

Effective from Session: 2023	3-2024						
Course Code	CA208	Title of the Course	DISCRETE MATHEMATICAL STRUCTURE	L	Т	Р	С
Year	II	Semester	IV	3	1	0	4
Pre-Requisite	NONE	Co-requisite	NONE				
Course Objectives	 To To To To wit To Intra 	study the concepts Rela learn Algebraic Structur learn Lattices: Ordered learn Introduction of th hout output. learn the concepts of No oduction to Turing Mac	tion and functions. res and Propositional Logic and their application in compute set, Posets and Introduction to Lattices, Properties of lattices ne Language, Kleene closure and finite automata with outpon- ne-Regular language: Pumping lemma, Introduction to Pusl whine.	r scien out and idown	ce. d Finite Autor	e Autorr nata,	nata

	Course Outcomes
CO1	Understand the concepts of relations and functions and terminology.
CO2	Understand the concept Algebraic Structures and Propositional Logic and their application in computer science
CO3	Understand the concept of Lattices: Ordered set, Posets and Introduction to Lattices, Properties of lattices.
CO4	Understand the concepts of Introduction of the Language, Kleene closure and finite automata with output and Finite Automata with output.
CO5	To understand the concepts of Non-Regular language: Pumping lemma, Introduction to Pushdown Automata, Introduction to Turing Machine.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO							
1	Relation	Relation: Relations on sets, Types of relations in a set, Properties of relations, Composition of relations, Representation of relations, Closures of relations. Function: Types of functions, Composition of functions, Recursively defined function.	7	CO1							
2	Algebraic Structures	Relation: Relations on sets, Types of relations in a set, Properties of relations, Composition of relations, Representation of relations, Closures of relations. Function: Types of functions, Composition of functions, Recursively defined function.	8	CO2							
3	Lattices	Lattices: Ordered set, Posets , Hasse diagram, Hasse diagram of partially ordered set Consistent enumeration, Isomorphic ordered set, Well ordered set, Introduction to Lattices, Properties of lattices, Bounded lattices, Distributive lattices, and Complemented lattices.s.	7	CO3							
4	Automata	Automata: Introduction of the Language, Kleene closure, Arithmetic expressions, Regula expressions, Generalized transition graph, Conversion of regular expression to Finit Automata, Non deterministic finite automata, Deterministic finite automata, Conversion of NFA to DFA, Optimization of DFA. Finite Automata with output: Moore machine, Mealy machine, Conversions (Moore machine to Mealy machine and vice-versa).	10	CO4							
5	Non-Regular language	Non-Regular language: Pumping lemma, Introduction to Pushdown Automata, Introduction to Turing Machine, Introduction to Chomsky Normal Form (CNF), Chomsky Hierarchy.	8	CO5							
Referen	ce Books:										
1. Lip	tschutz, Seymour, "Disc	prete Mathematics", TMH. 2.									
2. Tre	mbley, J.P and R. Mano	har, "Discrete Mathematical Structure with Application to Computer Science", TMH									
3. Hopcroft J.E, Ullman J.D., "Introduction to Automata theory, Languages and Computation", Narosa Publishing House.											
4. C.L.Liu, "Elements of Discrete Mathematics", McGraw Hill.											
e-Lear	rning Source:										
1. http	os://onlinecourses.nptel.	ac.in/noc20_cs82/preview									

2. https://nptel.ac.in/courses/106106183

						С	ourse A	Articul	ation N	Aatrix:	(Mappi	ng of COs	s with PO	s and PSC	Ds)			
PO- PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
CO1	3	1			1	1		1					3	1				
CO2	3	1	2			1	1						2	2				
CO3	2	2	1	1		2							3	1				
CO4	2	1	1			2	1						2	1				
CO5	2	1	1	1		1							3	1				



