SHREE DEVI INSTITUTE OF TECHNOLOGY

(Affiliated to Visvesvaraya Technological University & Recognized by AICTE)

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Academic year : 2022-2023

Semester-I

Subject: Mathematical Foundation for Computer Applications	**Subject Code:** 22MCA11

Course Outcomes

CO1	Apply the fundamentals of set theory and matrices for the given problem.
CO2	Apply the types of distribution, evaluate the mean and variance for the given case study/ problem
CO3	Solve the given problem by applying the Mathematical logic concepts.
CO4	Model the given problem by applying the concepts of graph theory
CO5	Design strategy using gaming theory concepts for the given problem.
CO6	Identify and list the different applications of discrete mathematical concepts in computer science.

CO-PO-PSO Mapping

Cos	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1			3	3								
CO2			3	3								
CO3			3	3								
CO4			3	3								
CO5			3	3								
CO6			3	3								
Average			3	3								

Subject: Operating System concepts.	**Subject Code:** 22MCA12

Course Outcomes

CO1	Analyse the basic Operating System Structure and concept of Process Management
CO2	Analyse the given Synchronization/ Deadlock problem to solve and arrive at valid conclusions.
CO3	Analyse OS management techniques and identify the possible modifications for the given problem context.
CO4	Demonstrate the working of basic commands of Unix environment including file processing 5
CO5	Demonstrate the usage of different shell commands, variable and AWK filtering to the given problem

CO-PO-PSO Mapping

Cos	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1		3								2		
CO2		3								2		
CO3		3								2		
CO4		3								2		
CO5		3								2		
Average		3								2		

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Subject: Data Structures with Algorithm											**Subject Code:** 22MCA13
Course Outcomes											
CO1	Demonstrate different data structures, its operations using C programming..										
CO2	Analyse the performance of Stack, Queue, Lists, Trees, Hashing, Searching and Sorting techniques.										
CO3	Implement some applications of data structures in a high-level language such as C/C++										
CO4	Design and apply appropriate data structures for solving computing problems.										
CO5	Compute the efficiency of algorithms in terms of asymptotic notations for the given problem.										
CO-PO-PSO Mapping											
Cos	**Pos**										
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1					3							3
CO2					3							3
CO3					3							3
CO4					3							3
CO5					3							3
Average					3							3

Subject: Computer Networks											**Subject Code:** 22MCA14
Course Outcomes											
CO1	Apply the basic concepts of networking and to analyse different parameters such as bandwidth, delay, throughput of the networks for the given problem.										
CO2	Apply different techniques to ensure the reliable and secured communication in wired and wireless communication										
CO3	A nalyse the networking concepts of TCP/IP for wired and wireless component										
CO4	Identify the issues of Transport layer to analyse the congestion control mechanism										
CO5	Design network topology with different protocols and analyse the performance using NS2										
CO-PO-PSO Mapping											
Cos	**Pos**										
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1	3											2
CO2	3											2
CO3	3											2
CO4	3											2
CO5	3											2
Average	**3**											2

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Subject: design and analysis of algorithm	**Subject Code:** 22MCA15

Course Outcomes

CO1	Categorize problems based on their characteristics and practical importance.
CO2	Develop Algorithms using iterative/recursive approach
CO3	Compute the efficiency of algorithms in terms of asymptotic notations
CO4	Design algorithm using an appropriate design paradigm for solving a given problem
CO5	Classify problems as P, NP or NP Complete
C06	Implement algorithms using various design strategies and determine their order ofgrowth.

CO-PO-PSO Mapping

Cos	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1		3									2	
CO2		3									2	
CO3		3									2	
CO4		3									2	
CO5		3									2	
Average		3									2	

Subject: Data Structures with Algorithms Lab	**Subject Code:** 22MCAL16

Course Outcomes

CO1	Implement sorting / searching techniques, and validate input/output for the given problem.
CO2	Implement data structures (namely Stacks, Queues, Circular Queues, Linked Lists, and Trees), its operations and algorithms
CO3	Implement the algorithm to find whether the given graph is connected or not and conclude on the performance of the technique implemented.
CO4	Design and apply appropriate data structures for solving computing problems
CO5	Implement the techniques for evaluating the given expression.

