

MARTHANDAM COLLEGE OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Course Outcomes – Odd Semester 2021-22

Sl. No.	Semester	Theory/ Practical	Course Code / Course Name
1)	3	Theory	MA8353 Transforms and Partial Differential Equations
2)	3	Theory	EE8351 Digital Logic Circuits
3)	3	Theory	EE8391 Electromagnetic Theory
4)	3	Theory	EE8301 Electrical Machines - I
5)	3	Theory	EC8353 Electron Devices and Circuits
6)	3	Theory	ME8792 Power Plant Engineering
7)	3	Practical	EC8311 Electronics Laboratory
8)	3	Practical	EE8311 Electrical Machines Laboratory – I
9)	5	Theory	EE8501 Power System Analysis
10)	5	Theory	EE8551 Microprocessors and Microcontrollers
11)	5	Theory	EE8552 Power Electronics
12)	5	Theory	EE8591 Digital Signal Processing
13)	5	Theory	CS8392 Object Oriented Programming
14)	5	Theory	OMD551 Basics of biomedical Instrumentation
15)	5	Practical	EE8511 Control and Instrumentation Laboratory
16)	5	Practical	HS8581 Professional Communication
17)	5	Practical	CS8383 Object Oriented Programming Laboratory
18)	7	Theory	EE8701 High Voltage Engineering
19)	7	Theory	EE8702 Power System Operation and Control
20)	7	Theory	EE8703 Renewable Energy Systems
21)	7	Theory	GE8071 Disaster Management
22)	7	Theory	EE8009 Control of Electrical Drives
23)	7	Theory	OML751 Testing of Materials
24)	7	Practical	EE8711 Power System Simulation Laboratory
25)	7	Practical	EE8712 Renewable Energy Systems Laboratory

Course Outcomes – EVEN Semester 2021-22

Sl. No.	Semester	Theory/ Practical	Course Code / Course Name
1)	4	Theory	MA8491 Numerical Methods
2)	4	Theory	EE8401 Electrical Machines - II
3)	4	Theory	EE8402 Transmission and Distribution
4)	4	Theory	EE8403 Measurements and Instrumentation
5)	4	Theory	EE8451 Linear Integrated Circuits and Applications
6)	4	Theory	IC8451 Control Systems
7)	4	Practical	EE8411 Electrical Machines Laboratory - II
8)	4	Practical	EE8461 Linear and Digital Integrated Circuits Laboratory
9)	4	Practical	EE8412 Technical Seminar
10)	6	Theory	EE8601 Solid State Drives
11)	6	Theory	EE8602 Protection and Switchgear
	6	Theory	EE8691 Embedded Systems
12)	6	Theory	EE8002 Design of Electrical Apparatus
13)	6	Theory	EE8005 Special Electrical Machines
14)	6	Practical	EE8661 Power Electronics and Drives Laboratory
15)	6	Practical	EE8681 Microprocessors and Microcontrollers Laboratory
16)	6	Practical	EE8611 Mini Project
17)	8	Theory	EE8011 Flexible AC Transmission Systems
18)	8	Theory	EI8073 Biomedical Instrumentation
19)	8	Practical	EE8811 Project Work

ODD Semester 2021-2022

III Semester B.E. EEE

MA8353 Transforms and Partial Differential Equations

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

CO1: Understand how to solve the given standard partial differential equations

CO2: Solve differential equations using Fourier series analysis which plays a vital role in engineering applications

CO3: Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations.

CO4: Understand the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering.

CO5: Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems.

EE8351 DIGITAL LOGIC CIRCUITS

Course Outcome : At the end of the course students will have the

CO1: Ability to design combinational and sequential Circuits.

CO2: Ability to simulate using software package.

CO3: Ability to study various number systems and simplify the logical expressions using Boolean functions

CO4: Ability to design various synchronous and asynchronous circuits.

CO5: Ability to introduce digital simulation for development of application oriented logic circuits.

EE8391 Electromagnetic Theory

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

CO1: Introduce the basic mathematical concepts related to electromagnetic vector fields

CO2: Impart knowledge on the concepts of Electrostatic fields, electrical potential, energy density and their applications.

CO3: Impart knowledge on the concepts of Magneto static fields, magnetic flux density, vector potential and its applications.