Course CodeCA210Title of the CourseSOFTWARE ENGINEERING AND PROJECT MANAGEMENTLTPCYearIISemesterIV3104Pre-RequisiteNONECo-requisiteNONEaaaaNONETo develop knowledge of phases in software development To develop good quality software and able to maintain quality of softwareaaaaaCourse ObjectivesTo develop knowledge of tools available for software development. To develop knowledge of tools available for software development. To develop knowledge of tools available for software development. To develop knowledge of testing and maintain robustness of softwareaaaaa	Effective from Session: 2016	5-2017						
Year II Semester IV 3 1 0 4 Pre-Requisite NONE Co-requisite NONE Image: Constant of the second	Course Code	CA210	Title of the Course	SOFTWARE ENGINEERING AND PROJECT MANAGEMENT	L	Т	Р	С
Pre-Requisite NONE Co-requisite NONE Image: Constraint of the second sec	Year	II	Semester	IV	3	1	0	4
• To develop knowledge of phases in software development • To develop good quality software and able to maintain quality of software • To know the team required for project management. • To develop knowledge of tools available for software development. • Knowledge of testing and maintain robustness of software	Pre-Requisite	NONE	Co-requisite	NONE				
	Course Objectives	 To To To To Known 	develop knowledge of p develop good quality so know the team required develop knowledge of to owledge of testing and r	hases in software development ftware and able to maintain quality of software for project management. pols available for software development. maintain robustness of software				

	Course Outcomes
CO1	To understand about designing model and practical implementation.
CO2	To take decision of project planning on the basis of cost evaluation.
CO3	To understand risk identification and management.
CO4	To use various tools for software design development.
CO5	To understand importance of quality of software.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO						
1	Software Product and SDLC	Software Engineering Fundamentals, Definition of Software Products, Phases of Software Development Life Cycle, Software Development Paradigm, Software Life Cycles Models: Build and Fix Model, Waterfall Model, Prototype Model, Iterative Model, Evolutionary Model, Spiral Model, Software Requirements Analysis and Specification: SRS, Characteristics of SRS.	8	CO1						
2	Software Design Principles	Software Design, Design Process, Design Principles: Abstraction, Refinement, Modularity, Information Hiding, Modular Design: Effective Modular Design and Functional Independence, Cohesion, Coupling, Top down and Bottom up Strategies, Coding: Coding Standard and Guidelines, Testing: Black Box Testing and White Box Testing.	8	CO2						
3	Software Configuration Management	Concept of Configuration Management. Software Maintenance: Categories of Maintenance, Software Reliability: Reliability, Reliability Metrics, Quality Concept: Quality Control, Quality Assurance, Software Quality, Scheduling Tools, Time Estimation, Resource Allocation, Differentiate Projects, Programs and Business Process, Elements of Proposal Process.	8	CO3						
4	CASE Tools	Relevance of CASE Tool: Building block for CASE Tools, Integrated Case Tool Environment, Generation of CASE Tool, High End and Low End CASE Tools. Project Management Fundamentals: Definition of Project, Project Specification and Parameters, Principles of Project Management, Project Management Life Cycle, Program Management Plan: Concept, Elements, Planning Issues, Benefits of Program Management.	8	CO4						
5	Software Project Management, Project Activities	Engineering Task, Management Task, Work Break down Structure: Concept of WBS, Meaning of Product Oriented Deliverable, Features of WBS, Comparison of Functional based vs. product Oriented Deliverability, Resource and Cost Requirements, Software Project Plans, Software Project Estimation, Project Monitoring and Progress Control, Risk Management: Risk Management Plan, Risk Mitigation Strategies, Software Measurement, Project Metrics, Project Audit: Data Collection, Analysis.	8	CO5						
Referen	ce Books:									
1. R. I	Pressman, "Software En	gineering", TMH.								
2. Par	ıkaj Jalote, "An Integrat	ed Approach to Software Engineering", Narosa.								
3. Rajib Mall, "Fundamental of Software Engineering", PHI.										
4. Pankaj Jalote, "Software Project Management in Practice", Person Education.										
e-Lea	rning Source:									
1. http	os://nptel.ac.in/courses/1	06105182								
2 http	s://onlinecourses notel	ac in/noc19 cs70/preview								

https://onlinecourses.nptel.ac.in/noc19_cs70/preview ۷.

