



# R.M.K. ENGINEERING COLLEGE

(An Autonomous Institution)

R.S.M Nagar, Kavaraipettai, Gummidipoondi Taluk Thiruvallur District, Tamil Nadu- 601206

Affiliated to Anna University, Chennai / Approved by AICTE, New Delhi

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## DEPARTMENT OF INFORMATION TECHNOLOGY

### Course Outcomes – ODD Semester 2022-2023

Sl. No.	Semester	Theory/Practical/ Lab Integrated	Course Code / Course Name
1)	3	Theory	20MA302 – Discrete Mathematics
2)	3	Theory	20IT301 – Object Oriented Programming Principles
3)	3	Theory	20CS404 – Operating Systems
4)	3	Theory	20CS402 – Design and Analysis of Algorithms
5)	3	Theory	20EC341 – Analog and Digital Communications
6)	3	Lab Integrated	20CS301 - Digital Principles and System Design
7)	3	Practical	20IT311 - Object Oriented Programming Principles Laboratory
8)	3	Practical	20CS412 – Operating Systems Laboratory
9)	3	Practical	20IT312 – Mini Project - I
10)	3	Practical	20CS313 – Aptitude and Coding Skills - I
11)	5	Theory	20CS501 – Computer Networks
12)	5	Theory	20IT502 – Object Oriented Systems Design
13)	5	Theory	20IT503 – Big Data Analytics
14)	5	Theory	20IT902 – Software Testing
15)	5	Lab Integrated	20IT501 - Web Development Frameworks
16)	5	Lab Integrated	20EC441 – Microprocessors and Interfacing
17)	5	Practical	20CS511 - Networks Laboratory
18)	5	Practical	20IT511 – Object Oriented Systems Design Laboratory
19)	5	Practical	20IT512 - Big Data Analytics Laboratory
20)	5	Practical	20CS512 – Advanced Aptitude and Coding Skills - 1
21)	7	Theory	CS8791 – Cloud Computing
22)	7	Theory	MG8591 – Principles of Management
23)	7	Theory	CS8792 - Cryptography and Network Security
24)	7	Theory	CS8079 - Human Computer Interaction
25)	7	Theory	OME752 – Supply Chain Management
26)	7	Practical	IT8711 – FOSS and Cloud Computing Laboratory
27)	7	Practical	IT8761 – Security Laboratory

Department of Information Technology

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### Third Semester B.Tech.

<b>20MA302 – Discrete Mathematics</b>	
COs	<b>Course Outcome: The students, after the completion of the course, are expected to ....</b>
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

<b>20IT301 – Object Oriented Programming Principles</b>	
COs	<b>Course Outcome : The students, after the completion of the course, are expected to ....</b>
CO1	Design and develop various applications in Java using OOD and Principles
CO2	Implement a given problem statement by selecting the right choice of options in Core Java.
CO3	Accomplish efficient programming in Core Java
CO4	Design and Develop real time applications to process high volume of data with consistency and atomicity
CO5	Develop applications to connect to Database using available thin drivers, and performs DDL operations

<b>20CS404 – Operating Systems</b>	
COs	<b>Course Outcome: The students, after the completion of the course, are expected to ....</b>
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.

<b>20CS402 – Design and Analysis of Algorithms</b>	
COs	<b>Course Outcome: The students, after the completion of the course, are expected to ....</b>
CO1	Analyze the efficiency of recursive and non-recursive algorithms mathematically
CO2	Analyze the efficiency of brute force, divide and conquer, decrease and conquer, Transform and conquer algorithmic techniques
CO3	Implement and analyze the problems using dynamic programming and greedy technique algorithmic techniques
CO4	Solve the problems using iterative improvement technique for optimization.
CO5	Compute the limitations of algorithmic power and solve the problems using backtracking and branch and bound technique.



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<b>20EC341 – Analog and Digital Communication</b>	
<b>COs</b>	<b>Course Outcome: The students, after the completion of the course, are expected to ....</b>
CO1	Analyze the different types of Analog Communication Systems.
CO2	Familiarize with Data Communication Techniques.
CO3	Explore the different types of Pulse Communication Techniques.
CO4	Analyze the various types of Digital Communication Schemes.
CO5	Solve Source Coding and Error Control Coding problems.
CO6	Apply the Principles of Multi-User Radio Communication

### Lab Integrated

<b>20CS301 - Digital Principles and System Design</b>	
<b>COs</b>	<b>Course Outcome: The students, after the completion of the course, are expected to ....</b>
CO1	Design and implement Digital Circuits using simplified Boolean functions
CO2	Analyze and Design and implement Combinational Circuits
CO3	Analyze and Design Synchronous Sequential Circuits
CO4	Analyze and Design Asynchronous Sequential Circuits
CO5	Implement designs using Programmable Logic Devices
CO6	Develop HDL code for Combinational and Sequential Circuits

### Laboratory

<b>20IT311 - Object Oriented Programming Laboratory</b>	
<b>COs</b>	<b>Course Outcome: The students, after the completion of the course, are expected to ....</b>
CO1	Develop and implement Java programs for simple applications that make use of classes Packages and interfaces.
CO2	Develop and implement Java programs with array list, exception handling and multithreading.
CO3	Design applications using file processing, generic programming and event handling.

