



Mar Ephraem

College of Engineering & Technology

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Malankara Hills, Elavuvilai, Marthandam – 629 171, Kanyakumari District, Tami Nadu.

Web: www.marephraem.edu.in, Ph: 04651 – 271111, 273111, Fax: 04651 – 270158, e-mail: marephraem@gmail.com

Department of Electrical and Electronics Engineering

Course Outcome 2017 Regulation Odd

| Semester | Subject Code | Subject | Co | Course outcome(CO) - Statements |
|----------|--------------|---|--------|--|
| III | MA8353 | Transforms and Partial Differential Equations | CO – 1 | Apply the solutions of partial differential equations |
| | | | CO – 2 | Utilize the Fourier series problems in current flow, sound waves |
| | | | CO – 3 | Find one dimensional wave equation and heat equations |
| | | | CO – 4 | Inference of Fourier transforms is in continuous time signals |
| | | | CO – 5 | Apply the Z transforms in discrete time signals |
| | | | CO – 6 | Summarize the physical problems of engineering. |
| | EE8351 | Digital Logic Circuits | CO – 1 | Ability to design combinational and sequential Circuits |
| | | | CO – 2 | Ability to simulate using software package. |
| | | | CO – 3 | Ability to study various number systems and simplify the logical expressions using Boolean functions |
| | | | CO – 4 | Ability to design various synchronous and asynchronous circuits. |
| | | | CO – 5 | Ability to introduce asynchronous sequential circuits and PLDs |
| | | | CO-6 | Ability to introduce digital simulation for development of application oriented logic circuits. |
| | EE8391 | Electromagnetic | CO – 1 | Interpret the coordinate systems used in |



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| | | | | |
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| | | Theory | | electromagnetic theory |
| | | | CO – 2 | Explain the Electric and Magnetic field intensity for continuous charge distributions |
| | | | CO – 3 | Develop the expression for capacitance and inductance in the continuous charge distributions |
| | | | CO – 4 | Build the boundary conditions for electric and magnetic field intensity |
| | | | CO – 5 | Illustrate the generation of EMF in static and dynamic conditions |
| | | | CO – 6 | Identify the properties of electromagnetic wave propagation from Maxwell's equation. |
| III | EE8301 | Electrical Machines - 1 | CO – 1 | Analyse the magnetic-circuits |
| | | | CO – 2 | Gain knowledge of basic electromechanical energy conversion process understands the concepts of electromechanical energy conversion |
| | | | CO – 3 | Acquire the knowledge in working principles of DC Generator |
| | | | CO – 4 | Acquire the knowledge in working principles of DC Motor |
| | | | CO – 5 | Acquire the knowledge in various losses taking place in D.C. Machines |
| | | | CO – 6 | Acquire the knowledge in constructional details of transformers |
| | EC8353 | Electron Devices And Circuits | CO – 1 | Explain the structure, characteristics and biasing of various PN junction diodes and its applications. |
| | | | CO – 2 | Explain the structure, characteristics and biasing of various types of transistors, thyristors and IGBT. |
| | | | CO – 3 | Analyze the BJT amplifier circuits using small signal and high frequency model. |
| | | | CO – 4 | Analyze the FET amplifier circuits using small signal and high frequency model. |
| | | | CO – 5 | Explain the differential amplifier and types of power amplifier and derive its efficiency. |



