



LOYOLA INSTITUTE OF TECHNOLOGY
Palanchur, Chennai – 600 123
Approved by AICTE, New Delhi and Affiliated to Anna
University, Chennai (An ISO Certified Institution)

Department of Electrical and Electronics Engineering

2017 Regulations

Course Outcomes (COs)

ODD SEM

II YEAR (6 Theory + 2 Labs)

| Si.No | Name of the Subject (In Abbreviation) | Course Outcomes | Statement |
|-------|---|-----------------|--|
| 1 | MA8353/Transforms and Partial Differential Equation | 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 Fourier transforms would provide them the ability to formulate and solve some of the physical problems of engineering. |
| | | CO5 | Construct z- transform and find inverse z-transform techniques for discrete time systems. |
| | | CO6 | Use the effective mathematical tools for the solutions of difference equations by using Z transform techniques for discrete time systems. |
| 2 | EE8351 Digital Logic Circuits | CO1 | Ability to interpret number systems and simplify logical expressions |
| | | CO2 | Ability to construct combinational logic circuits |
| | | CO3 | Ability to develop the synchronous sequential circuits |
| | | CO4 | Ability to develop the Asynchronous Sequential Circuits |
| | | CO5 | Ability to analyze the Programmable Logic Devices |
| | | CO6 | Ability to develop VHDL programs to design digital logic circuits |
| 3 | EE8391 Electromagnetic | CO1 | Express the basic mathematical concepts related to electromagnetic vector fields |
| | | CO2 | Correlate the basic concepts of electrostatics, electric potential, energy density with their applications |

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| | Theory | CO3 | Discuss the basic concepts of magneto statics, magnetic flux density, scalar and vector potential and its applications |
| | | CO4 | Differentiate the methods of EMF generation and Maxwell's equations |
| | | CO5 | Express the basic concepts of electromagnetic waves and characterizing parameters |
| | | CO6 | Analyze the Electromagnetic fields and apply them for the design of electrical equipment's and systems. |
| 4 | EE8301 Electrical machines - I | 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 |
| 5 | EC8353 Electron Devices and Circuits | CO1 | Explain the structure, characteristics of various diodes and their applications |
| | | CO2 | Explain the structure, characteristics of various diodes and their applications |
| | | CO3 | Analyse the operation of transistors and thyristors |
| | | CO4 | Analyze the small signal models transistor amplifier |
| | | CO5 | Examine/ Construct multistage amplifiers |
| | | CO6 | Describe the benefits of negative feedback for amplifier circuits |
| 6 | ME8792 Power Plant Engineering | CO1 | Able to understand different types of power plant |
| | | CO2 | Analyse and solve energy and economic related issues in power sectors. |
| | | CO3 | Providing an overview of Power Plants |
| | | CO4 | Detailing the role of Mechanical Engineers in their maintainance |
| | | CO5 | Power Plant functions and their flow lines and issues related to them |
| | | CO6 | Detailing the role of Mechanical Engineers in the power plant operation |
| 7 | EC8311 Electronics Laboratory | CO1 | Analyze the characteristics of PN, Zener diode and BJT in CE,CC,CB configurations experimentally |
| | | CO2 | Analyze the characteristics of JFET and UJT experimentally |
| | | CO3 | Analyze frequency response characteristics of a Common Emitter amplifier and Passive filters experimentally |
| | | CO4 | Analyze the characteristics of RC phase shift and LC oscillators experimentally |

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| | | CO5 | Analyze the characteristics of half-wave and full-wave rectifier with and without filters experimentally |
| | | CO6 | Analyze the characteristics of FET based differential amplifier experimentally |
| 8 | EE8311 Electrical Machines Laboratory - I | CO1 | Construct the circuit with appropriate connections for the given DC machine/transformer. |
| | | CO2 | Experimentally determine the characteristics of different types of DC machines. |
| | | CO3 | Demonstrate the speed control techniques for a DC motor for industrial applications. |
| | | CO4 | Identify suitable methods for testing of transformer and DC machines. |
| | | CO5 | Predetermine the performance parameters of transformers and DC motor. |
| | | CO6 | Understand DC motor starters and 3-phase transformer connections. |

EVEN SEM

II YEAR (6 Theory + 2 Labs)

| Si.No | Name of the Subject (In Abbreviation) | Course Outcomes | Statement |
|-------|--|-----------------|--|
| 1 | MA8491 Numerical Methods | 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 | Thorough understanding of the fundamental concepts of Various Numerical Techniques and Boundary Value Problems |
| | | CO6 | The students will have a clear perception of the power of numerical techniques to solve problems drawn from industry, management and other engineering fields. |
| 2 | EE8401 Electrical Machines - II | CO1 | Ability to understand the construction and working principle of Synchronous Generator |
| | | CO2 | Ability to understand MMF curves and armature windings. |
| | | CO3 | Ability to acquire knowledge on Synchronous motor. |
| | | CO4 | Ability to understand the construction and working principle of Three phase Induction Motor |
| | | CO5 | Ability to understand the construction and working principle of Special Machines |