CO-PO-PSO Mapping

COs	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1				2					2			
CO2				2					2			
CO3				2					2			
CO4				2					2			
CO5				2					2			
Average				2					2			

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Subject: Computer Networks Lab	**Subject Code:** 22MCAL17

Course Outcomes

CO1	Apply the basic concepts of networking and to analyse different parameters such as bandwidth, delay, throughput of the networks for the given problem.
CO2	Apply different techniques to ensure the reliable and secured communication in wired and wireless communication
CO3	Analyse the networking concepts of TCP/IP for wired and wireless components
CO4	Identify the issues of Transport layer to analyse the congestion control mechanism
CO5	Design network topology with different protocols and analyse the performance using any simulator

CO-PO-PSO Mapping

Cos	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1											2	2
CO2											2	2
CO3											2	2
CO4											2	2
CO5											2	2
Average											2	2

Subject: Research Methodology & IPR	**Subject Code:** 22RMI18

Course Outcomes

CO1	Identify the suitable research methods and articulate the research steps in a proper sequence for the given problem.
CO2	Carry out literature survey, define the problem statement and suggest suitable solution for the given problem and present in the format of the research paper (IEEE).
CO3	Analyse the problem and conduct experimental design with the samplings
CO4	Perform the data collection from various sources segregate the primary and secondary data
CO5	Apply some concepts/section of Copy Right Act /Patent Act /Cyber Law/ Trademark to the given case and develop –conclusions

CO-PO-PSO Mapping

COs	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1	3									3		
CO2	3									3		
CO3	3									3		
CO4	3									3		
CO5	3									3		
Average	**3**									3		

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Subject: Basics of programming and computer organization	**Subject Code:** 22MCA110
Course Outcomes	
CO1	Identify the suitable research methods and articulate the research steps in a proper sequence for the given problem.
CO2	Carry out literature survey, define the problem statement and suggest suitable solution for the given problem and present in the format of the research paper (IEEE).
CO3	Analyse the problem and conduct experimental design with the samplings
CO4	Perform the data collection from various sources segregate the primary and secondary data
CO5	Apply some concepts/section of Copy Right Act /Patent Act /Cyber Law/ Trademark to the given case and develop –conclusions

CO-PO-PSO Mapping

COs	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1			3					3				
CO2			3					3				
CO3			3					3				
CO4			3					3				
CO5			3					3				
Average			3					3				

SEM 2

Subject: Database Management System	**Subject Code:** 22MCA21
Course Outcomes	
CO1	Apply the basic concepts of database management in designing the database for the given problem.
CO2	Design entity-relationship diagrams to the given problem to develop database application with appropriate fields and validations.
CO3	Implement a database schema for the given problem domain
CO4	Formulate and execute SQL queries to the given problem.
CO5	Apply normalization techniques to improve the database design to the given problem

CO-PO-PSO Mapping

Cos	**POs**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1			3	3								
CO2			3	3								
CO3			3	3								
CO4			3	3								
CO5			3	3								
Average			3	3								

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Subject: Object Oriented Programming with Java	**Subject Code:** 22MCA22

Course Outcomes

CO1	Demonstrate the basic programming constructs of Java and OOP concepts to develop Java programs for a given scenario.
CO2	Illustrate the concepts of generalization and run time polymorphism applications to develop reusable components
CO3	Demonstrate the usage of Packages, Interfaces, Exceptions and Multithreading in building given applications.
CO4	Apply Enumerations, Wrappers, Auto boxing, Collection framework and I/O operations for effective coding to the given problem
CO5	Implement the concepts of Applets, and networking using Java network classes for developing the distributed applications to the given problem.

CO-PO-PSO Mapping

Cos	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1	3									2		
CO2	3									2		
CO3	3									2		
CO4	3									2		
CO5	3									2		
Average	**3**									2		

Subject: Software Engineering	**Subject Code:** 22MCA23

Course Outcomes

CO1	Identify and define different requirements for the given problem and present in the IEEE format
CO2	Use modern tool to create dynamic diagrams to represent the design for the given problem
CO3	Draw class diagram , analyse the different types of association that exists as per the given problem and represent them using UML notations.
CO4	Analyse the given system to identify actors, use cases to design use case diagrams for the given problem using RSA/open source tool.
CO5	Design the static/dynamic models to meet application requirements of the given system and generate code (skeleton) using the modern tool

