



MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE

363, Arcot Road, Kodambakkam, Chennai – 24

Approved by AICTE & Affiliated to Anna University

email Id: principal@msec.edu.in

Website : www.msec.edu.in

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE OUTCOMES:2017 REGULATION

MA8353 -Transforms and Partial Differential Equations

C201.1	To Formulate and solve partial differential equations.
C201.2	To Evaluate Fourier series of periodic functions.
C201.3	Apply the method of separation of variables to find the solution of heat and wave equation.
C201.4	Illustrate the Fourier transform techniques.
C201.5	Examine Z transform techniques and solve difference equations.

EE8351 Digital Logic Circuits

C202.1	To study various number systems and simplify the logical expressions using Boolean functions
C202.2	To study combinational circuits
C202.3	To design various synchronous and asynchronous circuits
C202.4	To introduce asynchronous sequential circuits and PLDs
C202.5	To introduce digital simulation for development of application oriented logic circuits


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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

EE8391 Electromagnetic Theory

C203.1	Explain the different coordinate systems, and apply Gauss's law
C203.2	Interpret the concepts of Electrostatic fields and apply boundary conditions on electrostatic fields
C203.3	Develop concepts of Magnetostatic fields and apply boundary conditions.
C203.4	Analyze the Maxwell's equations for electromagnetic fields
C203.5	Derive Electromagnetic wave equation and apply the Poynting expression.

EE8301 Electrical Machines - I

C204.1	Able to analyze the magnetic circuits & Calculate the induced EMF and understand the properties of magnetic materials.
C204.2	Able to understand the working of Transformer and analyze the operation of transformer indifferent loading condition
C204.3	Able to understand & analyze the concept of field energy and co-energy in single and multiple excited systems
C204.4	Understand the construction of D.C machines and operation of DC Generator
C204.5	Understand the operation of DC motor, Starting and speed control of DC motor, analyze the characteristics of dc motor & the braking system

EC8353 Electron Devices and Circuits

C205.1	Explain the structure and characteristics of various types of Diodes, design half and full wave Rectifiers.
C205.2	Understand the different configurations of BJT, MOSFET, UJT and draw its characteristics.
C205.3	Analyse the characteristics of amplifier gain and frequency response.
C205.4	Analyse the concepts of different modes of differential amplifier, tuned amplifier and power amplifier
C205.5	Develop the parameters of feedback amplifier circuit, describe different types of oscillator circuits.


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ME8792 Power Plant Engineering

C206.1	Explain the layout, construction and working of the components inside a thermal power plant.
C206.2	Explain the layout , construction and working of the components inside a diesel gas and combined cycle power plants.
C206.3	Explain the layout, construction and working of the components inside nuclear power plant.
C206.4	Explain the layout, construction and working of the components inside renewable energy power plants.
C206.5	Explain the application of power plants while extend their knowledge to power plant economics and environmental hazards and estimate the costs of electrical energy production.

EC8311 Electronics Laboratory

C207.1	To observe the characteristics of electronic devices such as diodes,transistors etc
C207.2	Measure voltage,frequency and phase of any waveform using CRO. Generate sine, square and triangular waveforms with required frequency and amplitude using function generator
C207.3	To analyse the characterisitics of common emitter amplifier and rc phase shift oscillator

EE8311 Electrical Machines Laboratory - I

C208.1	Ability to understand and analyze DC Generator
C208.2	Ability to understand and analyze DC Motor
C208.3	Ability to understand and analyse Transformers.


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MA8491 Numerical Methods

C209.1	Have clear perception of the power of numerical techniques ideas and would be able to demonstrate the applications of these techniques to problems drawn from industry, management and other engineering fields.
C209.2	Gain knowledge of interpolation-forward and backward.
C209.3	Solve problems in differentiation and integration.
C209.4	solve various types of initial value partial differential Equations
C209.5	Solve various types of Seidal method problems.