CO4: Impart knowledge on the concepts of Different methods of EMF generation and Maxwell's equations

CO5: Impart knowledge on the concepts of Electromagnetic waves and characterizing parameters

EE8301 Electrical Machines - I

Course Outcome : The students, after the completion of the course, are having the

CO1-Ability to analyze the magnetic-circuits.

CO2-Ability to acquire the knowledge in constructional details of transformers.

CO3-Ability to understand the concepts of electromechanical energy conversion.

CO4-Ability to acquire the knowledge in working principles of DC Generator.
CO5-Ability to acquire the knowledge in working principles of DC Motor
CO6-Ability to acquire the knowledge in various losses taking place in D.C. Machines

EC 8353-Electron Devices And Circuits
COs Course Outcome : The students, after the completion of the course, are expected to
CO1-Ability to understand the structure and working operation of basic electronic devices.
CO2-Ability to identify and differentiate both active and passive elements
CO3- Ability to Understand the operation and applications of transistor like BJT and FET
CO4-Choose and adapt the required components to construct an amplifier circuit
CO5-Employ the acquired knowledge in design and analysis of oscillators

ME8792 Power Plant Engineering
Course Outcome : Upon the completion of this course the students will be able to
CO1: Explain the layout, construction and working of the components inside a thermal power plant.
CO2: Explain the layout, construction and working of the components inside a Diesel, Gas and Combined cycle power plants.
CO3: Explain the layout, construction and working of the components inside nuclear power plants.
CO4: Explain the layout, construction and working of the components inside Renewable energy power plants.
CO5: Explain the applications of power plants while extend their knowledge to power plant economics and environmental hazards and estimate the costs of electrical energy production.

Laboratory

EC8311 Electronics Laboratory
COs Course Outcome : The students, after the completion of the course, are expected the
CO1- Ability to understand and analyze Diodes
CO2- Ability to understand and analyze Transistors
CO3- Ability to understand and analyze Rectifiers
CO4- Ability to understand and analyze Oscillators.
CO5- Ability to understand and analyze Photo semiconductor Device

EE8311 Electrical Machines Laboratory – I
Course Outcome : The students, after the completion of the course, are having the
CO1-Ability to understand and analyze DC Generator
CO2-Ability to understand and analyze DC Motor
CO3-Ability to understand and analyze Transformers.

EE8501 Power System Analysis
COs Course Outcome : The students, after the completion of the course, are having the
CO1: Ability to model the power system under steady state operating condition.
CO2: Ability to understand and apply iterative techniques for power flow analysis.
CO3: Ability to model and carry out short circuit studies on power system.
CO4: Ability to model and analyze stability problems in power system and to acquire knowledge on Fault analysis
CO5: Ability to model and understand various power system components and carry out power flow, short circuit and stability studies.

EE8551 MICROPROCESSORS AND MICROCONTROLLERS
COs Course Outcome : The students, after the completion of the course, are expected to
CO1: Ability to acquire knowledge in Addressing modes & instruction set of 8085 & 8051.
CO2: Ability to need & use of Interrupt structure 8085 & 8051.
CO3: Ability to understand the importance of Interfacing
CO4: Ability to explain the architecture of Microprocessor and Microcontroller.
CO5: Ability to write the assembly language programme.
CO6: Ability to develop the Microprocessor and Microcontroller based applications.

EE8552 POWER ELECTRONICS
COs Course Outcome : The students, after the completion of the course, are expected to
CO1: Understand different types of power semiconductor devices, their switching characteristics and driver circuits
CO2: Classify the various performance parameters in controlled rectifiers with different load conditions
CO3: Analyze DC –DC switching regulators with its Commutation Techniques and apply it for real time applications like SMPS
CO4: Explain the various pulse width modulated inverters for different loads and infer the effect of power quality disturbances over the system.
CO5: Analyze AC voltage controllers, Matrix Converters & Cyclo converters with various loads and infer its various configurations.

