MARTHANDAM COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Course Outcomes – Odd Semester 2021-22

Regulation 2017

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	EC8395 Communication Engineering
6)	3	Practical	CS8381 Data Structures Laboratory
7)	3	Practical	CS8383 Object OrientedProgramming Laboratory
8)	3	Practical	CS8382 Digital Systems Laboratory
9)	3	Practical	HS8381 Interpersonal Skills/Listening &Speaking

Sl. No.	Semester	Theory/ Practical	Course Code / Course Name
1)	5	Theory	MA8551 Algebra and Number Theory
2)	5	Theory	CS8591 Computer Networks
3)	5	Theory	EC8691 Microprocessors and Microcontrollers
4)	5	Theory	CS8501 Theory of Computation
5)	5	Theory	CS8592 Object Oriented Analysis and Design
6)	5	Theory	OCE551 Airpollution and Control Engineering
7)	5	Practical	EC8681 Microprocessors and Microcontrollers Laboratory
8)	5	Practical	CS8582 Object Oriented Analysis and Design Laboratory
9)	5	Practical	CS8581 Networks Laboratory

Sl. No.	Semester	Theory/ Practical	Course Code / Course Name
1)	7	Theory	MG8591 Principles of Management
2)	7	Theory	CS8792 Cryptography and Network Security
3)	7	Theory	CS8791 Cloud Computing
4)	7	Theory	IT8075 Software Project Management
5)	7	Theory	OBM752 Hospital Management
6)	7	Theory	CS8088 Wireless Adhoc and Sensor Networks
7)	7	Practical	CS8711 Cloud Computing Laboratory
8)	7	Practical	IT8761 Security Laboratory

Course Outcomes – EVEN Semester 2021-22

Regulation 2017

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 ofAlgorithms
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

Sl. No.	Semester	Theory/ Practical	Course Code / Course Name
1)	6	Theory	CS8651 Internet Programming
2)	6	Theory	CS8691 Artificial Intelligence
3)	6	Theory	CS8601 Mobile Computing
4)	6	Theory	CS8602 Compiler Design
5)	6	Theory	CS8603 Distributed Systems
6)	6	Theory	IT8076 Software Testing
7)	6	Practical	CS8661 Internet Programming Laboratory
8)	6	Practical	CS8662 Mobile Application Development Laboratory

9)	6	Practical	CS8611 Mini Project
10)	6	Practical	HS8581 Professional Communication

Sl. No.	Semester	Theory/ Practical	Course Code / Course Name
1)	8	Theory	GE8076-Professional Ethics in Engineering
2)	8	Theory	CS8078 Green Computing
3)	8	Practical	CS8811 Project Work

ODD Semester 2021-22

3 rd Semester B.E. CSE

MA8351 – Discrete Mathematics	
COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	Have knowledge of the concepts needed to test the logic of a program.
CO2	Have an understanding in identifying structures on many levels.
CO3	Be aware of a class of functions which transform a finite set into another finite set which relates to input and output functions in computer science.
CO4	Be aware of the counting principles.
CO5	Be exposed to concepts and properties of algebraic structures such as groups, rings and fields.

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 K Map
CO2	Design, analyze and write HDL code for Combinational Circuits
CO3	Design, analyze and write HDL code for Synchronous Sequential Circuits
CO4	Design and analyze Asynchronous Sequential Circuits
CO5	Implement designs using Programmable Logic Devices

CS8391 Data Structures	
COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	Implement abstract data types for linear data structures.
CO2	Apply linear data structures to problem solutions.
CO3	Apply Non Linear data structures(Trees) to problem solutions
CO4	Apply Linear data structures (Graphs) to problem solutions
CO5	Critically analyze the various sorting algorithms.

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 with the concepts 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

EC8395 Communication Engineering	
COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	Ability to comprehend and appreciate the significance and role of this course in the present contemporary world.
CO2	Apply analog and digital communication techniques.
CO3	Know about keying techniques.
CO4	Analyze information theory and coding.
CO5	Know about spread spectrum and multiple access techniques.