CO-PO-PSO Mapping

Cos	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1		3									2	
CO2		3									2	
CO3		3									2	
CO4		3									2	
CO5		3									2	
Average		3									2	

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Subject: Web Technologies												**Subject Code:** 22MCA24
Course Outcomes												
CO1	Apply the features JQuery for the given web based problem											
CO2	Demonstrate the development of XHTML documents using JavaScript and CSS											
CO3	Illustrate the use of CGI and Perl programs for different types of server side applications											
CO4	Design and implement user interactive dynamic web based applications.											
CO5	Demonsrtae applications of Angular JS and JQuery for the given problem											
CO-PO-PSO Mapping												
COs	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1						3	2					
CO2						3	2					
CO3						3	2					
CO4						3	2					
CO5						3	2					
Average						3	2					

Subject: COMPUTER GRAPHICS WITH OPEN GL												**Subject Code:** 22MCA251
Course Outcomes												
CO1	Apply the features JQuery for the given web based problem											
CO2	Demonstrate the development of XHTML documents using JavaScript and CSS											
CO3	Illustrate the use of CGI and Perl programs for different types of server side applications											
CO4	Design and implement user interactive dynamic web based applications.											
CO5	Demonsrtae applications of Angular JS and JQuery for the given problem											
CO-PO-PSO Mapping												
COs	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1					3			2				
CO2					3			2				
CO3					3			2				
CO4					3			2				
CO5					3			2				
Average					3			2				

Subject: Data Mining and Business Intelligence		**Subject Code:** 22MCA252
Course Outcomes		
CO1	Learn the concept of Data warehousing and OLAP	
CO2	:Understand storage and retrieval technique of data from DATA CUB	
CO3	:Analyze different types of data and different preprocessing techniques.	
CO4	Evaluate various Association algorithms and its applications.	
CO5	Apply different Classification technique.	
CO-PO-PSO Mapping		
COs	**Pos**	

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	1	2	3	4	5	6	7	8	9	10	11	12	
CO1		3							2				
CO2		3							2				
CO3		3							2				
CO4		3							2				
CO5		3							2				
Average		3							2				

Subject: Enterprise Resource Planning.									**Subject Code:** 22MCA253				
Course Outcomes													
CO1	Describe about evolution, characteristics and services in SOA with SOA architecture, WSDL, SOAP and UDDI.												
CO2	: Analyze the SOA Architectural style, SOA strategies, modeling web services												
CO3	: Design, implementing process of SOA in web service.												
CO4	: Apply the SOA operational style for the web services.												
CO5	: Apply the SOA operational style for the web services.												
CO-PO-PSO Mapping													
COs	**Pos**												
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
CO1		2					2						
CO2		2					2						
CO3		2					2						
CO4		2					2						
CO5		2					2						
Average		2					2						

Subject: USER INTERFACE DESIGN									**Subject Code:** 22MCA254				
Course Outcomes													
CO1	Use the new technologies that provide interactive devices and interfaces												
CO2	apply the process and evaluate UID.												
CO3	:understand Direct Manipulation and Virtual Environment												
CO4	:discuss the command, natural languages and issues in design for maintaining Qos												
CO5	:persuade user documentations and information search.												
CO-PO-PSO Mapping													
COs	**Pos**												
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
CO1	3									3			
CO2	3									3			
CO3	3									3			
CO4	3									3			
CO5	3									3			
Average	**3**									3			

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Subject: Optimization Techniques												**Subject Code:** 22MCA255
Course Outcomes												
CO1	Use the new technologies that provide interactive devices and interfaces											
CO2	apply the process and evaluate UID.											
CO3	:understand Direct Manipulation and Virtual Environment											
CO4	:discuss the command, natural languages and issues in design for maintaining Qos											
CO5	:persuade user documentations and information search.											
CO-PO-PSO Mapping												
COs	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1						2	2	2				
CO2						2	2	2				
CO3						2	2	2				
CO4						2	2	2				
CO5						2	2	2				
Average						2	2	2				