EE8401 Electrical Machines - II

C210.1	Ability to understand the construction, working principle and performance of Synchronous Generator
C210.2	Ability to acquire knowledge on Synchronous Motor
C210.3	Ability to understand the construction and working principle of three phase Induction Motor
C210.4	Ability to acquire knowledge on starting and speed control mechanisms on three phase Induction Motor
C210.5	Ability to understand the construction and working principle of Special Machines

EE8402 Transmission and Distribution

C211.1	To understand the importance and the functioning of transmission line parameters.
C211.2	To acquire knowledge on the modelling and performance of transmission lines.
C211.3	To understand the concept of Lines and Insulators
C211.4	To acquire knowledge on underground cables.
C211.5	To understand the importance of distribution systems of the electric power in power system


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EE8403 Measurements and Instrumentation

C212.1	To impart knowledge on basic functional elements of instrumentation, the factors affecting performance of measuring system and different measuring instruments to measure current and voltage.
C212.2	To understand the operating principles of various types of electrical instruments to measure different electrical quantities.
C212.3	To understand the working principle of various comparative methods in measurement techniques.
C212.4	To understand the working principle of various storage and display devices.
C212.5	To understand the concepts various transducers and the data acquisition systems.

EE8451 Linear Integrated Circuits and Applications

C213.1	Analyze the basic planar processes to fabricate the monolithic IC and Summarize the fabrication of active and passive components of ICs.
C213.2	Design the basic applications of op-amp and also analyze the characteristics of op-amp.
C213.3	Design the signal analysis using op-amp based circuits like filters, comparators, multivibrators, waveform generators, converters and instrumentation amplifier.
C213.4	Analyze the functional blocks and applications of special IC's like 555 Timer, 565-PLL, IC 566- VCO and AD633-Analog multiplier ICs.
C213.5	Analyze the functional blocks and applications of AD623, LM78XX, LM79XX, LM317, 723, SMPS and ICL8038.

IC8451 Control Systems

C214.1	To understand the use of transfer function models for analysis physical systems and introduce the control system components.
C214.2	To provide adequate knowledge in the time response of systems, understanding P,PI& PID controllers and to construct root locus for a system.
C214.3	To accord basic knowledge in obtaining the open loop and closed-loop frequency responses of systems using plotting techniques like bode plot and polar plot.
C214.4	To assess stability of a system using RH and nyquist stability criterion and to design compensators.
C214.5	To deduce state variable representation of physical systems and to inspect controllability and observability.

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EE8411 Electrical Machines Laboratory - II

C215.1	Ability to understand and analyze EMF and MMF methods
C215.2	Ability to understand the importance of Synchronous machines and analyze the characteristics of V and Inverted V curves
C215.3	Ability to understand the importance of Induction Machines and acquire knowledge on separation of losses

EE8461 Linear and Digital Integrated Circuits Laboratory

C216.1	Apply Boolean functions to implement adder, subtractor circuits and convert Excess 3 to BCD, Binary to Gray code and vice versa
C216.2	Test Parity generator and checker and Design encoder decoder circuits ,Demonstrate 4 bit synchronous, asynchronous counter and Shift registers.
C216.3	5 Apply OP-AMP to construct Adder, comparator, differentiator, Integrator and describe VCO, PLL characteristics.

EE8412 Technical Seminar

C217.1	Function effectively as an individual and Make effective presentation on Engineering/ technology
C217.2	Review, prepare and present technological developments in the field of electrical and electronics engineering.
C217.3	Design documentation and write effective reports on seminar topics

EE8501 Power System Analysis

C301.1	Develop the per unit mathematical model of the power system and bus admittance and impedance matrices.
C301.2	To derive the power flow equation and apply numerical methods to solve the power flow problem using Gauss seidal and Newton raphson method.
C301.3	To model and analyse the power system under symmetrical fault conditions.
C301.4	To model and analyse the power system under various unsymmetrical fault conditions.
C301.5	To model and analyse the transient behaviour of power system when it is subjected to a disturbance.


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EE8551 Microprocessors and Microcontrollers

C302.1	Ability to acquire knowledge in Architecture, Memory organization and Interrupts in 8085.
C302.2	Ability to understand the Instruction set, Data Transfer and Programming in 8085
C302.3	Ability to acquire knowledge in Architecture, Memory organization and Interrupts in 8051
C302.4	Ability to understand the importance of interfacing in 8085 & 8051
C302.5	Ability to write assembly language programmes in 8051 and design 8051 based applications

EE8552 Power Electronics

C303.1	Describe the static characteristics of various power semiconductor devices and acquire knowledge in driver and protection circuits.
C303.2	Compare the operation of various types of controlled rectifiers and implement the converters for real time applications.
C303.3	Realize the basics topologies of DC-DC switching regulators and acquire knowledge in real time applications and simulation skills.
C303.4	Describe the principle of operation of various Inverters and distinguish the different types of PWM techniques in harmonic reduction and understand real time applications.
C303.5	Explain the working principle of various AC- AC converters and control strategies and to choose converters for real time applications.

