R.M.K. ENGINEERING COLLEGE

(An Autonomous Institution)
R.S.M NAGAR, KAVARAIPETTAI – 601 206
Affiliated to Anna University, Chennai /Approved by AICTE, New Delhi/
Accredited by NAAC with A+ Grade / All the eligible UG Programs are Accredited by NBA, New Delhi
Course Outcomes-2024-25 ODD/EVEN Semester

Department of Computer Science and Engineering

Semester	Subject Code	Course Code/ Course Name
3	24MA301	Discrete Mathematics
3	24CS301	Computer Organization and Architecture
3	24CS302	Advanced Java Programming (Lab Integrated)
3	24GE301	Universal Human Values 2: Understanding Harmony
3	24CS304	Operating Systems (Lab Integrated)
3	24CS303	Database Management Systems (Lab Integrated)
3	24ME311	Product Development Lab - 1
3	24CS311	Aptitude and Coding Skills I
5	22CS902	Social Network Security (Lab Integrated)
5	22CS501	Computer Networks (Lab Integrated)
5	22AI401	Machine Learning (Lab Integrated)
5	22CS502	Theory of Computation (Lab Integrated)
5	22IT910	Rest Application Development Using Spring Boot and JPA (Lab Integrated
5	22CS511	Advanced Aptitude and Coding Skills I
5	22CS935	Data Exploration and Visualization
5	22CS937	Reinforcement and Ensemble Learning
7	22CS930	Enterprise Cyber Security
7	22CS912	Cloud Security Foundations
7	22CS919	Usability Design of Software Applications
7	22CS701	Cryptography and Cyber Security (Lab Integrated)
7	22CS702	Data Analytics (Lab Integrated)
7	22CS934	Cloud Services Management
7	22CS915	Mobile Architecture and Application Development
7	22AI903	Text and Speech Analytics
7	22CS936	Neural Networks and Deep Learning

SEMESTER 3

1. 22MA301 - DISCRETE MATHEMATICS

Course Outcomes (COs)	Description
C201.1	Use the matrix algebra methods to diagonalize the matrix.
C201.2	Determine the evolute of the curve.
C201.3	Apply differential calculus ideas on the function of several variables.
C201.4	Evaluate area and volume by applying the concept of multiple integral.
C201.5	Utilize the concept of vector calculus in evaluating integrals.

CO-PO/PSO MAPPING:

COs	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1	1	-	-	-	-	-	-	-	1	3	2	2
CO2	3	2	-	1	-	-	-	-	-	-	-	1	2	2	2
CO3	3	2	1	-	-	-	-	-	-	-	-	1	3	2	2
CO4	3	2	-	1	-	-	-	-	-	-	-	1	3	2	2
CO5	3	2	1	-	-	-	-	-	-	-	-	1	3	2	2

2. 22GE301 - UNIVERSAL HUMAN VALUES II: UNDERSTANDING HARMONY

Course Outcomes (COs)	Description
C202.1	Would become more aware of themselves, and their surroundings (family, society, nature)
C202.2	Would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.
C202.3	would have better critical ability.
C202.4	Would become sensitive to their commitment towards what they have understood (human values, human relationship and human society).
C202.5	Would be able to apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.

CO-PO/PSO MAPPING:

COs	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	2	1	1	3	1	1	1	1	-	-
CO2	-	-	-	-	-	3	3	1	2	1	2	1	2	1	-
CO3	-	-	-	-	-	1	1	1	1	1	1	1	1	-	-
CO4	-	-	-	-	-	1	1	3	3	1	1	1	2	-	-
CO5	-	-	-	-	-	2	2	3	1	2	1	3	2	-	-

3. 22CS301 - ADVANCED JAVA PROGRAMMING (THEORY WITH LAB)

Course Outcomes (COs)	Description
C203.1	Apply generic programming concept through collections to efficiently manage and process data structures.
C203.2	Apply advanced APIs to streamline data manipulation and perform unit testing for robust code development.
C203.3	Develop web applications using frameworks and other Java concepts
C203.4	Build scalable and maintainable applications using Frameworks
C203.5	Organize application logic, user interface, and data flow using the Spring MVC framework for efficient and modular development.
C203.6	Apply the object oriented programming concepts and frameworks to develop applications.

