Credits**	**Inst. Hours**	**Marks**		

L	T	P	S	Credits	Inst. Hours	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
(Minimum2programsfromeachcontent)

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 contributedtoeachPSO	15	14	11	15	11	10

SEC-I-Skill Enhancement Course

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst.Hours	CIA	External	Total
									Marks		
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
UNITI	**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
UNITII	**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
UNITIII	**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
UNITIV	**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

CourseOutcomes		ProgrammeOutcomes
CO	Oncompletionofthiscourse,studentswill	

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	Demonstratetheunderstandingofdifferent 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

	CourseOutcomes
CO1	OutlinetheComputerfundamentalsandvariousproblemsolvingconceptsinComputers
CO2	Describe the basic computer organization, software, computer languages, softwaredevelopment life cycle and the need of structured programming in solving acomputer problem
CO3	Identifythe types of computer languages, software, computer problems and examinehowto set up expressions and equations to solve the problem.
CO4	Choose most appropriate programminglanguages, constructs and features to solve theproblems in diversified domains.
CO5	Analyze the design of modules and functions in structuringthe solution and variousOrganizingtools in problem solving.

	Textbooks
☐	PradeepK.SinhaandPritiSinha,(2004)—ComputerFundamentals‖,SixthEdition, BPBPublications.(UnitI:Chapter1&2,UnitII:Chapter10&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, UnitV:Chapter4,5,6,7&8)

	ReferenceBooks
1.	R.G.Dromey,(2007),—HowtoSolveitbyComputer‖,PrenticeHallInternational SeriesinComputerScience.
2.	C.S.V.Murthy,(2009),—FundamentalsofComputers‖,ThirdEdition,Himalaya PublishingHouse.

NOTE:LatestEditionofTextbooksMaybeUsed

	WebResources
1.	http://www.tutorialspoint.com/computer_fundamentals/
2.	http://www.comptechdoc.org/basic/basictut/
3.	http://www.homeandlearn.co.uk/
4.	http://www.top-windows-tutorials.com/computer-basics/
5.	https://www.programiz.com/article/flowchart-programming(Algorithmandflow 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
Weightageofcoursecontributed toeach 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

								Marks		
SUBJECT NAME						CORE–IV:JAVA PROGRAMMING LAB				
SUBJECT CODE						23BIT2P1				
L	**T**	**P**	**S**	**Credits**	**Inst. Hours**		**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 tofind thebigger oftwo numberusingcommandlineargument.

2. Writeaprogramtofind thesumandaverageof theN numbersusing Command line argument

3. Writea mark listprogramtofind the total,average, resultand grade.

4. Writea programto preparetheEBBill calculation.

5. Writea programto findthe factorialvalue ofthe given number.

6. Writeaprogramto printtheMultiplication Table.

7. Writea programto printthe Fibonacci Series.

8. Writeaprogramtofindthe givennumberis primenumber or not.

9. Writea programtofind the givennumber is perfectnumberor not.

10. Writea programtofindthe givennumber isArmstrong or Not.

11. Writea programtoReversethe GivenNumber.

12. Writea programtofind the Sumof Digit.

13. Writeaprogramtoarrange thenumbersinDescending order.

14. Writea programtofind the Sumofeach Rowin the givenmatrix.

15. Writea programfor Matrix Addition.

16. Writea programfor Matrix Subtraction.

17. Write a program to perform the following string operations using String class:

    a.StringConcatenationb.Searchasubstringc.Toextractsubstringfromgivenstring

18. Writeaprogramtofindthe givenstringis PalindromeorNot.

19. Writea programtoCountthe no of Vowelsin the given string.

20. Writea programtoarrange the String an Ascending order.

21. WriteaprogramtocalculateAreaof Square,RectangleusingMethod Overloading.

22. Writea programusing Single Inheritance.

23. Writeaprogramtohandle theExceptionusingtryandmultiple catchblock.

24. Writea programtogenerate PrimeandPerfectnumberusing thread.

25. Writea programtoimplementaMark Listprogramusingpackage.

26. Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and forthe +, -,*, % 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" shouldappear above the buttons in a selected color. Initially there is no message shown.

28. Writea programtodraw a human face.

29. Writea programtodraw our national flag.

30. Writea programtodraw a Bar-chart.

CourseOutcomes	
CO1	Useappropriatesoftwaredevelopmentenvironmenttowrite,compileandexecute object-oriented Java programs
CO2	AnalyzeandidentifynecessarymechanismsofJavaneededtosolvereal-worldproblem
CO3	ImplementInheritance,package.
CO4	Implementmulti-threadingandexception-handling.
CO5	ExecuteGUI ,AWT andapplyeventhandling.

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
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-SkillEnhancementCourse

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	Contends	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 oflist
CO4	CreatingLinks.-Knowtheconceptofcreatinglinktoemailaddress
CO5	Conceptofaddingimages-Understandthetable creation.