EE8591 Digital Signal Processing

C304.1	To classify the different types of signals and systems and explain the sampling process of continuous time signal.
C304.2	To apply z-transform and inverse Z transform and analyze discrete time systems.
C304.3	To apply Radix -2 Decimation in Time (DIT) and Decimation in Frequency (DIF) FFT Algorithm to Compute Discrete Fourier Transform
C304.4	To design Infinite Impulse Response (IIR) filters and Finite Impulse Response (FIR) filters.
C304.5	To explain various architectures of Digital signal processors


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CS8392 Object Oriented Programming

C305.1	Outline OOP principles such as objects, classes, encapsulation, inheritance and polymorphism and associate those principles in java language.
C305.2	Design algorithms and develop programs using the concept of Inheritance and Interfaces.
C305.3	Examine the exception handling concepts and develop I/O streams for reading and writing files
C305.4	Develop programs that run in the same instant using multithreading and multitasking concepts and utilize the power of generic programming in java for robust programming.
C305.5	Design and develop applications in java using forms, AWT, and swing.

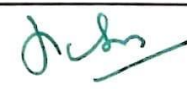
OAN551 SENSORS & TRANSDUCERS

C306.1	To acquire expertise in various calibration techniques and signal types for sensors
C306.2	To acquire knowledge in motion, proximity and ranging sensors in various applications
C306.3	To acquire knowledge in force, magnetic and heading sensors in various applications
C306.4	To acquire knowledge in optical, pressure, temperature and smart sensors in various applications
C306.5	To acquire knowledge in DAQ systems with different sensors for real time applications

EE8511 Control and Instrumentation Laboratory

C307.1	Analyze the characteristics of P, PI and PID controllers experimentally and analyze the stability of the control system using MATLAB
C307.2	Compute the transfer function of a Field controlled DC motor experimentally and analyze the response of Lag, Lead and Lag-Lead Compensators
C307.3	Analyze the transient response of Position Control system experimentally and analyze the Characteristics of Synchro-Transmitter- Receiver and to Use MATLAB for the Simulation of Control Systems.
C307.4	Ability to analyze the basic concepts of bridge networks and to analyze the Dynamics of Sensors/Transducers
C307.5	Measure the Power and Energy experimentally and analyze signal conditioning circuits and to Use MATLAB for Process Simulation


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HS8581 Professional Communication

C308.1	To enhance the students to make effective presentations.
C308.2	To help the students participate confidently in Group Discussions.
C308.3	To motivate and prepare the students to attend job interviews and be successful in their pursuit.
C308.4	To train and develop the adequate Soft Skills required for the workplace.
C308.5	Ability to interpret different genres of texts, infer implied meanings and evaluate it for ideas as well as for methods of presentation relevant in different situations.

CS8383 Object Oriented Programming Laboratory

C309.1	Design C++ programs using functions, classes with objects, member functions and constructors.
C309.2	Develop operator and function overloading and run time polymorphism using C++.
C309.3	Develop file handling techniques in C++ for sequential and random access also use Java code for strings.
C309.4	Construct packages and interfaces in Java.
C309.5	Create threads in Java and handle predefined and user defined exceptions.

EE8601 Solid State Drives

C310.1	Analyze the Classification of the various types of drives and load torque characteristics and Apply the multi quadrant dynamics in hoist load system.
C310.2	Analyze the operation of steady state analysis of single phase and three phase fully controlled converter and Chopper fed separately excited dc motor drives and discuss the various control strategies of converter.
C310.3	Analyze the operation and characteristics of various methods of solid state speed control of induction motor.
C310.4	Analyze the operation of various modes of V/f control of synchronous motor drives and different types of permanent magnet synchronous motor drives.
C310.5	Analyze and design a current and speed controller and develop the transfer function for DC motor, load and converter, closed loop control with current and speed feedback.