CO-PO/PSO MAPPING:

COs	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	-	-	-	1	1	1	-	2	3	3	2
CO2	2	3	3	3	-	-	-	1	1	1	-	2	3	3	2
CO3	3	3	3	3	-	-	-	2	2	2	-	3	3	3	3
CO4	3	3	3	3	-	-	-	2	2	2	-	3	3	3	3
CO5	3	3	3	3	-	-	-	2	2	2	-	3	3	3	3
CO6	3	3	3	3	-	-	-	2	2	2	-	3	3	3	3

4. 22CS302 - COMPUTER ORGANIZATION AND ARCHITECTURE

Course Outcomes (COs)	Description
C204.1	Explain the basic principles and operations of digital computers.
C204.2	Analyse the performance of computers by identifying factors that contribute to performance.
C204.3	Compare various I/O methods and understand memory management principles.
C204.4	Explain data flow in arithmetic algorithms.
C204.5	Demonstrating the concept of parallelism in hardware and software.
C204.6	Develop software to solve computationally intensive problems.

CO-PO/PSO MAPPING:

COs	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	1	-	-	-	-	-	-	-	-	2	–	–
CO2	3	2	2	-	-	-	-	-	-	-	-	-	3	–	–
CO3	3	1	2	-	-	-	-	-	-	-	-	-	3	1	–
CO4	3	-	1	-	-	-	-	-	-	-	-	-	2	2	–
CO5	3	2	-	-	-	-	-	-	-	-	-	-	2	2	–
CO6	3	2	3	-	-	-	-	-	-	-	-	-	3	3	2

5. 22CS303 - DESIGN AND ANALYSIS OF ALGORITHMS (THEORY WITH LAB)

Course Outcomes (COs)	Description
C205.1	Understand the different algorithm design paradigms.
C205.2	Design algorithms for real world problems using algorithmic design techniques.
C205.3	Analyse the efficiency of simple recursive and non-recursive algorithms.
C205.4	Analyse the algorithm's worst, best and average case behaviour in terms of time and space.
C205.5	Apply the limits of algorithms and how to cope with them.

C205.6	Develop applications by selecting suitable design technique in an efficient way.

CO-PO/PSO MAPPING:

COs	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	2	2	-	-	-	1	-	-	2	3	2	2
CO2	3	3	3	3	3	-	-	-	2	-	-	3	3	3	3
CO3	3	3	3	3	3	-	-	-	2	-	-	3	3	3	2
CO4	3	3	3	3	3	-	-	-	2	-	-	3	3	3	2
CO5	3	3	3	3	3	-	-	-	2	-	-	3	3	3	2
CO6	3	3	3	3	3	-	-	-	3	-	-	3	3	3	3

6. 22CS304 - OPERATING SYSTEMS (THEORY WITH LAB)

Course Outcomes (COs)	Description
C206.1	Demonstrate the basic concepts of operating systems and process.
C206.2	Implement process management techniques using inter-process communication.
C206.3	Implement the concepts of process synchronization and deadlocks.
C206.4	Apply various memory management schemes for the suitable scenario.
C206.5	Describe various I/O and file management techniques.
C206.6	Develop practical skills in developing system-level programming.

CO-PO/PSO MAPPING:

COs	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	2	-	-	-	2	1	1	-	2	3	2	-
CO2	3	3	3	3	-	-	-	1	2	2	-	2	3	3	2
CO3	3	3	3	3	-	-	-	2	1	1	-	3	3	3	2
CO4	3	3	3	3	2	-	-	1	1	-	-	3	3	3	2
CO5	3	2	2	2	-	-	-	-	1	2	-	2	2	2	-
CO6	3	3	3	3	2	-	-	2	2	3	-	3	3	3	3

7. 22ME311 - PRODUCT DEVELOPMENT LAB – 3

Course Outcomes (COs)	Description
C207.1	Enhance their skills in design concepts, rules and procedures.
C207.2	Develop their cognitive strategy to think, organize, learn and behave.
C207.3	Demonstrate the ability to provide conceptual design strategies for a product.
C207.4	Describe the procedure for designing a Mock-up model.
C207.5	Recognize and apply appropriate interdisciplinary and integrative strategies for solving complex problems.