Textbooks	
1	MasteringHTML5andCSS3Made Easy‖,TeachUCompInc.,.
2	ThomasMichaud,"FoundationsofWebDesign:IntroductiontoHTML& CSS"
WebResources	
1.	https://www.teachucomp.com/samples/html/5/manuals/Mastering-HTML5-CSS3.pdf
2.	https://www.w3schools.com/html/default.asp

Subject Code	SubjectName	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

CourseObjective	
C1	Understandthesystematicapproachtoproblemsolving.
C2	Knowtheapproachandalgorithmstosolvespecificfundamental problems.
C3	Understandtheefficientapproachtosolvespecificfactoring-relatedproblems.
C4	Understandtheefficientarray-relatedtechniquestosolvespecificproblems.
C5	Understandtheefficientmethodstosolvespecificproblemsrelatedtotextprocessing. 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 nth Fibonacci number.	6
UNIT IV	**Array Techniques**: Array order reversal – Array counting or histograming – Finding the maximum number in a set - Removal of duplicates from an ordered array - Partitioning an array – Finding the kth 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**

CourseOutcomes		ProgrammeOutcome
CO	Oncompletionofthiscourse,studentswill	
1	Understandthelogicofproblemandanalyses implementationofalgorithmandTopDown approach and concept of Recursion	PO1,PO6

2	AbletounderstandtheSequenceofNumbersand Series Fibonacci, Reversing ,Base Conversion.	PO2
3	AbletodoAlgebraicoperations	PO2,PO4
4	CoverageofArraysanditsLogics	PO6,PO8
5	TextProcessingand PatternSearchingApproach	PO7

TextBook

1	R.G.Dromey, *HowtoSolveitbyComputer*,PearsonIndia,2007

Referenceooks

1.	GeorgePolya,JeremyKilpatrick,*TheStanfordMathematicsProblemBook:WithHintsand Solutions*, Dover Publications, 2009 (Kindle Edition 2013).
2.	GregW.Scragg,*ProblemSolvingwithComputers*,Jones&Bartlett1st edition, 1996.

Webresources

1.	https://www.studytonight.com/
2.	https://www.w3schools.com/

MappingwithProgrammeOutcomes:

	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

	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 ExceptionHandlingandoops
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. WriteaProgramtocreateapageusingfunctionsforcomparingthreeintegersandprintthe largest 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. WriteaProgramtocreateasimple'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	Applythemethodsfordatarecovery,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 Guide‖, 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		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	Tounderstandthebasicconcepts,Evolutionand Benefitsof ERP.										
CO2	ToknowtheneedandRoleofERPinlogicalandPhysical Integration.										
CO3	Identifytheimportantbusinessfunctionsprovidedbytypicalbusiness softwaresuchasenterpriseresourceplanningandcustomerrelationship management										
CO4	Totrainthestudentstodevelopthebasicunderstandingofhow ERPenriches thebusinessorganizationsinachievingamultidimensionalgrowth										
CO5	Toaimatpreparingthestudentstechnologicalcompetitiveandmakethem readytoself-upgradewiththehighertechnicalskills										

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. BusinessProcessReengineering,DatawareHousing,DataMining, 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 or-ganizational culture. Using ERP tool: either SAP or ORACLE	6

	format to case study.	
	Total	**30**

CourseOutcomes

Course Outcomes	Oncompletionofthiscourse,studentswill;
CO1	UnderstandthebasicconceptsofERP.
CO2	Identifydifferenttechnologiesusedin ERP
CO3	Understandand applytheconceptsofERPManufacturingPerspectiveandERP Modules
CO4	Discussthebenefits ofERP
CO5	Applydifferenttoolsused in ERP

ReferenceText:	
1.	EnterpriseResourcePlanning–Alexis Leon,TataMcGrawHill.
2.	EnterpriseResourcePlanningbyAshimRajSingla(Author)-CengageIndia Private Limited-July 2016

References:	
1.	EnterpriseResourcePlanning–DiversifiedbyAlexis Leon, TMH.
2.	EnterpriseResource Planning–RaviShankar &S.Jaiswal, Galgotia

WebResources	
1.	1.https://www.tutorialspoint.com/management_concepts/enterprise_resource_planning.htm
2.	1.https://www.saponlinetutorials.com/what-is-erp-systems-enterprise-resource-planning/
3.	1.https://www.guru99.com/erp-full-form.html
4.	2.https://www.oracle.com/in/erp/what-is-erp/

MappingwithProgrammeOutcomes:

	PO1	PO2	PO3	PO4	PO5	PO6
CO 1	M		L			M
CO 2	M	S			L	M
CO 3		L	M			
CO 4				M		L
CO 5	M		L		M	
	S-Strong		**M-Medium**		**L-Low**	

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-Keywords-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-Keyboard and Mouse Events-Graphics using Turtle.
TOTAL	**75Hrs**

CourseOutcomes	
CO1	Outline the basic concepts in python language. Interpret different looping and conditional Statements in python language.
CO2	WorkwithList, tuplesanddictionary,Writeprogramusing list,tuplesanddictionary.
CO3	Conceptoffunction,Implementingtheconceptstringsinvariousapplication, Significance of Modules, Concept of reading and writing files.
CO4	ToimplementExceptionHandlingandoops.
CO5	TodevelopGUIapplicationsusingTkinter,Turtle.

