



R.M.K. COLLEGE OF ENGINEERING AND TECHNOLOGY

RSM Nagar, Puduvoyal – 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	22GE302 – UNIVERSAL HUMAN VALUES II
2)	3	Theory	22MA301- DISCRETE MATHEMATICS
3)	3	Theory	22GE201 - TAMILS AND TECHNOLOGY
4)	3	Theory	22CS302 - COMPUTER ORGANISATION AND ARCHITECTURE
5)	3	Theory+Lab	22CS303 - DESIGN AND ANALYSIS OF ALGORITHMAM
6)	3	Theory+Lab	22AI301 - ARTIFICIAL INTELLIGENCE
7)	3	Theory+Lab	22AI302 - DATA SCIENCE USING PYTHON
8)	3	Practical	22CS313 - PRODUCT DEVELOPMENT LAB 3
9)	3	Practical	22CS311- APTITUDE AND CODING SKILLS I
10)	5	Theory	21MA301 - DISCRETE MATHEMATICS
11)	5	Theory+Lab	21AI501 - DATA EXPLORATION AND VISUALIZATION
12)	5	Theory	21OE010 – BIOMEDICAL INSTRUMENTATION
13)	5	Theory	21AI502 - MACHINE LEARNING
14)	5	Theory	21CS501 – COMPUTER NETWORKS
15)	5	Practical	21AI511 - MACHINE LEARNING LABORATORY
16)	5	Practical	21CS512 – ADVANCED APTITUDE AND CODING SKILLS -I
17)	5	Practical	21CS513 - MINI PROJECT AND DESIGN THINKING LAB
18)	7	Theory	AD8701 - DEEP LEARNING
19)	7	Theory	AD8702 – TEXT ANALYTICS
20)	7	Theory	AD8703 – BASICS OF COMPUTER VISION
21)	7	Theory	AD8705 – AI & ROBOTICS
22)	7	Theory	OCY751 – WASTE WATER TREATMENT
23)	7	Theory	AD8704 – BIG DATA MANAGEMENT
24)	7	Practical	AD8711 - DEEP LEARNING AND NLP LAB
25)	7	Practical	AD9712 – MINIPROJECT ON ANALYTICS
26)	7	Theory	AD8013 – ETHICS OF ARTIFICIAL INTELLIGENCE (ADV. COURSE- 8 SEM)
27)	7	Theory	MG8591 – PRINCIPLES OF MANAGEMENT (ADV. COURSE – 8)

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	22CS411 – APTITUDE AND CODING SKILLS II
8)	4	Practical	22CS413 - PRODUCT DEVELOPMENT LAB 4
9)	4	Practical	22CS412 - MINI PROJECT AND DESIGN THINKING
10)	6	Theory	21AI601 - BUSINESS ANALYTICS
11)	6	Theory	21AI604 - KNOWLEDGE ENGINEERING
12)	6	Theory	21AI903 - REINFORCEMENT LEARNING
13)	6	Theory	21AI907- AI BLOCKCHAIN
14)	6	Practical	21AI611 - KNOWLEDGE ENGINEERING LABORATORY
15)	6	Practical	21CS613 - ADVANCED APTITUDE AND CODING SKILLS -II
16)	8	Practical	20AI811 - PROJECT PHASE -II

ODD Semester 2023-24

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

22GE302 - UNIVERSAL HUMAN VALUES II	
COs	Course Outcome : The students, after the completion of the course, are expected to
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	Course Outcome : The students, after the completion of the course, are expected to
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	Course Outcome : The students, after the completion of the course, are expected to
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	Course Outcome : The students, after the completion of the course, are expected to
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

22CS303 - DESIGN AND ANALYSIS OF ALGORITHM

COs	Course Outcome : The students, after the completion of the course, are expected to
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.