CO-PO/PSO MAPPING:

COs	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	-	1	2	2	1	-	-	2	-	-	3	-	-
CO2	2	3	2	-	1	-	1	1	2	-	-	-	-	2	-
CO3	3	2	3	2	2	-	2	1	2	2	2	-	2	3	-
CO4	2	1	-	1	2	-	-	-	1	-	2	-	1	-	-
CO5	3	3	3	3	3	3	3	2	2	-	-	3	3	3	3

8. 22CS311 - APTITUDE AND CODING SKILLS I

Course Outcomes (COs)	Description
C208.1	Develop vocabulary for effective communication skills.
C208.2	Build the logical reasoning enhance critical thinking.
C208.3	Develop error correction and debugging skills in programming.
C208.4	Apply programming skills to develop programs efficiently.
C208.5	Solve problems using quantitative skills.
C208.6	Develop effective reading and listening skills.

CO-PO/PSO MAPPING:

COs	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	–	–	-	-	-	-	-	-	2	2	-	-	–	–	–
CO2	2	2	2	-	-	-	-	-	1	1	-	-	–	–	–
CO3	3	3	3	-	-	-	-	-	2	1	-	-	3	3	2
CO4	3	3	3	-	-	-	-	-	2	2	-	-	3	3	3
CO5	2	3	2	-	-	-	-	-	1	1	-	-	2	2	2
CO6	–	–	-	-	-	-	-	-	2	2	-	-	–	–	–

9. 22CS312 - INTERNSHIP AND SEMINAR

Course Outcomes (COs)	Description
C209.1	Demonstrate an understanding of professional engineering practices and work environments through practical experience.
C209.2	Apply foundational engineering skills and theoretical knowledge to solve real-world problems encountered during internships.
C209.3	Develop effective communication skills by presenting technical and non- technical aspects of internship projects to an audience.
C209.4	Enhance teamwork and collaboration skills by working alongside industry professionals and peers in a professional setting.
C209.5	Reflect on personal learning, technical challenges, and problem-solving experiences encountered during the internship, fostering continuous improvement.
C209.6	Develop critical thinking and adaptability skills by analyzing industry trends and preparing for evolving challenges in engineering fields.

CO-PO/PSO MAPPING:

COs	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	1	-	2	1	2	-	-	-	1	3	2	-
CO2	3	3	3	2	2	-	-	-	-	-	-	1	3	3	2
CO3	-	-	-	-	-	-	-	3	3	2	2	2	-	-	2
CO4	-	-	-	-	-	-	-	3	2	1	2	2	-	2	-
CO5	-	-	2	-	-	-	-	-	-	-	2	3	2	2	1
CO6	-	2	2	2	2	-	-	-	-	-	2	2	-	3	3

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

3.1.A. COURSE OUTCOMES

2022 REGULATION - BATCH 2022-26

SEMESTER 4

1. 22EC441 - MICROCONTROLLERS AND EMBEDDED SYSTEMS

Course Outcomes (COs)	Description
C211.1	Acquire knowledge on the architecture of 8051 Microcontroller.
C211.2	Apply programming techniques in developing the assembly language program for microcontroller applications.
C211.3	Analyze various types of interfacing devices with other peripheral devices.
C211.4	Design and construct Microcontroller based systems.
C211.5	Acquire knowledge on basic components of embedded system.
C211.6	Describe the architecture and programming of ARM processor.

CO-PO/PSO MAPPING:

COs	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	-	-	-	-	-	-	3	2	-	3	-	1	-
CO2	3	2	-	-	-	-	-	-	3	2	-	3	-	1	-
CO3	3	2	1	-	-	-	-	-	3	2	-	3	1	1	-
CO4	2	1	1	-	-	-	-	-	3	2	-	3	1	1	-
CO5	2	1	1	-	-	-	-	-	3	2	-	3	1	1	-
CO6	3	2	-	-	-	-	-	-	3	2	-	3	-	1	-

2. 22MA401 - PROBABILITY AND STATISTICS (THEORY WITH LAB)

Course Outcomes (COs)	Description
C212.1	Calculate the statistical measures of standard distributions.
C212.2	Compute the correlation & regression for two dimensional random variables.
C212.3	Apply the concept of testing the hypothesis.
C212.4	Implement the concept of analysis of variance for various experimental designs.
C212.5	Demonstrate the control charts for variables and attributes.

