

Shanmuganathan Engineering College

**(Approved by AICTE, Affiliated by
Anna University Chennai)**

Department

Of

Electrical and Electronics Engineering

Regulation-2017

Course Outcomes

Course Code & Title : EE8251 Circuit Theory	
Year / Semester : I Year/II Semester	
Course Index : C113	
C113.1	Analyse the circuits using ohm's law, Kirchoff's laws, mesh current and Node Voltage method
C113.2	Apply the Network Theorems to the analysis of AC and DC circuits.
C113.3	Solve first and second order AC and DC Circuits for Steady – State and transient response in the time domain.
C113.4	Estimate the power consumed by the three- phase balanced circuits.
C113.5	Evaluate the response of the series and parallel resonance circuits, coupled circuits and tuned circuits.
Course Code & Title : GE8261 Engineering Practices Laboratory	
Year / Semester : I Year/II Semester	
Course Index : C115	
C115.1	Construct carpentry components and pipe connections including plumbing works.
C115.2	Use welding equipment's to join the structures
C115.3	Illustrate the basic machining operations
C115.4	Construct the models using sheet metal works
C115.5	Describe centrifugal pump, Air conditioner, operations of smithy, foundry and fittings.
C115.6	Construct the basic Electrical and Electronics circuits.
C115.7	Examine the different types of electronic circuits and components.
C115.8	Explain the electrical safety rules, grounding, general house wiring.
C115.9	Perform soldering in various electronic circuits.
C115.10	Illustrate the basic operation of domestic electrical appliances.
Course Code & Title : EE8261 Electric Circuits laboratory	
Year / Semester : I Year/II Semester	
Course Index : C116	
C116.1	Solve the electrical circuit problems using circuit theorems and laws.
C116.2	Simulate electrical circuits and to experimentally verify various theorems for circuit designing purposes.
C116.3	Experiment the frequency response and transients in passive elements.
C116.4	Simulate the resonance circuits for several applications such as designing of tuning circuit, signal processing and voltage magnification.
C116.5	Perform the simulation of three phase circuits using suitable simulation for both balanced and unbalanced condition.
Course Code & Title : EE8391 Digital Logic Circuits	
Year / Semester : II Year/III Semester	
Course Index : C202	
C202.1	Solve the problems in number systems and can examine the important characteristics of the digital logic family circuits.
C202.2	Develop the combinational circuits by simplifying the logical expressions using Boolean functions and K maps.
C202.3	Construct various synchronous and asynchronous circuits with its application.
C202.4	Apply the concepts of asynchronous sequential circuits and PLDs.
C202.5	Simulate using software package and development of application oriented logic circuits using VHDL.

Course Code & Title : EE8391 Electromagnetic Theory	
Year / Semester : II Year/III Semester	
Course Index : C203	
C203.1	Apply vector calculus to static electric-magnetic fields in different engineering situations.
C203.2	Solve electric potential problems in linear, isotropic media for simple geometrics.
C203.3	Determine voltage gradients for simple charge and current configurations and the force between charges and currents.
C203.4	Analyze Maxwell's equation in different forms (differential and integral) and apply them to diverse engineering problems.
C203.5	Examine the phenomena of wave propagation in free space and different media and its interfaces.
Course Code & Title : EE8301 Electrical Machines - I	
Year / Semester : II Year/III Semester	
Course Index : C204	
C204.1	Apply the concepts for the study and analysis of magnetic circuits and their applications
C204.2	Explore the operation and performance of single and three phase transformer
C204.3	Describe the electric and magnetic field interactions in electromechanical devices and machines
C204.4	Analyze the working principles, characteristics and performance of DC generator
C204.5	Explain the knowledge on working principle, characteristics, starting, speed control and performance analysis of DC motor
Course Code & Title : ME8792 Power Plant Engineering	
Year / Semester : II Year/III Semester	
Course Index : C206	
C206.1	Describe the various systems of coal based thermal power plant.
C206.2	Explain the various cycles and systems in diesel, gas and combined cycle power plant.
C206.3	Discuss the working of nuclear reactors in nuclear power plant.
C206.4	Explain the principle/construction and working of hydroelectric and various non-conventional power plants.
C206.5	Analyze energy, economic and environmental issues of power plant.
Course Code & Title : EE8311 Electrical Machines Laboratory- I	
Year / Semester : II Year/III Semester	
Course Index : C208	
C208.1	Determine the performance of various D.C. Generators and understand the applications of it to power system
C208.2	Troubleshoot the operation of various D.C. Generators
C208.3	Draw the performance characteristics of various D.C. Motors and understand the applications of it to power system
C208.4	Predetermine the performance of DC motor by conducting suitable tests
C208.5	Calculate the voltage regulation and predetermine the performance of the single phase and three phase transformer
Course Code & Title : EE8401 Electrical Machines -II	
Year / Semester : II Year/IV Semester	
Course Index : C210	