Textbooks	
1.	PythonProgramming-ChSatyanarayana,MRadhikaMani,BNJagadesh-UniversitiesPress.
2.	ProgrammingandProblemSolvingwithPython-AshokNamdevKamthane-Amit Ashok Kamthane -Second Edition-2020.

ReferenceBooks	
1.	PythonProgrammingUsingProblemSolvingApproach-ReemaThareja-Oxford University Pres
2.	VamsiKurama,―PythonProgramming:AModernApproach‖,PearsonEducation.

NOTE:LatestEditionof TextbooksMaybeUsed

WebResources	
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/

MAPPINGTABLE						
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 coursecontributed 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	Understandthefundamentalsofprogrammingusing Python,suchasvariables,data types,controlstructures,andfunctions.
LO2	LearnhowtousePythonlibrariesandmodulestosolveproblems.

Prerequisites:

Contents

1. WriteaPython Programforchecking whetherthegiven numberisan oddorevennumber.

2. WriteaPythonProgramtocheckleapyear.

3. WriteaPythonProgramtoCheck thegivennumberisPrime Numberornot.

4. WriteaPythonProgramtoCheck thegivennumberisPerfectNumberor not.

5. WriteaPythonprogramtogenerate list ofFibonaccinumber uptonnumbers.

6. WriteaPythonprogramtogeneratemultiplication table.

7. WriteaPythonprogramtoprinttheArmstrongnumberbetweenthetwo range.

8. Writeapythonprogramtocreate, appendand removelistsin python.

9. Writeaprogramto demonstrateworkingwithtuplesin python.

10. Writeaprogramtodemonstrate workingwithdictionariesin python.

11. WriteapythonprogramtodefineamoduletofindFactorialNumbersandimportthemoduleto another program.

12. WriteaPythonprogramtofind thegivenstringisPalindromeorNot

13. Writea python programbyusing exception handlingmechanism.

14. WriteapythontoImplementpythonscripttoacceptlineoftextandfindthenumberof characters, number of vowels and number of blank spaces in it.

15. Writea programtocopyfile contents fromone file toanother.

16. Writea programto preparethemarklist using files.

17. Writeaprogramtoprepare the eb billusing files.

18. CreateagraphicalapplicationinPythonTkinter topreparethesalarybillusing widgets.

19. Writea programto drawing acartoonor house using turtle.

20. Writea programto drawing acolouring 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

	CourseObjective
C1	To understand the robotics fundamentals
C2	Understand the sensors and matrix methods
C3	Understand the Localization: Self-localizations and mapping
C4	Tostudyabout the conceptofPathPlanning, Visionsystem
C5	Tolearnaboutthe conceptofrobotartificialintelligence

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 –IRbasedlocalizations –visionbasedlocalizations – Ultrasonic based localizations - GPS localization systems.	6	CO3
UNIT IV	PathPlanning:Introduction,pathplanning-overview-roadmap pathplanning-celldecompositionpathplanningpotentialfieldpath 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 foragriculture-mining-exploration-underwater-civilian- and military applications-nuclear applications-space Applications-Industrial robots-artificial intelligence in robots-application of robots in materialhandling-continuousarcwelding-spotwelding-spray painting-assemblyoperation-cleaning-etc.	6	CO5

CourseOutcomes		Programme Outcomes
CO	Oncompletionofthiscourse,studentswill	
1	Describethedifferentphysical formsofrobotarchitectures.	PO1
2	Kinematicallymodelsimplemanipulator andmobilerobots.	PO1,PO2
3	Mathematicallydescribeakinematicrobotsystem	PO4,PO6
4	Analyzemanipulationandnavigationproblemsusingknowledgeof coordinateframes,kinematics,optimization,control,anduncertainty.	PO4,PO5, PO6
5	Programroboticsalgorithmsrelatedtokinematics,control,optimization, and uncertainty.	PO3,PO8
TextBook		
1	Introduction toRobotics,4ebyJohn Craig(Author)-PearsonEducation-April2022	
2	Robotics:FieldofApplications:ForBeginnersbyDr.S.Uma(Author),Dr.V.Saranya (Author) December 2022	
3	IntroductiontoRobotics,3ed,AnIndianAdaptationbySaeedB.Niku(Author),Wiley Editorial Team -January 2024	
4	RicharedD.Klafter.ThomasAchmielewskiandMickaelNegin,RoboticEngineeringand IntegratedApproach,PrenticeHallIndia-Newdelhi-2001	
ReferenceBooks		
1.	Industrial robotic technology-programming and application by M.P.Groover et.al, McGrawhill2008	
2.	Roboticstechnologyand flexibleautomationbyS.R.Deb,THH-2009	
WebResources		
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	CIA	External	Total
									Marks		
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,CONFLICTANDPOWER: Forces of change; Planned change; Resistance; Approaches (Lewin'smodel, Organisational development);.Concept of conflict, Conflict process; Types, Functional/Dysfunctional. Introduction to power and politics.	6