CO-PO/PSO MAPPING:

COs	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	-	-	-	-	-	-	-	-	-	-	2	-	-
CO2	3	2	-	-		-	-	-	-	-	-	-	-	-	-
CO3	3	2	1	1	-	-	-	-	-	-	-	-	-	-	-
CO4	2	1	1	-	-	-	-	-	-	-	-	-	-	-	-
CO5	1	-	1	-	-	-	-	-	-	-	-	-	1	-	-

3. 22CS401 - DISTRIBUTED AND CLOUD COMPUTING (THEORY WITH LAB)

Course Outcomes (COs)	Description
C213.1	Explain the principles of distributed computing and cloud computing, including key terminology and architecture.
C213.2	Analyze algorithms for resource allocation, load balancing, and fault tolerance in distributed environments.
C213.3	Design and evaluate architectures for distributed systems and cloud platforms, including microservices and serverless models
C213.4	Implement and deploy applications on cloud platforms, utilizing tools and services such as containers, orchestration, and serverless computing.
C213.5	Critically assess case studies and real-world applications of distributed and cloud computing technologies
C213.6	Develop and simulate mutual exclusion algorithms to solve coordination problems in distributed applications.

CO-PO/PSO MAPPING:

COs	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	2	2	-	-	1	1	1	-	2	3	2	1
CO2	3	3	3	3	3	-	-	1	1	1	-	3	3	3	2
CO3	3	3	3	3	3	-	-	2	2	2	-	3	3	3	3
CO4	3	3	3	3	3	-	-	2	2	2	-	3	3	3	3
CO5	3	3	3	2	2	-	-	1	1	2	-	3	3	3	2
CO6	3	3	3	3	2	-	-	1	1	2	-	3	3	3	2

4. 22CS402 - WEB DEVELOPMENT FRAMEWORKS (THEORY WITH LAB)

Course Outcomes (COs)	Description
C214.1	Write Web API/RESTful API application programming interface to communicate with Spring boot as a serverside technology.
C214.2	Build single page applications as a reusable UI component technology as client-side technology.
C214.3	Build applications using server-side technologies.
C214.4	Able to develop a web application using latest Frameworks.
C214.5	Apply various features to develop client server applications.
C214.6	Design and integrate complex web components to enhance user interface and user experience in React Native and Storybook applications.

CO-PO/PSO MAPPING:

COs	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	2	2	-	-	-	-	1	-	1	2	3	3
CO2	2	3	2	-	1	-	-	3	-	-	-	-	1	2	3
CO3	3	-	3	2	-	-	-	-	-	1	-	2	2	3	2
CO4	-	2	2	-	3	-	-	-	-	2	-	2	-	3	3
CO5	-	2	3	3	-	-	-	-	-	-	-	2	-	2	3
CO6	-	2	2	-	2	-	-	3	-	-	-	2	-	2	3

5. 22AI301 - ARTIFICIAL INTELLIGENCE (THEORY WITH LAB)

Course Outcomes (COs)	Description
C215.1	Illustrate the structure of agents and to implement various Intelligent agents.
C215.2	Apply search strategies in problem solving and game playing using heuristic function.

C215.3	Implement logical agents and first-order logic problems.
C215.4	Apply problem-solving strategies with knowledge representation mechanism for solving hard problems.
C215.5	Demonstrate the basics of expert systems and to develop models using machine learning techniques.
C215.6	Apply AI algorithms to solve real-world problems.

CO-PO/PSO MAPPING:

COs	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	-	-	-	1	-	-	-	1	1	2	2	1
CO2	2	3	3	2	2	-	-	-	-	-	1	-	2	3	2
CO3	3	2	3	-	-	-	-	-	-	1	-	-	2	2	2
CO4	3	2	3	2	-	-	1	-	-	-	2	-	3	3	3
CO5	2	-	3	-	3	1	2	2	2	-	1	-	2	3	3
CO6	3	2	3	2	3	2	2	2	2	1	2	2	3	3	3

PROFESSIONAL ELECTIVE I (THEORY WITH LAB)

6. 22CS901 - ETHICAL HACKING (THEORY WITH LAB)

Course Outcomes (COs)	Description
C216.1.1	Identify cybersecurity threats and network vulnerabilities to enhance data and system security.
C216.1.2	Perform Penetration Testing using tools Metasploit and Nmap to evaluate system defenses.
C216.1.3	Apply ethical hacking techniques reconnaissance, scanning, and enumeration to evaluate security posture.
C216.1.4	Detect and exploit vulnerabilities in networks and systems while adhering to ethical standards.
C216.1.5	Analyze Software Vulnerabilities and mitigate risks.
C216.1.6	Develop and implement countermeasures against attacks such as SQL injection, DoS, and malware.