C210.1	Explain the concept, principle and performance of salient and non-salient pole synchronous generator.
C210.2	Describe the concept, principle and performance of synchronous motor.
C210.3	Illustrate the construction, working principle and performance of three phase induction motor.
C210.4	Examine various types of starting and speed control methods of three phase induction motor.
C210.5	Analyze the principle and performance of single phase induction motors and special electrical machines.
Course Code & Title : EE8402 Transmission and Distribution	
Year / Semester : II Year/IV Semester	
Course Index : C211	
C211.1	Explain the structure of electric power system and expressions for the computation of transmission line parameters
C211.2	Develop the equivalent circuits for the transmission lines based on distance and to determine voltage regulation and efficiency
C211.3	Analyze the mechanical design of transmission lines and the voltage distribution in insulator strings to improve the efficiency
C211.4	Explain the types, construction of cables and methods to improve the efficiency
C211.5	Explore about distribution systems, types of substations, methods of grounding, EHVAC, HVDC and FACTS
Course Code & Title : EE8403 Measurements and Instrumentation	
Year / Semester : II Year/IV Semester	
Course Index : C212	
C212.1	Acquire knowledge on basic functional elements of instruments and various types of errors present in measurements.
C212.2	Explain the various concepts of electrical and electronics instruments.
C212.3	Compare a suitable measuring instrument used for measuring different electrical quantities.
C212.4	Explain the operating principles of various storage and display devices.
C212.5	Explain the operational features of transducer and Data Acquisition System.
Course Code & Title : EE8451 Linear Integrated Circuits and Applications	
Year / Semester : II Year/IV Semester	
Course Index : C213	
C213.1	Acquire knowledge in IC fabrication procedure.
C213.2	Determine the DC and AC characteristics of op-amps and signal analysis using op-amp
C213.3	Construct the applications of op-amp based circuits.
C213.4	Examine the operation of special function IC's.
C213.5	Explain the operation of application IC's like voltage regulator and switching regulator.
Course Code & Title : IC8451 Control Systems	
Year / Semester : II Year/IV Semester	
Course Index : C214	
C214.1	Develop transfer function models of electrical systems and mechanical systems based on the knowledge of Mathematics, Science and Engineering fundamentals.
C214.2	Derive the time response of various linear systems.
C214.3	Draw the frequency response of the system and examine the effect of compensation on frequency response.