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 data structure operations
CO2	Write functions to implement non-linear data structure operations
CO3	Suggest appropriate linear / non-linear data structure operations for solving a given problem
CO4	Appropriately use the linear / non-linear data structure operations for a given problem
CO5	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 simple java programs that make use of classes and objects
CO2	Construct java programs using predefined classes and packages
CO3	Make use of Inheritances and Interfaces to develop java application
CO4	Model exception handling, multithreading, generic programming and file processing concepts in java
CO5	Build java application for real-time problems using Event Handling

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
CO4	Implement sequential circuits like counters

CO5	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
CO5	To speak fluently

5 th Semester B.E. CSE

MA8551 Algebra and Number Theory	
COs	**Course Outcome : The students, after the completion of the course, are expected to**
CO1	Apply the basic notions of groups, rings, fields which will then be used to solve related problems.
CO2	Explain the fundamental concepts of advanced algebra and their role in modern mathematics and applied contexts.
CO3	Demonstrate accurate and efficient use of advanced algebraic techniques.
CO4	Demonstrate their mastery by solving non - trivial problems related to the concepts, and by proving simple theorems about the, statements proven by the text.
CO5	Apply 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 and evaluate the performance of a network.
CO2	Understand the basics of how data flows from one node to another.
CO3	Analyze and design routing algorithms.
CO4	Design protocols for various functions in the network
CO5	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	Understand and execute programs based on 8086 microprocessor.
CO2	Design Memory Interfacing circuits.
CO3	Design and interface I/O circuits
CO4	Understand and execute programs based on 8051 microcontroller
CO5	Design and implement 8051 microcontroller based systems.

CS8501 Theory of Computation	
COs	**Course Outcome : The students, after the completion of the course, are expected to**
CO1	Construct automata, regular expression for any pattern.
CO2	Write Context free grammar for any construct.
CO3	Design Turing machines for any language.
CO4	Propose computation solutions using Turing machines
CO5	Derive whether a problem is decidable or not.

CS8592 Object Oriented Analysis and Design	
COs	**Course Outcome : The students, after the completion of the course, are expected to**
CO1	Express software design with UML diagrams
CO2	Design software applications using OO concepts.
CO3	Identify various scenarios based on software requirements
CO4	Transform UML based software design into pattern based design using design patterns
CO5	Understand the various testing methodologies for OO software

OCE551 Airpollution and Control Engineering	
COs	**Course Outcome : The students, after the completion of the course, are expected to**
CO1	An understanding of the nature and characteristics of air pollutants, noise pollution and basic concepts of air quality management
CO2	Ability to identify, formulate and solve air and noise pollution problems
CO3	Ability to design stacks and particulate air pollution control devices to meet applicable standards.
CO4	Ability to select control equipment.
CO5	Ability to ensure quality, control and preventive measures.

Laboratory

EC8681 Microprocessors andMicrocontrollers Laboratory	
COs	**Course Outcome : The students, after the completion of the course, are expected to**
CO1	Develop ALP for fixed and Floating Point and Arithmetic operations using 8086 microprocessor.
CO2	Make use of different I/O interfacing with 8086 microprocessor
CO3	Make use of different I/O interfacing with 8086 microprocessor
CO4	Construct different waveforms using 8086 microprocessor
CO5	Model serial and parallel interfacing of 8086 microprocessor

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	Draw the UML diagrams for the given specification
CO3	Identify and map basic software requirements in UML mapping.
CO4	Improve the software quality using design patterns and to explain the rationale behind
CO5	Applying specific design patterns. 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.

7 th 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 basic of management and its types, skills, management roles, types of business organization and current trends in business
CO2	Explain the nature and purpose of planning, types, objectives of planning and decision process.
CO3	Compare the different organization structures, authorities and responsibilities, human resource management and training and development.
CO4	Estimate the individual and group behavior, motivation, job satisfaction types and theories of leadership, communication and IT
CO5	Apply the knowledge using the various system and process of controlling, budgetary and non-budgetary control techniques, use of computer and IT in management control, reporting.