CO-PO/PSO MAPPING:

COs	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	-	2	-	-	1	-	-	-	2	3	2	1
CO2	3	3	3	-	3	-	-	-	-	-	-	2	3	3	2
CO3	2	3	3	-	3	-	-	-	1	1	-	2	3	3	2
CO4	2	3	3	-	3	-	-	2	-	-	-	2	3	3	2
CO5	3	2	3	-	2	-	-	-	-	-	-	3	3	3	3
CO6	3	3	3	-	3	-	-	-	2	1	-	3	3	3	3

7. 22CS907 - CLOUD FOUNDATIONS (THEORY WITH LAB)

Course Outcomes (COs)	Description
C216.2.1	Describe the different ways a user can interact with Cloud.
C216.2.2	Discover the different compute options in Cloud and implement a variety of structured and unstructured storage models.
C216.2.3	Discuss the different application managed service options in the cloud and outline how security in the cloud is administered in Cloud.
C216.2.4	Demonstrate how to build secure networks in the cloud and identify cloud automation and management tools.
C216.2.5	Discover a variety of managed big data services in the cloud.
C216.2.6	Use Cloud services to build applications.

CO-PO/PSO MAPPING:

COs	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	1	-	-	-	-	-	-	-	1	2	1	-
CO2	3	2	3	1	-	-	-	-	-	-	-	1	3	3	2
CO3	2	1	-	2	-	-	-	2	-	-	-	2	2	2	1
CO4	3	3	2	3	-	-	-	2	-	-	-	2	3	3	2
CO5	2	2	-	2	-	-	-	-	-	-	-	1	3	3	2
CO6	3	3	3	3	-	-	-	-	1	2	-	3	3	3	3

8. 22CS913 - UI/UX DESIGN (THEORY WITH LAB)

Course Outcomes (COs)	Description
C216.3.1	Create visually appealing and functional interfaces that enhance user interaction.
C216.3.2	Ensure products are intuitive, accessible, and meet user needs.
C216.3.3	Build and test design concepts to optimize user experience.
C216.3.4	Evaluate and refine designs based on user feedback.
C216.3.5	Structure content effectively for intuitive navigation.
C216.3.6	Design engaging interactions that improve usability.

CO-PO/PSO MAPPING:

COs	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	2	3	1	-	-	2	-	3	-	1	2	2	2
CO2	2	1	-	3	-	-	-	1	2	2	-	2	1	2	-
CO3	-	2	3	2	3	-	-	-	-	2	-	1	2	3	2
CO4	1	-	3	2	3	-	-	-	-	2	-	2	2	3	-
CO5	-	2	-	3	-	-	-	1	-	1	-	1	-	2	1
CO6	2	3	3	2	3	-	-	-	-	2	-	2	3	3	3

9. 22ME411 - PRODUCT DEVELOPMENT LAB – 4

Course Outcomes (COs)	Description
C217.1	Identify the real-time problems through literature.
C217.2	Develop feasible solutions for the problems.
C217.3	Evaluate the methods to develop solutions to the problem.
C217.4	Analyze the business opportunities for a new product.
C217.5	Prepare a detailed report for the experimental dissemination.

CO-PO/PSO MAPPING:

COs	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	-	2	-	-	-	-	-	2	-	1	2	-	-
CO2	2	2	3	3	3	-	-	-	2	-	1	2	3	2	-
CO3	1	3	3	2	2	-	-	-	-	-	2	1	2	3	-
CO4	-	-	2	-	3	-	3	3	3	2	-	2	-	3	3
CO5	-	2	-	1	-	2	-	3	2	3	3	2	1	-	3

10. 22CS411 - APTITUDE AND CODING SKILLS II

Course Outcomes (COs)	Description
C218.1	Develop advanced vocabulary for effective communication skills.
C218.2	Build an enhanced level of logical reasoning and quantitative skills.
C218.3	Develop error correction and debugging skills in programming.
C218.4	Apply data structures and algorithms in problem solving.
C218.5	Develop advanced vocabulary for effective reading skills.
C218.6	Apply advanced algorithm design techniques to develop programs.

