

R.M.K. ENGINEERING COLLEGE

RSM Nagar, Kavaraipettai – 601 206

Department of Computer Science and Engineering

Course Outcomes – ODD Semester 2022-2023

Sl. No.	Semester	Theory/ Practical	Subject Code	Course Code / Course Name
1)	3	Theory	20MA302	Discrete Mathematics
2)	3	Theory	20CS301	Digital Principles and Systems Design (Lab Integrated)
3)	3	Theory	20CS302	Object Oriented Programming
4)	3	Theory	20CS303	Software Engineering
5)	3	Theory	20IT403	Database Management Systems
6)	3	Theory	20GE301	Universal Human Values 2: Understanding Harmony
7)	3	Practical	20CS311	Object Oriented Programming Laboratory
8)	3	Practical	20IT412	Database Management Systems Laboratory
9)	3	Practical	20CS312	Mini Project
10)	3	Practical	20CS313	Aptitude and Coding Skills - I
11)	5	Theory	MA8551	Algebra and Number Theory
12)	5	Theory	CS8591	Computer Networks
13)	5	Theory	EC8691	Microprocessors and Microcontrollers
14)	5	Theory	CS8501	Theory of Computation
15)	5	Theory	CS8592	Object Oriented Analysis and Design
16)	5	Theory	OCE552	Geographic Information System
17)	5	Practical	EC8681	Microprocessors and Microcontrollers Laboratory
18)	5	Practical	CS8582	Object Oriented Analysis and Design Laboratory
19)	5	Practical	CS8581	Networks Laboratory
20)	7	Theory	MG8591	Principles of Management
21)	7	Theory	CS8792	Cryptography and Network Security
22)	7	Theory	CS8791	Cloud Computing
23)	7	Theory	OME752	Supply Chain Management
24)	7	Theory	GE 8077	Total Quality Management
25)	7	Theory	CS8079	Human Computer Interaction
26)	7	Practical	CS8711	Cloud Computing Laboratory
27)	7	Practical	IT8761	Security Laboratory

3rd Semester – B.E. CSE

20MA302 – Discrete Mathematics

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

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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.

20CS301 - Digital Principles and System Design

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

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CO1 Design and implement digital circuits using simplified Boolean functions

CO2 Analyze, design and implement combinational circuits.

CO3 Analyze, design and implement synchronous and asynchronous sequential circuits.

CO4 Understand Programmable Logic Devices.

CO5 Develop HDL code for combinational and sequential circuits.

20CS302– Object Oriented Programming

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

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CO1 Explain the object oriented programming concepts and fundamentals of Java

CO2 Develop Java programs with the packages, inheritance, interfaces and exceptions

CO3 Build Java applications with I/O streams, threads and generics classes

CO4 Apply strings and collections in applications

CO5 Develop interactive Java applications using swings and event handling mechanism

20CS303 –Software Engineering

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

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CO1 CO1: Summarize software engineering principles and activities involved in building largesoftware programs.

CO2 Describe the process of requirements gathering and analysisCO3: Illustrate the design process.

CO3 Analyse the various testing methods

CO4 Implement the source coding and Error control techniques.

CO5 Apply estimation techniques, schedule project activities and compute pricing

20IT403-Database Management Systems

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

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CO1 CO1 Implement SQL and effective relational database design concepts.

CO2 . Map ER model to Relational model to perform database design effectively.

CO3 Compare and contrast various indexing strategies in different database systems

CO4 Implement queries using normalization criteria and optimization techniques..

CO5 Analyse how advanced databases differ from traditional databases.

20GE301- Universal Human Values 2: Understanding Harmony

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

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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 (humanvalues, 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..

Laboratory

20CS311 - Object Oriented Programming Laboratory

COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	: Develop and implement Java programs for simple applications that make use of classes, packages and interfaces.
CO2	Develop and implement Java programs with collections, exception handling, regular expressions and multithreading.
CO3	Design applications using file processing and event handling

20IT412 –Database Management SystemsLaboratory

COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	Apply typical data definitions and manipulation commands.
CO2	Design applications to test Nested and Join Queries.
CO3	Implement simple applications that use Views
CO4	Implement applications that require a Front-end Tool.
CO5:	Critically analyze the use of Tables, Views, Functions and Procedures.

