



R.M.K. ENGINEERING COLLEGE

RSM Nagar, Kavaraipettai – 601 206



Department of Artificial Intelligence and Data Science

Course Outcomes ODD Semester 2024-25

Sl. No.	Semester	Theory/ Practical	Course Code	Course Name
1)	3	Theory	22GE301	Universal Human Values 2: Understanding Harmony
2)	3	Theory	22MA301	Discrete Mathematics
3)	3	Theory + Lab	22AI301	Artificial Intelligence
4)	3	Theory + Lab	22AI302	Data Science using Python
5)	3	Theory + Lab	22CS305	Advanced Java Programming
6)	3	Theory + Lab	22CS306	Design and Analysis of Algorithms
7)	3	Practical	22ME311	Product Development Lab 3
8)	3	Practical	22CS311	Aptitude and Coding Skills I
9)	3	Practical	22AI313	Internship
10)	5	Theory	22CB005	Open Elective I - Design Thinking
11)	5	Theory	22CS911	Professional Elective II – Data Engineering in Cloud
12)	5	Theory	22AI912	Professional Elective III– Multi-Core Architecture and Programming
13)	5	Theory + Lab	22AI501	Deep Learning
14)	5	Theory + Lab	22AI502	Data Exploration, Feature Engineering and Visualization
15)	5	Practical	22CS511	Advanced Aptitude and Coding Skills I
16)	5	Practical	22AI512	Internship and Career Readiness Course
17)	7	Theory + Lab	20AI703	Deep Learning Techniques
18)	7	Theory	20AI702	Natural Language Processing
19)	7	Theory	20CB505	Open Elective II - Design Thinking
20)	7	Theory	20CS905	Professional Elective IV –Computer Vision
21)	7	Theory + Lab	20AI921	Professional Elective V –Distributed and Cloud Computing
22)	7	Practical	20IT713	Professional Elective VI –Professional Readiness for Innovation, Employability and Entrepreneurship

EVEN Semester 2024-25

Sl. No.	Semester	Theory/ Practical	Course Code	Course Name
1)	4	Theory	22CS302	Computer Organization and Architecture
2)	4	Theory	22AI901	Professional Elective I - Business Intelligence and Analytics
3)	4	Theory + Lab	22MA401	Probability and Statistics
4)	4	Theory + Lab	22CS304	Operating Systems
5)	4	Theory + Lab	22AI402	Machine Learning
6)	4	Theory + Lab	22IT403	Web Development Frameworks
7)	4	Practical	22ME411	Product Development Lab-4
8)	4	Practical	22CS411	Aptitude and Coding Skills II
9)	6	Theory	22CS006	Open Elective II - Introduction to Computer Networks
10)	6	Theory	22AI602	Automata Theory and Compiler Design
11)	6	Theory	22AI903	Professional Elective IV - Text and Speech Analytics
12)	6	Theory	22AI911	Professional Elective V - Generative AI
13)	6	Theory + Lab	22CS602	Object Oriented Software Engineering
14)	6	Theory + Lab	22AI601	Reinforcement Learning
15)	6	Practical	22CS611	Advanced Aptitude and Coding Skills II
16)	6	Practical	22AI611	Mini Project
17)	8	Practical	20AI812	Project Work

ODD Semester 2024-25

3rd Semester – B.Tech. Artificial Intelligence and Data Science

20GE301 - UNIVERSAL HUMAN VALUES II	
COs	
CO1	Would become more aware of themselves, and their surroundings (family, society, nature).
CO2	Would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.
CO3	Would have better critical ability.
CO4	Would become sensitive to their commitment towards what they have understood (human values, human relationship, and human society).
CO5	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.

22MA301- DISCRETE MATHEMATICS	
COs	
CO1	Examine the validity of the arguments.
CO2	Apply various proof techniques and principles using analytic and combinatorial methods.
CO3	Develop the recurrence relation for the given problems.
CO4	Implement graph theory techniques to solve real time problems.
CO5	Understand groups, Rings and Fields.
CO6	Solve problems in Lattices and Boolean algebra.

22AI301 - ARTIFICIAL INTELLIGENCE	
COs	
CO1	Illustrate the structure of agents and to implement various Intelligent agents.
CO2	Apply search strategies in problem solving and game playing using heuristic function.
CO3	Implement logical agents and first-order logic problems.
CO4	Apply problem-solving strategies with knowledge representation mechanism for solving hard problems.
CO5	Demonstrate the basics of expert systems and to develop models using machine learning techniques.
CO6	Apply AI algorithms to solve real-world problems.