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						С	ourse A	Articul	ation N	Matrix:	(Mappi	ng of CO	s with PO	s and PSO	Os)			
PO- PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
CO1	3	1	2		1		1	1					3	1				
CO2	1	2	1	1		2		1					2	2				
CO3	3	2		1	1	1							3	1				
CO4		1	3		1	2	2	1					2	2				
CO5	2	1	1	1		2							2	1				



Effective from Session: 2016	b-201 7						
Course Code	CA212	Title of the Course	COMPUTER ARCHITECTURE AND MICROPROCESSOR	L	Т	Р	С
Year	II	Semester	IV	3	1	0	4
Pre-Requisite	NONE	Co-requisite	NONE				
Course Objectives	 To To To To Un 	learn the concepts regar understand the basic ide understand the program understand the basic con derstanding of the variou	ding microprocessor with 8 and 16 bit. a of the internal architecture and register configuration of re- ming techniques of with the help of Assembly Language Pro- ncept of parallel computing and significance of pipelining ar- us types of interconnection networks.	spectiv gramr id para	ve devic ning. Ilelism	es.	

	Course Outcomes
CO1	For a microprocessor system, student should be able to deal with the internal architecture of 8 bits and 16 bit microprocessor to analyze the working operation and to know the pin configuration for the respective microprocessor. A student should be good enough to deal with interrupts internally or externally.
CO2	He/she should be able to understand the basic concepts of Assembly language programming. For a particular data instruction set, student should be having a clear idea of solving machine language programs using kit. He/she shall be having an idea to tackle with counter delays and subroutines.
CO3	He/she should be able to know the concept of pipelining and parallelism in uniprocessor system for hazard detection. Understand the basic concept of Parallel computing.
CO4	A student should have a basic idea of job levels that are governed by an organization on priority basis. He/she should know the Pipeline scheduling theory
CO5	For good networking, a student should be able to draw SIMD interconnections and FFT or a butterfly method system for collision prevention and vector dispatching. He/she should be able to make Cube Interconnection Network, Shuffle-Exchange and Omega Network.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO							
1	8-bit Microprocessor	Introduction, Pin diagram and internal architecture of 8085 Microprocessor, Registers sets. 16-bit Microprocessor: Introduction, Pin diagram and internal architecture of 8086 microprocessor, Registers sets. Interrupts: Hardware and Software Interrupts.	8	CO1							
2	Assembly Language Programming and Instructions	Data transfer, Arithmetic operations, Logical operations, Branch operations, Looping counting, Indexing, Programming techniques, Counters and time delays. Parallel computing: Introduction, Parallelism in Uniprocessor Systems, Parallel computer structures, Architectural classification schemes, Parallel processing applications.	8	CO2							
3	Pipelining Processing and overlapped parallelism	Principle of Linear Pipelining, Classification of Pipelined Processor, General Pipelined and reservation tables, Interleaved memory organizations, Arithmetic pipelines. Principles of designing pipelined processors: Pipeline instruction execution, Pre-fetch buffer, Internal forwarding and Register tagging, Hazard detection and resolution.	8	CO3							
4	Pipeline scheduling theory	Scheduling problem, Collision vector, State diagram, Pipeline scheduling optimization, Multiple vector task dispatching, Masking and Data routing. Program partitioning and scheduling: Grain size and Latency, Grain packing and scheduling, Static multiprocessor scheduling. Program flow mechanism: Control flow vs. Data flow, Demand-driven mechanism, Comparison of flow mechanism.	8	CO4							
5	SIMD Interconnection network	Static, Dynamic networks, Mesh connected Illiac network, Cube interconnection network, Shuffle-exchange and Omega network. Parallel Algorithms for Array Processors: SIMD Matrix multiplication, SIMD Fast Fourier transforms.	8	CO5							
Referen	ce Books:										
1. Gaon	kar, Ramesh S, "Microp	rocessor Architecture, Programming and Applications with 8085", Penram International Publishi	ng.								
2. Ray A	A K, Bhurchandi K M , '	'Advanced Microprocessors and Peripherals", TMH.									
3. Hall D V, Microprocessor Interfacing', TMH.											
4. Liu and Gibson G A, "Microcomputer System: The 8086/8088 family", PHI.											
e-Lear	rning Source:										
1. http	os://nptel.ac.in/courses/1	06102062									