EE8591 Digital Signal Processing
Course Outcome : The students, after the completion of the course, are expected to
CO1: Ability to understand the importance of Fourier transform, digital filters and DS Processors.
CO2: Ability to acquire knowledge on Signals and systems & their mathematical representation.
CO3: Ability to understand and analyze the discrete time systems.
CO4: Ability to analyze the transformation techniques & their computation
CO5: Ability to understand the types of filters and their design for digital implementation.
CO6: Ability to acquire knowledge on programmability digital signal processor & quantization effects.

CS8392 Object Oriented Programming
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

OMD551 Basics of biomedical Instrumentation
Course Outcome : The students, after the completion of the course, are expected 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

Laboratory

HS8581 - Professional Communication
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-Improve the ability to understand the nuances of Grammar.

EE8511 Control and Instrumentation Laboratory
COs Course Outcome : The students, after the completion of the course, are expected to
CO1: Design compensators
CO2: Analyze the various types of converters.
CO3: Understand control theory and apply them to electrical engineering problems.
CO4: Study the simulation packages.
CO5: The basics of signal conditioning circuits.
CO6: Understand the basic concepts of bridge networks.

CS8383 Object Oriented Programming Laboratory
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

VII Semester B.E. EEE

EE8701- High Voltage Engineering
COs Course Outcome : The students, after the completion of the course, are having the
CO1-Ability to understand various types of over voltages in power system.
CO2-Ability to Understand the concept of Breakdown mechanism in solid, liquid and gaseous dielectrics
CO3-Ability to understand Generation of high voltages.
CO4-Ability to understand measurement of high voltages.
CO5-Ability to test power apparatus and insulation coordination

EE8702 Power System Operation and Control
COs Course Outcome : The students, after the completion of the course, are having the
CO1. Ability to understand the day-to-day operation of electric power system.
CO2. Ability to analyze the control actions to be implemented on the system to meet theminute-to-minute variation of system demand.
CO3. Ability to understand the significance of power system operation and control.
CO4. Ability to acquire knowledge on real power-frequency interaction.
CO5. Ability to understand the reactive power-voltage interaction.
CO6. Ability to design SCADA and its application for real time operation.

EE8703 Renewable Energy Systems
Course Outcome : The students, after the completion of the course, are having the
CO1- Ability to create awareness about renewable Energy Sources and technologies.
CO2-Ability to explain the Wind energy resources and technologies and their applications.
CO3-Ability to explain the solar energy resources and technologies and their applications.
CO4-Ability to explain the basics about biomass energy
CO5-Ability to explain the other renewable energy sources technologies and their applications.

GE8071 Disaster Management
Course Outcome : The students, after the completion of the course, are expected to
CO1: Differentiate the types of disasters, causes and their impact on environment and society.
CO2: Assess vulnerability and various methods of risk reduction measures as well as mitigation.
CO3: Draw the vulnerability profile of India, Scenarios in Indian context, disaster damage

assessment and management.

EE8009 Control of Electrical Drives
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COs Course Outcome : The students, after the completion of the course, are having the
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CO1: Ability to understand the DC drives control.
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CO2: Ability to study and analyze the Induction motor drive control.

CO3: Ability to study and understand the Synchronous motor drive control.
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CO4: Ability to study and analyze the SRM and BLDC motor drive control.
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CO5: Ability to analyze and design the Digital control for drives.

OML751 Testing of Materials

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

CO1: Identify suitable testing technique to inspect industrial component

CO2: Possess the ability to use mechanical testing technique and know its applications and limitations

CO3: Possess the ability to use non destructive testing technique and know its applications and limitations
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CO4: Possess the ability to use material characterization testing technique and know its applications and limitations
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CO5 : Possess the ability to use thermal and chemical testing technique and know its applications and limitations
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Laboratory

EE8712 Renewable Energy Systems Laboratory

Course Outcome : The students, after the completion of the course, are having the
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CO1: Ability to understand and analyze Renewable energy systems
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CO2: Ability to train the students in Renewable Energy Sources and technologies.

CO3: Ability to provide adequate inputs on a variety of issues in harnessing Renewable Energy.

CO4: Ability to simulate the various Renewable energy sources.

CO5: Ability to recognize current and possible future role of Renewable energy sources.
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CO6: Ability to understand basics of Intelligent Controllers.
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EE8711-Power System Simulation Laboratory
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COs Course Outcome : The students, after the completion of the course, are having the
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CO1. Ability to understand power system planning and operational studies

CO2. Ability to acquire knowledge on Formation of Bus Admittance and Impedance Matricesand Solution of Networks.