22AI302 - DATA SCIENCE USING PYTHON	
COs	
CO1	Explain the fundamentals of data science.
CO2	Experiment python libraries for data science.
CO3	Apply and implement basic classification algorithms.
CO4	Implement clustering and outlier detection approaches.
CO5	Present and interpret data using visualization tools in Python.
CO6	Use various data science algorithms to analyze data.

22CS305 – ADVANCED JAVA PROGRAMMING	
COs	
CO1	Implement various data structures by utilizing core Java features and libraries
CO2	Demonstrate proficiency in handling Java I/O operations, including file manipulation for efficient data storage and retrieval.
CO3	Apply and Analyze the Stream API for functional programming and data processing.
CO4	Implement advanced object serialization for complex data structures.
CO5	Utilize regular expressions for text parsing and string manipulation.
CO6	Build applications using advanced Java programming techniques.

22CS303 - DESIGN AND ANALYSIS OF ALGORITHMAM	
COs	
CO1	Understand the different algorithm design paradigms.
CO2	Design algorithms for real world problems using algorithmic design techniques.
CO3	Analyse the efficiency of simple recursive and non-recursive algorithms.
CO4	Analyse the algorithm's worst, best and average case behaviour in terms of time and space.
CO5	Apply the limits of algorithms and how to cope with them.
CO6	Develop applications by selecting suitable design technique in an efficient way.

Laboratory

22ME311-Product Development Lab 3	
COs	
CO1	Enhance their skills in design concepts, rules and procedures.
CO2	Develop their cognitive strategy to think, organize, learn and behave.
CO3	Demonstrate the ability to provide conceptual design strategies for a product.
CO4	Describe the procedure for designing a Mock-up model.
CO5	Recognize and apply appropriate interdisciplinary and integrative strategies for solving complex problems.

22CS311-Aptitude and Coding Skills I	
COs	
CO1	Develop vocabulary for effective communication skills.
CO2	Build the logical reasoning enhance critical thinking.
CO3	Develop error correction and debugging skills in programming.
CO4	Apply programming skills to develop programs efficiently
CO5	Solve problems using quantitative skills
CO6	Develop effective reading and listening skills.

5th Semester – B.Tech. Artificial Intelligence and Data Science

20CB505- DESIGN THINKING	
COs	
CO1	Understand the phases of design thinking process.
CO2	Conduct an immersion activity to create an empathy map.
CO3	Define the key problems of the personas created.
CO4	Apply the ideation phase steps to present the prototype ideas.
CO5	Create a prototype with value propositions and test the prototype.

22CS911 – DATA ENGINEERING IN CLOUD	
COs	
CO1	Outline exploratory data analysis and the phases involved in data analysis.
CO2	Demonstrate various statistical techniques for data analysis.
CO3	Present the basics of feature engineering on different types of data.
CO4	Perform data analysis and apply visualization techniques.
CO5	Apply the methods of time series analysis.
CO6	Develop dashboards using different datasets by applying data engineering and feature extraction techniques.

20AI912 – MULTI-CORE ARCHITECTURE AND PROGRAMMING	
COs	
CO1	Illustrate multicore architectures and identify their characteristics and challenges.
CO2	Identify the issues in programming Parallel Processors.
CO3	Write programs using OpenMP and MPI.
CO4	Design parallel programming solutions to common problems.
CO5	Compare and contrast programming for serial processors and programming for parallel processors.
CO6	Elaborate on various concepts of multi-core architectures.

22AI501 – DEEP LEARNING	
COs	
CO1	Demonstrate the basics of deep neural networks to solve real world problems.
CO2	Implement deep learning models.
CO3	Elaborate CNN and RNN architectures of deep neural networks.
CO4	Use autoencoders in neural networks.
CO5	Illustrate the various deep generative models.
CO6	Apply deep generative models to solve real world problems.

22AI502 – DATA EXPLORATION, FEATURE ENGINEERING AND VISUALIZATION	
COs	
CO1	Outline exploratory data analysis and the phases involved in data analysis.
CO2	Demonstrate various statistical techniques for data analysis.
CO3	Present the basics of feature engineering on different types of data.
CO4	Perform data analysis and apply visualization techniques.
CO5	Apply the methods of time series analysis.
CO6	Develop dashboards using different datasets by applying data engineering and feature extraction techniques.

