MARTHANDAM COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Outcomes – Odd Semester 2021-22

Sl. No.	Semester	Theory/ Practical	Course Code / Course Name
	R2017		
1)	3	Theory	MA8352 Linear Algebra and Partial Differential Equations
2)	3	Theory	EC8393 Fundamentals of Data Structures In C
3)	3	Theory	EC8351 Electronic Circuits-I
4)	3	Theory	EC8352 Signals and Systems
5)	3	Theory	EC8392 Digital Electronics
6)	3	Theory	EC8391 Control Systems Engineering
7)	3	Practical	EC8381 Fundamentals of Data Structures in C Laboratory
8)	3	Practical	EC8361 Analog and Digital Circuits Laboratory
	3	Practical	HS8381 Interpersonal Skills/Listening &Speaking
	R2017		
9)	5	Theory	EC8501 Digital Communication
10)	5	Theory	EC8553 Discrete-Time Signal Processing
11)	5	Theory	EC8552 Computer Architecture and Organization
12)	5	Theory	EC8551 Communication Networks
13)	5	Theory(professional elective -I)	EC8073 Medical Electronics
14)	5	Theory(open elective -I)	OMD551 Basic of Biomedical Instrumentation
15)	5	Practical	EC8562 Digital Signal Processing Laboratory
16)	5	Practical	EC8561 Communication Systems Laboratory
	5	Practical	EC8563 Communication Networks Laboratory
17)	R2017		
18)	7	Theory	EC8701 Antennas and Microwave Engineering
19)	7	Theory	EC8751 Optical Communication
20)	7	Theory	EC8791 Embedded and Real Time Systems
21)	7	Theory	EC8702 Ad hoc and Wireless Sensor Networks
22)	7	Theory (Professional Elective -III)	GE8071 Disaster Management
23)	7	Theory (Open Elective – II)	OCH752 Energy Technology
24)	7	Practical	EC8711 Embedded Laboratory
25)	7	Practical	EC8761 Advanced Communication Laboratory

MARTHANDAM COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Outcomes – Even Semester 2021-22

Sl. No.	Semester	Theory/ Practical	Course Code / Course Name
	R2017		
1)	4	Theory	MA8451 Probability and Random Processes
2)	4	Theory	EC8452 Electronic Circuits II
3)	4	Theory	EC8491 Communication Theory
4)	4	Theory	EC8451 Electromagnetic Fields
5)	4	Theory	EC8453 Linear Integrated Circuits
6)	4	Theory	GE8291 Environmental Science and Engineering
7)	4	Practical	EC8461 Circuits Design and Simulation Laboratory
8)	4	Practical	EC8462 Linear Integrated Circuits Laboratory
	R2017		
9)	6	Theory	EC8691 Microprocessors and Microcontrollers
10)	6	Theory	EC8095 VLSI Design
11)	6	Theory	EC8652 Wireless Communication
12)	6	Theory	MG8591 Principles of Management
13)	6	Theory	EC8651 Transmission Lines and RF Systems
14)	6	Theory(Professional Elective -II)	EC8004 Wireless Networks
15)	6	Practical	EC8681 Microprocessors and Microcontrollers Laboratory
	6	Practical	EC8661 VLSI Design Laboratory
	6	Practical	EC8611 Technical Seminar
	6	Practical	HS8581 Professional Communication
	R2017		
18)	8	Theory(Professional Elective IV)	GE8076 Professional Ethics in Engineering
19)	8	Theory(Professional Elective V)	EC8094 Satellite Communication
22)	8	Practical	EC8811 Project Work

ODD Semester 2021-2022

III Semester B.E. ECE

MA8352 Linear Algebra And Partial Differential Equations
COs Course Outcome : Upon successful completion of the course, students should be able to:
CO1 Explain the fundamental concepts of advanced algebra and their role in modern mathematics and applied contexts.
CO2 Demonstrate accurate and efficient use of advanced algebraic techniques
CO3 Demonstrate their mastery by solving non - trivial problems related to the concepts and by proving simple theorems about the statements proven by the text.
CO4 Able to solve various types of partial differential equations
CO5 . Able to solve engineering problems using Fourier series

EC8393 Fundamentals Of Data Structures In C
COs Course Outcome : Upon completion of the course, students will be able to:
CO1 Implement linear and non-linear data structure operations using C .
CO2 Suggest appropriate linear / non-linear data structure for any given data set.
CO3 Apply hashing concepts for a given problem
CO4 Modify or suggest new data structure for an application
CO5 Appropriately choose the sorting algorithm for an application

EC8351 Electronic Circuits-I
COs Course Outcome : Upon completion of the course, students will be able to:
CO1:Acquire knowledge of Working principles, characteristics and applications of BJT and FET
CO2 Frequency response characteristics of BJT and FET amplifiers
CO3 Analyze the performance of small signal BJT and FET amplifiers - single stage and multi stage amplifiers
CO4 Apply the knowledge gained in the design of Electronic circuits