2. https://nptel.ac.in/courses/106105163

						С	ourse A	Articul	ation N	Matrix:	(Mappi	ng of CO	s with PO	s and PS	Os)			
P O- PS O	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
C O																		
CO 1	2	1		2	1	1							2	1				
CO 2	3	2	1		1		1						3	1				
CO 3	2	1		1	1	1							2	1				



CO 4	2	1	2			2	1				-		3	1		
CO 5		2	3	1	1	1	2						2	1		



Effective from Session: 2023-2024											
Course Code	CA213	Title of the Course	PRINCIPLES OF OPERATING SYSTEM	L	Т	Р	С				
Year	Π	Semester	IV	3	1	0	4				
Pre-Requisite	NONE	Co-requisite	NONE								
Course Objectives	 To To To To To To 	understand various oper study process managem understand process sync learn various memory n study file management a	ating system types, Architecture design of OS and their serv ent concepts and various scheduling algorithm. hronization concepts and dead lock handling mechanism. hanagement schemes. and Disk management techniques.	ices.							

	Course Outcomes
CO1	Know different OS types and basic component of OS Architecture.
CO2	Analyze issues in process management and evaluations of various scheduling algorithms.
CO3	Understand process synchronization problem and provide solution for critical section problem and deadlock management.
CO4	Analyze and implement various memory management techniques.
CO5	Identify the use of storage management techniques and solve various disk scheduling problems.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO						
1	Introduction	Definition and types of Operating systems, Batch Systems, Multiprogramming, Time Sharing, Parallel, Distributed and Real-Time Systems, Operating System Structure, Operating System Components and Services, System Calls, System Programs, Virtual Machines.	8	CO1						
2	Process Management	Process Concept, Process Scheduling, Cooperating Processes, Threads, Interprocess Communication, CPU Scheduling Criteria, Scheduling Algorithms, Multiple-Processor Scheduling, Real-Time Scheduling and Algorithm evaluation.	8	CO2						
3	Process Synchronization And Deadlocks	The Critical-Section Problem, Synchronization Hardware, Semaphores, Classical Problems of Synchronization, Critical Regions, Monitors, Deadlocks-System Model, Characterization, Deadlock Prevention, Avoidance and Detection, Recovery from Deadlock, Combined approach to Deadlock Handling.	8	CO3						
4	Memory Management	Logical and Physical Address Space, Swapping, Contiguous Allocation, Paging, Segmentation with Paging, Virtual Memory, Demand Paging and its performance, Page Replacement Algorithms, Allocation of Frames, Thrashing, Page Size and other considerations, Demand Segmentation.	8	CO4						
5	File Management	File Systems, Secondary Storage Structure, File concept, Access methods, Directory implementation, Efficiency and performance, Recovery. Disk Management: Disk Structure, Disk scheduling, Disk management, Recovery, Swap-Space Management, Disk Reliability. Windows NT-Design Principles, System Components, Environmental subsystems, File system, Networking and Program interface. Introduction to Android Operating System.	8	CO5						
Referen	ce Books:									
1. Abrał	nam Siberschatz and Pet	er Galvin "Operating System Concepts", Wiley.								
2. Milar	n Milankovic, "Operatin	g Systems, Concept and Design", McGraw Hill.								
3. Harvey M Deital, "Operating System", Addison Wesley.										
4. Tannenbaum, "Operating System", TMH.										
e-Learning Source:										
1. https://nptel.ac.in/courses/106106144										
2. https:	://nptel.ac.in/courses/10	<u>6105214</u>								