Course Outcomes	OnCompletionofthecoursethestudents will
CO1	TodefineOrganisationalBehaviour,UnderstandtheopportunitythroughOB.
CO2	Toapplyself-awareness,motivation,leadershipandlearningtheoriesat workplace.
CO3	Toanalyzethecomplexitiesandsolutionsofgroupbehaviour.
CO4	Toimpactandbringpositivechangeinthecultureoftheorganisaiton.
CO5	Tocreateacongenialclimateinthe organization.

ReadingList	
1.	NeharikaVohra Stephen P. Robbins, Timothy A. Judge, *Organizational Behaviour*,PearsonEducation,18thEdition,2022.
2.	FredLuthans,*OrganizationalBehaviour*,TataMcGrawHill,2017.
3.	RayFrench,CharlotteRayner,GaryRees&SallyRumbles,*Organizational Behaviour*,John Wiley&Sons, 2011
4.	LouisBevoc,AllisonShearsett,RachaelCollinson,*OrganizationalBehaviour Reference*,NutriNicheSystemLLC(28 April2017)
5.	Dr.Christopher P. Neck, JefferyD. Houghton and Emma L. Murray, *OrganizationalBehaviour:ASkill-BuildingApproach,*SAGEPublications,Inc; 2nd edition (29 November 2018).
ReferencesBooks	
1.	UmaSekaran, OrganizationalBehaviourText&cases,2ndedition,Tata McGraw HillPublishingCO.Ltd
2.	GangadharRao,Narayana,V.S.PRao,OrganizationalBehaviour1987,Reprint 2000, Konark Publishers Pvt. Ltd, 1st edition
3.	S.S.Khanka,OrganizationalBehaviour,S.Chand&Co,NewDelhi.
4.	J.Jayasankar,OrganizationalBehaviour, MarghamPublications,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

SUBJECT NAME				CC-IX-DATA COMMUNICATION 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	Thiscourseistoprovidestudentswithan overviewoftheconceptsandfundamentals ofdatacommunicationandcomputernetworks
LO2	Tofamiliarizethestudentwiththebasic taxonomyandterminologyofthe computer.
LO3	Studentwillbeabletounderstandvarioustypesoftransmissionmedia,network devices;andparametersofevaluationofperformanceforeachmediaanddevice.

Prerequisites:	
Contents	
Unit I	Introduction:DataCommunication-Networks:DistributedProcessing-Network CriteriaPhysicalStructures–NetworkModels-CategoriesofNetwork-Internetwork -TheInternetProtocolsandStandards–NetworkModels:LayersintheOSI 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-StatisticalTDM-TransmissionMedia:Guidedmedia-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: CyclicRedundancyCheck - Checksum. Data Link Control:Framing-FlowControlandErrorControl-NoiselessChannel:Stop-and-waitProtocol.
Unit IV	Wired LANs: Standard Ethernet-GIGABIT Ethernet-Wireless LAN: Bluetooth Connecting LANs: Connecting Devices**:** Passive Hubs- Repeaters-Active Hubs-Bridges-TwoLayerSwitches-Routers-ThreelayerSwitches-Gateway-Network Layer:InternetProtocol:IPv4–Ipv6-TransitionfromIPv4toIPv6.
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-CommonUses-Applications-WiFi-WiMax Lifi-LifivsWifi.
TOTAL	**75 Hrs**

CO	CourseOutcomes
CO1	Understandthefundamentalconceptsofcomputernetworksanditsapplicationareas
CO2	Identifyandusevariousnetworkingtechniquesandcomponentstoestablish networkingconnectionandtransmission
CO3	Analyzetheservices performedbydifferentnetworklayersandrecentadvancements innetworking
CO4	Comparevariousnetworkingmodels,layers,protocolsand technologies.
CO5	Selecttheappropriatenetworkingmechanismstobuildareliablenetwork
Textbooks	
➢	DataCommunicationsandNetworkingwithTCPIPProtocolSuitebyBehrouzA. Forouzan (Author) -McGraw-Hill- 6th Edition-August 2022
➢	CommunicationNetworks:AConciseIntroduction,SecondEditionbyJeanWalrand, Shyam Parekh -Springer International Publishing AG-2018
ReferenceBooks	
1.	DataCommunicationandComputerNetworks-AjitPal-PhiLearningPvt.Ltd..
NOTE:LatestEditionofTextbooksMaybeUsed	
WebResources	
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 contributedtoeachPSO	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	Understandthecoreprinciplesof.NETFramework.
LO2	Toprovidesufficientknowledgeindevelopingwindows/webapplicationsusing VB.NETand ASP.NET.
LO3	CreateaSQLServerdatabaseand utilize EntityFrameworkfordata access.