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 and System security standards

CS8791 Cloud Computing	
COs	**Course Outcome : The students, after the completion of the course, are expected to**
CO1	Articulate the main concepts, key technologies, strengths and limitations of cloud computing.
CO2	Learn the key and enabling technologies that help in the development of cloud.
CO3	Develop the ability to understand and use the architecture of compute and storage cloud, service and delivery models.
CO4	Explain the core issues of cloud computing such as resource management and security.
CO5	Be able to install and use current cloud technologies.Evaluate and choose the appropriate technologies, algorithms and approaches for implementation and use of cloud.

IT8075 Software Project Management	
COs	**Course Outcome : The students, after the completion of the course, are expected to**
CO1	Understand Project Management principles while developing software.
CO2	Gain extensive knowledge about the basic project management concepts, framework and the process models.
CO3	Obtain adequate knowledge about software process models and software effort estimation techniques.
CO4	Define the checkpoints, project reporting structure, project progress and tracking mechanisms using project management principles.
CO5	Learn staff selection process and the issues related to people management

OBM752 Hospital Management	
COs	**Course Outcome : The students, after the completion of the course, are expected to**
CO1	Explain the principles of Hospital administration.
CO2	Identify the importance of Human resource management.
CO3	List various marketing research techniques.
CO4	Identify Information management systems and its uses.
CO5	Understand safety procedures followed in hospitals

CS8088 Wireless Adhoc and Sensor Networks	
COs	**Course Outcome : The students, after the completion of the course, are expected to**
CO1	Identify different issues in wireless ad hoc and to analyze protocols developed for ad hoc networks
CO2	To analyze the Transport Layer protocols and their QoS for ad hoc networks.
CO3	Identify different issues in wireless sensor and to analyze protocols developed for wireless sensor networks.
CO4	To analyze the Transport Layer protocols and their QoS for wireless sensor networks.
CO5	To identify and understand security issues in ad hoc and sensor networks

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

EVEN Semester

4 th Semester – B.E. CSE

MA8402 Probability And Queuing Theory	
COs	**Course Outcome : The students, after the completion of the course, are expected to**
CO1	Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon.
CO2	Understand the basic concepts of one and two dimensional random variables and apply in engineering applications.
CO3	Apply the concept of random processes in engineering disciplines.
CO4	Acquire skills in analyzingqueueing models
CO5	Understand and characterize phenomenon which evolve with respect to time in a probabilistic manner

CS8491 Computer Architecture	
COs	**Course Outcome : The students, after the completion of the course, are expected to**
CO1	Understand the basics structure of computers, operations and instructions.
CO2	Design arithmetic and logic unit.
CO3	Understand pipelined execution and design control unit.
CO4	Understand parallel processing architectures.
CO5	Understand the various memory systems and I/O communication.

CS8492 Database Management Systems	
COs	**Course Outcome : The students, after the completion of the course, are expected to**
CO1	Classify the modern and futuristic database applications based on size and complexity
CO2	Map ER model to Relational model to perform database design effectively
CO3	Write queries using normalization criteria and optimize queries
CO4	Compare and contrast various indexing strategies in different database systems
CO5	Appraise how advanced databases differ from traditional databases.

CS8451 Design and Analysis ofAlgorithms	
COs	**Course Outcome : The students, after the completion of the course, are expected to**
CO1	Interpret the fundamental needs of algorithms in problem solving
CO2	Classify the different algorithm design techniques for problem solving
CO3	Develop algorithms for various computing problems.
CO4	Develop the improvement method to find the feasible solution
CO5	Identify the limitations of algorithms in problem solving

CS8493 Operating Systems	
COs	**Course Outcome : The students, after the completion of the course, are expected to**
CO1	Understand the basic concepts and functions of operating systems.
CO2	Analyze various scheduling algorithms and understand deadlock, prevention and avoidance algorithms.
CO3	Compare and contrast various memory management schemes.
CO4	Understand the functionality of file systems.
CO5	Perform administrative tasks on Linux Servers,compareiOS and Android Operating Systems.