CO3. Ability to analyze the power flow using GS and NR method
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CO4. Ability to find Symmetric and Unsymmetrical fault

CO5. Ability to understand the economic dispatch.
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CO6. Ability to analyze the electromagnetic transients.
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EVEN Semester

IV Semester – B.E. EEE

MA8491 Numerical Methods

Course Outcome : Upon successful completion of the course, students should be able to:

CO1: Understand the basic concepts and techniques of solving algebraic and transcendental equations.

CO2: Appreciate the numerical techniques of interpolation and error approximations in various intervals in real life situations.

CO3: Apply the numerical techniques of differentiation and integration for engineering problems.

CO4: Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.

CO5: Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications.

EE8401 Electrical Machines - II

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

CO1: Understand the constructional details and the performance of salient and non-salient type synchronous generators.

CO2: Discuss the Principle of operation and analyse the performance of synchronous motor

CO3: Understand the construction, principle of operation and performance analysis of induction machines

CO4: Explain the starting, Braking and speed control of three-phase induction motors.

CO5: Discuss the construction, principle of operation and performance of single phase induction motors and special

EE8402 Transmission and Distribution

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

CO1. To understand the importance and the functioning of transmission line parameters.

CO2. To understand the concepts of Lines and Insulators.

CO3. To acquire knowledge on the performance of Transmission lines and to understand the importance of distribution of the electric power in power system.

CO4. To acquire knowledge on Underground Cables

CO5. To become familiar with the function of different components used in Transmission and Distribution levels of power system and modelling of these components.

EE8403- Measurements And Instrumentation

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

CO1. To acquire knowledge on Basic functional elements of instrumentation

CO2. To understand the concepts of Fundamentals of electrical and electronic components

CO3. Ability to compare between various measurement techniques

CO4. To acquire knowledge on Various storage and display devices

CO5. To understand the concepts Various transducers and the data acquisition

systems

EE8451 Linear Integrated Circuits and Applications

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

CO1: Ability to acquire knowledge in IC fabrication procedure Ability to analyze the characteristics of Op-Amp

CO2: To understand the importance of Signal analysis using Op-amp based circuits.

CO3: Functional blocks and the applications of special ICs like Timers, PLL circuits, Regulator Circuits.

CO4: To understand and acquire knowledge on the Applications of Op-amp

CO5: Ability to understand and analyse, linear integrated circuits their Fabrication and Application.

IC 8451 – Control Systems

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

CO1: Develop various representations of system based on the knowledge of Mathematics, Science and Engineering fundamentals.

CO2: Do time domain analysis of various models of linear system.

CO3: Do frequency domain analysis of various models of linear system.

CO4: Interpret characteristics of the system to develop mathematical model and design appropriate compensator for the given specifications to understand use of PID controller in closed loop system.

CO5: Ability to come out with solution for complex control problem.

Laboratory

EE8411 Electrical Machines Laboratory-II

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

CO1: Understand the regulation of three phase alternator by various methods like EMF, MMF, ZPF and ASA methods.

CO2: Describe the regulation of three phase salient pole alternator by slip test and measuring its negative and zero sequence impedance.

CO3: Understand the fundamental characteristics of synchronous motor by relating parameters like field current, armature current.

CO4: Explain the performance characteristics of three phase induction motor

CO5: Analyse the performance characteristics of single phase induction motor Learning the various types of starters using

EE8461 -Linear and Digital Integrated circuits Laboratory

COs Course Outcome : At the end of the course, the student should have the :

CO1: Ability to understand and implement Boolean Functions.

CO2: Ability to understand the importance of code conversion

CO3: Ability to Design and implement 4-bit shift registers.
CO4: Ability to acquire knowledge on Application of Op-Amp.
CO5: Ability to Design and implement counters using specific counter IC.