Prerequisites:

Contents	
Unit I	Introductionto.NET–The.NETFramework–Benefitsof.NET–Common LanguageRuntime–FeaturesofCLR-CompilationandMSIL–The.NET Frameworklibraries –TheVisualStudioIntegratedDevelopmentEnvironment.
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–Delegatesand 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 - BuildingFormswithWebserverControls–ValidationServerControls–RichWeb Controls-CustomControls–Collectionsand 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	**CourseOutcomes**

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 VisualBasic-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.	Kiong 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

				Credits	Inst. Hours	Marks		
L	**T**	**P**	**S**			**CIA**	**External**	**Total**
-	-	5	-	**4**	**5**	**25**	**75**	**100**

	SUBJECT NAME	CC-XI-.NET Programming Lab
	SUBJECT CODE	**23BIT5P1**

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**

LearningObjectives

LO1	ToUnderstandthefundamentalsofe-commerceand itssignificancein the modern business landscape.
LO2	TounderstandthebasicConceptsofDigitalmarketingandthe road mapforsuccessful Digitalmarketingstrategies.
LO3	Applyethicalandlegalconsiderationsin e-commerceanddigitalmarketing 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&Customizingmessages-DigitaladvertisingMarketinIndia-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-Keyword advertising-Google web-master and analytics overview-Affiliate Marketing-Email Marketing-Mobile Marketing, Display adverting-Buying Models-different type of ad tools-Display advertisingterminology-typesofdisplayads-differentadformats-Adplacement techniques-importantadterminology-ProgrammaticDigitalAdvertising.
TOTAL	**75 Hrs**

CO	**CourseOutcomes**

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	Helps 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 - PHI Learning 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	TounderstandthebasicDBMSmodelsand architecture
LO2	Tolearn howtoqueryand normalizethedatabase.
LO3	TostudythedatabasedesigntransactionProcessingandManagementandSecurity Issues.

Prerequisites:

Contents

UnitI	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–DatabaseSystemEnvironment–Centralized&Client Server Architecture for DBMS-Classification of DBMS.
UnitII	Basic Relational Model: Relational Model Concepts – Relational Model Constraints and Relational Database Schemas – Update Operations, Tractions, Dealing with Constraint Violations – Formal Relational Languages: Unary Relational Operations: SELECT and PROJECT – Relational Algebra Operations fromSetTheory–BinaryRelationalOperations:JOINandDIVISION– ExamplesofQueriesinRelationalAlgebra.
UnitIII	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 DesignintoLogicalDesign:RelationalDatabaseDesignusingER-Relational Mapping– MappingEER ModelConstructs to Relations
UnitIV	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 NormalForm–ThirdNormalForm–BCNF-FourthNormalForm-FifthNormal Form.
UnitV	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 CreatingProceduresandFunctions–DeletingaStoredProcedureorFunction– Packages – Database Triggers – Types Of Triggers – Deleting a Trigger – Raise-Application Error Procedure
TOTAL	**75 Hrs**

CO	CourseOutcomes
CO1	OutlinethefundamentalRDBMSconceptsandPL/SQL
CO2	Applydatabaseoperations, mapping,normalization,SQLand PL/SQL
CO3	Analyzetherequirementstoimplementrelationaldatabaseconcepts
CO4	Evaluatethedatabasebasedonvariousmodelsand normalization.
CO5	DesignandconstructnormalizedtablesandmanipulateiteffectivelyusingSQLand PL/SQL database objects
Textbooks	
➢	RamezElmasri,ShamkantB.Navathe(2014),―DatabaseSystems‖,Sixthedition, PearsonEducation, NewDelhi.
➢	SQL,Pl/SQLTheProgrammingLanguageOfOracleByIvanBayross- VISIONIAS - 2020.
ReferenceBooks	
1.	AbrahamSilberschatz,HenryF.Korth,S.Sudarshan,DatabaseSystemConcepts,Tata McGraw Hill Publication, 7th Edition.

NOTE:LatestEditionofTextbooksMaybeUsed

WebResources	
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 contributedtoeachPSO	15	14	11	15	15	13

							Marks		
				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	Toidentifytheunderlyingconceptsand the fundamentaldata miningmethodologies withtheabilitytoformulate andsolve 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**:DataCleaning–DataIntegration-DataReduction-Data Transformation.
Unit II	**Association Rules Mining**: Introduction – Frequent Itemset Mining Methods: Apriori Algorithm-Generating Association Rules from Frequent Itemsets-ImprovingtheefficiencyofApriori-APattern–Growth-Approachformining FrequentItemsets-PatternEvaluationMethods.
Unit III	**Classification:** Introduction –Basic concepts – Logistic regression –Decisiontree induction–Bayesianclassification,Rule–basedclassification-ModelEvaluation and selection.
Unit IV	**Cluster Analysis:** Introduction-Requirements for Cluster Analysis - **Partitioning Methods**: The K-Means method - **Hierarchical Method**: Agglomerative method - **Densitybasedmethods:**DBSCAN-**EvaluationofClustering**:Determiningthe NumberofClusters–MeasuringClusteringQuality.
Unit V	**Outlier Detection:** Outliers and Outlier Analysis – Outlier DetectionMethods - **Data Visualization:** Pixel-oriented visualization – Geometric Projection visualizationtechnique-Icon-based-Hierarchicalvisualization-Visualizingcomplex data and relations.
TOTAL	**60 Hrs**