Laboratory

22CS511 – ADVANCED APTITUDE AND CODING SKILLS I	
COs	
CO1	Develop advanced vocabulary for effective communication skills.
CO2	Build an enhanced level of logical reasoning and quantitative skills.
CO3	Develop error correction and debugging skills in programming.
CO4	Apply advanced data structures and algorithms in problem solving.
CO5	Develop coding solutions for real-world problems.
CO6	Develop advanced vocabulary for effective reading skills.

7th Semester – B.Tech. Artificial Intelligence and Data Science

20AI703-DEEP LEARNING TECHNIQUES	
COs	
CO1	Explain the basics of deep neural networks.
CO2	Describe advanced deep learning models.
CO3	Understand and Implement CNN and RNN architectures of deep neural networks.
CO4	Learn autoencoders in neural networks.
CO5	Apply deep generative models to solve real world problems.

20AI702-NATURAL LANGUAGE PROCESS	
COs	
CO1	Apply the fundamentals of natural language processing.
CO2	Perform word level analysis.
CO3	Analyze the syntax using various methods.
CO4	Understand the role of semantics and pragmatics.
CO5	Use discourse algorithms and various lexical resources

20CB505 – DESIGN THINKING	
COs	
CO1	Understand the phases of design thinking process.
CO2	Conduct an immersion activity to create an empathy map.
CO3	Define the key problems of the personas created.
CO4	Apply the ideation phase steps to present the prototype ideas.
CO5	Create a prototype with value propositions and test the prototype.

20CS905 – COMPUTER VISION	
COs	
CO1	Describe the concepts related to Image formation and processing.
CO2	Compare the concepts related to feature detection, matching and detection.
CO3	Understanding feature based alignment and motion estimation.
CO4	Study of 3D Reconstruction.
CO5	Perform image based rendering and recognition.

20AI921 – DISTRIBUTED AND CLOUD COMPUTING	
COs	
CO1	Articulate the main concepts and key technologies of cloud computing.
CO2	Learn various cloud services and platforms to cater the requirements in the growth of the businesses.
CO3	Develop the ability to understand the cloud infrastructure and virtualization that help in the development of cloud.
CO4	Explain the high-level automation and orchestration systems that manage the virtualized infrastructure.
CO5	Summarizes the programming paradigms used in cloud and how cloud software deployments scale to large numbers of users.

Laboratory

20IT713 - PROFESSIONAL READINESS FOR INNOVATION, EMPLOYABILITY AND ENTREPRENEURSHIP	
COs	
CO1	Upskill in emerging technologies and apply to real industry-level use cases
CO2	Understand agile development process
CO3	Develop career readiness competencies, Team Skills / Leadership qualities
CO4	Develop Time management, Project management skills and Communication Skills
CO5	Use Critical Thinking for Innovative Problem Solving
CO6	Develop entrepreneurship skills to independently work on products

EVEN Semester 2024-25

4th Semester – B.Tech. Artificial Intelligence and Data Science

22CS302 – COMPUTER ORGANIZATION AND ARCHITECTURE	
COs	
CO1	Explain the basic principles and operations of digital computers.
CO2	Analyse the performance of computers by identifying factors that contribute to performance.
CO3	Compare various I/O methods and understand memory management principles.
CO4	Explain data flow in arithmetic algorithms.
CO5	Demonstrating the concept of parallelism in hardware and software.
CO6	Develop software to solve computationally intensive problems.

22AI901 - Business Intelligence and Analytics	
COs	
CO1	Understand the business intelligence (BI) methodology and concepts.
CO2	Learn about descriptive, inferential statistics and data warehousing operations.
CO3	Analyze wide range of applications of data mining.
CO4	Analyze the various prescriptive analytics methods.
CO5	Develop and deploy Business Analytic Models.
CO6	Perform various analysis on different business models.

22MA401 - Probability and Statistics	
COs	
CO1	Calculate the statistical measures of standard distributions.
CO2	Compute the correlation & regression for two dimensional random variables.
CO3	Apply the concept of testing the hypothesis.
CO4	Implement the concept of analysis of variance for various experimental designs.
CO5	Demonstrate the control charts for variables and attributes.

22CS304 – OPERATING SYSTEMS	
COs	
CO1	Demonstrate the basic concepts of operating systems and process.
CO2	Implement process management techniques using inter-process communication.
CO3	Implement the concepts of process synchronization and deadlocks.
CO4	Apply various memory management schemes for the suitable scenario.
CO5	Describe various I/O and file management techniques.
CO6	Develop practical skills in developing system-level programming.