EC8352 Signals And Systems
COs Course Outcome : Upon completion of the course, students will be able to:
CO1 To be able to determine if a given system is linear/causal/stable
CO2 Capable of determining the frequency components present in a deterministic signal
CO3 Capable of characterizing LTI systems in the time domain and frequency domain
CO4 To be able to compute the output of an LTI system in the time and frequency domains

EC8392 Digital Electronics
COs Course Outcome : Upon completion of the course, students will be able to:
CO1 Use digital electronics in the present contemporary world
CO2 Design various combinational digital circuits using logic gates
CO3 Do the analysis and design procedures for synchronous and asynchronous sequential circuits
CO4 Use the semiconductor memories and related technology

CO5 Use electronic circuits involved in the design of logic gates

EC8391 Control Systems Engineering
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1: Identify the various control system components and their representations.
CO2: Analyze the various time domain parameters.
CO3: Analysis the various frequency response plots and its system
CO4: Apply the concepts of various system stability criterions
CO5: Design various transfer functions of digital control system using state variable model

EC8381 Fundamentals Of Data Structures In C Laboratory
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1: Write basic and advanced programs in C
CO2:Implement functions and recursive functions in C
CO3:Implement data structures using C
CO4: Choose appropriate sorting algorithm for an application and implement it in a modularized way

EC8361 Analog And Digital Circuits Laboratory
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1:Design and Test rectifiers, filters and regulated power supplies.
CO2:Design and Test BJT/JFET amplifiers
CO3:Differentiate cascode and cascade amplifiers.
CO4:Analyze the limitation in bandwidth of single stage and multi stage amplifier
CO5:Measure CMRR in differential amplifier
CO6:Simulate and analyze amplifier circuits using PSpice.
CO7:Design and Test the digital logic circuits

HS8381 Interpersonal Skills/Listening &Speaking
Course Outcomes COs: Upon completion of the course, the student should be able 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

ODD Semester 2021-2022

V Semester B.E. ECE

EC 8501-Digital Communication
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1: Design PCM systems
CO2: Design and implement base band transmission schemes
CO3 :Design and implement band pass signalling schemes
CO4: Analyse the spectral characteristics of band pass signaling schemes and their noise performance
CO5: **Design error control coding schemes**

EC8553 Discrete Time Signal Processing
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1: Apply DFT for the analysis of digital signals and systems
CO2: Design IIR and FIR filters
CO3:Characterize the effects of finite precision representation on digital filters
CO4:Design multirate filters
CO5: **Apply adaptive filters appropriately in communication systems**

EC 8552 & Computer Architecture and Organization
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1: Describe data representation, instruction formats and the operation of a digital computer
CO2:Illustrate the fixed point and floating-point arithmetic for ALU operation
CO3:Illustrate the fixed point and floating-point arithmetic for ALU operation
CO4: Explain the concept of various memories, interfacing and organization of multiple processors
CO5: **Discuss parallel processing technique and unconventional architectures**

EC8551 – Communication Networks
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1:Identify the components required to build different types of networks.
CO2: Choose the required functionality at each layer for given application
CO3:Identify solution for each functionality at each layer
CO4:Trace the flow of information from one node to another node in the network.
CO5: **Understand the basic layers and its functions in computer networks.**

EC8073- Medical Electronics
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1:Know the human body electro- physiological parameters and recording of bio-potentials
CO2:Comprehend the non-electrical physiological parameters and their measurement – body temperature, blood pressure, pulse, blood cell count, blood flow meter etc
CO3:Interpret the various assist devices used in the hospitals viz. pacemakers, defibrillators, dialyzers and ventilators.
CO4:Comprehend physical medicine methods eg. ultrasonic, shortwave, microwave surgical diathermies , and bio-telemetry principles and methods
CO5:Know about recent trends in medical instrumentation

OMD551 Basics of Biomedical Instrumentation
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1:To Learn the different bio potential and its propagation.
CO2:To get Familiarize the different electrode placement for various physiological recording
CO3:Students will be able design bio amplifier for various physiological recording
CO4:Students will understand various technique non electrical physiological measurements
CO5:Understand the different biochemical measurements

EC8563 Communication Networks Laboratory
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1:Communication between two desktop computers
CO2:Implementation of different protocols
CO3:To Implement Program using sockets
CO4:To Implement and compare the various routing algorithms
CO5:To Use the simulation tool

EC8562 Digital Signal Processing Laboratory
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1:Carryout basic signal processing operations
CO2:Demonstrate their abilities towards MATLAB based implementation of various DSP systems
CO3:Analyze the architecture of a DSP Processor
CO4:Design and Implement the FIR and IIR Filters in DSP Processor for performing filtering operation over real-time signals
CO5:Design a DSP system for various applications of DSP