C214.4	Apply the concepts of system stability to analyse performance of closed loop systems.
C214.5	Explain the basic concepts of state variable analysis of systems and calculate the solution of state and output equation.
Course Code & Title : EE8411 Electrical Machines Laboratory-II	
Year / Semester : II Year/IV Semester	
Course Index : C215	
C215.1	Determine the regulation of a synchronous generator and explain the applications to power system.
C215.2	Draw the performance characteristics of synchronous motor and explain the applications to power system.
C215.3	Draw the performance characteristics of three phase squirrel cage and slip ring induction motor and understand the applications to power system.
C215.4	Calculate the efficiency and performance characteristics of single phase induction motor.
C215.5	Troubleshoot the operation of various Induction and synchronous machine.
Course Code & Title : EE8412 Technical Seminar	
Year / Semester : II Year/IV Semester	
Course Index : C217	
C217.1	Explain the significance of learning recent advancement in electrical and electronics engineering discipline.
C217.2	Review and prepare the State-of-art technologies in the present technological developments
C217.3	Organize the presentation using the concepts of ordering and determining the central, main and supporting ideas
C217.4	Present any topic in any recent advancement with good communicative skill in front of peers and faculty members
C217.5	Perform well in placement recruitment drive with good technical skills and communication skills
Course Code & Title : EE8501 Power System Analysis	
Year / Semester : III Year/V Semester	
Course Index : C301	
C301.1	Classify the power system components such as generator, transformer and transmission lines under steady state operating condition.
C301.2	Solve the power system using iterative techniques for planning, operation and control of a power system to calculate the steady state power flow.
C301.3	Determine the short circuit capacity of any power system under symmetrical fault using bus impedance matrix and Thevenin's theorem to calculate fault current.
C301.4	Apply the concept of symmetrical components and sequence networks to analyze the power system when it is subjected to an unsymmetrical fault.
C301.5	Explain the power system under steady state and transient condition and to find the stability of the power system using numerical methods
Course Code & Title : EE8551 Microprocessors and Microcontrollers	
Year / Semester : III Year/V Semester	
Course Index : C302	
C302.1	Describe the operation of 8085 microprocessor architecture.
C302.2	Design and implement programs on 8085 microprocessor.
C302.3	Elaborate the operation of 8051 microcontroller architecture.
C302.4	Describe the commonly used peripherals and interfacing.

C302.5	Develop an applications using 8051 microcontroller.
Course Code & Title : EE8552 Power Electronics	
Year / Semester : III Year/V Semester	
Course Index : C303	
C303.1	Explain various power semiconductor devices and their switching characteristics.
C303.2	Analyse and choose various AC – DC converters for real time applications.
C303.3	Describe the basic topologies, operation and switching techniques of DC to DC converters.
C303.4	Differentiate different modulation techniques and harmonic reduction methods for inverters.
C303.5	Illustrate the working of AC to AC converters and their applications.
Course Code & Title : EE8591 Digital Signal Processing	
Year / Semester : III Year/V Semester	
Course Index : C304	
C304.1	Analyze the various properties of signals and systems, their mathematical representation and the various types of sampling and quantization
C304.2	Analyze discrete time LTI(Linear Time Invariant) systems using Z transform and DTFT(Discrete Time Fourier Transform).
C304.3	Apply the concepts of DFT(Discrete Fourier Transform) and FFT(Fast Fourier Transform) to solve Electrical Engineering Problems.
C304.4	Design Finite Impulse Response (FIR) and Infinite Impulse Response (IIR) digital filters.
C304.5	Explain the architectural features, addressing formats and the various functional modes of DSP Processors.
Course Code & Title : OAN551 Sensors and Transducers	
Year / Semester : III Year/V Semester	
Course Index : C309	
C309.1	Expertise in various calibration techniques and signal types for sensors
C309.2	Apply the various sensors in the Automotive and Mechatronics applications
C309.3	Explain force, magnetic and heading sensor in Aerospace and Home appliances.
C309.4	Describe the basic principles of various smart sensors.
C309.5	Implement the DAQ systems with different sensors for real time applications.
Course Code & Title : EE8511 Control and Instrumentation Laboratory	
Year / Semester : III Year/V Semester	
Course Index : C310	
C310.1	Explain control theory and apply to electrical engineering problems.
C310.2	Analyze the various types of ADC, DAC converters.
C310.3	Design lag, lead and lag-lead compensators.
C310.4	Describe the basics of bridge networks and signal conditioning circuits.
C310.5	Demonstrate the response and stability of control systems using simulation package.
Course Code & Title : EE8601 Solid State Drives	
Year / Semester : III Year/VI Semester	
Course Index : C313	
C313.1	Explain the steady state operation and transient dynamics of a motor load system.
C313.2	Examine the operation of converter/chopper fed dc drive.