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| | | CO6 | Ability to predetermine the performance characteristics of Synchronous Machines. |
| 3 | EE8402 Transmission and Distribution | 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. |
| | | CO4 | To understand the importance of distribution of the electric power in power system. |
| | | CO5 | To acquire knowledge on Underground Cables |
| | | CO6 | To become familiar with the function of different components used in Transmission and Distribution levels of power system and modeling of these components. |
| 4 | EE8403 Measurement and Instrumentation | CO1 | To acquire knowledge on Basic functional elements of instrumentation |
| | | CO2 | To understand the concepts of Fundamentals of electrical and electronic instruments |
| | | 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 |
| | | CO6 | Ability to model and analyze electrical and electronic Instruments and understand the operational features of display Devices and Data Acquisition System |
| 5 | EE8451 Linear Integrated Circuits | CO1 | Ability to acquire knowledge in IC fabrication procedure |
| | | CO2 | Ability to analyze the characteristics of Op-Amp |
| | | CO3 | To understand the importance of Signal analysis using Op-amp based circuits. |
| | | CO4 | Functional blocks and the applications of special ICs like Timers, PLL circuits, regulator Circuits. |
| | | CO5 | To understand and acquire knowledge on the Applications of Op-amp |
| | | CO6 | Ability to understand and analyse, linear integrated circuits their Fabrication and Application |
| 6 | IC8451 Control Systems | CO1 | Develop various representations of system based on the knowledge of Mathematics, Science and Engineering fundamentals. |
| | | CO2 | Illustrate the time response of first and second order systems using standard test signals and the use of PID controller in closed loop system. |
| | | CO3 | Examine the frequency-domain response of various models of linear system. |
| | | CO4 | Identify a compensator system for the given specifications. |
| | | CO5 | Interpret characteristics of the system to develop mathematical model in state-variable form (state variable models) |

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| | | CO6 | Perceive the solution for complex control problem. |
| 7 | EE8411 Electrical Machines Laboratory - II | CO1 | Ability to understand and analyze EMF and MMF methods |
| | | CO2 | Ability to understand and analyze ZPF and ASA methods |
| | | CO3 | Ability to analyze the characteristics of V and Inverted V curves |
| | | CO4 | Ability to understand the importance of Synchronous machines |
| | | CO5 | Ability to understand the importance of Induction Machines |
| | | CO6 | Ability to acquire knowledge on separation of losses |
| 8 | EE8461 Linear and Digital Integrated circuits Laboratory | CO1 | Ability to understand and implement Boolean Functions. |
| | | CO2 | Ability to understand the importance of code conversion |
| | | CO3 | Ability to design and implement error detecting code |
| | | CO4 | Ability to design and implement 4-bit shift registers |
| | | CO5 | Ability to acquire knowledge on Application of Op-Amp |
| | | CO6 | Ability to design and implement counters using specific counter IC. |
| 9 | EE8412 Technical Seminar | CO1 | Ability to review, prepare and present technological developments |
| | | CO2 | Ability to face the placement interviews |

ODD SEM

III YEAR (6 Theory + 2 Labs)

| Si.No | Name of the Subject (In Abbreviation) | Course Outcomes | Statement |
|-------|--|-----------------|---|
| 1 | EE8501 Power System Analysis | CO1 | Model the power system under steady state operating condition |
| | | CO2 | Understand and apply iterative techniques for power flow analysis |
| | | CO3 | Model and carry out symmetrical short circuit studies on power system. |
| | | CO4 | Model and carry out unsymmetrical short circuit studies on power system |

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| | | CO5 | Model and analyze stability problems in power system |
| | | CO6 | Model and analyze the transient behaviour of power system when it is subjected to a fault |
| 2 | EE8551 Microprocessors and Microcontrollers | 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 |
| 3 | EE8552 Power Electronics | CO1 | Summarize the fundamental concepts of power switching devices. |
| | | CO2 | Analyze single phase power converter circuits and their application. |
| | | CO3 | Analyze three phase power converter circuits and their application. |
| | | CO4 | Analyze switching regulator circuits and their application. |
| | | CO5 | Analyze various harmonic reduction techniques. |
| | | CO6 | Develop skills to simulate converter circuits using simulation software. |
| 4 | EE8591 Digital Signal Processing | CO1 | Ability to understand the basic concepts of Signals and systems, their mathematical representation and quantization effects. |
| | | CO2 | Ability to apply the Z transformation techniques on discrete time systems. |
| | | CO3 | Ability to apply the concepts of the Discrete Fourier transformation techniques & their computation. |
| | | CO4 | Ability to analyze the types of Infinite Impulse Response filters and their design for digital implementation. |
| | | CO5 | Ability to analyze the types of Finite Impulse Response filters and their design for digital implementation. |
| | | CO6 | Ability to understand the architecture and addressing modes of programmable digital signal processors. |
| 5 | CS8392 Object Oriented Programming | CO1 | Develop Java programs using OOP principles |
| | | CO2 | Develop Java programs using the concepts of inheritance and interfaces |
| | | CO3 | Build Java applications using exceptions and I/O streams |
| | | CO4 | Develop Java applications with threads and generics classes |
| | | CO5 | Develop interactive Java programs using swings |
| | | CO6 | Develop an application based upon the concepts of Java. |