CO-PO/PSO MAPPING:

COs	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	–	-	-	-	-	-	-	2	2	-	-	–	–	–
CO2	2	3	2	-	-	-	-	-	1	-	-	-	–	–	–
CO3	3	3	3	-	-	-	-	-	-	-	-	-	3	3	2
CO4	3	3	3	-	-	-	-	-	-	-	-	-	3	3	3
CO5	1	-	-	-	-	-	-	-	3	-	-	-	2	2	2
CO6	3	3	3	-	-	-	-	-	-	-	-	-	–	–	–

11. 22CS412 - MINI PROJECT AND DESIGN THINKING LAB

Course Outcomes (COs)	Description
C219.1	Understand the design thinking process and able to visualize the problem.
C219.2	Analyse the problem using innovation tools.
C219.3	Design a prototype for an identified problem solution.
C219.4	Testing and evaluate strategies in improving the solution.
C219.5	Apply the innovation ideas to real-world applications.
C219.6	Develop miniprojects for real life problems.

CO-PO/PSO MAPPING:

COs	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	-	1	-	1	-	-	-	2	-	-	1	-	-
CO2	2	3	-	2	-	2	-	-	-	-	-	-	2	-	-
CO3	1	2	3	3	2	3	1	-	-	-	-	-	2	-	-
CO4	-	2	3	2	2	2	-	-	-	-	-	1	2	-	-
CO5	3	2	3	2	2	3	-	-	-	-	-	-	3	3	1
CO6	3	2	3	3	3	3	2	2	2	2	1	3	3	3	3

SEMESTER 5

1. 22CS908 - CLOUD ARCHITECTING (THEORY WITH LAB)

Course Outcomes (COs)	Description
C301.1.1	Explain cloud architecture principles and AWS storage solutions.
C301.1.2	Deploy and manage AWS compute and database resources securely.
C301.1.3	Design and configure secure AWS networks using VPC and IAM.
C301.1.4	Implement scalable and resilient AWS architectures with high availability.
C301.1.5	Build decoupled and serverless applications using AWS services like Lambda.
C301.1.6	Develop disaster recovery strategies for AWS environments.

CO-PO/PSO MAPPING:

COs	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	-	-	2	-	-	3	-	2	-	2	3	2	2
CO2	2	2	-	-	2	-	-	2	2	2	-	2	3	2	2
CO3	2	2	-	-	2	-	-	2	2	2	-	2	3	2	2
CO4	2	2	3	-	2	-	-	2	2	2	-	2	3	3	2
CO5	2	2	3	-	2	-	-	-	2	2	-	2	3	3	3
CO6	2	2	3	-	2	-	-	-	2	2	-	2	3	3	3

2. 22CS902 - SOCIAL NETWORK SECURITY (THEORY WITH LAB)

Course Outcomes (COs)	Description
C301.2.1	Develop security applications of social networks.
C301.2.2	Implement data anonymization techniques.
C301.2.3	Analyze and secure social networks
C301.2.4	Handle security challenges in social networks.
C301.2.5	Develop security tools for social networks.
C301.2.6	Create newer social networking applications.

CO-PO/PSO MAPPING:

COs	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	-	2	-	-	2	-	-	-	2	3	2	2
CO2	3	3	2	-	2	-	-	3	-	-	-	2	3	2	2
CO3	3	3	3	-	2	-	-	3	1	1	-	3	3	2	3
CO4	2	3	3	-	2	-	-	3	2	1	-	3	3	2	3
CO5	3	2	3	-	3	-	-	2	1	1	-	2	3	2	3
CO6	3	2	3	-	3	-	-	2	2	2	-	2	3	2	3

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

3.1.A. COURSE OUTCOMES

2022 REGULATION - BATCH 2022-26

3. 22CS918 - SOFTWARE TESTING AND AUTOMATION (THEORY WITH LAB)

Course Outcomes (COs)	Description
C301.3.1	Understand the basic concepts of software testing and the need for software testing.
C301.3.2	Design Test planning and different activities involved in test planning.
C301.3.3	Design effective test cases that can uncover critical defects in the application.
C301.3.4	Carry out advanced types of testing.
C301.3.5	Automate the software testing using Selenium and TestNG.
C301.3.6	Analyze and evaluate the results of testing to ensure software quality, and implement continuous improvement processes based on testing outcomes.