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| | | | CO – 6 | Employ the acquired knowledge in design and analysis of oscillators |
| III | ME8792 | Power Plant Engineering | CO – 1 | Explain the layout, construction and working of the components inside a thermal power plant |
| | | | CO – 2 | Explain the layout, construction and working of the components inside a Diesel, Gas and Combined cycle power plants |
| | | | CO – 3 | Explain the layout, construction and working of the components inside nuclear power plants. |
| | | | CO – 4 | Explain the layout, construction and working of the components inside Renewable energy power plants |
| | | | CO – 5 | Explain the applications of power plants while extend their knowledge to power plant economics and environmental hazards and estimate the costs of electrical energy |
| | | | CO – 6 | Discuss different power generation methods and boilers and estimate load curves and load duration curves. |
| | EC8311 | Electronics Laboratory | CO – 1 | Explain the characteristics of semiconductor devices |
| | | | CO – 2 | Analyze astable and monostable multivibrators |
| | | | CO – 3 | Develop differential amplifiers using FET |
| | | | CO – 4 | Infer frequency and phase measurements using CRO |
| | | | CO – 5 | Construct RC, LC phase shift oscillators |
| | | | CO – 6 | Experiment with passive filters |
| | EE8311 | Electrical Machines Laboratory - I | CO – 1 | Ability to understand and analyze DC Generator |
| CO – 2 | | | Ability to understand and analyze DC Motor | |
| CO – 3 | | | Ability to understand and analyse Transformers. | |
| V | EE8501 | Power System Analysis | CO – 1 | Understand different methods to analyse power system for the purpose of system planning and operation |



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| | | | CO – 2 | Develop the single line diagram and per unit analysis for the power system studies. |
| | | | CO – 3 | Select suitable iterative method for power flow studies. |
| | | | CO – 4 | Compute the fault current and short circuit capacity for symmetrical fault. |
| | | | CO – 5 | Apply the usage of various sequence networks for unsymmetrical fault studies. |
| | | | CO-6 | Select suitable algorithm for stability analysis. |
| EE8551 | Microprocessors and Microcontrollers | CO – 1 | Explain the architecture and functionalities of 8085 Microprocessor. | |
| | | CO – 2 | Analyze Assembly level programming in real time applications using 8085. | |
| | | CO – 3 | Explain the architecture and functionalities of 8051 Microcontroller. | |
| | | CO – 4 | Configure the external peripherals interfacing with the 8085 microprocessor and 8051 microcontroller. | |
| | | CO – 5 | Develop skill in simple applications programming with 8051. | |
| | | CO – 6 | Compare the programming concepts of 8085 and 8051 | |
| V | EE8552 | Power Electronics | CO – 1 | To apply the concepts of electronics switches, the essentiality of gate triggering circuits and need of snubber circuits for the working of power converters. |
| | | | CO – 2 | To analyse the operation, characteristics and performance parameters of controlled converter. |
| | | | CO – 3 | To analyse different topologies of DC-DC converters and distinguish the application of DC-DC converters in real time. |
| | | | CO – 4 | To distinguish the different modulation techniques of pulse width modulated inverters and the harmonic reduction methods. |
| | | | CO – 5 | To apply the concepts of AC voltage control and interpret practical application of AC voltage control. |



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| | EE8591 | Digital Signal Processing | CO - 6 | To analyse the operation of control circuits and applications of power electronic circuits |
| | | | CO - 1 | Ability to understand the basic concepts of Signals and systems, their mathematical Representation and quantization effects. |
| | | | CO - 2 | Ability to apply the Z transformation techniques on discrete time systems. |
| | | | CO - 3 | Ability to apply the concepts of the Discrete Fourier transformation techniques & their computation. |
| | | | CO - 4 | Ability to analyze the types of Finite Impulse Response filters and their design for digital implementation. |
| | | | CO - 5 | Ability to analyze the types of Finite Impulse Response filters and their design for digital implementation. |
| | | | CO-6 | Ability to understand the architecture and addressing modes of programmable digital signal processors. |
| V | CS8392 | Object Oriented Programming | CO - 1 | Develop Java programs using OOP principles |
| | | | CO - 2 | Develop Java programs using the concepts of inheritance and interfaces |
| | | | CO - 3 | Build Java applications using exceptions and I/O Streams |
| | | | CO - 4 | Develop Java applications with threads and generic classes |
| | | | CO - 5 | Develop interactive Java programs using swings |
| | | | CO - 6 | Develop an application based upon concepts of Java. |
| | OCE551 | Air Pollution and Control Engineering | 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's. |