C313.3	Apply the control methods for the induction motor drives for suitable applications.
C313.4	Analyze the operation and performance of synchronous motor drives.
C313.5	Design the current and speed controllers for a closed loop solid state DC motor drives.
Course Code & Title : EE8602 Protection and Switchgear	
Year / Semester : III Year/VI Semester	

Course Index : C314	
C314.1	Analyze the knowledge on different protective schemes in power system
C314.2	Explain various electromagnetic relays and its application
C314.3	Choose the protection scheme for various faults in motor, generator, transformer, bus bar, transmission line
C314.4	Examine various static relays and numerical relays and its application
C314.5	Describe concepts and principle of various circuit breakers
Course Code & Title : EE8691 Embedded Systems	
Year / Semester : III Year/VI Semester	
Course Index : C315	
C315.1	Explain the building blocks of embedded systems.
C315.2	Analyse the various communications in processors and input/output interfacing.
C315.3	Apply the embedded development strategies to develop the embedded firmware environment.
C315.4	Describe the various scheduling techniques in Real Time Operating System.
C315.5	Apply the concepts of embedded system in application developments within realistic constraints such as economic, environmental and society.
Course Code & Title : EE8002 Design of Electrical Apparatus	
Year / Semester : III Year/VI Semester	
Course Index : C316	
C316.1	Explain basics of design consideration for rotating and static electrical machines and design of field system for its application.
C316.2	Describe the design of single and three phase transformer.
C316.3	Discuss the design of armature and field of DC machines.
C316.4	Design stator and rotor of induction motor.
C316.5	Analyze and design synchronous machines.
Course Code & Title : EE8005 Special Electrical Machines	
Year / Semester : III Year/VI Semester	
Course Index : C318	
C318.1	Explain the construction, operation and control methods of stepping motors
C318.2	Describe the operation of various power controllers required for switched reluctance motors
C318.3	Derive the expressions for magnetic circuit analysis, emf and torque equations of permanent magnet brushless DC motors
C318.4	Illustrate the construction, operation and performance characteristics of permanent magnet synchronous motors
C318.5	Choose a special machine for a particular application
Course Code & Title : EE8006 Power Quality	
Year / Semester : III Year/VI Semester	
Course Index : C319	

C319.1	Examine various sources, causes and effects of power quality issues in electrical power systems.
C319.2	Analyse the sources and mitigation techniques against voltage sag and swell in power systems.
C319.3	Explain the various sources for harmonics, harmonic indices and harmonics reduction methods.
C319.4	Explain the principle of operation of shunt and series compensators to mitigate various power quality issues also the methods of voltage regulation and power factor correction.
C319.5	Solve the power quality issues by employing custom power devices and power quality monitoring equipments.
Course Code & Title : EE8661 Power Electronics and Drives Laboratory Year / Semester : III Year/VI Semester Course Index : C320	
C320.1	Demonstrate the gate pulse generation using various configurations and
C320.2	Explain the characteristics of various switches.
C320.3	Illustrate the operation and performance parameters of DC – AC, DC – DC converter circuits.
C320.4	Interpret the performance of AC – DC, AC – AC converter circuits.
C320.5	Simulate various power electronic converter circuits.
Course Code & Title : EE8681 Microprocessors and Microcontrollers Laboratory Year / Semester : III Year/VI Semester Course Index : C321	
C321.1	Apply the arithmetic operations, logic operations and sorting using 8085 microprocessor.
C321.2	Write a program for code conversion, finding the maximum and minimum numbers in a series.
C321.3	Analyze the operations of peripheral interfacing with 8085 microprocessor and write program using jubins Simulator.
C321.4	Apply the arithmetic, logic operations and branching operation using 8051 microcontroller.
C321.5	Write a program for peripheral interfacing with 8051 microcontroller.
Course Code & Title : EE8611 Mini Project Year / Semester : III Year/VI Semester Course Index : C322	
C322.1	Apply the fundamental knowledge and skills, which are acquired within the technical area to a given problem as well as summarize list of literature review, analyze previous researcher's work and relate them to the project.
C322.2	Design engineering solutions to complex problems and conduct experiments, as well as analyze and interpret the data.
C322.3	Utilize technology tools for communication, collaboration, decision support and also demonstrate the knowledge, skills and attitudes of a professional engineer.
C322.4	Interact with team members in a professional manner, respecting differences, to ensure a collaborative project environment and also demonstrate a strong working knowledge of ethics.
C322.5	Document and present one's own work for a given target group with good oral and written presentation skills and also recognize the need for life-long learning by undergoing the project work