EC8561- Communication Systems Laboratory
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1:Simulate & validate the various functional modules of a communication system
CO2:Demonstrate their knowledge in base band signaling schemes through implementation of digital modulation schemes
CO3:Apply various channel coding schemes & demonstrate their capabilities towards the improvement of the noise performance of communication system
CO4:Simulate Error control coding schemes
CO5:Simulate end-to-end communication Link

ODD Semester 2021-2022

VII Semester B.E. ECE

EC8701 Antennas And Microwave Engineering
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1: Apply the basic principles and evaluate antenna parameters and link power budgets
CO2:Design and assess the performance of various antennas
CO3:Design a microwave system given the application specifications

EC8751 Optical Communication
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1:Realize basic elements in optical fibers, different modes and configurations.
CO2:Analyze the transmission characteristics associated with dispersion and polarization techniques
CO3:Design optical sources and detectors with their use in optical communication system
CO4:Construct fiber optic receiver systems, measurements and coupling techniques.
CO5:Design optical communication systems and its networks.

EC8791 Embedded And Real Time Systems
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1: Describe the architecture and programming of ARM processor
CO2:Outline the concepts of embedded systems
CO3:Explain the basic concepts of real time operating system design
CO4:Model real-time applications using embedded-system concepts

EC8702 Ad Hoc And Wireless Sensor Networks
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1:Know the basics of Ad hoc networks and Wireless Sensor Networks
CO2:Apply this knowledge to identify the suitable routing algorithm based on the network and user requirement
CO3:Apply the knowledge to identify appropriate physical and MAC layer protocols
CO4:Understand the transport layer and security issues possible in Ad hoc and sensor networks.
CO5:Be familiar with the OS used in Wireless Sensor Networks and build basic modules

GE8071 Disaster Management
Course Outcomes COs: Upon completion of the course, the student should be able to:
• Differentiate the types of disasters, causes and their impact on environment and society
• Assess vulnerability and various methods of risk reduction measures as well as mitigation.
• Draw the hazard and vulnerability profile of India, Scenarios in the Indian context, Disaster damage assessment and management.

OCH752 Energy Technology
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1. Understand the concepts of energy usage and global energy scenario.
CO2: Identify the working principle of different resources of energy.
CO3: Understand the field applications of solar energy, Geothermal & tidal energy, Winds energy and to know how it can be tapped.
CO4: Identify the Biomass sources and develop design parameters for equipment to be used in chemical process industries and its impact on environment.
CO5: Illustrate the concepts of Direct Energy Conversion systems & their applications.

EC8711 Embedded Laboratory
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1:Write programs in ARM for a specific Application
CO2:Interface memory, A/D and D/A convertors with ARM system
CO3:Analyze the performance of interrupt
CO4:Write program for interfacing keyboard, display, motor and sensor.
CO5:Formulate a mini project using embedded system

EC8761 Advanced Communication Laboratory
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1:Analyze the performance of simple optical link by measurement of losses and Analyzing the mode characteristics of fiber
CO2:Analyze the Eye Pattern, Pulse broadening of optical fiber and the impact on BER
CO3:Estimate the Wireless Channel Characteristics and Analyze the performance of Wireless Communication System
CO4: Understand the intricacies in Microwave System design

EVEN Semester 2021-2022

IV -Semester B.E. ECE

MA8451 Probability and Random Processes
Course Outcomes COs: Upon completion of the course, the student should be able 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 random processes in engineering disciplines.
CO4: Understand and apply the concept of correlation and spectral densities.
CO5: The students will have an exposure of various distribution functions and help in acquiring skills in handling situations involving more than one variable.
CO6: Able to analyze the response of random inputs to linear time invariant systems.

EC8452 Electronic Circuits II
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1:Analyze different types of amplifier, oscillator and multivibrator circuits
CO2:Design BJT amplifier and oscillator circuits
CO3:Analyze transistorized amplifier and oscillator circuits
CO4:Design and analyze feedback amplifiers
CO5:Design LC and RC oscillators, tuned amplifiers, wave shaping circuits, multivibrators, power amplifier and DC convertors.