22MA402 - MACHINE LEARNING	
COs	
CO1	Explain the basics of Machine Learning and model evaluation.
CO2	Study dimensionality reduction techniques.
CO3	Understand and implement various classification algorithms.
CO4	Understand and implement various unsupervised learning techniques.
CO5	Build Neural Networks and understand the different types of learning.
CO6	Use Machine Learning Algorithms to build applications.

22IT403 - WEB DEVELOPMENT FRAMEWORKS	
COs	
CO1	Personalize web pages using text formatting, graphics, audio, and video.
CO2	Hands on knowledge on Rest API, propTypes
CO3	Able to develop a web application using latest React Framework
CO4	Apply various React features including functions, components, and services.
CO5	Able to develop application using ReactJshooks.
CO6	Design and integrate complex web components to enhance user interface and

Laboratory

22ME411 - PRODUCT DEVELOPMENT LAB-4	
COs	
CO1	Identify the real-time problems through literature.
CO2	Develop feasible solutions for the problems.
CO3	Evaluate the methods to develop solutions to the problem.
CO4	Analyze the business opportunities for a new product.
CO5	Prepare a detailed report for the experimental dissemination.

22CS411 – APTITUDE AND CODING SKILLS II	
COs	
CO1	Develop advanced vocabulary for effective communication skills.
CO2	Build an enhanced level of logical reasoning and quantitative skills.
CO3	Develop error correction and debugging skills in programming.
CO4	Apply data structures and algorithms in problem solving.
CO5	Develop advanced vocabulary for effective reading skills
CO6	Apply advanced algorithm design techniques to develop programs

6th Semester – B.Tech. Artificial Intelligence and Data Science

22CS006 – INTRODUCTION OF COMPUTER NETWORKS

COs	
CO1	Understand the fundamental concepts of computer networks.
CO2	Apply the various routing protocols to solve real-world problems.
CO3	Understand the layered architecture.
CO4	Apply the simulation tools to implement various protocols used in the various layers.
CO5	Analyze the various application layer protocols.
CO6	Apply the mathematical knowledge to do performance analysis of various routing protocols.

22AI602 – AUTOMATA THEORY AND COMPILER DESIGN

COs	
CO1	Construct deterministic and non-deterministic finite automata.
CO2	Design context free grammars for formal languages using regular expressions.
CO3	Use PDA and Turing Machines for recognizing context-free languages.
CO4	Design a lexical analyzer.
CO5	Design syntax analyzer.
CO6	Design a simple code generator and apply different code optimizations.

22AI903 - Text and Speech Analytics

COs	
CO1	Apply the fundamental techniques in text processing for various NLP tasks.
CO2	Implement advanced language models and improve text classification accuracy.
CO3	Designing text processing systems using state-of-the-art techniques.
CO4	Design, implement, and evaluate ASR and TTS systems.
CO5	Apply advanced speech recognition methodologies in practical applications.
CO6	Use information Retrieval Techniques to build and evaluate text processing systems.

22AI911 - Generative AI

COs	
CO1	Understand the basic concepts of Generative AI.
CO2	Build Generative AI systems to generate outputs of different domains.
CO3	Deploy Generative AI Models.
CO4	Compare and use the various Large Language Models.
CO5	Understand the basics of Prompt Engineering.
CO6	Apply Generative AI to solve real world applications.

22CS602 – OBJECT ORIENTED SOFTWARE ENGINEERING	
COs	
CO1	Summarize software engineering principles and activities involved in building large software programs
CO2	Describe the different phases of software development.
CO3	Explain the basics of OOAD and develop software using object oriented design.
CO4	Illustrate the different stages of the design process with a case study.
CO5	Develop mini-projects using the application of object oriented analysis and design.
CO6	Apply different testing strategies to develop efficient projects.

22AI601 - REINFORCEMENT LEARNING	
COs	
CO1	Outline the concepts of Reinforcement Learning.
CO2	Solve problems using Dynamic Programming and Monte Carlo Decision Process.
CO3	Implement the concept of Temporal difference Learning (TDL) to solve real world problems.
CO4	Apply functional approximation in reinforcement learning.
CO5	Implement Deep Reinforcement Learning to solve real world problems.
CO6	Solve real-world problems using Reinforcement Learning

Laboratory

22CS611 – ADVANCED APTITUDE AND CODING SKILLS II	
COs	
CO1	Develop advanced vocabulary for effective communication and reading skills.
CO2	Build an enhanced level of logical reasoning and quantitative skills.
CO3	Develop error correction and debugging skills in programming.
CO4	Apply data structures and algorithms in problem solving.
CO5	Develop coding solutions for real-world problems.
CO6	Engage in collaborative projects and provide constructive feedback during code reviews.