EE8412 Technical Seminar
Course Outcome : The students, after the completion of the course, are expected to got the
CO1: Ability to review, prepare and present technological developments
CO2: Ability to face the placement interviews

VI Semester B.E. EEE

EE8601 Solid State Drives
COs Course Outcome : The students, after the completion of the course, are expected to
CO1: Study about the steady state operation and transient dynamics of a motor load system.
CO2: Analyze the operation of the converter/chopper fed dc drive.
CO3: Analyze the operation and performance of induction motor drives.
CO4 : Analyze the operation and performance of synchronous motor drives.
CO5: Analyze and design the current and speed controllers for a closed loop solid state DC motor drive.

EE8602 – Protection And Switchgear
COs Course Outcome : The students, after the completion of the course, are having the
CO1- Ability to find the causes of abnormal operating conditions of the apparatus and system.
CO2 - Ability to analyze the characteristics and functions of Electromagnetic Relays.
CO3 - Ability to study about the apparatus protection
CO4 - Ability to study about the static and numerical relays.
CO5 - Ability to acquire knowledge on functioning of circuit breaker.

EE8691 Embedded Systems
Course Outcome : The students, after the completion of the course, have the
CO1: Ability to understand and analyze Embedded systems.
CO2: Ability to suggest an embedded system for a given application.
CO3: Ability to operate various Embedded Development Strategies
CO4: Ability to study about the bus Communication in processors and ability to acquire knowledge on various processor scheduling algorithms
CO5: Ability to understand basics of Real time operating system.

EE8002 Design of Electrical Apparatus
Course Outcome : The students, after the completion of the course, are expected to
CO1: Ability to understand basics of design considerations for rotating and static electrical machines

CO2: Ability to design of field system for its application.
CO3: Ability to design sing and three phase transformer.
CO4: Ability to design armature and field of DC machines.
CO5: Ability to design stator and rotor of induction motor.
CO6: Ability to design and analyze synchronous machines.

EE8005 Special Electrical Machines
Course Outcome : The students, after the completion of the course, are having the
CO1-Ability to acquire the knowledge on construction and operation of stepper motor.
CO2-Ability to construction, principle of operation, switched reluctance motors.
CO3-Ability to acquire the knowledge on construction and operation of permanent magnet brushless D.C. motors.
CO4-Ability to acquire the knowledge on construction and operation of permanent magnet synchronous motors.
CO5-Ability to select a special Machine for a particular application.

Laboratory

EE8661Power Electronics and Drives Laboratory
COs Course Outcome : The students, after the completion of the course, are having the
CO1. Ability to practice and understand converter and inverter circuits and apply software forengineering problems.
CO2. Ability to experiment about switching characteristics various switches.
CO3. Ability to analyze about AC to DC converter circuits.
CO4. Ability to analyze about DC to AC circuits.
CO5. Ability to acquire knowledge on AC to AC converters
CO6. Ability to acquire knowledge on simulation software.

EE8681 – Microprocessors and Microcontrollers Laboratory
COs Course Outcome : The students, after the completion of the course, are expected to
CO1: Ability to understand and apply computing platform and software for engineering problems.
CO2: Ability to programming logics for code conversion.
CO3: Ability to acquire knowledge on A/D and D/A.
CO4: Ability to understand basics of serial communication.
CO5: Ability to understand and impart knowledge in DC and AC motor interfacing.
CO6: Ability to understand basics of software simulators.

EE8611 Mini Project
Course Outcome :
CO1: On Completion of the mini project work students will be in a position to take up their final year project work and find solution by formulating proper methodology.

EE8011 Flexible AC Transmission system

Course Outcome : The students, after the completion of the course, they have the

C01: Ability to understand, analyze and develop analytical model of FACTS controllers.

C02: Ability to understand the power system application.

C03: Ability to understand the concepts about load compensation techniques.

C04: Ability to acquire knowledge on facts devices.

C05: Ability to understand the start-of-art of the power system.

EI8073 Biomedical Instrumentation

Course Outcome : At the end of the course students will have the

CO1: Ability to understand the philosophy of the heart, lung, blood circulation and respiration system.

CO2: Ability to provide latest ideas on devices of non-electrical devices.

CO3: Ability to gain knowledge on various sensing and measurement devices of electrical origin.

CO4: Ability to bring out the important and modern methods of imaging techniques and their analysis.

CO5: Ability to explain the medical assistance/techniques, robotic and therapeutic equipments.

Laboratory

EE8811- 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