		Course Articulation Matrix: (Mapping of COs with POs and PSOs)																
PO- PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
CO1	3	1			1	1							3	1				
CO2	1	3	1	2	1								2	3				
CO3	2	3		2	1	1		1					3	1				
CO4	1	2	2	1		2	1						2	3				
CO5		3	1	2	1	2		1					2	2				



Effective from Session: 2016	5-2017									
Course Code	CA214	Title of the Course	le of the Course JAVA PROGRAMMING							
Year	II	Semester	IV	3	1	0	4			
Pre-Requisite	NONE	Co-requisite	NONE							
	• To	learn the various feature	es of Java and comparing with C++.							
	• To	learn the Java environm	ent for writing programs and Java program structure.							
	• To	learn the various Object	s oriented features with Java.							
Course Objectives	• To	To learn the Array, String, Exception Handling concepts								
	• To	learn the concepts of Th	read, Package, Applet and implementing them in creating a	web pa	age.					

	Course Outcomes
CO1	Able to understand the features of Java Programming Language with Syntax and structure of Java Programs and how to use various operators
	in Java.
CO2	Able to understand that how to implement the Object oriented features by writing Java programs.
CO3	Ability to define Arrays, Strings, Vectors, Packages etc. in Java and implementing the Exception handling Mechanism in Java.
CO4	Ability to understand the different concepts to create and use Threads and Packages in Java.
CO5	Ability to understand the different concepts of applets and adding them to a HTML File.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO							
1	Java Basic	Comparison of C++ and JAVA, JAVA and Internet, JAVA support systems, JAVA environment, JAVA program structure, Tokens, Statements, JVM, Constant and Variables, Data Types, Declaration of variables, Scope of variables, Symbolic constants, Type Casting. Operators: Arithmetic, Relational, Logical assignments, Increment and Decrement, Conditional, Bitwise, Special, Expressions and its evaluation.	8	CO1							
2	Inheritance	Defining a Class, Adding variables and Methods to classes, Creating Objects, Accessing Class Members, Constructors, Methods Overloading, Static Members, Nesting of Methods. Extending a Class, Overriding Methods, Final Variables and Methods, Final Classes, Finalize Methods, Abstract Methods and Classes, Visibility Control.	8	CO2							
3	Arrays	One Dimensional and Two Dimensional, Strings, Vectors, Wrapper Classes. Interface: Defining Interface, Extending Interface, Implementing Interface, Accessing Interface Variable. Exception Handling: Concepts of Exceptions, Types of Exception, Try and Catch keyword, Nested Try and Catch.	8	CO3							
4	Threads	Creating Threads, Extending Threads Class, Stopping and Blocking a Thread, Life Cycle of a Thread, Using Thread Methods, Thread Exceptions, Thread Priority, Synchronization. Package: System Packages, Using System Package, Adding a Class to a Package, Hiding Classes	8	CO4							
5	Applets	Local and Remote Applets, Writing Applets, Applets life cycle, Creating an executable Applet, Designing a Web Page, Applet Tag, Adding Applet to HTML File, Running the Applet, Passing parameters to Applets, Aligning the display, HTML Tags and Applets, Getting input from the user.	8	CO5							
Referen	ce Books:										
1. E. Ba	llagurusamy, "Programm	ning in Java", TMH Publications.									
2. Peter	Norton, "Peter Norton	Guide to Java Programming", Techmedia Publications.									
3. Naughton, Schildt, "The Complete Reference JAVA 2", TMH.											
4. Dustin R. Callway, "Inside Servlets", Addison Wesley.											
e-Learning Source:											
1. https:	1. https://nptel.ac.in/courses/106105191										
2. https	://onlinecourses.nptel.ac	.in/noc22 cs47									