CO	CourseOutcomes
CO1	Outlinethefundamentalsandtheprinciplesof DataMining
CO2	Applysuitabledifferentpreprocessing fordatamining
CO3	Classifydata-miningtechniquesbasedonthedifferent applications
CO4	Analyzethevarious dataminingalgorithmswithrespecttofunctionality
CO5	Recommendappropriatedatamodelsfordataminingtechniquestosolverealworld problems

	Textbooks
➤	DataMining:TheDataMiningGuideforBeginners,IncludingApplicationsforBusiness, Data Mining Techniques, Concepts, and More by Herbet Jones 2020.
➤	DataMining:Concepts andTechniques-JiaweiHan ,MichelineKamber &Jian Pei -MorganKaufmann-Edition:2019

	ReferenceBooks
1.	IanH.WittenandEibeFrank,(2005),―DataMining:PracticalMachineLearningTools andTechniques(SecondEdition)‖,MorganKaufmann.
2.	ArunKPujari,―DataMiningTechniques‖, 10impression, UniversityPress,2008.
3.	DanielT.Larose,ChantalD. Larose,"DataminingandPredictiveanalytics,"Second Ed.,WileyPublication, 2015.
4.	G.K.Gupta,―IntroductiontoDataminingwithcasestudies‖,2ndEdition,PHIPrivate limited,NewDelhi, 2011.

NOTE:LatestEditionof TextbooksMaybeUsed
WebResources
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 contributedtoeachPSO	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

LearningObjectives

LO1	Tolearnvarious conceptsofAITechniques&Algorithm.
LO2	TolearnprobabilisticreasoningandmodelsinAI.
LO3	TolearnvarioustypeofReinforcementlearning.

Prerequisites:

Contents

Unit I	Overview:foundations,scope,problems,andapproachesofAI.Intelligentagents: reactive,deliberative,goal-driven,utility-driven,andlearningagents,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,depthfirst. HeuristicSearches:"Best"firstsearches.Heuristicin 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,connectiontologic,independence,Bayesrule,Bayesian networks,probabilisticinference,sample applications.
Unit V	Decision Making: Decision- Making: basics of utility theory, decision theory, sequential decision problems, elementary game theory, sample applications. MachineLearningandKnowledgeAcquisition:learningfrommemorization, examples,explanation,andexploration.
TOTAL	**60 Hrs**

CourseOutcomes		ProgrammeOutcome
CO	Oncompletionofthiscourse,studentswill	
1	Understandthevariousconceptsof AITechniques.	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.,―AClassicalApproachtoArtificalIntelligence‖,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	

MappingwithProgrammeOutcomes:

	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–MLPasa 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	Outlinetheimportanceofmachinelearningintermsofdesigningintelligent machines
CO2	Identifysuitablemachinelearningtechniquesfortherealtime applications
CO3	Analyzethetheoreticalconceptsandhowtheyrelatetothepracticalaspectsof machine learning.
CO4	Assessthesignificanceof principles,algorithmsandapplicationsofmachinelearning throughahands-onapproach
CO5	Comparethemachinelearningtechniqueswithrespective functionality

Textbooks	
➢	(UnitI–UnitIV): IntroductiontoMachineLearning-EthemAlpaydın—PHILearning (**Unit V:** Machine learning with python tutorial) https://www.tutorialspoint.com/machine_learning_with_python/machine_learning_with_python_tutorial.pdf

ReferenceBooks	
1.	DesigningMachineLearningSystems:AnIterativeProcessforProduction-Ready Applications-byChipHuyen-Shroff/O'Reilly-2022
2.	MachineLearninginDataScienceUsingPython-byDr.R.NageswaraRao-Dreamtech Press-2022
3.	MachineLearning: Hands-OnforDevelopersandTechnical Professionals-JasonBell-WileyPublication,2015.