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| | | | CO5 | Ability to ensure quality, control and preventive measures. |
| | | | CO6 | Analyze the basic concepts of air quality management |
| | EE8511 | Control and Instrumentation Laboratory | CO – 1 | Ability to understand control theory and apply them to electrical engineering problems. |
| | | | CO – 2 | Ability to analyze the various types of converters |
| | | | CO – 3 | Ability to design compensators |
| | | | CO – 4 | Ability to understand the basic concepts of bridge networks |
| | | | CO – 5 | Ability to the basics of signal conditioning circuits |
| | | | CO – 6 | Ability to study the simulation packages. |
| | HS8581 | Professional Communication | CO – 1 | Enhance the Employability and Career Skills of students |
| | | | CO – 2 | Orient the students towards grooming as a professional |
| | | | CO – 3 | Make them Employability Graduates |
| | | | CO – 4 | Develop their confidence and help them attend interviews successfully. |
| | CS8383 | Object Oriented Programming Lab | CO – 1 | To build software development skills using java programming for real-world applications |
| | | | CO – 2 | To understand and apply the concepts of classes, packages, interfaces, array list, exception handling and file processing. |
| CO – 3 | | | To develop applications using generic programming and event handling. | |
| VII | EE8701 | High voltage engineering | CO1 | Describe the causes of power systems over voltages |
| | | | CO2 | Summarize the impact of over voltages on dielectrics |
| | | | CO3 | Explain the breakdown mechanism of dielectrics |
| | | | CO4 | Classify protection devices to prevent Flashovers |
| | | | CO5 | Discuss the testing of power system apparatus |
| | | | CO6 | Summarize the methods of HV measurements |



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| VII | EE8702 | Power System Operation and Control | CO-1 | Ability to understand the day-to-day operation of electric power system. |
| | | | CO-2 | Ability to analyze the control actions to be implemented on the system to meet the minute-to-minute variation of system demand. |
| | | | CO-3 | Ability to understand the significance of power system operation and control. |
| | | | CO-4 | Ability to acquire knowledge on real power-frequency interaction. |
| | | | CO-5 | Ability to understand the reactive power-voltage interaction. |
| | | | CO-6 | Ability to design SCADA and its application for real time operation. |
| | EE8703 | Renewable Energy Systems | CO-1 | Understand the current energy scenario, environment aspect and renewable energy resources in India |
| | | | CO-2 | Understand the basic concept of wind energy conversion system and basics of grid Integration. |
| | | | CO-3 | Understand the solar energy conversion system and different types of solar plants. |
| | | | CO-4 | Experiment with standalone and grid connected PV system. |
| | | | CO-5 | Explain the basic of renewable sources like Hydro, biomass and Geothermal |
| | | | CO-6 | Explain the basic of different ocean energy system and Fuel cell. |
| | OCS752 | Introduction to C Programming | CO-1 | Develop algorithmic solutions to simple computational problems using basic constructs |
| | | | CO-2 | Develop simple applications in C using Control Constructs |
| | | | CO-3 | Design and implement applications using arrays |
| | | | CO-4 | Represent data using string and string operations |
| | | | CO-5 | Decompose a C program into functions and pointers |
| | | | CO-6 | Represent and write program using structure and union |
| EI8075 | Fibre Optics and | CO1 | Classify the types of optical fibers and | |