						С	ourse A	Articul	ation N	Aatrix:	(Mappi	ng of COs	s with PO	s and PSC	Os)			
PO- PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
CO1	3	1		1	1								3	1				
CO2	2		1		1	2		2					3	1				
CO3	2	1	3	1		1	2	1					2	2				
CO4	1	1	2	1		3	1	2					3	1				
CO5	1	1	2	1		2	1						2	1				



Effective from Session: 2016	-2017						
Course Code	CA215	Title of the Course	MICROPROCESSOR LAB	L	Т	Р	С
Year	II	Semester	IV	0	0	3	3
Pre-Requisite	NONE	Co-requisite	NONE				
Course Objectives	 To To To To To To 	impart basic understand understand the addressi understand the instructi- introduce the concepts of develop Assembly lang	ing of the internal organization of 8086 Microprocessor ng mode of 8086 Microprocessor on sets 8086 microprocessor and their utilization of interfacing microprocessors with external devices uage programming skills.				

	Course Outcomes
CO1	Build a program on a microprocessor using instruction set of 8086.
CO2	Understand different addressing modes and instructions of 8086, design and develop assembly language programs using software interrupt subroutines and macros
CO3	Use the knowledge of the 8086 instruction set and utilize it in programming
CO4	Describe the internal architecture and different modes of operations of a typical microcontroller
CO5	Implement programming module of Stepper motor, Seven Segment Display to work with 8086 processor

Experiment No.	Title of the Experiment	Content of Unit	Contact Hrs.	Mapped CO							
1	Processors	Study of 8085 and 8086.	2	CO1							
2	Assembly Language	Assembly Language programs for 8086	2	CO1							
3	Data Transfers	Address and Data Transfer.	2	CO2							
4	Arithmetic	Addition, Subtraction.	2	CO2							
5	Data Transfer	Block transfer	2	CO3							
6	Greatest numbers	Find greatest numbers.	2	CO4							
7	Complements	Find r's and (r-l)'s complements of signed and unsigned number.	2	CO4							
8	Multiplication	Multiplication of two hexadecimal/octal numbers. Division of two hexadecimal/octalnumbers	2	CO5							
Reference Book	KS:										
1. Gaonkar, Rar	1. Gaonkar, Ramesh S, "Microprocessor Architecture, Programming and Applications with 8085", Penram International Publishing.										
2. Ray A K, Bhurchandi K M, "Advanced Microprocessors and Peripherals", TMH.											
e-Learning Source:											
1. http://vlabs.iitb.ac.in/vlabs-dev/labs_local/microprocessor/labs/exp8/simulation.php											
2. https://npte	1.ac.in/courses/108103157										

						С	ourse A	Articul	ation N	Matrix:	(Mappi	ng of CO	s with PO	s and PSC	Ds)			
PO- PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
CO1	1	1	3	1	1		1						2	2				
CO2	2		3	1	1		1						3	1				
CO3	3	1	2	1		1							2	1				
CO4	3	1	1	1		1	1						3	1				
CO5	1	1	3	1	1		1						2	2				



Effective from Session: 2016-2017													
Course Code	CA216	Title of the Course	JAVA PROGRAMMING LAB	L	Т	Р	С						
Year	II	Semester	IV	0	0	3	3						
Pre-Requisite	NONE	Co-requisite	o-requisite NONE										
Course Objectives	•	To learn the object o To learn the concept: To learn the concept: To learn the concept: To learn the concept:	riented concepts and apply them in solving problems in java s of Inheritance and Polymorphism. s of Packages and Interfaces in Java. s of Exception handling and Multithreading. s of Graphical User Interface using Applets and AWT Contro	ols.									

	Course Outcomes
CO1	Able to implement classes, objects, members of a class and relationships among them needed for a specific problem.
CO2	Able to implement programs using concepts of Inheritance and Polymorphism.
CO3	Able to implement the concepts of Packages and Interfaces in Java.
CO4	Able to develop Java Programs using the concepts of Exception Handling and Multithreading.
CO5	Able to develop the GUI based web applications using Applets and various AWT controls.