CO-PO/PSO MAPPING:

COs	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	-	3	-	-	-	2	2	-	-	3	2	2
CO2	3	2	2	-	3	-	-	-	2	2	-	-	3	2	2
CO3	3	2	2	-	3	-	-	-	1	2	-	-	3	2	2
CO4	3	2	2	-	3	-	-	-	1	2	-	-	3	2	2
CO5	3	2	2	-	3	-	-	-	1	2	-	-	3	2	2
CO6	3	3	3	-	3	-	-	-	2	2		-	3	2	2

4. 22CB005 - DESIGN THINKING

Course Outcomes (COs)	Description
C302.1	Understand the phases of design thinking process.
C302.2	Conduct an immersion activity to create an empathy map.
C302.3	Define the key problems of the personas created.
C302.4	Apply the ideation phase steps to present the prototype ideas.
C302.5	Create a prototype with value propositions and test the prototype.

CO-PO/PSO MAPPING:

COs	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	3	3	3	3	3	3	3	1	1	2	2	3	3	3
CO2	1	2	2	2	3	2	2	2	1	1	3	-	3	3	3
CO3	1	3	3	3	3	2	2	2	1	1	2	-	3	3	3
CO4	1	3	3	3	3	2	2	2	1	1	2	-	3	3	3
CO5	1	3	3	3	3	2	2	2	1	1	3	-	3	3	3

5. 22CS501 - COMPUTER NETWORKS (THEORY WITH LAB)

Course Outcomes (COs)	Description
C303.1	Explain the fundamental concepts of computer networking and network architecture.
C303.2	Analyze the performance of various network protocols used in data transmission.
C303.3	Design basic network architectures including LAN and WAN using appropriate hardware and software.
C303.4	Develop skills to diagnose common network issues using tools.
C303.5	Analyze the various application layer protocols.
C303.6	Implement protocols used for finding shortest route for data transmission.

CO-PO/PSO MAPPING:

COs	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	-	-	-	-	-	-	-	-	2	3	2	1
CO2	3	3	2	-	-	-	-	2	-	-	-	2	3	3	1
CO3	3	2	3	-	2	-	-	-	-	2	-	2	3	3	2
CO4	3	2	2	-	2	1	-	2	-	2	-	3	3	3	2
CO5	3	3	2	-	1	-	-	2	-	-	-	2	3	3	2
CO6	3	3	3	-	2	-	-	2	-	2	-	3	3	3	3

6. 22CS502 - THEORY OF COMPUTATION (THEORY WITH LAB)

Course Outcomes (COs)	Description
C304.1	Explain the key concepts of automata, formal languages, and computational models.
C304.2	Differentiate between types of formal languages and their corresponding automata.
C304.3	Analyze problems for decidability and understand the complexity.
C304.4	Design computation solutions using Turing machines.
C304.5	Apply formal proof techniques to demonstrate properties of languages and automata.
C304.6	Discuss practical applications of computation theory in computer science.

CO-PO/PSO MAPPING:

COs	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	-	-	-	-	-	-	-	-	2	3	2	1
CO2	3	3	2	-	-	-	-	2	-	-	-	2	3	3	1
CO3	3	3	3	-	2	-	-	2	-	2	-	2	3	3	2
CO4	3	3	3	-	2	1	-	2	-	2	-	3	3	3	2
CO5	3	3	2	-	1	-	-	2	-	-	-	2	3	3	2
CO6	3	3	3	-	2	-	-	2	-	2	-	3	3	3	3

7. 22AI401 - MACHINE LEARNING (THEORY WITH LAB)

Course Outcomes (COs)	Description
C305.1	Explain the basics of Machine Learning and model evaluation.
C305.2	Study dimensionality reduction techniques.
C305.3	Understand and implement various classification algorithms.
C305.4	Understand and implement various unsupervised learning techniques.
C305.5	Build Neural Networks and understand the different types of learning.
C305.6	Develop simple projects using machine learning concepts.

CO-PO/PSO MAPPING:

COs	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	-	1	-	-	-	-	-	-	1	2	2	1
CO2	3	3	3	-	2	1	-	-	-	-	-	1	3	3	2
CO3	3	3	3	-	2	-	-	-	-	-	-	2	3	3	2
CO4	3	3	3	-	2	-	-	-	-	-	-	2	3	3	2
CO5	3	3	3	-	3	1	-	-	-	1	-	2	3	3	2
CO6	3	3	3	-	3	2	-	1	1	2	-	3	3	3	3

8. 22IT910 - REST APPLICATION DEVELOPMENT USING SPRING BOOT AND JPA (THEORY WITH LAB)

Course Outcomes (COs)	Description
C306.1	Create simple applications using RESTful APIs and effectively manage HTTP methods within the Spring Boot framework.
C306.2	Apply database connectivity with JPA, utilizing advanced queries to interact with the database.
C306.3	Build applications using Spring Boot and perform CRUD operations efficiently using JPQL.
C306.4	Demonstrate the implementation of various relational mappings in JPA, including one- to-one and one-to-many associations.
C306.5	Develop real-time applications that integrate user interfaces and utilize Spring AOP for method interception and advice handling.
C306.6	Apply security measures to REST APIs using Spring Security and JWT to protect sensitive data and ensure secure communication between clients and servers.