EC8491 Communication Theory
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1: Design AM communication systems
CO2: Design Angle modulated communication systems
CO3: Apply the concepts of Random Process to the design of Communication systems
CO4: Analyze the noise performance of AM and FM systems
CO5: Gain knowledge in sampling and quantization

EC8451 Electromagnetic Fields
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1: Display an understanding of fundamental electromagnetic laws and concepts
CO2: Write Maxwell's equations in integral, differential and phasor forms and explain their physical meaning
CO3: Explain electromagnetic wave propagation in lossy and in lossless media
CO4: Solve simple problems requiring estimation of electric and magnetic field quantities based on these concepts and laws

EC8453 Linear Integrated Circuits
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1: Design linear and non linear applications of OP – AMPS
CO2: Design applications using analog multiplier and PLL
CO3: Design ADC and DAC using OP – AMPS
CO4: **Generate waveforms using OP – AMP Circuits**
CO5: **Analyze special function ICs**

GE8291 Environmental Science and Engineering
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1: Environmental Pollution or problems cannot be solved by mere laws. Public participation is an important aspect which serves the environmental Protection. One will obtain knowledge on the following after completing the course.
CO2: Public awareness of environmental is at infant stage.
CO3:Ignorance and incomplete knowledge has lead to misconceptions
CO4:Development and improvement in std. of living has lead to serious environmental disasters

EC8461 Circuits Design and Simulation Laboratory
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1: Analyze various types of feedback amplifiers
CO2: Design oscillators, tuned amplifiers, wave-shaping circuits and multivibrators
CO3: Design and simulate feedback amplifiers, oscillators, tuned amplifiers, wave-shaping circuits and multivibrators using SPICE Tool.

EC8462 Linear Integrated Circuits Laboratory
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1: Design amplifiers, oscillators, D-A converters using operational amplifiers.
CO2: Design filters using op-amp and performs an experiment on frequency response.
CO3: Analyze the working of PLL and describe its application as a frequency multiplier.
CO4: **Design DC power supply using ICs.**
CO5: **Analyze the performance of filters, multivibrators, A/D converter and analog multiplier using SPICE.**

VI - Semester B.E. ECE

EC8691 Microprocessors and Microcontrollers
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1:Understand and execute programs based on 8086 microprocessor.
CO2: Design Memory Interfacing circuits.
CO3: Design and interface I/O circuits.
CO4: Design and implement 8051 microcontroller based systems.

EC8095 VLSI Design
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1: Realize the concepts of digital building blocks using MOS transistor.
CO2: Design combinational MOS circuits and power strategies.
CO3: Design and construct Sequential Circuits and Timing systems.
CO4: Design arithmetic building blocks and memory subsystems.
CO5:Apply and implement FPGA design flow and testing

EC8652 Wireless Communication
Course Outcomes COs: Upon completion of the course, the student should be able to:
Characterize a wireless channel and evolve the system design specifications
CO1:Design a cellular system based on resource availability and traffic demands
CO2:Types of digital signals for fading channels
CO3:Identify suitable signaling and multipath mitigation techniques for the wirelesschannel and system under consideration.
CO4:Identify suitable multiple antenna techniques
CO5:Characterize a wireless channel and evolve the system design specifications

MG8591 Principles of Management
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1:Identify the factors that make up an organization's environment and the four stages of an organization's life cycle
CO2:Identify the relationship between strategic, tactical and operational plans
CO3:Identify the stages of team development
CO4:Identify the relationship between behaviors and motivation
CO5:Identify the steps managers can take to implement planned change

EC8651 Transmission Lines and RF Systems
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1:Explain the characteristics of transmission lines and its losses
CO2:Write about the standing wave ratio and input impedance in high frequency transmission lines
CO3:Analyze impedance matching by stubs using smith charts
CO4:Analyze the characteristics of TE and TM waves
CO5:Design a RF transceiver system for wireless communication

EC8004 Wireless Networks
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1:Conversant with the latest 3G/4G networks and its architecture
CO2:Implement the Network layer in the internet
CO3:Design and implement wireless network environment for any application using latest wireless protocols and standards
CO4:Ability to select the suitable network depending on the availability and requirement
CO5:Implement different type of applications for smart phones and mobile devices with latest network strategies

EC8681 Microprocessors and Microcontrollers Laboratory
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1:Write ALP Programmes for fixed and Floating Point and Arithmetic operation
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

EC8661 VLSI Design Laboratory
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1:Write HDL code for basic as well as advanced digital integrated circuit
CO2:Import the logic modules into FPGA Boards
CO3:Synthesize Place and Route the digital IP
CO4:Design the layouts of Digital & Analog IC Blocks using EDA
CO5:Simulate and Extract the layouts of Digital & Analog IC Blocks using EDA

HS8581 Professional Communication
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1:Enhance the Employability and Career Skills of students
CO2:Orient the students towards grooming as a professional
CO3:Make them Employability Graduates
CO4:Develop their confidence and help them attend interviews successfully.

VIII -Semester B.E. ECE

GE8076 Professional Ethics in Engineering
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1:To apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society.

EC8094 Satellite Communication
Course Outcomes COs: Upon completion of the course, the student should be able to:
CO1:Analyze the satellite orbits
CO2:Analyze the earth segment and space segment
CO3:Analyze the satellite Link design
CO4:Design various satellite applications

EC8811 Project Work
Course Outcomes COs: Upon completion of the course, the student should be able 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.