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EE8602 Protection and Switchgear

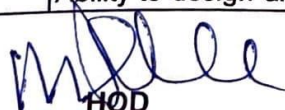
C311.1	Ability to find the causes of abnormal operating conditions of the power system and acquire the knowledge on Methods of Grounding
C311.2	Ability to understand and analyze Electromagnetic relay characteristics
C311.3	Ability to study about the apparatus protection
C311.4	Ability to study about the static and numerical relays
C311.5	Ability to acquire knowledge on functioning of circuit breaker and suggest suitability circuit breaker

EE8691 Embedded Systems

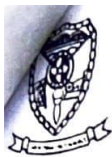
C312.1	Ability to understand and analyze Embedded systems.
C312.2	Ability to suggest an embedded system for a given application.
C312.3	Ability to operate various Embedded Development Strategies
C312.4	Ability to acquire knowledge on various processor scheduling algorithms.
C312.5	Ability to understand basics of Real time operating system.

EE8002 DESIGN OF ELECTRICAL MACHINES

C313.1	Ability to understand basics of design considerations for rotating and static electrical Machines and ability to design of field system and armature for its application.
C313.2	Ability to design single phase and three phase transformer.
C313.3	Ability to design armature and field of DC machines.
C313.4	Ability to design stator and rotor of induction motor.
C313.5	Ability to design and analyze synchronous machines.


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EC8395 COMMUNICATION ENGINEERING

C314.1	Describe the concepts of analog modulation systems
C314.2	Illustrate pulse communication techniques
C314.3	Summarize the concepts of digital modulation systems.
C314.4	Implement the source coding techniques.
C314.5	Explain the basic principles in the generation of spread spectrum signals and multiple access in communication systems

EE8661 Power Electronics and Drives Laboratory

C315.1	Develop schemes for generation of firing pulses suitable for the power switches in converter circuits.
C315.2	Evaluate the performance of powerconverter circuits
C315.3	Experience the platform for simulation of power electronic circuits

EE8681 Microprocessors and Microcontrollers Laboratory

C316.1	Ability to acquire knowledge in Addressing modes & instruction set of 8085 & 8051.
C316.2	Ability to need & use of Interrupt structure 8085 & 8051.
C316.3	Ability to understand the importance of Interfacing

EE8611 Mini Project

C317.1	Apply practical knowledge within the chosen area of expertise for project development
C317.2	Identify, analyze, design and handle prototype projects with a complete and organized approach
C317.3	Contribute as an individual or in a team in development of technical projects
C317.4	Develop effective communication skills for presentation of project related activities and prepare mini project reports and examination

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EE8701 High Voltage Engineering

C401.1	Apply the knowledge of Engineering fundamentals to identify the causes of different over voltages in Electrical Power System and select the protection system according to the types of over voltages.
C401.2	Identify the factors that leads the breakdown mechanism of different dielectric materials and Compare dielectric strength of the different dielectric materials (Gas, Oil, Vacuum and solid)
C401.3	Apply the knowledge of Engineering fundamentals to identify the generating circuits to produce different high voltages and High currents.
C401.4	Apply the knowledge of Engineering fundamentals to identify the measuring instrument to measure the different over voltages and currents in Electrical Power System.
C401.5	Analyse the testing of different Electrical power apparatus and the insulation coordination.

EE8702 Power System Operation and Control

C402.1	Ability to understand the day-to-day operation of electric power system and to analyze the control actions to be implemented on the system to meet the minute-to-minute variation of system demand.
C402.2	Ability to acquire knowledge on real power-frequency interaction and To model power-frequency dynamics and to design power-frequency controller.
C402.3	Ability to understand the reactive power-voltage interaction and To model reactive power-voltage interaction and the control actions to be implemented for maintaining the voltage profile against varying system load.
C402.4	Ability to understand the significance of power system operation and control and To study the economic operation of power system.
C402.5	Ability to understand the various systems available and design SCADA and its application for real time operation.

EE8703 Renewable Energy Systems

C403.1	Analyze the challenges and problems associated with the use of various energy sources, including fossil fuels, with regard to future supply and the environment.
C403.2	Formulate the power in wind energy, classify the types of WPPs, select the site for WPPs and analyze the grid integration issues of WPPs.
C403.3	Apply the knowledge of engineering for harnessing thermal and electrical energy from solar energy
C403.4	Apply the knowledge of engineering for harnessing electrical energy from biomass, geothermal and hydro power energy.
C403.5	Apply the knowledge of engineering for harnessing electrical energy from ocean energy, fuel cell, hybrid energy systems and production with storage of the hydrogen.

