



R.M.K. ENGINEERING COLLEGE
RSM Nagar, Kavaraipettai – 601 206



Department of Artificial Intelligence and Data Science

Course Outcomes
ODD Semester 2023-24

Sl. No.	Semester	Theory/ Practical	Course Code / Course Name
1)	3	Theory	20GE301 - UNIVERSALHUMAN VALUES II
2)	3	Theory	22MA301- DISCRETE MATHEMATIES
3)	3	Theory	22GE201 - TAMILS AND TECHNOLOGY
4)	3	Theory	22CS302 - COMPUTER ORGANISATION AND ARCHITECTURE
5)	3	Theory	22CS303 - DESIGN AND ANALYSIS OF ALGORITHMAM
6)	3	Theory	22AI301 - ARTIFICIAL INTELLIGENCE
7)	3	Theory	22AI302 - DATA SCIENCE USING PYTHON
8)	3	Practical	22CS303 - DESIGN AND ANALYSIS OF ALGORITHMAM
9)	3	Practical	22AI301 - ARTIFICIAL INTELLIGENCE
10)	3	Practical	22AI302 - DATA SCIENCE USING PYTHON
11)	3	Practical	22ME311 - PRODUCT DEVELOPMENT LAB 3
12)	3	Practical	22CS311- APTITUDE AND CODING SKILLS I
13)	5	Theory	20MA302 - DISCRETE MATHEMATICS
14)	5	Theory	20AI501 - DATA EXPLORATION AND VISUALIZATION (Lab Integrated)
15)	5	Theory	20CE003 - GEOGRAPHIC INFORMATION SYSTEM
16)	5	Theory	20AI502 - MACHINE LEARNING
17)	5	Theory	20AI920 - INTERNET PROGRAMMING (LAB INTEGRATED)
18)	5	Practical	20AI511 - MACHINE LEARNING LABORATORY
19)	5	Practical	20CS513 - MINI PROJECT AND DESIGN THINKING LABORATORY
20)	7	Theory	20AI701 - DEEP LEARNING TECHNIQUES
21)	7	Theory	20AI702 - NATURAL LABGUAGE PROCESS
22)	7	Theory	20CE001 - CLIMATE CHANGE AND ITS IMPACT
23)	7	Theory	20AI915 - IMAGE AND VIDEO ANALYTICS
24)	7	Theory	20CS907 - HUMAN COMPUTER INTERACTION
25)	7	Practical	20AI711 - DEEP LEARNING AND NLP LAB
26)	7	Practical	20IT928 - PROFESSIONAL READINGNESS FOR INNOVATION, EMPLOYABILITY AND ENTERPRENEURSHIP

EVEN Semester 2023-24

Sl. No.	Semester	Theory/ Practical	Course Code / Course Name
1)	4	Lab Integrated Theory	22MA401 - PROBABILITY AND STATISTICS
2)	4	Lab Integrated Theory	22CS304 - OPERATING SYSTEM
3)	4	Lab Integrated Theory	22CS401 - DISTRIBUTED CLOUD COMPUTING
4)	4	Lab Integrated Theory	22AI401 - MACHINE LEARNING
5)	4	Lab Integrated Theory	22CS402 - WEB DEVELOPMENT FRAMEWORK
6)	4	Lab Integrated Theory	22AI901 - BUSINESS INTELLIGENCE AND ANALYTICS
7)	4	Practical	22ME411 - PRODUCT DEVELOPMENT LAB 4
8)	4	Practical	22CS412 - MINI PROJECT AND DESIGN THINKING
9)	6	Theory	22AI605 - BUSINESS ANALYTICS
10)	6	Theory	20AI606 - KNOWLEDGE ENGINEERING
11)	6	Theory	20AI903 - REINFORCEMENT LEARNING
12)	6	Theory	20AI907- AI BLOCKCHAIN
13)	6	Practical	20AI611 - KNOWLEDGE ENGINEERING LABRATORY
14)	8	Practical	20AI811 - PROJECT PHASE -II

ODD Semester 2023-24

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	Validate the arguments using connectives and rule of inference.
CO2	Solve linear recurrence relations.
CO3	Determine Euler's path and Hamilton paths.
CO4	Identify algebraic structures of groups, rings, and fields.
CO5	Interpret lattices as algebraic structures.

22GE201 - TAMILS AND TECHNOLOGY	
COs	
CO1	Identify the role of weaving and ceramic technology in ancient Tamil Culture.
CO2	Assess the design and construction technology ideas in the current Tamil society.
CO3	Identify the different types of manufacturing technology used in Tamil society and their significance.
CO4	Classify agricultural and irrigation technologies in ancient Tamil society and its current relevance.
CO5	Discuss the fundamentals of scientific Tamil and Tamil computing.