Subject: Cryptography and Network Security												**Subject Code:** 22MCA261
Course Outcomes												
CO1	:Identify common network security vulnerabilities/attacks;											
CO2	Understand the foundations of Cryptography and network security.											
CO3	:Understand encryption and decryption of messages using block ciphers											
CO4	:Demonstrate detailed knowledge of the role of encryption to protect data.											
CO5	: Analyze Network Security Practice And System Security.											
CO-PO-PSO Mapping												
COs	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1			3	3								
CO2			3	3								
CO3			3	3								
CO4			3	3								
CO5			3	3								
Average			3	3								

Subject: Artificial Intelligence	**Subject Code:** 22MCA262
Course Outcomes	
CO1	After studying this course, students will be able to: CO1: Acquire knowledge of - Uncertainty and Problem solving techniques - Symbolic knowledge representation to specify domains - Reasoning tasks of a situated software agent
CO2	: Comprehend on - different logical systems for inference over formal domain representations - trace on particular inference algorithm working on a given problem specification
CO3	Apply and Analyse AI technique to any given concrete problem
CO4	Interpret and Implement non-trivial AI techniques in a relatively large system

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CO-PO-PSO Mapping												
COs	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1			3						3			
CO2			3						3			
CO3			3						3			
CO4			3						3			
Average			3						3			

Subject: Mobile Application Development		**Subject Code:** 22MCA263
Course Outcomes		
CO1	: Illustrate effective user interfaces that leverage evolving mobile device capabilities	
CO2	Develop applications using software development kits (SDKs), frameworks and toolkits	
CO3	: Establish various methods to integrate database and server-side technologies	
CO4	Design and develop open source software based mobile applications	
CO5	Build and deploy competent mobile development solutions	

CO-PO-PSO Mapping												
COs	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1		3						3				
CO2		3						3				
CO3		3						3				
CO4		3						3				
CO5		3						3				
Average		3						3				

Subject: Distributed operating System		**Subject Code:** 22MCA264
Course Outcomes		
CO1	Analyse the basic Operating System Structure and concept of Process Management	
CO2	Analyse the given Synchronization/ Deadlock problem to solve and arrive at valid conclusions.	
CO3	Analyse OS management techniques and identify the possible modifications for the given problem context.	
CO4	Demonstrate the working of basic commands of Unix environment including file processing 5	
CO5	Demonstrate the usage of different shell commands, variable and AWK filtering to the given problem	

CO-PO-PSO Mapping												
COs	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1					3						2	
CO2					3						2	
CO3					3						2	
CO4					3						2	
CO5					3						2	
Average					3						2	

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Subject: Natural Language Processing	**Subject Code:** 22MCA265
Course Outcomes	
CO1	Analyse the basic Operating System Structure and concept of Process Management
CO2	Analyse the given Synchronization/ Deadlock problem to solve and arrive at valid conclusions.
CO3	Analyse OS management techniques and identify the possible modifications for the given problem context.
CO4	Demonstrate the working of basic commands of Unix environment including file processing 5
CO5	Demonstrate the usage of different shell commands, variable and AWK filtering to the given problem

CO-PO-PSO Mapping

COs	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1	3									2		
CO2	3									2		
CO3	3									2		
CO4	3									2		
CO5	3									2		
Average	**3**									2		

Subject: DBMS LABORATORY	**Subject Code:** 22MCAL27
Course Outcomes	
CO1	Analyse the basic Operating System Structure and concept of Process Management
CO2	Analyse the given Synchronization/ Deadlock problem to solve and arrive at valid conclusions.
CO3	Analyse OS management techniques and identify the possible modifications for the given problem context.
CO4	Demonstrate the working of basic commands of Unix environment including file processing 5
CO5	Demonstrate the usage of different shell commands, variable and AWK filtering to the given problem

CO-PO-PSO Mapping

COs	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1				3		3						
CO2				3		3						
CO3				3		3						
CO4				3		3						
CO5				3		3						
Average				3		3						

Subject: JAVA PROGRAMMING LABORTORY	**Subject Code:** 22MCAL28
Course Outcomes	
CO1	Analyse the basic Operating System Structure and concept of Process Management
CO2	Analyse the given Synchronization/ Deadlock problem to solve and arrive at valid conclusions.
CO3	Analyse OS management techniques and identify the possible modifications for the given problem context.
CO4	Demonstrate the working of basic commands of Unix environment including file processing 5

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CO5	Demonstrate the usage of different shell commands, variable and AWK filtering to the given problem