20CS313 -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 and reading skills.
CO2	Build the logical reasoning and quantitative skills
CO3	Develop error correction and debugging skills in programming

5th Semester B.E. CSE

MA8551-Algebra and Number Theory

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

CO1	Introduce the basic notions of groups which will be used to solve group theory related problems.
CO2	Introduce the basic notions of rings, fields which will then be used to solve related problems.
CO3	Introduce and apply the concepts of rings, finite fields and polynomials.
CO4	Understand the basic concepts in number theory.
CO5	Examine the key questions in the Theory of Numbers.
CO6	Give an integrated approach to number theory and abstract algebra, and provide a firm basis for further reading and study in the subject.

CS8591-Computer Networks

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

CO1	Understand the basic layers and its functions in computer networks
CO2	Evaluate the performance of a network
CO3	Understand the basics of how data flows from one node to another
CO4	Analyze and design routing algorithm and protocols for various functions in the network
CO5	Analyze functionalities and protocols at the Transport Layer
CO6	Understand the working of various application layer protocols

EC8691-Microprocessors and Microcontrollers

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

CO1	Describe the architecture of 8086, addressing modes and machine language instruction formats.
CO2	Differentiate minimum and maximum modes of 8086 and concepts of I/O Programming
CO3	Describe 8255 modes of operation, interfacing A to D, D to A converters
CO4	Apply the programming techniques in designing simple assembly language programs for solving simple problems by using instruction sets of microcontroller
CO5	Describe the architecture of 8051 microcontroller and its addressing modes
CO6	Design a microcontroller based system

CS8501-Theory of Computation

COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	Students should be able to design an automata for any given pattern
CO2	Students should be able to specify regular expression for any string pattern
CO3	Students should be able to write context free grammar for any language
CO4	Students should be able to apply turing machine to propose computation solution
CO5	Students should be able to interpret whether a problem is decidable or not
CO6	Students should be able to interpret NP class problems

CS8592- Object Oriented Analysis and Design

COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	Explain OOAD concepts and various UML diagrams.
CO2	Illustrate about domain models and conceptual classes
CO3	Explain Dynamic and implementation UML diagram.
CO4	Select an appropriate design pattern
CO5	Develop Code from Design, Compare and contrast various testing techniques
CO6	Demonstrate various designing Techniques

OCE552-Geographic Information System

COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	Outline the basic idea about fundamentals of GIS.
CO2	Understand the types of spatial data models.
CO3	Discuss about the data input and topology.
CO4	Understand the data management functions and data output.
CO6	Outline the application of GIS.
CO6	Apply the GIS tools to develop real time applications.

EC8681-Microprocessors and Microcontrollers Laboratory

COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	Write ALP Programmes for fixed and Floating Point and Arithmetic operations.
CO2	Interface different I/Os with processor.
CO3	Generate waveforms using Microprocessors.
CO4	Execute Programs in 8051.
CO5	Explain the difference between simulator and Emulator.

CS8582-Object Oriented Analysis and Design Laboratory

COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	Perform OO analysis and design for a given problem specification.
CO2	Identify and map basic software requirements in UML mapping.
CO3	Improve the software quality using design patterns and to explain the rationale behind applying specific design patterns.
CO4	Test the compliance of the software with the SRS.

CS8581-Networks Laboratory

COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	Implement various protocols using TCP and UDP.
CO2	Compare the performance of different transport layer protocols.
CO3	Use simulation tools to analyze the performance of various network protocols.
CO4	Analyze various routing algorithms.
CO5	Implement error correction codes.

7th Semester B.E. CSE

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

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	Analyse 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

OME752-Supply Chain Management

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

GE 8077-Total Quality Management	
COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	Understand the quality philosophies and customer focused managerial system
CO2	Summarize the quality management principles
CO3	Apply six sigma concept in manufacturing and service sector
CO4	Determine the tools and techniques for quality improvement.
CO5	Analyze standards and auditing system on implementation of TQM.
CO6	Analyze standards for the operation of EMS.

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	Apply six sigma concept in manufacturing and service sector
CO4	Determine the tools and techniques for quality improvement.
CO5	Analyze standards and auditing system on implementation of TQM.
CO6	Analyze standards for the operation of EMS.

Laboratory

CS8711 - Cloud Computing Laboratory	
COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	Configure various virtualization tools such as Virtual Box, VMware workstation
CO2	Design and deploy a web application in a PaaS environment
CO3	Learn how to simulate a cloud environment to implement new schedulers
CO4	Install and use a generic cloud environment that can be used as a private cloud.
CO5	Manipulate large data sets in a parallel environment

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

Course Outcomes – EVEN Semester 2021-2022

Sl. No.	Semester	Theory/ Practical	Course Code / Course Name
1)	4	Theory	20MA402 - Probability and Statistics
2)	4	Theory	20CS401 - Computer Architecture
3)	4	Theory	20CS402 - Design and Analysis of Algorithms
4)	4	Theory	20CS403 - Internet Programming
5)	4	Theory	20CS404 - Operating Systems
6)	4	Theory	20EC441 - Microprocessors and Interfacing (Lab Integrated)
7)	4	Practical	20CS411 - Internet Programming Laboratory
8)	4	Practical	20CS412 - Operating Systems Laboratory
9)	4	Practical	20CS413 - Internship
10)	4	Practical	20CS414 - Aptitude and Coding Skills - II
11)	6	Theory	20CS601 - Compiler Design (Lab integrated)
12)	6	Theory	20CS602- Cryptography and Network Security
13)	6	Theory	20CS603- Mobile Computing
14)	6	Theory	20AI502- Machine Learning
15)	6	Theory	20CS917 - Data Science Fundamentals
16)	6	Theory	20CS918 - Google Cloud: Architecting with Google Compute Engine
17)	6	Practical	20CS611 - Mobile Application Development Laboratory
18)	6	Practical	20CS612- Security Laboratory
19)	6	Practical	20CS613- Internship
20)	6	Practical	20CS614 - Advanced Aptitude and Coding Skills-II

EVEN Semester 2020-2021

4th Semester – B.E. CSE

20MA402- Probability and Statistics	
COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	Understand the fundamental knowledge of modern probability theory and standard distributions.
CO2	Categorize the probability models and function of random variables based on one and two dimensional random variables.
CO3	Employ the concept of testing the hypothesis in real life problems.
CO4	Implement the analysis of variance for real life problems.
CO5	Apply the statistical quality control in engineering and management problems.

20CS401 - Computer 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	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.

20CS402 - Design and Analysis of Algorithms	
COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	Analyse the efficiency of recursive and non-recursive algorithms mathematically.
CO2	Analyse the efficiency of brute force, divide and conquer, decrease and conquer, Transform and conquer algorithmic techniques.
CO3	Implement and analyse the problems using dynamic programming and greedy technique algorithmic techniques.
CO4	Solve the problems using iterative improvement technique for optimization.
CO6	Outline the limitations of Algorithm power.

20CS403 - Internet Programming	
COs	Course Outcome : The students, after the completion of the course, are expected to
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.
CO6	Explain the different advanced databases

20CS404 - Operating Systems	
COs	Course Outcome : The students, after the completion of the course, are expected to
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.

20EC441 - Microprocessors and Interfacing (Lab Integrated)	
COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	Acquire knowledge of basic architecture, operation, programming of microprocessor 8086.
CO2	Summarize the design of basic and multiprocessor systems and their bus timings.
CO3	Design the 8086 interfaces with memory, I/O and other peripheral chips.
CO4	Describe the basic architecture and programming of microcontroller 8051.
CO5	Apply programming concepts to implement microcontroller interfaces for different applications.
CO6	Design and construct Microprocessor and Microcontroller based systems.

Laboratory

20CS411 - Internet Programming Laboratory

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

CO1 Create web pages using HTML/XML and style sheets.