CS8494 Software Engineering	
COs	**Course Outcome : The students, after the completion of the course, are expected to**
CO1	To understand the phases in a software project
CO2	To understand fundamental concepts of requirements engineering and Analysis Modeling.
CO3	To understand fundamental concepts of requirements engineering and Analysis Modeling.
CO4	To understand the various software design methodologies
CO5	To learn various testing and maintenance measures

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 and Create processes and implement IPC
CO4	Analyze the performance of the various Page Replacement Algorithms
CO5	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 job applications.
CO3	Read and evaluate texts critically.
CO4	Display critical thinking in various professional contexts
CO5	Read with correct pronunciation

6th Semester B.E. CSE

CS8651 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.
CO5	Use AJAX and web services to develop interactive web applications

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	Explain the basics of mobile telecommunication systems
CO2	Illustrate the generations of telecommunication systems in wireless networks
CO3	Determine the functionality of MAC, network layer and Identify a routing protocol for a given Ad hoc network
CO4	Explain the functionality of Transport and Application layers
CO5	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	Understand the different phases of compiler,Design a lexical analyzer for a sample language.
CO2	Apply different parsing algorithms to develop the parsers for a given grammar.
CO3	Understand syntax-directed translation and run-time environment.
CO4	Learn to implement code optimization techniques and a simple code generator.
CO5	Design and implement a scanner and a parser using LEX and YACC tools.

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	Understand the Mutual Exclusion and Deadlock detection algorithms in distributed systems
CO4	Describe the agreement protocols and fault tolerance mechanisms in distributed systems.
CO5	Describe the features of peer-to-peer and distributed shared memory systems

IT8076 Software Testing	
COs	**Course Outcome : The students, after the completion of the course, are expected to**
CO1	To learn the criteria for test cases.
CO2	To learn the design of test cases.
CO3	To understand test management
CO4	To understand test automation techniques.
CO5	To apply test metrics and measurements.

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 ApplicationDevelopment 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	Discover potential research areas in the field of IT
CO2	Conduct a survey of several available literature in the preferred field of study
CO3	Compare and contrast the several existing solutions for research challenge
CO4	Demonstrate an ability to work in teams and manage the conduct of the research study
CO5	Formulate and propose a plan for creating a solution for the research plan identified

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
CO5	Enhance the Employability and Career Skills.

8th Semester B.E. CSE

GE8076-Professional Ethics in Engineering	
COs Course Outcome : The students, after the completion of the course, are expected to	
CO1	To understand the core values that shapes the ethical behavior of an engineer and exposed awareness on professional ethics and human values
CO2	To understand the basic perception of profession, professional ethics, various moral issues & uses of ethical theories
CO3	The students will understand various social issues, industrial standards, code of ethics

	and role of professional ethics in engineering field
CO4	The students will be aware of responsibilities of an engineer for safety and risk benefit analysis, professional rights and responsibilities of an engineer
CO5	The students will acquire knowledge about various roles of engineers in variety of global issues and able to apply ethical principles to resolve situations that arise in their professional lives

CS8078 GREEN COMPUTING	
COs Course Outcome : The students, after the completion of the course, are expected to	
CO1	Acquire knowledge to adopt green computing practices to minimize negative impacts on the environment.
CO2	Enhance the skill in energy saving practices in their use of hardware.
CO3	Evaluate technology tools that can reduce paper waste and carbon footprint by the stakeholders.
CO4	Understand the ways to minimize equipment disposal requirements .
CO5	Understand about Green IT Strategies and Applications

Laboratory

CS8811 Project Work	
COs Course Outcome : The students, after the completion of the course, are expected to	
CO1	Discover potential research areas in the field of IT
CO2	Conduct a survey of several available literature in the preferred field of study
CO3	Compare and contrast the several existing solutions for research challenge
CO4	Demonstrate an ability to work in teams and manage the conduct of the research study.
CO5	Formulate and propose a plan for creating a solution for the research plan identified