NOTE:LatestEditionofTextbooksMaybeUsed

WebResources	
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
Weightageofcourse contributedtoeach 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/ Field Visit**		-	-	-	-	2	-	25	75	100

						Marks		
				Credits	**Inst. Hours**	**CIA**	**External**	**Total**
SUBJECT NAME				CC-XIII-Software Project Management				
SUBJECT CODE				23BIT6C1				
L	**T**	**P**	**S**					
4	**-**	**-**	**-**	**4**	**6**	**25**	**75**	**100**

Learning Objectives	
LO1	Todefineandhighlight importanceofsoftwareproject management.
LO2	Toformulateanddefinethesoftwaremanagementmetrics&strategyin managing projects
LO3	Understandtoapplysoftwaretestingtechniquesincommercial environment

Prerequisites:	

Contents	
UnitI	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.
UnitII	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 interactiveprocesses-Basicsofsoftwareestimation-Effortandcostestimation techniques-cosmic full function points.
UnitIII	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-Riskmanagement-PERTtechnique-MontoCarloSimulation-Resource Allocation-Creation of critical paths-Cost Schedules.
UnitIV	Framework for management and control-Collection of data-Visualizing progress-Cost monitoring-Earned value analysis-Prioritizing monitoring-Project tracking-changecontrol-Softwareconfigurationmanagement-Managingcontracts-Contract management,
UnitV	Staffing in software projects-Managing people-organizational behavior-best methods of staff selection-motivation-The Oldham-Hack man job characteristics model-stress-health and safety-ethical professional concerns-working in teams-Decisionmaking-organizationalstructures-communicationgenres-communication plans-Leadership.
TOTAL	**90 Hrs**

CO	CourseOutcomes
CO1	Understandtheprinciplesandconceptsofprojectmanagement
CO2	Knowledgegainedtotrainsoftwareprojectmanagers
CO3	Applysoftwareprojectmanagement methodologies
CO4	Abletocreatecomprehensiveproject plans
CO5	Evaluateandmitigaterisksassociatedwithsoftwaredevelopmentprocess

Textbooks
➢ SoftwareProjectManagement-BobHughes, MikeCotterell, RajibMall -TMH 6th - 2018
➢ ProjectManagementandTools&Technologies:Anoverview-ShaileshMehta SPD 1st 2017

ReferenceBooks
1. SoftwareProjectManagement:AUnifiedFramework -WalkerRoyce -Pearson
2. Effectivesoftwareprojectmanagement -RobertK.Wysocki, wileypublications

NOTE:LatestEditionofTextbooksMaybeUsed

WebResources
1. NPTEL&MOOCcourses titledSoftwareProjectManagement
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
Weightageofcoursecontributed to each PSO	15	14	11	15	15	13

Subject Code	SubjectName	Category	L	T	P	S	Credits	Inst.Hours	CIA	External	Total
										Marks	
23BIT6D	CC-XIV-Dissertation	Core-XIV	-	-	12	-	8	12	50	150	200

<table>
<tr><th colspan="2">Course Objective</th></tr>
<tr><td>LO1</td><td>Thestudentswillbeallowedtoworkonanyprojectbasedontheconcepts studied incore/elective courses.</td></tr>
<tr><td>LO2</td><td>The project work should be compulsorily done in the college only under the supervision of the department staff.</td></tr>
<tr><td>LO3</td><td>Thecombinedprojectshallbeundertakenbythestudentsasateamoftwo.</td></tr>
<tr><td>LO4</td><td>ThenumberofteamsshouldbeequallyassignedtoexistingStaffmembers.</td></tr>
<tr><td>LO5</td><td>Thefollowing listofparameterstakenintoaccountfortheevaluationofProject workandViva-voce.TotalMarks:200(Internal:50marks,External:150Marks)</td></tr>
</table>

Contents	No.of Hours
Parameters: ForInternalMarks: Tworeviewmeetings-2×10=20Marks Debugging =10Marks Execution =10Marks Output =10Marks _____ Total =50Marks _____ ForExternalMarks: Project Report =50Marks Project demo & Presentation =50Marks Viva-Voce =50Marks _____ Total =150Marks _____	180

Total	
	180

Course Outcomes	ProgrammeOutcome
CO	Oncompletionofthiscourse,	
CO1	Students will demonstrate creativity and innovationinthedesignandimplementationof ITsolutions,andintheexplorationofnew ideasandapproacheswithinthefield..	PO1
CO2	Students will gain knowledge about technological components of the software's	PO1, PO2
CO3	Identifying,analyzing,anddesigningsystems to solve information technology problems	PO1, PO3

	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**

LearningObjectives	
LO1	To gainknowledgeon IndustryInternetofThings
LO2	ToLearn aboutthe privacyand SecurityissuesinIoT
LO3	ToImplementbasicIoTapplications

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.
UnitII	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 principlesandneededcapabilities,AnIoTarchitectureoutline,standards considerations.
UnitIII	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.
UnitIV	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,IoTforRetailingIndustry,IoTForOilandGasIndustry,Opinions onIoTApplicationandValueforIndustry,HomeManagement.
UnitV	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 TowardsaSecurePlatform,SmartieApproach.DataAggregationfortheIoTin SmartCities, Security.
TOTAL	**75 Hrs**

CO	CourseOutcomes
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 realtime 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

ReferenceBooks

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

WebResources

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

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

							Marks		
				JECTNAME		DSE-III-Cloud Computing			
				SUBJECT CODE		23BIT6E2			
L	T	P	S	Credits	Inst. Hours	CIA	External	Total
5	-	-	-	3	5	25	75	100