CO-PO-PSO Mapping

COs	Pos											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1				3								3
CO2				3								3
CO3				3								3
CO4				3								3
CO5				3								3
Average				3								3
												3

Subject: SEMINAR	**Subject Code:** 22MCA29

Course Outcomes

CO1	Analyse the basic Operating System Structure and concept of Process Management
CO2	Analyse the given Synchronization/ Deadlock problem to solve and arrive at valid conclusions.
CO3	Analyse OS management techniques and identify the possible modifications for the given problem context.
CO4	Demonstrate the working of basic commands of Unix environment including file processing 5
CO5	Demonstrate the usage of different shell commands, variable and AWK filtering to the given problem

CO-PO-PSO Mapping

COs	Pos											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1		3					3					
CO2		3					3					
CO3		3					3					
CO4		3					3					
CO5		3					3					
Average		3					3					

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SEM 3

Subject: Data Analytics using Python	**Subject Code:** 22MCA31
Course Outcomes	
CO1	Demonstrate basic data analytics principles and techniques
CO2	Apply control structures the concepts of inheritance and overloading for a given problem
CO3	Perform essential operations using Numpy and Pandas
CO4	Structuring the data in the dataset for a given problem
CO5	Demonstrate the concepts of data visualization.

CO-PO-PSO Mapping

Cos	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1			3	3								
CO2			3	3								
CO3			3	3								
CO4			3	3								
CO5			3	3								
Average			3	3								

Subject: IOT	**Subject Code:** 22MCA32
Course Outcomes	
CO1	Analyse the IoT architecture and design along with functional/compute stack and data management..
CO2	Apply IOT architecture for a given problem
CO3	Analyse the application protocol, transport layer methods for the given business case.
CO4	Analyse the application of data analytics for IOT for a given
CO5	Analyse the architecture and develop programming using modern tools for the given use case

CO-PO-PSO Mapping

Cos	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1						3	3					
CO2						3	3					
CO3						3	3					
CO4						3	3					
CO5						3	3					
Average						3	3					

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Subject: Block chain Technology											**Subject Code:** 22MCA331
Course Outcomes											
CO1	Understand the structure of a blockchain networks										
CO2	Design and analyze the application										
CO3	Understand how block chain systems										
CO4	Design ,build and deploy smart contacts										
CO5	Evaluate security,privacy and efficiency										
CO-PO-PSO Mapping											
Cos	**Pos**										
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1		3										3
CO2		3										3
CO3		3										3
CO4		3										3
CO5		3										3
Average		3										3

Subject: CLOUD COMPUTING											**Subject Code:** 22MCA332
Course Outcomes											
CO1	Understand the structure of a blockchain networks										
CO2	Design and analyze the application										
CO3	Understand how block chain systems										
CO4	Design ,build and deploy smart contacts										
CO5	Evaluate security,privacy and efficiency										
CO-PO-PSO Mapping											
Cos	**Pos**										
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1						1			2	1		1
CO2						1			2	1		1
CO3						1			2	1		1
CO4						1			2	1		1
CO5						1			2	1		1
Average						1			2	1		1

Subject: DIGITAL MARKETING	**Subject Code:** 22MCA333
Course Outcomes	
CO1	: Understand the cloud computing delivery model and the enabling technologies.
CO2	Understand the cloud computing platforms, key technology drivers and cloud programming/software environments
CO3	: Identify the need for cloud computing model and compare various key enabling technologies.
CO4	Design ,build and deploy smart contacts
CO5	Analyze and choose an appropriate programming environment for building cloud applications.
CO-PO-PSO Mapping	

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Cos	Pos											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1											3	3
CO2											3	3
CO3											3	3
CO4											3	3
CO5											3	3
Average											3	3

Subject: Object Oriented Modeling and Design	**Subject Code:** 22MCA334
Course Outcomes	
CO1	Demonstrate the basic programming constructs of Java and OOP concepts to develop Java programs for a given scenario.
CO2	Illustrate the concepts of generalization and run time polymorphism applications to develop reusable components
CO3	Demonstrate the usage of Packages, Interfaces, Exceptions and Multithreading in building given applications.
CO4	Apply Enumerations, Wrappers, Auto boxing, Collection framework and I/O operations for effective coding to the given problem
CO5	Implement the concepts of Applets, and networking using Java network classes for developing the distributed applications to the given problem.