Experiment No.	Title of the Experiment	Content of Unit	Contact Hrs.	Mapped CO							
1	Classes and Objects	Program illustrating Classes and Objects.	2	CO1							
2	Overloading	Program illustrating Method Overloading and Method Overriding.	2	CO1							
3	Interface	Program illustrating concept of Interface.	2	CO2							
4	Inheritance	Program illustrating use of Final and Super keyword	2	CO2							
5	Packages	Program that illustrates the following a) Creation of simple package. b) Accessing a package.	2	CO3							
6	Threads	Program for creating multiple threads a) Using Thread class. b) Using RunnableInterface.	2	CO4							
7	Exceptions	Program that illustrates the following a) Handling predefined exceptions. b) Handling user defined exceptions.	2	CO4							
8	Applets	Program to illustrate the concept of Applets.	2	CO5							
Reference Book	is:										
1. E. Balagurusa	my, "Programming in Java	", TMH Publications.									
2. Peter Norton,	"Peter Norton Guide to Jav	a Programming", Techmedia Publications.									
e-Learning So	e-Learning Source:										

1. https://onlinecourses.nptel.ac.in/noc22_cs47

						С	ourse A	Articul	ation N	Matrix:	(Mappi	ng of CO	s with PO	s and PSC	Ds)			
PO- PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
CO1	2	1	3	1	1		1						1	2				
CO2	2	1	3		1	1							1	2				
CO3	1	1	2	1		2	2						2	1				
CO4	1	1	3	1		1	1						2	1				
CO5	2	1	3	1		2	1						2	1				



Effective from Session: 2023-2024													
Course Code	CA220	Title of the Course	MINI PROJECT/APPRENTICESHIP/ INTERNSHIP	L	Т	Р	С						
Year	Π	Semester	IV	0	0	3	2						
Pre-Requisite	NONE	Co-requisite	NONE										
Course Objectives	 To To To To To 	strengthen the understan understand the Project I plan for various activiti develop student's abilit understand the importan ried out.	nding of your fundamentals through effective application of Development Process. es of the project and distribute the work amongst team mem tes to transmit technical information clearly and test the sam nee of document design by compiling Technical Report on t	theore bers. ie. he Mir	tical co ni Proje	ncepts. ct work							

	Course Outcomes										
CO1	Understand how to identify the issues and challenges of industry.										
CO2	Understand, plan and execute a Mini Project with team.										
CO3	To inculcate innovative thinking and thereby preparing students for main project.										
CO4	Prepare a technical report based on the Mini project.										
CO5	Deliver technical presentation based on the Mini Project work carried out.										

Exper iment	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO							
1	Phase1	To understand and identify the real world problems, able to collect and prepare requirement document.	3	CO1							
2	Phase2	To enable students to create very precise plan and solution for the identified problem.	3	CO2							
3	Phase3	To build project team among the students for the project.	3	CO3							
4	Phase4	Phase4 To implement the project by using appropriate tools and techniques and prepare a technical mini project report.									
5	Phase5	To improve the team building, communication and management skills of the students.	3	CO5							
Reference E	Books:										
1.	Mark O'Ncile, "Web	Services – Security", TMH.									
2.	Ivan Bayross, "HTM	L, DHTML, JavaScript, Perl CGI", BPB Publication.									
3.	Jessica Burdman, "Co	ollaborative Web Development", Pearson Education Asia									
e-Learnin	g Source:										
1. https://r	1. https://nptel.ac.in/courses/110104073										
2. https://r	ptel.ac.in/courses/11	0104073									

						С	ourse A	Articul	ation N	Aatrix:	(Mappi	ng of CO	s with PO	s and PSO	Ds)			
PO- PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
CO1	3	1			1	1							3	1				
CO2	3	1	2			1	1	2					2	2				
CO3		2	3	1	1	2	2						3	1				
CO4	1	3	2	2		2	1						2	2				
CO5		2	2	1	2	1		1					2	2				