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| | | Laser Instrumentation | | discuss the various losses and dispersion involved in optical fibers and discuss about various optical sources, optical detectors, optical connectors and splices. |
| | | | CO2 | Illustrate the various applications of lasers in industries. |
| | | | CO3 | Explain the characteristics and types of lasers. |
| | | | CO4 | Develop a thorough knowledge about applications of lasers in industries and material processing |
| | | | CO5 | Explain the concept of holography using lasers. |
| | | | CO6 | Interpret the applications of lasers in medical field |
| VII | GE 8077 | Total Quality Management | CO-1 | Understand the quality philosophies and customer focused managerial system |
| | | | CO-2 | Summarize the quality management principles |
| | | | CO-3 | Apply six sigma concept in manufacturing and service sector |
| | | | CO-4 | Determine the tools and techniques for quality improvement. |
| | | | CO-5 | Analyze standards and auditing system on implementation of TQM. |
| | | | CO-6 | Analyze standards for the operation of EMS. |
| | EE8711 | Power System Simulation lab | CO-1 | Model the Transmission line of power system |
| | | | CO-2 | Develop Bus Impedance and Admittance matrices for a network |
| | | | CO-3 | Analysis of Load flow by numerical methods |
| | | | CO-4 | Determine the fault current for the N bus system |
| | | | CO-5 | Examine the stability level of Single and Multi machine system |
| | | | CO-6 | Analyze the load frequency dynamics of multi area system |



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| | | | CO-6 | Analyze the load frequency dynamics of multi area system |



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Department of Electrical and Electronics Engineering

Course Outcome 2017 Regulation Even

| Semester | Subject Code | Subject | Co | Course outcome(CO) - Statements |
|----------|--------------|-----------------------------|--------|---|
| IV | MA8491 | Numerical methods | CO – 1 | Find the solutions of algebraic and transcendental equations |
| | | | CO – 2 | Choose power method for Eigen values |
| | | | CO – 3 | Apply the concept of Numerical differentiation and integration in engineering |
| | | | CO – 4 | Examine Initial value problem for Ordinary differential equation |
| | | | CO – 5 | Apply the boundary value problem in PDE and ODE |
| | | | CO – 6 | Solve the Linear system of Equation |
| | EE8402 | Transmission & Distribution | CO – 1 | To understand the importance and the functioning of transmission line parameters. |
| | | | CO – 2 | To understand the concepts of Lines and Insulators. |
| | | | CO – 3 | To acquire knowledge on the performance of Transmission lines. |
| | | | CO – 4 | To understand the importance of distribution of the electric power in power system |
| | | | CO – 5 | To acquire knowledge on Underground Cabilities |
| | | | CO – 6 | To become familiar with the function of different components used in Transmission and Distribution levels of power system and modeling of these components. |
| | EE8401 | Electrical Machines-II | CO – 1 | Skilled to relate the knowledge on Construction and performance of salient and non – salient type synchronous generators. |
| | | | CO – 2 | Capable of narrating the knowledge on Principle of operation and performance of synchronous motor |
| | | | CO – 3 | Ability to apply the knowledge on Construction, principle of operation and performance of induction machines. |



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| | | | CO – 4 | Ability to apply the knowledge on Starting and speed control of three-phase induction motors |
| | | | CO – 5 | Ability to apply the knowledge on Construction, principle of operation and performance of single phase induction motors and special machines |
| | | | CO - 6 | Ability to apply the knowledge of AC Electrical equipments and their applications in Power System |
| IV | EE8451 | Linear integrated circuits and applications | CO – 1 | Outline the fabrication process of IC |
| | | | CO – 2 | Illustrate the ideal and non ideal characteristics of op-amp |
| | | | CO – 3 | Explain various applications of op-amp. |
| | | | CO – 4 | Design the different types of oscillators and ADC,DAC |
| | | | CO – 5 | Illustrate various application ICs |
| | | | CO-6 | Explain the working of special function ICs. |
| | EE8403 | Measurements and Instrumentation | CO – 1 | To acquire knowledge on Basic functional elements of instrumentation |
| | | | CO – 2 | To understand the concepts of Fundamentals of electrical and electronic instruments |
| | | | CO – 3 | Ability to compare between various measurement techniques |
| | | | CO – 4 | To acquire knowledge on Various storage and display devices |
| | | | CO – 5 | To understand the concepts Various transducers and the data acquisition systems |
| | | | CO – 6 | Ability to model and analyze electrical and electronic Instruments and understand the operational features of display Devices and Data Acquisition System. |
| IV | IC 8451 | Control Systems | CO – 1 | Ability to develop various representations of system based on the knowledge of Mathematics, Science and Engineering fundamentals. |
| | | | CO – 2 | Ability to do time domain and frequency domain analysis of various models of linear system. |
| | | | CO – 3 | Ability to interpret characteristics of the system to develop mathematical model. |