CO-PO-PSO Mapping

Cos	Pos											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	3	3										
CO2	3	3										
CO3	3	3										
CO4	3	3										
CO5	3	3										
Average	**3**	3										

Subject: NOSQL	**Subject Code:** 22MCA335
Course Outcomes	
CO1	Assimilate fundamental concepts in the context of a number of different NOSQL products
CO2	Construct redefined logical database
CO3	Execute various CRUD operations
CO4	Build a database system
CO5	Use the mongoDB

CO-PO-PSO Mapping

Cos	Pos											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1		3					3					
CO2		3					3					
CO3		3					3					

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CO4		3					3					
CO5		3					3					
Average		3					3					

Subject: Advanced Java and J2EE	**Subject Code:** 22MCA341

Course Outcomes

CO1	Apply the concept of Servlet and its life cycle to create web application
CO2	Apply JSP tags and its services to web application.
CO3	To study the various types of testing.
CO4	Differentiate between functional testing and structural testing
CO5	Analyze the performance of fault based testing, planning and Monitoring the process, Documentation testing.

CO-PO-PSO Mapping

Cos	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1				3	3							
CO2				3	3							
CO3				3	3							
CO4				3	3							
CO5				3	3							
Average				3	3							

Subject: Introduction to Dot Net framework for application development	**Subject Code:** 22MCA342

Course Outcomes

CO1	Understand C# and client-server concepts using .Net Frame Work Components
CO2	Apply delegates, event and exception handling to incorporate with ASP, Win Form, ADO.NET.
CO3	Analyze the use of .Net Components depending on the problem statement.
CO4	Implement & develop a web based and Console based application with Database connectivity

CO-PO-PSO Mapping

Cos	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1	3										3	
CO2	3										3	
CO3	3										3	
CO4	3										3	
Average	**3**										3	

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Subject: Knowledge Engineering												**Subject Code:** 22MCA343
Course Outcomes												
CO1	Understand C# and client-server concepts using .Net Frame Work Components											
CO2	Apply delegates, event and exception handling to incorporate with ASP, Win Form, ADO.NET.											
CO3	Analyze the use of .Net Components depending on the problem statement.											
CO4	Implement & develop a web based and Console based application with Database connectivity											
CO5												
CO-PO-PSO Mapping												
Cos	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1					3			3				
CO2					3			3				
CO3					3			3				
CO4					3			3				
CO5					3			3				
Average					3			3				

Subject: Software Testing]]												**Subject Code:** 22MCA344
Course Outcomes												
CO1	Acquire knowledge of basic principles and knowledge of software testing and debugging and test cases.											
CO2	Will be able to understand the perceptions on testing like levels of testing, generalized pseudo code and with related examples.											
CO3	To study the various types of testing											
CO4	Differentiate between functional testing and structural testing.											
CO5	Analyze the performance of fault based testing, planning and Monitoring the process, Documentation testing											
CO-PO-PSO Mapping												
Cos	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1	3	3										
CO2	3	3										
CO3	3	3										
CO4	3	3										
CO5	3	3										
Average	**3**	3										

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Subject: Virtual Reality	**Subject Code:** 22MCA345
Course Outcomes	
CO1	Acquire knowledge of basic principles and knowledge of software testing and debugging and test cases.
CO2	Will be able to understand the perceptions on testing like levels of testing, generalized pseudo code and with related examples.
CO3	To study the various types of testing
CO4	Differentiate between functional testing and structural testing.
CO5	Analyze the performance of fault based testing, planning and Monitoring the process, Documentation testing

CO-PO-PSO Mapping

Cos	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1			3						3			
CO2			3						3			
CO3			3						3			
CO4			3						3			
CO5			3						3			
Average			3						3			

Subject: Data Analytics Lab with Mini-project	**Subject Code:** 22MCAL36
Course Outcomes	
CO1	Develop python program to perform search/sort on a given data set
CO2	Demonstrate object oriented principles
CO3	Demonstrate data visualization using Numpy for a given problem
CO4	Demonstrate regression model for a given problem
CO5	Design and develop an application for the given problem

CO-PO-PSO Mapping

Cos	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1	3											3
CO2	3											3
CO3	3											3
CO4	3											3
CO5	3											3
Average	**3**											3