Course Code & Title : EE8701 High Voltage Engineering	
Year / Semester : IV Year/VII Semester	
Course Index : C401	
C401.1	Identify the source, effects and protection methods of over voltages in power system.
C401.2	Describe the breakdown mechanism in different dielectrics
C401.3	Explain the different methods of overvoltage generation
C401.4	Explore the various overvoltage measurement methods
C401.5	Apply the concepts of high voltage testing principles to power apparatus
Course Code & Title : EE8702 Power System Operation and Control	
Year / Semester : IV Year/VII Semester	
Course Index : C402	
C402.1	Illustrate the basic concepts of power system operation and control.
C402.2	Construct the power-frequency controller to single area and two area systems.
C402.3	Employ the suitable control actions to maintain the voltage profile against various Loads
C402.4	Schedule the power system economically by unit commitment and economic dispatch.
C402.5	Apply the concept of computer control of power system
Course Code & Title : EE8703 Renewable Energy Systems	
Year / Semester : IV Year/VII Semester	
Course Index : C403	
C403.1	Explain the importance and limitations of renewable energies using present Indian and International energy scenario.
C403.2	Describe the working of different types of wind power plants and its grid integration issues.
C403.3	Discuss the solar energy harnessing methods along with types, characteristics and applications.
C403.4	Analyze the energy conversion process and the environmental effects on biomass energy, geo thermal energy and hydro power generating power plants.
C403.5	Examine the working of several renewable energy systems such as tidal energy, ocean thermal energy, hydrogen production and storage, Energy storage systems and hybrid systems.
Course Code & Title : GE8077 Total Quality Management	
Year / Semester : IV Year/VII Semester	
Course Index : C407	
C407.1	Discuss the contributions of Quality Guru.
C407.2	Explain the principles of TQM.
C407.3	Apply the tools and techniques of quality management to manufacturing and service processes.
C407.4	Describe TQM tools and techniques such as Cost of Quality, QFD and TPM.
C407.5	Discuss the elements of Quality system standards.
Course Code & Title : EE8711 Power System Simulation Laboratory	
Year / Semester : IV Year/VII Semester	
Course Index : C408	
C408.1	Determine the bus impedance and admittance matrices using MATLAB

C408.2	Apply numerical methods for solving load flow problems and verify using Power World Simulator.
C408.3	Analyze various faults occurring in power system and simulate the faults using Power World Simulator.
C408.4	Analyze small signal stability of Single Machine Infinite Bus (SMIB) system and draw the swing curve using MATLAB.
C408.5	Generate the coding for economic dispatch problems and load frequency dynamics problems using MATLAB.
Course Code & Title : EE8712 Renewable Energy Systems Laboratory Year / Semester : IV Year/VII Semester Course Index : C409	
C409.1	Demonstrate the concept of electric power generation using several renewable energy resources.
C409.2	Analyze the characteristics and shadowing effect of solar PV energy system.
C409.3	Evaluate the performance of Grid connected and Standalone PV system, micro wind generation, fuel cell and Hybrid systems.
C409.4	Simulate various renewable energy technologies such as solar PV system, wind, fuel cell and hybrid energy systems.
C409.5	Analyze the significance of intelligent controllers for hybrid energy generation systems.