	LearningObjectives
LO1	Tolearnthefundamentalsandessentials 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	CourseOutcomes
CO1	Explainthecoreconceptsofthecloudcomputingparadigm.
CO2	Outlinethevirtualizationtechnologyanddeterminetheiruses.
CO3	Applythefundamentalconceptsindatacenterstounderstandthetradeoffsinpower,efficiency and cost.
CO4	Identifyresourcemanagementfundamentals,i.e.resourceabstraction,sharingand sandboxingandoutlinetheirroleinmanaginginfrastructurein cloudcomputing.
CO5	Analyzevariouscloudprogrammingmodelsandapplythemtosolveproblemsonthe cloud.
Textbooks	
➢	CloudComputing:Implementation,ManagementandSecurity-Rittinghouse,JohnW., and James F. Ransome- CRC Press, 2017.
➢	CloudComputingbySunilkumarManvi, GopalShyam -CRCPress-2021
ReferenceBooks	
1.	TheCloudComputing BookbyDouglasComer-Chapman and Hall/CRC-2021
2.	CloudComputingforDummiesbyJudith Hurwitz, DanielKirsch -Wiley-2020

NOTE:LatestEditionofTextbooksMaybeUsed

WebResources	
1.	NPTEL&MOOCcoursestitledcloudcomputing.
2.	https://www.javatpoint.com/cloud-computing
3.	https://k21academy.com/cloud-blogs/cloud-fundamentals/

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

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

LearningObjectives	
LO1	Identifyanddescribethe methodsand techniquescommonlyused indata science.
LO2	TolearnaboutModel development.

Prerequisites:	

Contents	
UnitI	Introduction to Data Science – Evolution of Data Science – Data Science Roles – Stagesin aData ScienceProject– Applicationsof DataScienceinvarious fields– DataSecurityIssues.
UnitII	DataCollectionandDataPre-Processing-DataCollectionStrategies–DataPre-Processing Overview– Data Cleaning– Data Integrationand Transformation– Data Reduction – Data Discretization.
UnitIII	Exploratory Data Analytics Descriptive Statistics – Mean, Standard Deviation, Skewness and Kurtosis – Box Plots – Pivot Table – Heat Map – Correlation Statistics – ANOVA.
UnitIV	ModelDevelopmentSimpleandMultipleRegression–ModelEvaluationusing Visualization–ResidualPlot–DistributionPlot–PolynomialRegressionand Pipelines– MeasuresforIn-sampleEvaluation –PredictionandDecisionMaking.
UnitV	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	CourseOutcomes
CO1	UnderstandthebasicsinDataScience .
CO2	UnderstandoverviewandbuildingprocessinData Science.
CO3	UnderstandDataCollectionandDataPre-Processing .
CO4	UnderstandtheDataAnalytics/ Statistics.
CO5	AnalyzevariousModelDevelopment/Evaluation.

Textbooks	
➢	"DoingDataScience"-CathyO'Neiland RachelSchutt-O'Reilly, 2015
➢	ManagingDataScienceEffectiveStrategiestoManageDataScienceProjectsand Build a Sustainable Team By Kirill Dubovikov-Packt Publishing-2019
➢	An introductiontoDataSciencebyJeffrey Stanton.

ReferenceBooks	
1.	IntroductiontoDataScience EssentialConceptsByPetersMorgan-CreateSpace IndependentPublishing Platform
2.	TheElements ofDataAnalytic StylebyJeff Leek

NOTE:LatestEditionofTextbooksMaybeUsed

WebResources	
1.	NPTEL&MOOC coursestitledData Science.
2.	https://www.simplilearn.com/tutorials/data-science-tutorial
3.	https://www.w3schools.com/datascience/

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

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
LearningObjectives								
LO1	Toknowthefundamentalconceptsofbig dataandanalytics.							
LO2	Toexploretoolsand practicesforworkingwithbigdata.							
Prerequisites:								
Contents								
UnitI	Introduction to Big Data Analytics – Data Analytics – Analytics Terminology – Types of Analytics – Analytics LifeCycle - DataStore – 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.							
UnitIII	Market Basket Analysis– Kernel Density Estimation– Regression– Relational Logistics Regression –Relational Neighbor Classifiers –Bigraphs – Collective Inferencing.							
UnitIV	Common predictive Modeling Techniques: RFM – Regression – Generalised Linear Models – Neural Network – Decision and Regression trees – Support vector Machines – Bayesian Methods Network Classification – Ensemble Methods.							
UnitV	SegmentationandHadoop–ClusterAnalysis –DistanceMeasures –Evaluating Clustering – Number of Clusters – K-means Algorithm – Hierarchical Clustering –Introduction to Neural Networks – Support Vector Machines - K NearestNeighborclassification-Ensemblelearning.Hadoopconcepts- Hadoopdistributedfilesystem (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 problem solving involved in stocks & shares, graphs	PO3,PO8

TextBook	
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

ReferenceBooks	
1.	Quantitative Aptitude For Competitive Examinations |Latest questions I 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

WebResources	
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