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

Department of Computer Science and Engineering

Course Outcomes – ODD Semester 2019-2020

Sl. No.	Semester	Theory/ Practical	Course Code / Course Name
1)	3	Theory	MA8351 -Discrete Mathematics
2)	3	Theory	CS8351 - Digital Principles and System Design
3)	3	Theory	CS8391 - Data Structures
4)	3	Theory	CS8392 - Object Oriented Programming
5)	3	Theory	EC 8395 - Communication Engineering
6)	3	Practical	CS8381 - Data Structures Laboratory
7)	3	Practical	CS8383 - Object Oriented Programming Laboratory
8)	3	Practical	CS8382 - Digital Systems Laboratory
9)	3	Practical	HS8381 - Interpersonal Skills/Listening &Speaking
10)	5	Theory	MA8551 - Algebra and Number Theory
11)	5	Theory	CS8591 - Computer Networks
12)	5	Theory	EC8691 - Microprocessors and Microcontrollers
13)	5	Theory	CS8501 - Theory of Computation
14)	5	Theory	CS859 - Object Oriented Analysis and Design
15)	5	Practical	EC8681 - Microprocessors and Microcontrollers Laboratory
16)	5	Practical	CS8582 - Object Oriented Analysis and Design Laboratory
17)	5	Practical	CS8581 - Networks Laboratory
18)	7	Theory	CS6701 - Cryptography and Network Security
19)	7	Theory	CS6702 - Graph Theory and Applications
20)	7	Theory	CS6703 - Grid and Cloud Computing
21)	7	Theory	CS6704 - Resource Management Techniques
22)	7	Theory	CS6007 - Information Retrieval
23)	7	Theory	IT6801 - Service Oriented Architecture
24)	7	Practical	CS6711 - Security Lab
25)	7	Practical	CS6712 - Grid and Cloud Computing Lab

ODD Semester 2019-2020

3rd Semester – B.E. CSE

MA8351 – Discrete Mathematics	
COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Find the pcnf & pdnf, rules of inference theory and proof methods.
CO2	Understanding the mathematical Induction, pigeonhole principle, Permutations and combinations, Generating functions, Inclusion and exclusion principle and Applying its applications.
CO3	Apply the concepts and techniques of Graphs and graph models
CO4	Be exposed to concepts and properties of algebraic structures such as groups, rings and fields.
CO5	Understanding lattices and Boolean algebra
CO6	Develop knowledge in Logic, Graphs and algebraic system in engineering.

CS8351 - Digital Principles and System Design	
COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Simplify Boolean functions using KMap
CO2	Design and Analyze Combinational Circuits.
CO3	Design and Analyze Synchronous Sequential Circuits.
CO4	Design and Analyze Asynchronous Sequential Circuits.
CO5	Implement designs using Programmable Logic Devices.
CO6	Write HDL code for combinational and Sequential Circuits.

CS8391 – Data Structures	
COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Implement abstract data types using arrays and linked list.
CO2	Apply the different linear data structures like stack and queue to various computing problems.
CO3	Implement different types of trees and apply them to problem solutions.
CO4	Discuss graph structure and understand various operations on graphs and their applicability.
CO5	Analyze the various sorting and searching algorithms.
CO6	Understand the hashing technique and hash functions.

CS8392 – Object Oriented Programming	
COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Develop Java programs using OOP principles
CO2	Develop Java programs using the concepts of inheritance and interfaces
CO3	Build Java applications using exceptions and I/O streams
CO4	Develop Java applications with threads and generics classes
CO5	Develop interactive Java programs using swings
CO6	Develop an application based upon the concepts of Java.

EC 8395 – Communication Engineering	
COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Describe the concepts of analog modulation systems
CO2	Illustrate pulse communication techniques.
CO3	Summarize the concepts of digital modulation systems
CO4	Implement the source coding and Error control techniques.
CO5	Explain the basic principles in the generation spread spectrum signals
CO6	Explain the methods for multiple access in communication systems.

Laboratory

CS8381 - Data Structures Laboratory	
COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Write functions to implement linear and non-linear data structure operations
CO2	Suggest appropriate linear / non-linear data structure operations for solving a given problem
CO3	Appropriately use the linear / non-linear data structure operations for a given problem
CO4	Apply appropriate hash functions that result in a collision free scenario for data storage and retrieval.