CO2 Design user interfaces using Java frames and applets.

CO3 Develop dynamic web pages using server-side scripting and PHP programming.

CO4 Build applications with AJAX.

CS8461 - Operating Systems Laboratory

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

CO1 Practice system calls and shell programming.

CO2 Implement various CPU scheduling algorithms.

CO3 Build inter process communication deadlock detection and avoidance algorithms.

CO4 Design page replacement and disk scheduling algorithms.

CO5 Implement file allocation strategies.

20CS414 - Aptitude and Coding Skills - II

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.

6th Semester – B.E. CSE

CS8651 - Internet Programming	
COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	Create a basic website using HTML and Cascading Style Sheets
CO2	Design and implement dynamic web page with validation using JavaScript objects and by applying different event handling mechanisms
CO3	Access JSON data files and use the content within JavaScript
CO4	Design and implement server side programs using Servlets, JDBC and JSP
CO5	Design and implement simple web page in PHP, and to present data in XML format
CO6	Design a simple web page using AJAX

CS8691 - Artificial Intelligence	
COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	Use appropriate search algorithms for any AI problem.
CO2	Represent a problem using first order and predicate logic.
CO3	Provide the apt agent strategy to solve a given problem.
CO4	Design software agents to solve a problem.
CO5	Design applications for NLP that use Artificial Intelligence.

CS8601 - Mobile Computing	
COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	Understand the basic concepts of mobile computing
CO2	Explain the basics of mobile telecommunication systems
CO3	Illustrate the generations of telecommunication systems in wireless networks
CO4	Demonstrate the functionality of MAC, network layer and Identify a routing protocol for a given Ad hoc network
CO5	Explain the functionality of Transport and Application layers
CO6	Develop a mobile application using android/blackberry/ios/Windows SDK

CS8602 - Compiler Design	
COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	Design various phases of compiler, a lexical analyzer and use LEX tool.
CO2	Design a syntax analyzer and use YACC tool.
CO3	Discuss intermediate code generation.
CO4	Discuss the various storage allocation strategies and implement a code generator.
CO5	Apply the various optimization techniques.

CS8603 - Distributed Systems

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

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|------------|---|
| CO1 | Elucidate the foundations and issues of distributed systems. |
| CO2 | Understand the various synchronization issues and global state for distributed systems. |
| CO3 | Comprehend the Mutual Exclusion and Deadlock detection algorithms in distributed systems. |
| CO4 | Show the use of agreement protocols and fault tolerance mechanisms in distributed systems |
| CO5 | Relate the features of peer-to-peer and distributed shared memory systems |
| CO6 | Interpret the real-time distributed system applications |

IT8076 - Software Testing

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

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|------------|---|
| CO1 | Design test cases suitable for a software development for different domains |
| CO2 | Identify suitable tests to be carried out |
| CO3 | Prepare test planning based on the document |
| CO4 | Document test plans and test cases designed |
| CO5 | Use automatic testing tools |
| CO6 | Develop and validate a test plan |

Laboratory

CS8661 - Internet Programming Laboratory

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

CO1 Construct Web pages using HTML/XML and style sheets.

CO2 Build dynamic web pages with validation using Java Script objects and by applying different event handling mechanisms.

CO3 Develop dynamic web pages using server side scripting.

CO4 Use PHP programming to develop web applications.

CO5 Construct web applications using AJAX and web services

CS8662 - Mobile Application Development Laboratory

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

CO1 Develop mobile applications using GUI and Layouts.

CO2 Develop mobile applications using Event Listener.

CO3 Develop mobile applications using Databases.

CO4 Develop mobile applications using RSS Feed, Internal/External Storage, SMS, Multithreading and GPS.

CO5 Analyze and discover own mobile app for simple needs.

CS8611 Mini Project

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

CO1 On Completion of the mini project students will be in a position to take up challenging real world problems and find solution using appropriate methodology

HS8581 Professional Communication

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

CO1 Make effective presentations

CO2 Participate confidently in Group Discussions.

CO3 Attend job interviews and be successful in them

CO4 Develop adequate Soft Skills required for the workplace