CO-PO/PSO MAPPING:

COs	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	-	2	-	-	-	-	1	-	2	3	3	2
CO2	3	3	3	-	3	-	-	-	-	-	-	2	3	3	2
CO3	3	2	3	-	2	-	-	-	-	1	-	2	3	3	2
CO4	3	3	3	-	3	-	-	-	-	2	-	2	3	3	2
CO5	3	2	3	-	2	2	-	1	1	2	-	3	3	3	2
CO6	3	3	3	-	3	2	-	3	2	2	-	3	3	3	2

9. 22CS511 - ADVANCED APTITUDE AND CODING SKILLS I

Course Outcomes (COs)	Description
C307.1	Develop advanced vocabulary for effective communication skills.
C307.2	Build an enhanced level of logical reasoning and quantitative skills.
C307.3	Develop error correction and debugging skills in programming.
C307.4	Apply advanced data structures and algorithms in problem solving.
C307.5	Develop coding solutions for real-world problems.
C307.6	Develop advanced vocabulary for effective reading skills

CO-PO/PSO MAPPING:

COs	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	–	–	-	-	-	-	-	-	2	2	-	-	-	-	-
CO2	2	2	-	-	-	-	-	-	1	1	-	-	-	-	-
CO3	3	3	2	-	-	-	-	-	2	1	-	-	3	3	2
CO4	3	3	2	-	-	-	-	-	2	2	-	-	3	3	3
CO5	2	3	2	-	-	-	-	-	1	1	-	-	2	2	2
CO6	2	–	-	-	-	-	-	-	2	2	-	-	–	–	–

10. 22CS512 - INTERNSHIP/SEMINAR

Course Outcomes (COs)	Description
C308.1	Enhance communication, teamwork, and problem-solving skills in a workplace setting.
C308.2	Apply academic concepts to real-world projects relevant to the internship field.
C308.3	Develop key competencies related to the industry, such as project management or data analysis.
C308.4	Build professional relationships and networks to enhance future career opportunities.
C308.5	Conduct self-assessment to evaluate strengths and areas for improvement.
C308.6	Effectively receive and integrate feedback to improve performance.

CO-PO/PSO MAPPING:

COs	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	3	3	-	-	2	3	3	1	2	-	-	-
CO2	3	3	3	-	-	-	-	-	-	-	2	2	3	3	2
CO3	3	3	2	-	-	3	-	-	-	-	3	2	3	3	2
CO4	-	-	-	-	2	-	-	2	3	3	2	2	-	-	1
CO5	-	-	-	-	3	-	1	-	2	-	-	3	-	-	-
CO6	-	-	-	-	3	2	-	-	-	-	-	3	-	-	-

SEMESTER 6

1. 22CS603 - PROFESSIONAL ETHICS

Course Outcomes (COs)	Description
C309.1	Summarize the importance of human values in work place.
C309.2	Discuss the senses of engineering ethics, moral dilemmas, moral autonomy and uses of ethical theories.
C309.3	Describe the role of engineers as responsible experimenters and necessity of codes of ethics in engineering.
C309.4	Explain safety, risk, responsibilities and rights in the society.
C309.5	Analyze the global issues related to environmental ethics, computer ethics, weapons development and the role of engineers as expert witnesses and advisors.
C309.6	Apply ethics in society and discuss the ethical issues related to engineering.

CO-PO/PSO MAPPING:

COs	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	2	2	3	2	1	-	2	-	-	-
CO2	-	-	-	-	-	2	3	3	2	2	-	2	-	-	-
CO3	-	-	-	-	-	3	2	3	2	2	-	2	1	-	-
CO4	-	-	-	-	-	3	3	3	2	1	-	2	1	-	-
CO5	-	-	-	-	-	3	3	3	2	2	1	2	-	1	-
CO6	-	-	-	-	-	3	3	3	2	2	1	3	1	2	1

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

3.1.A. COURSE OUTCOMES

2022 REGULATION - BATCH 2022-26