CS8383 - 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
CO2	Develop and implement Java programs with arraylist
CO3	Develop and implement Java programs for simple applications that make use of classes

CS8382 - Digital Systems Laboratory	
COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Implement simplified combinational circuits using basic logic gates
CO2	Implement combinational circuits using MSI devices
CO3	Implement sequential circuits like registers and counters
CO4	Simulate combinational and sequential circuits using HDL

HS8381 - Interpersonal Skills / Listening & Speaking	
COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Listen and respond appropriately.
CO2	Participate in group discussions
CO3	Make effective presentations
CO4	Participate confidently and appropriately in conversations both formal and informal

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

CS859- 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

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

CS6701 – Cryptography and Network Security	
COs	Course Outcome : The students, after the completion of the course, are expected to ….
CO1	Illustrate the principles of number theory and compare various cryptographic techniques.
CO2	Demonstrate how Block Ciphers such as DES, AES, Triple DES, RC5 and public key crypto-systems are implemented.
CO3	Apply hash function and digital signatures to implement authentication protocols
CO4	Illustrate the role of firewall in implementing trusted systems
CO5	Analyze how applications can be secured
CO6	Illustrate secure coding in the developed applications

CS6702 – Graph Theory and Applications	
COs	Course Outcome : The students, after the completion of the course, are expected to ….
CO1	Explain the precise and accurate mathematical definitions of objects in graph theory.
CO2	Identify spanning trees, cut sets, isomorphism and different representations of a planar graph
CO3	Explain chromatic characteristics and directed graphs.
CO4	Solve problems on permutations and combinations.
CO5	Make use of the knowledge of generating functions to solve problems.
CO6	Solve problems on recurrence relations

CS6703 – Grid and Cloud Computing	
COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Describe the grid computing techniques to solve large scale scientific problems.
CO2	Explain the concept of virtualization.
CO3	Use the grid and cloud tool kits.
CO4	Summarize the security models in the grid and the cloud environment
CO5	Understand how Grid computing helps in solving large scale scientific problems
CO6	Understand the security issues in the grid and the cloud environment.

CS6704 – Resource Management Techniques	
COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Use Simplex method to solve optimization problems
CO2	Solve the problems to find minimum cost and shortest route
CO3	Apply integer programming to solve real-life applications
CO4	Apply the methods to solve Non-linear programming problems
CO5	Use CPM for project management
CO6	Use PERT for project management

CS6007 – Information Retrieval	
COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Explain the various components and open source frameworks of information retrieval
CO2	Summarize the various models for information retrieval system
CO3	Interprets the functions of web search engines
CO4	Demonstrate the link analysis concepts to provide better search results
CO5	Use the concepts of specialized search to provide recommendation systems to users
CO6	Apply the text mining algorithms to web documents

IT6801 – Service Oriented Architecture	
COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Explain the fundamentals of XML
CO2	Develop applications based on XML
CO3	Discuss the key principles of SOA
CO4	Describe the web services concepts
CO5	Develop and test web services
CO6	Solve enterprise problems using SOA

Laboratory

CS6711 - Security Laboratory	
COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Implement the cipher techniques.
CO2	Develop the various security algorithms.
CO3	Use different open source tools for network security and analysis.

CS6712 - Grid and Cloud Computing Laboratory	
COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Use the grid and cloud tool kits.
CO2	Design and implement applications on the Grid.
CO3	Design and Implement applications on the Cloud

Course Outcomes – EVEN Semester 2019-2020

Sl. No.	Semester	Theory/ Practical	Course Code / Course Name
1)	4	Theory	MA8402 - Probability and Queueing Theory
2)	4	Theory	CS8491 - Computer Architecture
3)	4	Theory	CS8492 - Database Management Systems
4)	4	Theory	CS8451 - Design and Analysis of Algorithms
5)	4	Theory	CS8493 - Operating Systems
6)	4	Theory	CS8494 - Software Engineering
7)	4	Practical	CS8481 - Database Management Systems Laboratory
8)	4	Practical	CS8461 - Operating Systems Laboratory
9)	4	Practical	HS8461 - Advanced Reading and Writing
10)	6	Theory	CS8651 - Internet Programming
11)	6	Theory	CS8691 - Artificial Intelligence
12)	6	Theory	CS8601 - Mobile Computing
13)	6	Theory	CS8602 - Compiler Design
14)	6	Theory	CS8603 - Distributed Systems
15)	6	Theory	IT8076 - Software Testing
16)	6	Practical	CS8661 - Internet Programming Laboratory
17)	6	Practical	CS8662 - Mobile Application Development Laboratory
18)	6	Practical	CS8611- Mini Project
19)	6	Practical	HS8581 - Professional Communication
20)	8	Theory	CS6801 - Multi – Core Architectures and Programming
21)	8	Theory	CS6010 - Social Network Analysis
22)	8	Theory	MG6088 - Software Project ManagemenT
23)	8	Practical	CS6811 - Project Work

EVEN Semester 2019-2020

4th Semester – B.E. CSE

MA8402 - Probability and Queueing Theory	
COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Find the distribution and measures of Discrete and continuous random variables
CO2	Evaluating the measures of two dimensional Discrete and continuous random variables
CO3	Apply the concept of random processes to characterize a random signal.
CO4	Examine Queueing Models and find the characteristics of Queueing system
CO5	Analyzing series Queues and Queueing networks
CO6	Understanding Correlation and Linear regression of two dimensional Discrete and continuous random variables

CS8491 - Computer Architecture	
COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Identify the basic organization of computer system and performance of a computer system.
CO2	Utilize the basic instruction set, operations and addressing modes of MIPS architecture.
CO3	Examine the procedure involved in designing ALU
CO4	Compare and Contrast the non-pipelined and pipelined data path implementation of MIPS
CO5	Inspect Parallel Processing challenges, Hardware Multithreading and Multicore architectures
CO6	Examine the performance of Memory and I/O systems.