<b>20CS412 -Operating Systems Laboratory</b>	
<b>COs</b>	<b>Course Outcome: The students, after the completion of the course, are expected to ....</b>
CO1	Compare the performance of various CPU Scheduling Algorithms
CO2	Implement Deadlock avoidance and Detection Algorithms
CO3	Create processes and implement IPC
CO4	Analyze the performance of the various Page Replacement Algorithms
CO5	Implement File Organization and File Allocation Strategies



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<b>20IT312 – Mini Project - I</b>	
<b>COs</b>	<b>Course Outcome: The students, after the completion of the course, are expected to ....</b>
CO1	Define the problem statement, study of requirements; study related Literature and the possible feasibilities.
CO2	Demonstrate a sound technical knowledge of their selected project domain.
CO3	Analyze the problem statement and design the architecture and modules for the proposed system
CO4	Implement the problem and test the project with various test cases
CO5	Demonstrate the knowledge, skills and attitudes of a software professional
CO6	To take up challenging real world problems and find solution using appropriate methodology.

<b>20IT312 – Aptitude and Coding Skills - I</b>	
<b>COs</b>	<b>Course Outcome: The students, after the completion of the course, are expected to ....</b>
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.

### Fifth Semester B.Tech.

<b>20CS501 – Computer Networks</b>	
<b>COs</b>	<b>Course Outcome: The students, after the completion of the course, are expected to ....</b>
CO1	Explain the basic layers and its functions, and transmission media in computer networks
CO2	Examine the performance of different types of networks
CO3	Inspect the functionalities of data link and media access control protocols
CO4	Examine different routing algorithms
CO5	Identify appropriate protocol to be used at the transport layer
CO6	Explain the working of various application layer protocols.

<b>20IT502 – Object Oriented Systems Design</b>	
<b>COs</b>	<b>Course Outcome: The students, after the completion of the course, are expected to ....</b>
CO1	Understand the fundamentals of object modeling
CO2	To understand and differentiate Unified Process from other approaches.
CO3	Design a static UML diagrams.
CO4	Design a dynamic UML and implementation diagrams.
CO5	To improve the software design with design patterns.
CO6	To test the software against its requirements specification



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<b>20IT503 – Big Data Analytics</b>	
<b>COs</b>	<b>Course Outcome: The students, after the completion of the course, are expected to ....</b>
CO1	Identify Big Data and its Business Implications
CO2	List the components of Hadoop and Hadoop Eco- System
CO3	Access and Process Data on Distributed File System
CO4	Manage Job Execution in Hadoop Environment
CO5	Develop Big Data Solutions using Hadoop Eco System

<b>20IT902 – Software Testing</b>	
<b>COs</b>	<b>Course Outcome: The students, after the completion of the course, are expected to ....</b>
CO1	Understand the impact of defects in software development process
CO2	Design test cases suitable for a software development for different domains
CO3	Identify suitable tests to be carried out
CO4	Prepare test planning based on the document
CO5	Develop and validate a test plan
CO6	Document test plans and test cases designed
CO7	Use automatic testing tools

### Lab Integrated

<b>20IT501 - Web Development Frameworks</b>	
<b>COs</b>	<b>Course Outcome: The students, after the completion of the course, are expected to ....</b>
CO1	Personalize web pages using text formatting, graphics, audio, and video.
CO2	Hands on knowledge on Typescript
CO3	Able to develop a web application using latest Angular Framework
CO4	Able to develop a web application using latest Angular Framework
CO5	Able to develop data driven back end API using NodeJS as the core platforms.

<b>20EC441 - Microprocessors and Interfacing</b>	
<b>COs</b>	<b>Course Outcome: The students, after the completion of the course, are expected to ....</b>
CO1	Acquire knowledge on the architecture of 8086 microprocessor and 8051 microcontroller.
CO2	Apply programming techniques in developing the assembly language program for microprocessor applications.
CO3	Apply programming techniques in developing the assembly language program for microcontroller applications.
CO4	Analyze various types of interfacing devices with other peripheral devices.
CO5	Design and Construct Memory Interfacing Circuits.
CO6	Design and Construct Microprocessor and Microcontroller based systems.



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### Laboratory

<b>20CS511 - Networks Laboratory</b>	
<b>COs</b>	<b>Course Outcome: The students, after the completion of the course, are expected to ....</b>
CO1	Understand the various networking commands in different OS and troubleshoot it
CO2	Perform error detection & correction and flow control mechanisms in network programming.
CO3	Program with raw sockets for network protocol implementation
CO4	Understand the usage of various network programming APIs and application layer protocols.
CO5	Simulate various network protocols and analyze their behavior in the network

<b>20IT511 – Object Oriented Systems Design Laboratory</b>	
<b>COs</b>	<b>Course Outcome: The students, after the completion of the course, are expected to ....</b>
CO1	Develop and implement simple applications that make use of classes, packages and interfaces.
CO2	Develop and implement the above application using exception handling.
CO3	Develop and implement above application with inheritance and polymorphism
CO4	Develop real-world applications using OOP Concepts

<b>20IT512 – Big Data Analytics Laboratory</b>	
<b>COs</b>	<b>Course Outcome: The students, after the completion of the course, are expected to ....</b>
CO1	Identify the key issues in big data management and experiment with Hadoop framework.
CO2	Develop problem solving and critical thinking skills in fundamental enable techniques like Hadoop and MapReduce.
CO3	Construct and Explain with structure and unstructured data by using NoSQL commands.
CO4	Analyze the algorithms of big data analytics in various applications like recommender systems, social media applications.

<b>20CS512 – Advanced Aptitude and Coding Skills - I</b>	
<b>COs</b>	<b>Course Outcome: The students, after the completion of the course, are expected to ....</b>
CO1	Develop vocabulary for effective communication and reading skills
CO2	Build the logical reasoning and quantitative skills
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### Seventh Semester B.Tech.

#### CS8791 – Cloud Computing

COs	Course Outcome: The students, after the completion of the course, are expected to ....
CO1	Describe the principles of Parallel and Distributed Computing and evolution of cloud computing from existing technologies
CO2	Implement different types of Virtualization technologies and Service Oriented Architecture systems
CO3	Elucidate the concepts of NIST Cloud Computing architecture and its design challenges
CO4	Analyze the issues in Resource provisioning and Security governance in clouds
CO5	Choose among various cloud technologies for implementing applications
CO6	Install and use current cloud technologies

#### MG8591 – Principles of Management

COs	Course Outcome: The students, after the completion of the course, are expected to ....
CO1	Describe the historical evolution of management theories for business organizations
CO2	Demonstrate the use of planning tools for strategic management
CO3	Identify the most appropriate organizational structure.
CO4	Discuss HR strategies for planning, recruiting and training employees.
CO5	Explain the theories of motivation and leadership to manage a group.
CO6	Summarize the controlling methods and tools to increase productivity of the Organization.

#### CS8792 - Cryptography and Network Security

COs	Course Outcome: The students, after the completion of the course, are expected to ....
CO1	Understand the fundamentals of networks security, security architecture, threats and vulnerabilities
CO2	Apply the different cryptographic operations of symmetric cryptographic algorithms
CO3	Apply the different cryptographic operations of public key cryptography
CO4	Apply the various Authentication schemes to simulate different applications.
CO5	Understand various Security practices
CO6	Understand System security standards

#### CS8079 - Human Computer Interaction

COs	Course Outcome: The students, after the completion of the course, are expected to ....
CO1	Examine the effective dialog for HCI
CO2	Inspect interactive design process in human computer interaction
CO3	Inspect software design process in human computer interaction
CO4	Examine various models and theories related to human computer interaction
CO5	Utilize the HCI implications for designing multimedia/ e-commerce/ e-learning Web sites
CO6	Build meaningful user interface

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<b>OME752 – Supply Chain Management</b>	
<b>COs</b>	<b>Course Outcome: The students, after the completion of the course, are expected to ....</b>
<b>CO1</b>	Understand fundamental supply chain management concepts.
<b>CO2</b>	Understand the design factors and various design options of distribution networks in industries
<b>CO3</b>	Understand the framework of supply chain networks and functions
<b>CO4</b>	Understand the foundational role of logistics as it relates to transportation and warehousing.
<b>CO5</b>	Understand the various sourcing decisions in supply chain
<b>CO6</b>	Understand the supply chain management in IT industries

### Laboratory

<b>IT8711 – FOSS and Cloud Computing Laboratory</b>	
<b>COs</b>	<b>Course Outcome: The students, after the completion of the course, are expected to ....</b>
<b>CO1</b>	Configure various virtualization tools such as Virtual Box, VMware workstation
<b>CO2</b>	Design and deploy a web application in a PaaS environment
<b>CO3</b>	Learn how to simulate a cloud environment to implement new schedulers.
<b>CO4</b>	Install and use a generic cloud environment that can be used as a private cloud
<b>CO5</b>	Manipulate large data sets in a parallel environment.

<b>IT8761 – Security Laboratory</b>	
<b>COs</b>	<b>Course Outcome: The students, after the completion of the course, are expected to ....</b>
<b>CO1</b>	Develop code for classical Encryption Techniques to solve the problems.
<b>CO2</b>	Build cryptosystems by applying symmetric and public key encryption algorithms
<b>CO3</b>	Construct code for authentication algorithms
<b>CO4</b>	Develop a signature scheme using Digital signature standard.
<b>CO5</b>	Demonstrate the network security system using open source tools