22CS302 - COMPUTER ORGANISATION AND ARCHITECTURE

COs	
CO1	Explain the basic principles and operations of digital computers.
CO2	Design Arithmetic and Logic Unit to perform fixed and floating-point operations
CO3	Develop pipeline architectures for RISC Processors.
CO4	Summarize Various Memory systems & I/O interfacings.
CO5	Recognize Parallel Processor and Multi Processor Architectures

22CS303 - DESIGN AND ANALYSIS OF ALGORITHMAM

COs	
CO1	Solve mathematically the efficiency of recursive and non-recursive algorithms
CO2	Design and Analyse the efficiency of divide and conquer and transform and conquer algorithmic techniques
CO3	Implement and analyse the problems using dynamic programming
CO4	Solve the problems using and greedy technique and iterative improvement technique for optimization
CO5	Compute the limitations of algorithmic power and solve the problems using backtracking and branch and bound technique.

22AI301 - ARTIFICIAL INTELIGENCE

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.

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

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 and reading skills.
CO2	Build the logical reasoning and quantitative skills.
CO3	Develop error correction and debugging skills in programming.

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

20MA302-Discrete Mathematics

COs	
CO1	Examine the validity of the arguments.
CO2	Demonstrate various proof techniques and application of principles.
CO3	Apply graph theory techniques to solve real life problems
CO4	Identify algebraic techniques to formulate and solve group theoretic problems.
CO5	Utilize the significance of lattices and Boolean algebra in computer science and engineering.

20AI501- DATA EXPLORATION AND VISUALIZATION

COs	
CO1	Explain the overview of exploratory data analysis and phases involved in data analytics
CO2	Explore in-depth knowledge in EDA techniques
CO3	Apply the visualization techniques in data
CO4	Describe the methods of time series analysis
CO5	Represent the data in tree and hierarchical formats

20AI502 - MACHINE LEARNING	
COs	
CO1	Explain the basics of Machine Learning and Supervised Algorithms.
CO2	Understand the various classification algorithms.
CO3	Study dimensionality reduction techniques.
CO4	Elaborate on unsupervised learning techniques.
CO5	Understand various Graphical models and understand the basics of reinforcement learning.

20AI920 - INTERNET PROGRAMMING	
COs	
CO1	Construct a basic website using HTML and Cascading Style Sheets.
CO2	Build dynamic web page with validation using Java Script objects and by applying different event handling mechanisms.
CO3	Develop server side programs using Servlets and JSP.
CO4	Construct simple web pages in PHP and to represent data in XML format.
CO5	Apply AJAX and web services to develop interactive web applications.

20CE003 - GEOGRAPHIC INFORMATION SYSTEM	
COs	
CO1	Describe the fundamentals of maps and their characteristics, GIS & its components.
CO2	Demonstrate various spatial data models and their advantages.
CO3	Identify GIS Data sources, data input, data editing and conversion.
CO4	Carry out raster and vector data analysis for various applications.
CO5	Explain the spatial information along with quality assessment for applications.
CO6	Identify an error free GIS database for civil engineering applications.

Laboratory

20AI511-Machine Learning Laboratory	
COs	
CO1	Analyse supervised, unsupervised or semi-supervised learning algorithms for any given problem.
CO2	Apply the appropriate linear models for any given problem.
CO3	Understand the foundation of probabilistic models and apply unsupervised algorithms for clustering
CO4	Select the appropriate graphical models of machine learning.
CO5	Apply deep learning algorithms to improve efficiency.

20CS513 - MINI PROJECT AND DESIGN THINKING

COs	
CO1	Understand the design thinking process and able to visualize the problem.
CO2	Analyse the problem using innovation tools
CO3	Design a prototype for an identified problem solution
CO4	Testing and evaluate strategies in improving the solution
CO5	Apply the innovation ideas to real-world applications.

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

20AI701-DEEP LEARNING TECHNIQUES

COs	
CO1	Explain the basics of deep neural networks.
CO2	Describe advanced deep learning models.
CO3	Understand CNN and RNN architectures of deep neural networks.
CO4	Learn autoencoders in neural networks.
CO5	Learn about the deep generative models.