22AI301 - ARTIFICIAL INTELIGENCE

COs	Course Outcome : The students, after the completion of the course, are expected to
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	Course Outcome : The students, after the completion of the course, are expected to
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

22CS313-Product Development Lab 3	
COs	Course Outcome : The students, after the completion of the course, are expected to
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	Course Outcome : The students, after the completion of the course, are expected to
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

21MA301-Discrete Mathematics	
COs	Course Outcome : The students, after the completion of the course, are expected to
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.

21AI501- DATA EXPLORATION AND VISUALIZATION	
COs	Course Outcome : The students, after the completion of the course, are expected to
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

21AI502 – MACHINE LEARNING

Cos	Course Outcome : The students, after the completion of the course, are expected to
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.

210E010 – BIOMEDICAL INSTRUMENTATION

COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	Explain the different types of bio-potentials, their sources, and mechanisms of propagation.
CO2	Analyze the characteristics of bio-signals and their significance in physiological measurements.
CO3	Justify the appropriate electrode placements for various physiological recordings.
CO4	Design bio-amplifiers for different physiological signal acquisitions
CO5	Compare the various techniques for non-electrical physiological measurements.
CO6	Examine and apply different biochemical measurement techniques in biomedical applications

21CS501 – COMPUTER NETWORKS

COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	Explain the fundamental concepts of computer networking and network architecture.
CO2	Analyze the performance of various network protocols used in data transmission.
CO3	Design basic network architectures including LAN and WAN using appropriate hardware and software.
CO4	Develop skills to diagnose common network issues using tools.
CO5	Analyze the various application layer protocols.
CO6	Implement protocols used for finding shortest route for data transmission.

Laboratory

21AI511-Machine Learning Laboratory

COs	Course Outcome : The students, after the completion of the course, are expected to
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.

21CS512 – Advanced Aptitude and Coding Skills - I

COs	Course Outcome : The students, after the completion of the course, are expected to
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

21CS513 - MINI PROJECT AND DESIGN THINKING

COs	Course Outcome : The students, after the completion of the course, are expected to
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.
CO6	Develop miniprojects for real life problems.

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

AD8701 - DEEP LEARNING

COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	Explain the basics in deep neural networks
CO2	Apply Convolution Neural Network for image processing.
CO3	Explain the basics of Artificial Intelligence using deep learning
CO4	Apply deep learning algorithms for data science
CO5	Apply deep learning algorithms for variety applications.

AD8702 – TEXT ANALYTICS

COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	Design text extraction techniques.
CO2	Devise clustering techniques for text mining.
CO3	Design classification techniques for text mining
CO4	Apply visualization techniques and perform anomaly & trend detection.
CO5	Perform Event operations in Text streams

AD8703 – BASICS OF COMPUTER VISION

COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	Explain low level processing of image and transformation techniques applied to images
CO2	Explain the feature extraction, segmentation and object recognition methods
CO3	Apply Histogram transform for detection of geometric shapes like line, ellipse and objects.
CO4	Illustrate 3D vision process and motion estimation techniques.
CO5	Apply vision techniques to real time applications

AD8705 – AI & ROBOTICS

COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	Explain the types of Robots.
CO2	Narrate the kinematics of Robots
CO3	Implement image processing algorithms
CO4	Devise Localization algorithms.
CO5	Devise Path planning methods for navigation

AD8704 – BIG DATA MANAGEMENT

COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	Describe big data and use cases from selected business domains
CO2	Explain NoSQL big data management
CO3	Install, configure, and run Hadoop and HDFS.
CO4	Perform map-reduce analytics using Hadoop.
CO5	Use Hadoop related tools such as HBase, Cassandra, Pig, and Hive for big data analytics.

OCY751 – WASTE WATER TREATMENT

COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	Interpret the water quality parameters and the various methods involved in preliminary treatment of waste water.
CO2	Summarize the different types of filters, various softening methods of water and Industrial water treatment for boilers.
CO3	Predict the suitable conservational treatment methods of waste water.
CO4	Identify the pre and primary treatment methods based on the impurities present in waste water.
CO5	Differentiate adsorption and oxidation process for the treatment of water..