Subject: IoT Lab with Mini Project	**Subject Code:** 22MCAL37
Course Outcomes	
CO1	Apply the concept of Servlet and its life cycle to create web application.
CO2	Apply IOT techniques for a given problem
CO3	Analyse the application protocol, transport layer methods for the given business case.
CO4	Design and develop an application for the given problem for the societal/industrial problems
CO5	Develop python program by applying suitable feature for the given problem and verify the output

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CO-PO-PSO Mapping												
Cos	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1						3				3		
CO2						3				3		
CO3						3				3		
CO4						3				3		
CO5						3				3		
Average						3				3		

Subject: SOCIAL PROJECT	**Subject Code:** 22MCAL38
Course Outcomes	
CO1	Apply the concept of Servlet and its life cycle to create web application.
CO2	Apply IOT techniques for a given problem
CO3	Analyse the application protocol, transport layer methods for the given business case.
CO4	Design and develop an application for the given problem for the societal/industrial problems
CO5	Develop python program by applying suitable feature for the given problem and verify the output

CO-PO-PSO Mapping												
Cos	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1							3				3	
CO2							3				3	
CO3							3				3	
CO4							3				3	
CO5							3				3	
Average							3				3	

Subject: Internship	**Subject Code:** 22MCA39
Course Outcomes	
CO1	Analyse the real-time industry/research work environment with emphasis on organizational structure/job process/different departments and functions / tools /technology.
CO2	Develop applications using modern tools and technologies.
CO3	Demonstrate self-learning capabilities with an effective report and detailed presentation.

CO-PO-PSO Mapping												
Cos	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1				3		3						
CO2				3		3						
CO3				3		3						
Average				3		3						

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Subject: Deep Learning	**Subject Code:** 22MCA411
Course Outcomes	
CO1	Understand the main fundamentals that drive deep learning
CO2	Be able to build train and apply fully connected deep neural networks
CO3	Know how to implement efficient CNN Or RNN
CO4	Understand the key features in a neural networks architecture
CO5	

CO-PO-PSO Mapping

Cos	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1	3						3					
CO2	3						3					
CO3	3						3					
CO4	3						3					
CO5	3						3					
Average	**3**						3					

Subject: Big Data Analytics	**Subject Code:** 22MCA412
Course Outcomes	
CO1	Identify the business problem for a given context and frame the objectives to solve it through data analytics tools.
CO2	Apply various algorithms for handling large volumes of data.
CO3	Illustrate the architecture of HDFS and explain functioning of HDFS clusters.
CO4	Analyse the usage of Map-Reduce techniques for solving big data problems.
CO5	Conduct experiment with various datasets for analysis / visualization and arrive at valid conclusions.

CO-PO-PSO Mapping

Cos	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1											3	3
CO2											3	3
CO3											3	3
CO4											3	3
CO5											3	3
Average											3	3

Subject: Wireless Ad Hoc Networks	**Subject Code:** 22MCA413
Course Outcomes	
CO1	Apply the concept and usages web based programming techniques.
CO2	Learning and Developing XHTML documents using JavaScript and CSS
CO3	To be familiar in the use of CGI and Perl programs for different types of server side applications.
CO4	Design and implement user interactive dynamic web based applications.
CO5	Evaluate the given wed application and enhance it using latest web technologies.

CO-PO-PSO Mapping

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Cos	Pos											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1				3								3
CO2				3								3
CO3				3								3
CO4				3								3
CO5				3								3
Average				3								3

Subject: Software Project Management		**Subject Code:** 22MCA414
Course Outcomes		
CO1	Understand the practices and methods for successful software project management	
CO2	Identify techniques for requirements, policies and decision making for effective resource management	
CO3	: Apply the evaluation techniques for estimating cost, benefits, schedule and risk	
CO4	: Devise a framework for software project management plan for activities, risk, monitoring and control	
CO5	: Devise a framework to manage people	

CO-PO-PSO Mapping

Cos	Pos											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1		3								3		
CO2		3								3		
CO3		3								3		
CO4		3								3		
CO5		3								3		
Average		3								3		