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| | | | CO – 4 | Ability to design appropriate compensator for the given specifications. | |
| | | | CO – 5 | Ability to come out with solution for complex control problem. | |
| | | | CO – 6 | Ability to understand use of PID controller in closed loop system. | |
| | EE8411 | Electrical Machines Laboratory – II | | CO – 1 | Ability to understand and analyze EMF and MMF methods |
| | | | | CO – 2 | Ability to analyze the characteristics of V and Inverted V curves |
| | | | | CO – 3 | Ability to understand the importance of Synchronous machines |
| | | | | CO – 4 | Ability to understand the importance of Induction Machines |
| | | | | CO – 5 | Ability to acquire knowledge on separation of losses |
| | | | | CO – 6 | |
| | EE8461 | Linear and Digital Integrated Circuits Laboratory | | CO – 1 | Illustrate the ideal and non ideal characteristics of op-amp |
| | | | | CO – 2 | Explain various applications of op-amp. |
| | | | | CO – 3 | Illustrate the ideal and non ideal characteristics of op-amp |
| CO – 4 | | | | Implement various number systems and simplify the logical expressions using Boolean functions | |
| CO – 5 | | | | Design combinational circuits | |
| CO – 6 | | | | To design various synchronous and asynchronous circuits. | |
| VI | EE8601 | Solid State Drives | CO – 1 | Apply concepts of Motor load dynamics and ability to discriminate steady state and transient operation. | |
| | | | CO – 2 | Analyse the operation of the converter / chopper fed DC drive | |
| | | | CO – 3 | Analyse the operation of both classical and modern induction motor drives. | |
| | | | CO – 4 | Develop a control structure for a drive system to improve its performance of both classical and modern synchronous motor drives | |
| | | | CO – 5 | Design the current and speed controllers for a closed loop solid-state DC motor drive | |



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| VI | EE8602 | Protection and Switchgear | CO – 6 | Analyse and design open loop and closed-loop electrical drives |
| | | | CO – 1 | To infer the different kinds of Protective Equipments in Power Systems |
| | | | CO – 2 | Use the appropriate relay for the protection of power system. |
| | | | CO – 3 | Apply different methods of protection for various power system components |
| | | | CO – 4 | Describe static relays and numerical protection |
| | | | CO – 5 | To understand the fundamental ideas in switching, breaking and making of breakers |
| | | | CO – 6 | Describe various types of circuit breakers and their operation |
| | EE8691 | Embedded Systems | CO – 1 | Understand and Analyze Embedded systems. |
| | | | CO – 2 | Distinguish the bus communication in processors. |
| | | | CO – 3 | Operate various Embedded Development Strategies |
| | | | CO – 4 | Understand basics of Real time operating system. |
| | | | CO – 5 | Classify various processor scheduling algorithms. |
| | | | CO – 6 | Interpret an embedded system for a given application. |
| | GE8075 | Intellectual Property Rights | CO – 1 | Ability to manage Intellectual Property portfolio to enhance the value of the firm. |
| | | | CO – 2 | Review an intellectual property portfolio and comprehend the extent of their protection. |
| | | | CO – 3 | Develop a business plan that advances the value of their intellectual property portfolio |
| | | | CO – 4 | Develop a strategy of marketing their intellectual property and understand some negotiation basics. |
| | | | CO – 5 | Explain some of the limits of their intellectual property rights and comprehend some basic legal pitfalls |