AD8013 – ETHICS OF ARTIFICIAL INTELLIGENCE

COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	Understand the ethical issues in the development of AI agents
CO2	Learn the ethical considerations of AI with perspectives on ethical values
CO3	Apply the ethical policies in AI based applications and Robot development
CO4	To implement the AI concepts to societal problems by adapting the legal concepts by securing fundamental rights.
CO5	This study will help to overcome the evil genesis in the concepts of AI

MG8591 – PRINCIPLES OF MANAGEMENT

COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	Upon completion of the course, students will be able to have clear understanding of managerial functions like planning, organizing, staffing, leading & controlling and have same basic knowledge on international aspect of management

Laboratory

AD8711 - DEEP LEARNING AND NLP LAB

COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	Apply deep neural network for simple problems
CO2	: Apply Convolution Neural Network for image processing.
CO3	Apply Recurrent Neural Network and its variants for text analysis
CO4	Apply generative models for data augmentation.
CO5	Develop a real world application using suitable deep neural networks

EVEN Semester 2023-24

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

22MA402-Probability and Statistics	
COs	Course Outcome : The students, after the completion of the course, are expected to
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	Course Outcome : The students, after the completion of the course, are expected to
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

22CS401 - DISTRIBUTED AND CLOUD COMPUTING	
COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	Explain the principles of distributed computing and cloud computing, including key terminology and architecture.
CO2	Analyze algorithms for resource allocation, load balancing, and fault tolerance in distributed environments.
CO3	Design and evaluate architectures for distributed systems and cloud platforms, including microservices and serverless models
CO4	Implement and deploy applications on cloud platforms, utilizing tools and services such as containers, orchestration, and serverless computing.
CO5	Critically assess case studies and real-world applications of distributed and cloud computing technologies
CO6	Develop and simulate mutual exclusion algorithms to solve coordination problems in distributed applications.

22AI401-MACHINE LEARNING

COs	Course Outcome : The students, after the completion of the course, are expected to
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	Course Outcome : The students, after the completion of the course, are expected to
CO1	Write Web API/RESTful API application programming interface to communicate with Spring boot as a server side technology.
CO2	Build single page applications as a reusable UI component technology as client-side technology
CO3	Build applications using server-side technologies
CO4	Able to develop a web application using latest Frameworks.
CO5	Apply various features to develop client server applications.
CO6	Design and integrate complex web components to enhance user interface and

22AI901 - BUSINESS INTELLIGENCE AND ANALYTICS

COs	Course Outcome : The students, after the completion of the course, are expected to
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

22CS413- PRODUCT DEVELOPMENT LAB-4	
COs	Course Outcome : The students, after the completion of the course, are expected to
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	Course Outcome : The students, after the completion of the course, are expected to
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.
CO6	Develop mini projects for real life problems.

22CS411- Aptitude and Coding Skills -II Laboratory	
COs	Course Outcome : The students, after the completion of the course, are expected to
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

21AI601-Business Analytics

COs	Course Outcome : The students, after the completion of the course, are expected to
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.

21AI604-KNOWLEDGE ENGINEERING

COs	Course Outcome : The students, after the completion of the course, are expected to
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.

21AI903 - REINFORCEMENT LEARNING

COs	Course Outcome : The students, after the completion of the course, are expected to
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 (TDL)
CO4	Describe how functional approximation is used in reinforcement learning.
CO5	Learn the basics of Deep Reinforcement Learning

21AI907 -AI IN BLOCK CHAIN

COs	Course Outcome : The students, after the completion of the course, are expected to
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

21AI611-Knowledge Engineering Laboratory

COs	Course Outcome : The students, after the completion of the course, are expected to
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.

21CS613 – Advanced Aptitude and Coding Skills – II Laboratory

COs	Course Outcome : The students, after the completion of the course, are expected to
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.