Subject: Software Defined Networks		**Subject Code:** 22MCA415
Course Outcomes		
CO1	Understand the practices and methods for successful software project management	
CO2	Identify techniques for requirements, policies and decision making for effective resource management	
CO3	: Apply the evaluation techniques for estimating cost, benefits, schedule and risk	
CO4	: Devise a framework for software project management plan for activities, risk, monitoring and control	
CO5	: Devise a framework to manage people	

CO-PO-PSO Mapping

Cos	Pos											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1		3						3				
CO2		3						3				
CO3		3						3				
CO4		3						3				
CO5		3						3				
Average		3						3				

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Subject: IT Project Management												**Subject Code:** 22MCA421
Course Outcomes												
CO1	Understand the practices and methods for successful software project IT management											
CO2	Identify techniques for requirements, policies and decision making for effective resource management											
CO3	: Apply the evaluation techniques for estimating cost, benefits, schedule and risk											
CO4	: Devise a framework for software project management plan for activities, risk, monitoring and control											
CO5	: Devise a framework to manage people											
CO-PO-PSO Mapping												
Cos	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1				3	3							
CO2				3	3							
CO3				3	3							
CO4				3	3							
CO5				3	3							
Average				3	3							

Subject: Semantic Web and Social Networks												**Subject Code:** 22MCA422
Course Outcomes												
CO1	Understand the basics of semantic web and social networks											
CO2	Understand the electronic source for network analysis											
CO3	Modeling and aggregating sociak network data											
CO4	Develop social semantic applications											
CO5	Evaluate web based social network and ontology											
CO-PO-PSO Mapping												
Cos	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1									3	3		
CO2									3	3		
CO3									3	3		
CO4									3	3		
CO5									3	3		
Average									3	3		

Subject: Game Designing												**Subject Code:** 22MCA423
Course Outcomes												
CO1	Gain an understanding terminology of game design											
CO2	Demonstrate a deep understanding the principles of game design											
CO3	Demonstrate the basic principle requires to produce games											
CO4	Explain game development theory and architecture											
CO5	Understanging the designing concepts											
CO-PO-PSO Mapping												
Cos	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**

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CO1		3									3		
CO2		3									3		
CO3		3									3		
CO4		3									3		
CO5		3									3		
Average		3									3		

Subject: Agile Technology											**Subject Code:** 22MCA424		
Course Outcomes													
CO1	Fundamental of agile technology												
CO2	Explain agile principles												
CO3	Apply scrum principles												
CO4	Apply practices of XP and incremental design												
CO5	Reduce source delivery												
CO-PO-PSO Mapping													
Cos	**Pos**												
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
CO1			3									3	
CO2			3									3	
CO3			3									3	
CO4			3									3	
CO5			3									3	
Average			3									3	

Subject: Software Metrics & Quality Assurance											**Subject Code:** 22MCA425		
Course Outcomes													
CO1	Describe fundamental concets of software quality assurance												
CO2	Explore test planning and its management												
CO3	Understand fundamentalconcepts of software automation												
CO4	Demonstrate software quality tools and analyze their effectiveness												
CO5	Apply selenium automation tool for testing web based application												
CO-PO-PSO Mapping													
Cos	**Pos**												
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
CO1						3					3		
CO2						3					3		
CO3						3					3		
CO4						3					3		
CO5						3					3		
Average						3					3		

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Subject: TECHNICAL SEMINAR	**Subject Code:** 22MCA43

Course Outcomes

CO1	Describe fundamental concets of software quality assurance
CO2	Explore test planning and its management
CO3	Understand fundamentalconcepts of software automation
CO4	Demonstrate software quality tools and analyze their effectiveness
CO5	Apply selenium automation tool for testing web based application

CO-PO-PSO Mapping

Cos	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1	3						3					
CO2	3						3					
CO3	3						3					
CO4	3						3					
CO5	3						3					
Average	**3**						3					

Subject: PROJECT WORK PHASE 2	**Subject Code:** 22MCA44

Course Outcomes

CO1	Describe fundamental concets of software quality assurance
CO2	Explore test planning and its management
CO3	Understand fundamentalconcepts of software automation
CO4	Demonstrate software quality tools and analyze their effectiveness
CO5	Apply selenium automation tool for testing web based application

CO-PO-PSO Mapping

Cos	**Pos**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1				3				3				
CO2				3				3				
CO3				3				3				
CO4				3				3				
CO5				3				3				
Average				3				3				

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