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

20CE001-CLIMATE CHANGE AND ITS IMPACT

COs	
CO1	Understand the terminologies involved in climatology and their role in global climate change
CO2	Explain the national and state action plan on climate change.
CO3	Discuss the missions developed with respect to sustainable development of natural resources.
CO4	Describe the climate change scenarios at regional and global level and the working of regional and global climate models.
CO5	Appraise the application of climate change models in India.
CO6	Summarize the impact of climate change on the concept of vulnerability indices

20AI915-IMAGE AND VIDEO ANALYTICS

COs	
CO1	Understand the basics of image processing techniques for computer vision and video analysis.
CO2	Explain the techniques used for image pre-processing.
CO3	Learn the various image Segmentation techniques.
CO4	Understand the various Object recognition mechanisms.
CO5	Elaborate on the motion analysis techniques for video analytics.

20CS907-HUMAN COMPUTER INTRACTION

COs	
CO1	Enumerate the basic concepts of human, computer interactions
CO2	Inspect software design process in human computer interaction
CO3	Examine various models and theories related to human computer interaction
CO4	Build meaningful user interface
CO5	Establish the different levels of communication across the application stakeholders.

Laboratory

20IT928-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

20AI711-DEEPLARNING AND NLP LAB

COs	
CO1	To understand text analytics using Various NLP techniques.
CO2	To learn the basic and important design concepts of image analytics.
CO3	To Understand key technology foundations required for video analytics.
CO4	Understand different methodologies to create applications using deep learning.

EVEN Semester 2023-24

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

20MA402-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 SYSTEM	
COs	
CO1	Implement the basic concepts of operating systems and process.
CO2	Analyse various CPU scheduling algorithms and thread mechanism.
CO3	Implement the concepts of process synchronization and deadlocks.
CO4	Design various memory management schemes to given situation.
CO5	Implement various I/O and file management techniques.

20CS401 - DISTRIBUTE AND CLOUD COMPUTING	
COs	
CO1	Articulate the main concepts and models underlying distributed computing.
CO2	Learn how to maintain consistency and perform efficient coordination in distributed systems through the use of logical clocks, global states, and snapshot recording algorithms.
CO3	Learn different distributed mutual exclusion algorithms
CO4	Develop the ability to understand the cloud infrastructure and virtualization that help in the development of cloud.
CO5	Explain the high-level automation and orchestration systems that manage the virtualized infrastructure.

20MA401-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.

22CS402 - WEB DEVELOPMENT FRAME WORKS

COs	
CO1	Write Web API/RESTful API application programming interface to communicate with Spring boot as a serverside technology.
CO2	Build single page applications using REACT as a reusable UI component technology as client side technology
CO3	Build applications using Node Js as server side technologies
CO4	Able to develop a web application using latest Angular Framework
CO5	Apply various Angular features including directives, components, and services.

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.

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.

22CS412 - MINI PROJECT AND DESIGN THINKING

COs	
CO1	Understand the design thinking process and able to visualize the problem.
CO2	Analyse the problem using innovation tools
CO3	Design a prototype for an identified problem solution
CO4	Testing and evaluate strategies in improving the solution
CO5	Apply the innovation ideas to real-world applications.

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

20AI601-Business Analytics

COs	
CO1	Understand of how managers use business analytics to formulate and solve business problems.
CO2	Develop and deploy Business Analytic Models.
CO3	Understand the business analytics at analytical and warehouse level.
CO4	Analyze the various predictive analytics methods in business.
CO5	Analyze the various prescriptive analytics methods in business.

20AI606-KNOWLEDGW ENGINEERING

COs	
CO1	Understand the basics of Knowledge Engineering.
CO2	.Discuss reasoning under uncertainty.
CO3	Design and develop ontologies.
CO4	Apply reasoning with ontologies and rules.
CO5	Understand learning and rule learning.

20AI903 - REINFORCEMENT LEARNING

COs	
CO1	Learn about the concepts of Reinforcement Learning.
CO2	Understand the concept of Dynamic Programming and Monte Carlo Decision Process
CO3	Understand the concept of Temporal difference Learning (TML)
CO4	Describe how functional approximation is used in reinforcement learning.
CO5	Learn the basics of Deep Reinforcement Learning

20AI907 -AI IN BLOCK CHAIN

COs	
CO1	Acquire knowledge in Blockchain Technologies.
CO2	Understand how block chain and AI can be used to innovate
CO3	Explain Cryptocurrencies and AI.
CO4	Develop applications using blockchain.
CO5	Understand the limitations and future scope of AI in Blockchain.

Laboratory

20AI611-Knowledge Engineering Laboratory

COs	
CO1	Represent Knowledge for various domains.
CO2	Implement an Expert System.
CO3	Develop Ontologies for a given domain.
CO4	Develop Fuzzy Rule based Systems.
CO5	Apply classification algorithms.