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OCS752 Introduction of computer programming

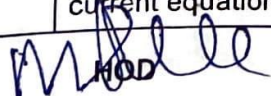
C404.1	Develop executable C programs with decision making and looping statements, which illustrate the use of various operators.
C404.2	Write executable C programs which process the data that are stored in an array.
C404.3	Create executable C programs to process strings and use pointers for array processing and parameter passing
C404.4	Divide a given computational problem into a number of modules called functions and develop multi-function C program by using recursion if required, to solve the computational problem.
C404.5	Develop executable C programs with structure for storing the data to be processed

GE8071 Disaster Management

C405.1	Differentiate the types of disasters, causes and their impact on environment and society
C405.2	Assess vulnerability and various methods of risk reduction measures as well as mitigation.
C405.3	Draw the hazard and vulnerability profile of India, Scenarios in the Indian context, Disaster damage assessment and management.
C405.4	Gain knowledge on Role of GIS and Information Technology Components in Preparedness, Risk Assessment, Response and Recovery Phases of Disaster
C405.5	Gain knowledge on Space Based Inputs for Disaster Mitigation and Management and field works related to disaster management.

EE8010 Power Systems Transients

C406.1	Explain the concept of transients and Compute the solution of transient current equation for RL and RLC system.
C406.2	Illustrate the importance of switching transients; Explain the concept of resistance switching, load switching and capacitance switching.
C406.3	Explain the concept of lightning mechanism, Describe the interaction between lightning and power system
C406.4	Apply the concept of reflection and refraction, Draw the Bewley Lattice diagram for different systems.
C406.5	Explain the concept of transients and Compute the solution of transient current equation for RL and RLC system.


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EE8711 Power System Simulation Laboratory

C407.1	Ability to understand power system planning and operational studies.
C407.2	Ability to acquire knowledge on Formation of Bus Admittance and Impedance Matrices and Solution of Networks
C407.3	Ability to analyze the power flow using GS and NR method and to find Symmetric and Unsymmetrical fault
C407.4	Ability to understand the economic dispatch and to analyze the electromagnetic transients.

EE8712 Renewable Energy Systems Laboratory

C408.1	Analyze the V-I characteristics and efficiency of 1 KW solar PV system with stand alone and grid connected by conducting experiment and simulation using MATLAB Simulink.
C408.2	Analyze the performance and assessment of micro wind energy generator, solar-wind hybrid system and various types of intelligent controller for hybrid system by conducting experiment and simulation using MATLAB Simulink.
C408.3	Analyze the Hydel power using MATLAB Simulink and analyze the performance and assessment of Fuel cell by conducting experiment and simulation using MATLAB Simulink.

GE8076 Professional Ethics in Engineering

C409.1	Gain awareness on human values for professional excellence and stress management
C409.2	Gain knowledge on engineering ethics, moral issues & uses of ethical theories
C409.3	Understand the role of engineers as responsible experimenters along with courses of ethics in engineering field .
C409.4	Gain awareness of responsibilities of an engineer for safety and risk along with risk-benefit analysis
C409.5	Acquire knowledge on global issues and able to apply ethical principles to resolve situations that arise in their professional lives

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EE8073 Biomedical Instrumentation

C410.1	Identify the functions of human nervous system and describe the basic components of biomedical system and give brief idea of different types of transducers.
C410.2	Identify the functions of human nervous system and describe the basic components of biomedical system and give brief idea of different types of transducers.
C410.3	To understand the different types of electrodes and its placement for various recording
C410.4	Explain the basic principles of imaging techniques and patient monitoring system.
C410.5	Describe the functions of life assisting and therapeutic equipments.

EE8811 Project Work

C411.1	Identify and apply the real world and societal importance problems in the Electrical and its allied area.
C411.2	Identify, analyze, design, implement and handle prototype projects with a complete and organized solution methodologies
C411.3	Apply modern engineering tools for solution
C411.4	Contribute as an individual or in a team in development of technical projects
C411.5	Develop effective communication skills for presentation of project related activities and prepare reports and examination following professional ethics


HOD



PRINCIPAL

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