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| 6 | OMD551 Basics of Biomedical Instrumentation | 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 | To learn the about different bio-chemical electrodes |
| | | CO6 | Understand the different biochemical measurements |
| 7 | EE8511 Control and Instrumentation Laboratory | CO1 | Ability to understand control theory and apply them to electrical engineering problems. |
| | | CO2 | Ability to analyze the various types of converters. |
| | | CO3 | Ability to design compensators |
| | | CO4 | Ability to understand the basic concepts of bridge networks. |
| | | CO5 | Ability to the basics of signal conditioning circuits. |
| | | CO6 | Ability to study the simulation packages. |
| 8 | HS8581 Professional Communication | 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 |
| 9 | CS8383 Object Oriented Programming Laboratory | CO1 | Develop and implement Java programs for simple applications that make use of classes, packages and interfaces. |
| | | CO2 | Develop and implement Java programs with arraylist, exception handling and multithreading. |
| | | CO3 | Design applications using file processing, generic programming and event handling. |

EVEN SEM

III YEAR (5 Theory + 2 Labs)

| Si.No | Name of the Subject (In Abbreviation) | Course Outcomes | Statement |
|-------|--|-----------------|---|
| 1 | EE8601 Solid State Drives | CO1 | Ability to study about the steady state operation and transient dynamics of a motor load system |
| | | CO2 | Ability to analyze the operation of the converter/chopper fed dc drive. |
| | | CO3 | Ability to analyze the operation and performance of Induction motor drives |

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| | | CO4 | Ability to analyze the operation and performance of Synchronous motor drives |
| | | CO5 | Analyze and Understand Transfer function for DC motor / load and converter and Converter Selection and Characteristics |
| | | CO6 | Ability to analyze and design the current and speed controllers for a closed loop solid state DC motor drive |
| 2 | EE8602 Protection and Switchgear | CO1 | Ability to find the causes of abnormal operating conditions of the apparatus and system. |
| | | CO2 | Ability to analyze the characteristics and functions of relays and protection schemes |
| | | 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 & to suggest suitable circuit breaker. |
| | | CO6 | Ability to acquire knowledge on advanced protective schemes evolved for industries |
| 3 | EE8691 Embedded Systems | 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. |
| | | CO5 | Ability to acquire knowledge on various processor scheduling algorithms. |
| | | CO6 | Ability to understand basics of Real time operating system. |
| 4 | EE8002 Design of Electrical Apparatus | 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 single 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 |
| 5 | EE8005 Special Electrical Machines | CO1 | Explain the performance characteristics of synchronous reluctance motors. |
| | | CO2 | Classify the excitation modes of stepping motor |
| | | CO3 | Construct the power converter circuits for Switched reluctance motor |
| | | CO4 | Analyze the magnetic characteristics of brushless D.C motor |
| | | CO5 | Compare the control methods of permanent magnet synchronous motor |
| | | CO6 | Analyze the logical sequence operation of special machines by using Software program. |

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| 6 | EE8661 Power Electronics and Drives Laboratory | CO1 | Ability to practice and understand converter and inverter circuits and apply software for engineering 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. |
| 7 | EE8681 Microprocessors and Microcontrollers Laboratory | 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 |
| 8 | EE8611 Mini Project | 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. |

ODD SEM

IV YEAR (5 Theory + 2 Labs)

| Si.No | Name of the Subject (In Abbreviation) | Course Outcomes | Statement |
|-------|--|-----------------|---|
| 1 | EE8701 High Voltage Engineering | CO1 | Ability to understand various types of over voltages in power system. |
| | | CO2 | Ability to understand Transients in power system |
| | | CO3 | Ability to understand Generation and measurement of high voltage |
| | | CO4 | Ability to measure over voltages |
| | | CO5 | Ability to understand High voltage testing. |
| | | CO6 | Ability to test power apparatus and insulation coordination |
| 2 | EE8702 Power System Operation and Control | CO1 | Ability to understand the significance of power system operation and control. |
| | | CO2 | Ability to analyse the control actions to be implemented on the system to meet the minute-to-minute variation of system demand. |
| | | CO3 | Ability to acquire knowledge on real power-frequency interaction. |

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| | | CO4 | Ability to understand the reactive power-voltage interaction. |
| | | CO5 | Ability to understand the day-to-day operation of electric power system. |
| | | CO6 | Ability to design SCADA and its application for real time operation. |
| 3 | EE8703 Renewable Energy Systems | CO1 | Understand the current energy scenario, environment aspect and renewable energy resources in India |
| | | CO2 | Understand the basic concept of wind energy conversion system and basics of grid Integration. |
| | | CO3 | Understand the solar energy conversion system and different types of solar plants. |
| | | CO4 | Experiment with stand alone and grid connected PV system. |
| | | CO5 | Explain the basic of renewable sources like Hydro, biomass and Geothermal |
| | | CO6 | Explain the basic of different ocean energy system and Fuel cell. |
| 4 | OBT751 Analytical Methods and Instrumentation | CO1 | To Gain knowledge on principle of spectrometry and the optical instruments.Gain knowledge on principle of spectrometry and the optical instruments. |
| | | CO2 | Able to gain knowledge about the theoretical aspects of molecular spectroscopy |
| | | CO3 | To Develop knowledge of NMR & mass spectrometry |
| | | CO4 | Able to comprehend different separation are used in analytical |
| | | CO5 | Gain knowledge on different microscopy |
| | | CO6 | Ability to understand voltametry and study of surfaces |
| 5 | GE8071 Disaster Management | CO1 | To differentiate the types of disasters, causes and their impact on environment and society. |
| | | CO2 | To assess vulnerability and various methods of risk reduction measures as well as mitigation. |
| | | CO3 | To draw the hazard and vulnerability profile of India, Scenarios in the Indian context. |
| | | CO4 | To know the disaster damage assessment and management. |
| | | CO5 | To awareness of institutional processes in the country and to develop rudimentary ability to respond to their surroundings with potential disaster response in areas where they live. |
| | | CO6 | To complete preparedness, response and recovery in order to reduce the impact of disasters. |
| 6 | EE8010 Power System Transients | CO1 | Ability to understand the Source, Effects and Importance of Transients. |
| | | CO2 | Ability to understand the Forms and Effects of Switching Transients. |
| | | CO3 | Ability to understand the Phenomenon of lightning strokes and Protection of Devices from Lightning. |
| | | CO4 | Ability to understand the propagation, reflection and refraction of travelling waves on transmission lines. |

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| | | CO5 | Ability to understand the impact of voltage transients caused by faults, circuit breaker action, load rejection on integrated power systems. |
| | | CO6 | Apply electromagnetic transient program for simulating transient conditions |
| 7 | EE8711 Power System Simulation Laboratory | CO1 | Ability to understand power system planning and operational studies. |
| | | CO2 | Ability to acquire knowledge on Formation of Bus Admittance and Impedance Matrices and Solution of Networks. |
| | | CO3 | Ability to analyze the power flow using GS and NR method |
| | | CO4 | Ability to find Symmetric and Unsymmetrical fault |
| | | CO5 | Ability to understand the economic dispatch. |
| | | CO6 | Ability to analyze the electromagnetic transients. |
| 8 | EE8712 Renewable Energy Systems Laboratory | CO1 | Ability to understand and analyze Renewable energy systems. |
| | | 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. |
| | | CO6 | Ability to understand basics of Intelligent Controllers. |

EVEN SEM

IV YEAR (2 Theory)

| Si.No | Name of the Subject (In Abbreviation) | Course Outcomes | Statement |
|-------|--|-----------------|--|
| 1 | EE8015 Electric Energy Generation, Utilization and Conservation | CO1 | To understand the main aspects of generation, utilization and conservation. |
| | | CO2 | To construct an electric connection for any domestic appliance like refrigerator as well as to design a battery charging circuit for a specific household application. |
| | | CO3 | To identify an appropriate method of heating for any particular industrial application. |
| | | CO4 | To realize the appropriate type of electric supply system as well as to evaluate the performance of a traction unit. |
| | | CO5 | To understand the main aspects of Traction. |
| | | CO6 | To evaluate domestic wiring connection and debug any faults occurred. |
| 2 | EI8073 Biomedical | CO1 | Ability to understand the analysis systems of various organ types. |
| | | CO2 | Ability to understand the philosophy of the heart, lung, blood circulation |

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| | Instrumentation | CO3 | Ability to provide latest ideas on devices of non-electrical devices.respirationsystem. |
| | | CO4 | Ability to gain knowledge on various sensing and measurement devices of electrical origin. |
| | | CO5 | Ability to bring out the important and modern methods of imaging techniques and their analysis. |
| | | CO6 | Ability to explain the medical assistance/techniques, robotic and therapeutic equipments. |
| 3 | EE8811 Project Work | 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. |