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| VI | EE 8005 | Special Electrical Machines | CO – 6 | Ability to manage emergency issues |
| | | | CO – 1 | To select the different types of stepper motor by knowing the working of various types of stepper motor, their characteristics, closed loop control and applications. |
| | | | CO – 2 | To describe the principle & features of variable reluctance and to select the various types of SRM based on their applications. |
| | | | CO – 3 | Describe the magnetic circuit analysis and the magnetic materials and working principles, EMF, Torque equation, Characteristics and applications of BLPMDC motor. |
| | | | CO – 4 | To describe the phasor diagram, volt-amp requirements, features, working principles, EMF, torque equation, characteristics and applications of Permanent Magnet Synchronous Motors. |
| | | | CO – 5 | Analyze the working principles, applications and difference between various types of special electrical machines. |
| | EE8661 | Power Electronics and Drives Laboratory | CO-1 | Demonstration of firing circuits |
| | | | CO-2 | Analyze static and dynamic characteristics of switching devices |
| | | | CO-3 | Experiment with converters. |
| | | | CO-4 | Experiment with switch mode power supplies. |
| | | | CO-5 | Experiment with switching regulators. |
| | | | CO-6 | Analyze the converter circuits using simulation software |
| | EE 8681 | Microprocessors and Microcontrollers Laboratory | CO – 1 | Understand and Analyze Embedded systems. |
| | | | CO – 2 | Distinguish the bus communication in processors. |
| | | | CO – 3 | Operate various Embedded Development Strategies |
| | | | CO – 4 | Understand basics of Real time operating system. |
| | | | CO – 5 | Classify various processor scheduling algorithms. |
| | | | CO – 6 | Interpret an embedded system for a given application. |



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Run by Catholic Diocese Of Marthandam | Approved by AICTE |

Affiliated To Anna University, Chennai | Accredited by NAAC |

Malankara Hills, Elavuvilai, Marthandam – 629 171, Kanyakumari District, Tami Nadu.

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|------|--------|-------------------------------------|--------|---|
| | EE8611 | Mini Project | CO – 1 | Explain the engineering concepts |
| | | | CO – 2 | Solve problems to new situations with knowledge, facts, techniques and rules in a different way |
| | | | CO – 3 | Discover new computational platform in electrical & electronics fields |
| | | | CO – 4 | Determine the performance of complex power network |
| | | | CO – 5 | Formulate real world problem with global outlook |
| | | | CO – 6 | Improve the managerial skills to meet the industry |
| VIII | GE8076 | Professional Ethics in Engineering | CO1 | Describe the human values with regard to the individual lifestyle for the society |
| | | | CO2 | Explain the role of ethics to the engineering field |
| | | | CO3 | Describe how engineering is applied in association with ethics based on engineering experimentation |
| | | | CO4 | Explain the engineering ethics-based safety, responsibilities and rights |
| | | | CO5 | Discuss the global issues of professional ethics in engineering |
| | | | CO6 | Experiment the professional ethics in engineering-based product development |
| VIII | EE8018 | Microcontroller Based System Design | CO – 1 | Impart knowledge about Architecture of PIC microcontroller |
| | | | CO – 2 | Interrupts and timers |
| | | | CO – 3 | Peripheral devices for data communication and transfer |
| | | | CO – 4 | Functional blocks of ARM processor |
| | | | CO – 5 | Architecture of ARM processors |
| | | | CO – 6 | Design and programming of microcontroller based system design-case studies and exercises |
| | EE8811 | Project Work | CO – 1 | Explain the engineering concepts |
| | | | CO – 2 | Solve problems to new situations with knowledge, facts, techniques and rules in a different way |
| | | | CO – 3 | Discover new computational platform in electrical & electronics fields |



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ANISH JOHN PAUL. M
Head of the Department

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