CS8492 - Database Management Systems	
COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Discuss the fundamental concepts of relational database and SQL
CO2	Use ER model for Relational model mapping to perform database design effectively
CO3	Summarize the properties of transactions and concurrency control mechanisms
CO4	Outline the various storage and optimization techniques
CO5	Compare and contrast various indexing strategies in different database systems
CO6	Explain the different advanced databases

CS8451 - Design and Analysis of Algorithms	
COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Explain the Analysis of Algorithm Efficiency and Compare the Mathematical analysis for Recursive and Non-recursive algorithms.
CO2	Identify the efficiency of Brute Force And Divide-And-Conquer technique algorithms.
CO3	Identify the efficiency of Dynamic Programming And Greedy Technique algorithms.
CO4	Solve the problems using Iterative Improvement technique.
CO5	Solve the problems using Backtracking and Branch and Bound Technique.
CO6	Outline the limitations of Algorithm power.

M CS8493 - Operating Systems	
COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Explain the overall view of the computer system and operating system.
CO2	Apply various CPU scheduling algorithms, synchronization primitives and deadlock handling methods
CO3	Compare and contrast various memory management schemes and file system functionalities
CO4	Analyze the performance of the various page replacement algorithms and interpret the file system implementation, sharing and protection mechanisms.
CO5	Analyze the performance of the various disk scheduling algorithms
CO6	Demonstrate administrative tasks on Linux servers and to be familiar with the basics of Mobile OS like iOS and Android

CS8494 - Software Engineering	
COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Identify the key activities in managing a software project and recognize different process model
CO2	Explain the concepts of Requirements Engineering and Analysis Modeling.
CO3	Outline the systematic procedures for software design and deployment.
CO4	Compare various testing and maintenance methods
CO5	Interpret the project schedule, estimate project cost and effort required.
CO6	Outline various risk management activities and identifying risks through RMMM Plan.

Laboratory

CS8481 - Database Management Systems Laboratory	
COs	Course Outcome : The students, after the completion of the course, are expected to ....
CO1	Use 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.

CS8461 - Operating Systems Laboratory	
COs	Course Outcome : The students, after the completion of the course, are expected to ....
CO1	Compare the performance of various CPU Scheduling Algorithms.
CO2	Implement Deadlock avoidance and Detection Algorithms.
CO3	Implement Semaphores.
CO4	Create processes and implement IPC.
CO5	Analyze the performance of the various Page Replacement Algorithms.
CO6	Implement File Organization and File Allocation Strategies.

HS8461 - Advanced Reading and Writing	
COs	Course Outcome : The students, after the completion of the course, are expected to ....
CO1	Write different types of essays.
CO2	Write winning job applications.
CO3	Read and evaluate texts critically.
CO4	Display critical thinking in various professional contexts

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 ….**
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 ….**
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

8th Semester – B.E. CSE

CS6801 - Multi – Core Architectures and Programming

COs	Course Outcome : The students, after the completion of the course, are expected to ….
CO1	Analyze the performance of the multi core architectures and parallel program design
CO2	Understand the challenges in parallel and multi-threaded programming
CO3	Develop programs using Open MP
CO4	Develop programs using MPI
CO5	Compare and contrast programming for serial processors and programming for parallel Processors.

CS6010 - Social Network Analysis

COs	Course Outcome : The students, after the completion of the course, are expected to ….
CO1	Examine semantic web related applications
CO2	Illustrate knowledge using ontology
CO3	Relating mining communities in Web Social Networks
CO4	Predict human behavior in social web and related communities
CO5	Apply and Visualize social networks
CO6	Understand the Applications of Social Network.

MG6088 - Software Project Management

COs	Course Outcome : The students, after the completion of the course, are expected to ….
CO1	Understand the Software Project management, methodologies, principles, cost benefit evaluation and risk evaluation.
CO2	Able to determine the effort and cost estimation of a project.
CO3	Make use of the concepts of activity planning, Sequencing and scheduling and risk management.
CO4	Apply the CPM and PERT to allocate resources to the project
CO5	Understand the principles of configuration management and control
CO6	Understand the staff selection, team structures and working in teams.

Laboratory

CS6811 - Project Work

COs	Course Outcome : The students, after the completion of the course, are expected to ....
CO1	On Completion of the project work students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology