ACHARYA INSTITUTE OF TECHNOLOGY

Department of Electrical & Electronics Engineering

Bengaluru-560107

COURSE OUTCOMES
(2018-19)

DEPARTMENT	EEE	SEMESTER	1	COURSE CODE	18ELE13	COURSE ID	C103
COURSE TITLE		BASIC ELECTRICAL ENGINEERING					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C103.1		Analyze DC and AC circuits.					
C103.2		Identify DC and AC machines, domestic wiring and protective devices required for particular application.					
C103.3		Implement electrical and electromagnetic laws to solve problems on DC and AC circuits and machines.					
C103.4		Explain the constructional and working principle of DC and AC machines.					
DEPARTMENT	EEE	SEMESTER	1	COURSE CODE	18ELEL17	COURSE ID	C107
COURSE TITLE		BASIC ELECTRICAL ENGINEERING LABORATORY					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C107.1		Conduct experiments on DC and AC circuits.					
C107.2		Conduct experiments on safety aspects, wiring and consumption of electrical power.					
C107.3		Understand the basic concepts of AC and DC machines, fuses, MCB and UPS					
C107.4		Demonstrate the usage of different electrical measuring instruments.					
DEPARTMENT	EEE	SEMESTER	3	COURSE CODE	17MAT31	COURSE ID	C201
COURSE TITLE		Engineering Mathematics-III					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C201.1		Have the knowledge of Fourier series, Fourier transforms, Z-transforms, Calculus of variations, Numerical and statistical methods					
C201.2		Solve Engineering problems using Fourier series and Fourier transforms Numerical and statistical methods and Calculus of Variation.					
C201.3		Communicate and reflect on applications of Mathematics as tool.					
DEPARTMENT	EEE	SEMESTER	3	COURSE CODE	17EE32	COURSE ID	C202
COURSE TITLE		Electric Circuit Analysis					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C202.1		Apply the various circuit reduction techniques, network theorems, Laplace transform, transient behavior of circuit elements under switching conditions, and concept of series and parallel resonance ,3 phase unbalanced system, two port network to a given electrical network.					
C202.2		Interpret the behavior of series and parallel resonant circuits, circuit elements under switching conditions, different network theorems and two port networks, Laplace transform for various time functions					
C202.3		Identify the sources and networks, State different network theorems, Define Laplace transform for standard test inputs, active and reactive power and two port network parameters.					
DEPARTMENT	EEE	SEMESTER	3	COURSE CODE	17EE33	COURSE ID	C203

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COURSE TITLE		Transformers and Generators					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C203.1		Explain the construction, operation of single phase, three phase transformers and synchronous Generators.					
C203.2		Describe and select various transformer connections					
C203.3		Compute the circuit parameters of transformer, synchronous machine					
C203.4		Analyse the performance of the transformers, DC generators and Syn. Generators					
DEPARTMENT	**EEE**	**SEMESTER**	**3**	**COURSE CODE**	**17EE34**	**COURSE ID**	**C204**
COURSE TITLE		**Analog Electronic Circuits**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C204.1		Describe the working of clippers, clampers, amplifiers and oscillators					
C204.2		Distinguish various clippers, clampers, amplifiers and oscillators for a given application.					
C204.3		Design, analyze and solve diode circuits, transistors, amplifiers and oscillators.					
DEPARTMENT	**EEE**	**SEMESTER**	**3**	**COURSE CODE**	**17EE35**	**COURSE ID**	**C205**
COURSE TITLE		**Digital System Design**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C205.1		Understand the basic principles of Boolean algebra, Combinational, Sequential circuits and Hardware Description Language (HDL) Module.					
C205.2		Apply the different techniques (Boolean algebra, K-Maps and Quine –Mc Clusky Methods and MEV/VEM) to minimize the Combinational and Sequential circuits.					
C205.3		Analyze and evaluate different techniques to realize various Combinational and Sequential circuits.					
C205.4		Design and develop Combinational and Sequential circuits by use of conventional methods and Hardware Description Language (HDL) module.					
DEPARTMENT	**EEE**	**SEMESTER**	**3**	**COURSE CODE**	**17EE36**	**COURSE ID**	**C206**
COURSE TITLE		**Electrical and Electronic Measurements**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C206.1		Illustrate various electrical and electronic instruments used to measure, display and record the different electrical and magnetic parameters.					
C206.2		Compare the different electrical and electronic measuring, display and recording instruments used in electrical and electronics.					
C206.3		Solve numerical involved in measurement of respective electrical parameters.					
C206.4		Analyze the errors in electrical instruments and specify respective minimization techniques.					
DEPARTMENT	**EEE**	**SEMESTER**	**3**	**COURSE CODE**	**17EEL37**	**COURSE ID**	**C207**
COURSE TITLE		**Electrical Machines Laboratory -1**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C207.1		Evaluate the performance of transformers from the test data obtained.					
C207.2		Connect and operate two single phase transformers of different KVA rating in parallel.					

C207.3		Connect single phase transformers for three phase operation and phase conversion.					
C207.4		Compute the voltage regulation of synchronous generator using the test data obtained in the laboratory.					
DEPARTMENT	**EEE**	**SEMESTER**	**3**	**COURSE CODE**	**17EEL38**	**COURSE ID**	**C208**
COURSE TITLE		**Electronics Laboratory**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C208.1		Design and test different diode circuits.					
C208.2		Design and test amplifier and oscillator circuits and analyze their performanc					
C208.3		Use universal gates and ICs for code conversion and arithmetic operations.					
C208.4		Apply the knowledge of counters and sequence generators					
DEPARTMENT	**EEE**	**SEMESTER**	**5**	**COURSE CODE**	**15EE51**	**COURSE ID**	**C301**
COURSE TITLE		**Management and Entrepreneurship**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C301.1		Knowledge on fundamental concepts of Management and Entrepreneurship					
C301.2		Understanding the functions of Managers, Entrepreneurs and their social responsibilities, Compare various types of Entrepreneurs					
DEPARTMENT	**EEE**	**SEMESTER**	**5**	**COURSE CODE**	**15EE52**	**COURSE ID**	**C302**
COURSE TITLE		**Microcontroller**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C302.1		Describe the internal organization, instruction set, data types and addressing modes of 8051.					
C302.2		Develop assembly and embedded C programs for applications of 8051 Microcontrollers.					
C302.3		Analyze and design circuitry to interface peripherals devices with 8051.					
C302.4		Work as an individual or as a team –member to design and implement projects on real time embedded system applications using microcontroller					
DEPARTMENT	**EEE**	**SEMESTER**	**5**	**COURSE CODE**	**15EE53**	**COURSE ID**	**C303**
COURSE TITLE		**Power Electronics**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C303.1		Describe the Power devices, Power electronics circuits with their characteristics and effects.					
C303.2		Compute the performance parameters of different power converters and power devices for given data.					
C303.3		Analyze the behavior of power devices and power converters for different load condition.					
C303.4		Design the triggering and protection circuits for power Converters and devices					
DEPARTMENT	**EEE**	**SEMESTER**	**5**	**COURSE CODE**	**15EE54**	**COURSE ID**	**C304**
COURSE TITLE		**Signals and Systems**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C304.1		Apply the knowledge of mathematics and engineering to analyse and obtain the response of continuous and discrete system.					

C304.2		Analyze LTI system and their properties using impulse response					
C304.3		Apply various transformation techniques to solve difference and differential equations and sketch the block diagram					
C304.4		Analyze continuous time and discrete signals and systems in frequency domain using Fourier analysis tools like CTFS,CTFT,DTFS and DTFT					
C304.5		Analyze discrete time systems using Z-transforms					
DEPARTMENT	**EEE**	**SEMESTER**	**5**	**COURSE CODE**	**15EE553**	**COURSE ID**	**C305**
COURSE TITLE		**Estimation and costing (Professional Elective)**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C305.1		Able to explain the general principles involved in estimation costing, market survey, purchase system and general idea about IE rules and act.					
C305.2		Able to calculate the load requirement and size of the cables for single and multi-circuits used in buildings with protective devices.					
C305.3		Able to explain the concept of service connection and estimate the materials required for electrical installation of power circuits.					
C305.4		Able to estimate the materials required for electrical installation of overhead transmission & distribution lines and substations.					
C305.5		Design the optimized lighting system for residential, commercial, industrial applications in order to save electrical energy					
DEPARTMENT	**EEE**	**SEMESTER**	**5**	**COURSE CODE**	**15EE562**	**COURSE ID**	**C306**
COURSE TITLE		**Programmable Logic Controllers (Open Elective)**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C306.1		Understand the importance of PLC, its architecture and the convections to be followed.					
C306.2		Able to analyze the instructions and rules used to build the program.					
C306.3		Able to Identify appropriate operators, delay counter instructions and use the function block diagrams					
C306.4		Able to understand the data handling concept and its application.					
DEPARTMENT	**EEE**	**SEMESTER**	**5**	**COURSE CODE**	**15EE563**	**COURSE ID**	**C307**
COURSE TITLE		**Renewable Energy Sources (Open Elective)**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C307.1		Describe the challenges involved in identification of Conventional and Non-Conventional energy sources and discuss the issues related to energy scarcity and its solution.					
C307.2		Explain the working principle of Non-Conventional methods of generating electricity and its storage.					
C307.3		Calculate the performance parameters of various renewable energy systems and discuss its applications.					
C307.4		Asses various field applications of Non-Conventional Energy sources					
DEPARTMENT	**EEE**	**SEMESTER**	**5**	**COURSE CODE**	**15EEL57**	**COURSE ID**	**C308**
COURSE TITLE		**Microcontroller laboratory**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C308.1		Write, simulate and debug 8051 programs using assembly and Embedded C languages.					
C308.2		Demonstrate the control of ancillary devices using 8051 Microcontroller.					

		(speed of a stepper motor, dc motor and the interface ADC, DAC, LCD and Keypad interfacing with 8051)					
C308.3		Design and implement real time embedded system applications using 8051 microcontroller.					
DEPARTMENT	**EEE**	**SEMESTER**	**5**	**COURSE CODE**	**15EEL58**	**COURSE ID**	**C309**
COURSE TITLE		**Power electronics laboratory**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C309.1		List and describe various power semiconductor devices, power converters and its applications.					
C309.2		Explain the characteristics of power semiconductor devices and operation of various power converters for different loads.					
C309.3		Apply the concept of power electronic converters to control different loads and compute their performance parameters					
DEPARTMENT	**EEE**	**SEMESTER**	**7**	**COURSE CODE**	**15EE71**	**COURSE ID**	**C401**
COURSE TITLE		**Power System Analysis-II**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C401.1		Identify network matrices and models for solving load flow problems and perform steady state power flow analysis of power systems using numerical iterative techniques.					
C401.2		Explain optimal operation of generators on a bus bar, optimal unit commitment, optimal scheduling for hydro-thermal system, power system security and reliability.					
C401.3		Illustrate the use of various numerical techniques applied to power systems and numerical solution of swing equation for multi-machine stability.					
C401.4		Analyze limit violation in load flow, optimal scheduling of hydrothermal system and short circuit faults in power system.					
DEPARTMENT	**EEE**	**SEMESTER**	**7**	**COURSE CODE**	**15EE72**	**COURSE ID**	**C402**
COURSE TITLE		**Power System Protection**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C402.1		Identify and list various protective components based on the fault condition in power system network.					
C402.2		Understand the construction, working principle and characteristics of different types of relays, circuit breakers and discuss protection against over voltages.					
C402.3		Classify and compare various types of relays, circuit breakers and fuses.					
C402.4		Apply conventional and numerical relays to the protection of rotating machines, bus bars, transformers, transmission lines and distribution network.					
DEPARTMENT	**EEE**	**SEMESTER**	**7**	**COURSE CODE**	**15EE73**	**COURSE ID**	**C403**
COURSE TITLE		**High Voltage Engineering**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C403.1		Evaluation of dielectric performance of high voltage equipment's, PD, RI and corona as per Standards.					
C403.2		Analyze the circuits of AC, DC and transient voltage and currents,					

	Generation and Measurements.						
C403.3	Applying knowledge of dielectric property for insulation coordination of lines and power Equipment's.						
C403.4	Describe the dielectric properties of solid, liquid and gaseous insulating material, causes of overvoltages, corona and their remedial measures.						
DEPARTMENT	**EEE**	**SEMESTER**	**7**	**COURSE CODE**	**15EE742**	**COURSE ID**	**C404**
COURSE TITLE	**Utilization of Electric Power (Professional Elective-III)**						
COURSE OUTCOME NO	**COURSE OUTCOME STATEMENTS**						
C404.1	Use electrical engineering principles in the analysis of electrical heating, welding, electrolysis, illumination and traction.						
C404.2	Design various heating and lighting systems required for different electrical applications.						
C404.3	Solve various numerical problems related to heating, welding, electrolysis, illumination and electric traction.						
C404.4	Analyze the behavior of heating elements and electric traction under various operating conditions.						
C404.5	Compare and analyze different types of hybrid electric vehicles and their environmental impact.						
DEPARTMENT	**EEE**	**SEMESTER**	**7**	**COURSE CODE**	**15EE752**	**COURSE ID**	**C405**
COURSE TITLE	**Testing and Commissioning of Electrical Apparatus (Professional Elective-IV)**						
COURSE OUTCOME NO	**COURSE OUTCOME STATEMENTS**						
C405.1	Discuss different types of tools and apparatus required for installation, maintenance, repair work of electrical equipment and underground cables according to India Electricity Rules.						
C405.2	Identify the specifications, installation and commissioning testing procedure of various electrical equipment and underground cables.						
C405.3	Analyze the specifications, Installation and testing of the electrical equipment and underground cables						
C405.4	Decide the testing and installation methods required for electrical equipment and underground cables depending on the condition of the site.						
DEPARTMENT	**EEE**	**SEMESTER**	**7**	**COURSE CODE**	**15EE753**	**COURSE ID**	**C406**
COURSE TITLE	**Spacecraft Power Technologies (Professional Elective-IV)**						
COURSE OUTCOME NO	**COURSE OUTCOME STATEMENTS**						
C406.1	Discuss the increasing demand for space craft power systems and to give an overview of electrical power system and its technology.						
C406.2	Describe the elements of a space photovoltaic power system, the status of solar cell technologies presently in use.						
C406.3	Discuss advances in both cell and array technology, and solar thermo photovoltaic energy conversion.						
C406.4	Discusses, space-qualified components, the array of chemical storage technologies including both batteries and fuel cells.						
C406.5	Describe components and techniques for achieving the various Power Management and Distribution functions and examples of several PMAD configurations						

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DEPARTMENT	EEE	SEMESTER	7	COURSE CODE	15EEL76	COURSE ID	C407
COURSE TITLE		Power System Simulation Laboratory					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C407.1		Describe the parameters of transmission line, synchronous machine, fault, swing curve, load flow analysis and economic load dispatch in the power system					
C407.2		Explain the concepts of transmission line, synchronous machine, fault, swing curve, load flow analysis and economic load dispatch in the power system					
C407.3		Apply various numerical techniques to perform load flow analysis, economic load dispatch problem, different types of faults and calculate various transmission line and synchronous machine parameters of a given power system using Matlab/Mipower.					
DEPARTMENT	EEE	SEMESTER	7	COURSE CODE	15EEL77	COURSE ID	C408
COURSE TITLE		Relay and High Voltage Laboratory					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C408.1		Define the operating characteristics of different types of relay, HVAC, HVDC and differentiate different dielectric medium.					
C408.2		Predict the operating time of different types of relay, breakdown strength of air and liquid dielectric medium.					
C408.3		Demonstrate the operating characteristics of different types of relays and spark over characteristics of air and liquid dielectric medium and calculate the capacitance of parallel plate capacitor and co-axial cable.					
DEPARTMENT	EEE	SEMESTER	7	COURSE CODE	15EEP78	COURSE ID	C409
COURSE TITLE		Project Phase – I + Seminar					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C409.1		Demonstrate a sound technical knowledge of their selected project topic.					
C409.2		Undertake problem identification, formulation and solution.					
C409.3		Design engineering solutions to complex problems utilizing a systems approach					
C409.4		Communicate with engineers and the community at large in written an oral forms.					
C409.5		Demonstrate the knowledge, skills and attitudes of a professional engineer.					

M.Tech

DEPARTMENT	EEE	SEMESTER	1	COURSE CODE	18EEE11	COURSE ID	C101
COURSE TITLE		Mathematical Methods in Control					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C101.1		Understand the fundamentals of vector space and bases in reference to transformations.					
C101.2		Solve system of linear equations using direct and iterative methods					
C101.3		Use the idea of Eigen values and Eigen vectors for the application of SVD.					
C101.4		Describe the basic notions of discrete and continuous probability distributions.					

C101.5		Find out responses of linear systems using statistical and probability tools					
DEPARTMENT	**EEE**	**SEMESTER**	**1**	**COURSE CODE**	**18EPS12**	**COURSE ID**	**C102**
COURSE TITLE		**Modeling and Analysis of Electrical Machines**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C102.1		Describe basic concepts of modeling of dc machines, ac machines, single and three phase transformers					
C102.2		Comparison of actual and approximate transient torque-angle characteristics during a 3-phase fault at the machine terminals					
C102.3		Application of reference frame theory to transform three phase induction motors to two-phase. Application of Park's transformation to Syn. machine					
C102.4		Model synchronous machine to perform dynamic analysis under different conditions					
DEPARTMENT	**EEE**	**SEMESTER**	**1**	**COURSE CODE**	**18EPS13**	**COURSE ID**	**C103**
COURSE TITLE		**Power System Dynamics (Stability & control)**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C103.1		Apply the knowledge of mathematical models of synchronous machine, excitation system, transmission lines and loads for power system representation.					
C103.2		Analyze the dynamic performance(transient stability) of the modeled power systems with single and multi-machine environment					
C103.3		Investigate the dynamics of power system with and without using Power system					
DEPARTMENT	**EEE**	**SEMESTER**	**1**	**COURSE CODE**	**18EPS14**	**COURSE ID**	**C104**
COURSE TITLE		**Computer Relaying for Power System**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C104.1		Enumerate the importance of computer relaying, Mathematical basis for protective relaying, relaying algorithms, digital filters and hardware organization used for power system protection and travelling waves.					
C104.2		Illustrate the principle and operation of different types of protections used for electrical Machines, transmission line and digital filters.					
C104.3		Interpret different types of protection algorithms used for transformers, transmission lines and WAMs techniques for relaying applications.					
C104.4		Discriminate different algorithms used for machines and transmission line, also relaying application of travelling waves in single and three phase lines.					
DEPARTMENT	**EEE**	**SEMESTER**	**1**	**COURSE CODE**	**18EPS15**	**COURSE ID**	**C105**
COURSE TITLE		**Power Electronic Converters**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C105.1		Describe the suitable power electronic converters and control techniques.					
C105.2		Learn the working of different power electronic converters.					
C105.3		Explain the characteristics of different power electronic converters operate in continuous and discontinuous mode and find out the application of power electronic converters.					
C105.4		Analyze and simulate the performance of power electronic converters.					
DEPARTMENT	**EEE**	**SEMESTER**	**1**	**COURSE**	**18EPSL16**	**COURSE ID**	**C106**

				CODE			
COURSE TITLE		**Power System Laboratory – I**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C106.1		Describe load flow , Contingency, voltage stability, ATC, reactive power optimization, optimal dispatch, state estimation, relay coordination and Harmonic Analysis					
C106.2		Express the problems given with the use of Simulation					
C106.3		Demonstrate the given problem with the use of Modern tools					
DEPARTMENT	**EEE**	**SEMESTER**	**1**	**COURSE CODE**	**18RMI17**	**COURSE ID**	**C107**
COURSE TITLE		**Research Methodology and IPR**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C107.1		Describe research methodology and the technique of defining a research problem, explanation of literature review in research, carrying out a literature search, developing theoretical and conceptual frameworks and writing a review.					
C107.2		Interpret various research designs and their characteristics and also different methods of data collections.					
C107.3		Illustrate several parametric tests of hypotheses and Chi-square test and the art of interpretation and the art of writing research reports.					
C107.4		Analyze the various forms of the intellectual property, its relevance and business impact in the changing global business environment and leading International Instruments concerning IPR.					
DEPARTMENT	**EEE**	**SEMESTER**	**2**	**COURSE CODE**	**18ELE23**	**COURSE ID**	**C113**
COURSE TITLE		**BASIC ELECTRICAL ENGINEERING**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C113.1		Analyze DC and AC circuits.					
C113.2		Identify DC and AC machines, domestic wiring and protective devices required for particular application.					
C113.3		Implement electrical and electromagnetic laws to solve problems on DC and AC circuits and machines.					
C113.4		Explain the constructional and working principle of DC and AC machines.					
DEPARTMENT	**EEE**	**SEMESTER**	**2**	**COURSE CODE**	**18ELEL27**	**COURSE ID**	**C117**
COURSE TITLE		**BASIC ELECTRICAL ENGINEERING LABORATORY**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C117.1		Conduct experiments on DC and AC circuits.					
C117.2		Conduct experiments on safety aspects, wiring and consumption of electrical power.					
C117.3		Understand the basic concepts of AC and DC machines, fuses, MCB and UPS					
C117.4		Demonstrate the usage of different electrical measuring instruments.					
DEPARTMENT	**EEE**	**SEMESTER**	**4**	**COURSE CODE**	**17MAT41**	**COURSE ID**	**C211**
COURSE TITLE		**Engineering Mathematics-IV**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C211.1		Identify the numerical techniques to solve the problems, special functions,					

		complex variables, probability, sampling theory and stochastic process.					
C211.2		Compute the solutions using numerical techniques, special functions, complex variables, probability, sampling theory and stochastic process.					
C211.3		Interpret the solutions using numerical techniques, special functions, complex variables, probability, sampling theory and stochastic process.					
DEPARTMENT	**EEE**	**SEMESTER**	**4**	**COURSE CODE**	**17EE42**	**COURSE ID**	**C212**
COURSE TITLE		**Power Generation and Economics**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C212.1		Describe the general layout/arrangement, advantages/Disadvantages, working of major equipment and auxiliaries used in conventional power plants and substations.					
C212.2		Classify substations and explain the importance of grounding.					
C212.3		Sketch Hydrograph, load curve, load duration curve, flow duration curve, mass curve for hydro power plant and Bus bar arrangement schemes in Substations.					
C212.4		Analyze the economic features of Conventional power plants.					
DEPARTMENT	**EEE**	**SEMESTER**	**4**	**COURSE CODE**	**17EE43**	**COURSE ID**	**C213**
COURSE TITLE		**Transmission and Distribution**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C213.1		Analyze the performance of transmission line with the effect of sag, wind, ice & different parameters.					
C213.2		Develop the mathematical models of different types of transmission lines and assess their performance.					
C213.3		Discuss/Describe reliability & quality of distribution systems, advantages of different transmission & distribution system & types of conductors & supporting structures.					
C213.4		Describe the various parameters of transmission system, selection of insulators, importance of sag corona & lightening, types of distribution systems & grading.					
DEPARTMENT	**EEE**	**SEMESTER**	**4**	**COURSE CODE**	**17EE44**	**COURSE ID**	**C214**
COURSE TITLE		**Electric Motors**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C214.1		Analyze the performance of AC and DC motors.					
C214.2		Employ the most suitable method of starting and speed control for AC and DC motors and to solve problems on AC and DC motors.					
C214.3		Explain the performance characteristics of AC and DC motors for different modes of operation.					
DEPARTMENT	**EEE**	**SEMESTER**	**4**	**COURSE CODE**	**17EE45**	**COURSE ID**	**C215**
COURSE TITLE		**Electromagnetic Field Theory**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C215.1		Apply the concepts of vectors and its operation in solving problems associated with static, steady and time varying fields.					
C215.2		Apply the laws of Electrostatics, Magnetostatics and Electromagnetics in developing Maxwell's equations for static and time varying fields.					

C215.3		Analyze the performance of electromagnetic fields and waves using Maxwell's equation in different media and also at the boundaries.					
C215.4		Develop the relationship between electric and magnetic fields under steady conditions.					
DEPARTMENT	**EEE**	**SEMESTER**	**4**	**COURSE CODE**	**17EE46**	**COURSE ID**	**C216**
COURSE TITLE		**Operational Amplifier and Linear ICs**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C216.1		Design and develop models using linear integrated circuits for a given specification.					
C216.2		Analyse the working of different applications of op-amps.					
C216.3		Solve problems related to op-amps, timers, voltage regulators and PLL.					
C216.4		Understand the basics of linear integrated circuits (op-amps, timers, voltage regulators and PLL)					
DEPARTMENT	**EEE**	**SEMESTER**	**4**	**COURSE CODE**	**17EEL47**	**COURSE ID**	**C217**
COURSE TITLE		**Electrical Machines Laboratory-2**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C217.1		Test DC machines to determine their characteristics and also to control the speed of DC motor					
C217.2		Pre-determine the performance characteristics of DC machines by conducting suitable tests.					
C217.3		Perform load test on single phase and three phase induction motor to assess its performance.					
C217.4		Conduct test on induction motor and on a synchronous motor to pre-determine the performance characteristics.					
DEPARTMENT	**EEE**	**SEMESTER**	**4**	**COURSE CODE**	**17EEL48**	**COURSE ID**	**C218**
COURSE TITLE		**Op-Amps and Linear ICs Laboratory**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C218.1		Design and build various linear integrated circuits.					
C218.2		Troubleshoot and test various linear integrated circuits.					
C218.3		Apply the concepts of electronics of electronic components in designing and building various linear integrated circuits.					
DEPARTMENT	**EEE**	**SEMESTER**	**6**	**COURSE CODE**	**15EE61**	**COURSE ID**	**C311**
COURSE TITLE		**Control Systems**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C311.1		Develop mathematical models of open loop and closed loop physical systems.					
C311.2		Analyze time response and frequency response of a control system.					
C311.3		Determine the stability of a system in the time and frequency domain through different methods.					
C311.4		Develop a control system model in continuous and discrete time using state variable techniques.					
DEPARTMENT	**EEE**	**SEMESTER**	**6**	**COURSE CODE**	**15EE62**	**COURSE ID**	**C312**
COURSE TITLE		**Power System Analysis-I**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					

C312.1		• Describe representation of power system in its equitant circuit and in one line diagram, • Define symmetrical and Unsymmetrical faults and system stability					
C312.2		• Understand per unit system, symmetrical components and classify the faults and its severity. • Explain about power system stability and the dynamics of synchronous machine					
C312.3		Use the tool of symmetrical components and per unit system for fault calculations and equal area criterion for stability calculation.					
C312.4		Analyze different faults in the power system and examine the stability conditions of the system					
DEPARTMENT	**EEE**	**SEMESTER**	**6**	**COURSE CODE**	**15EE63**	**COURSE ID**	**C313**
COURSE TITLE		**Digital Signal Processing**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C313.1		Apply fast and efficient algorithms for computing DFT and inverse DFT of a given sequence					
C313.2		Design infinite impulse response Butterworth and Chebyshev digital filters using impulse invariant / bilinear transformation technique.					
C313.3		Design FIR filters by use of window function or by frequency sampling method.					
C313.4		Realize a digital IIR filter by direct, cascade, parallel and ladder methods of realization.					
DEPARTMENT	**EEE**	**SEMESTER**	**6**	**COURSE CODE**	**15EE64**	**COURSE ID**	**C314**
COURSE TITLE		**Electrical Machine Design**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C314.1		Design overall dimensions of AC and DC machines based on Specific Loadings					
C314.2		To carry out a detailed design of AC and DC machines					
C314.3		Examine various performance indices of the designed AC and DC machines as per specified constraints/standards					
C314.4		Explain the factors to be considered in selecting the materials for design of various parts of electrical machines					
DEPARTMENT	**EEE**	**SEMESTER**	**6**	**COURSE CODE**	**15EE651**	**COURSE ID**	**C315**
COURSE TITLE		**Computer Aided Electrical Drawing (Professional Elective-II)**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C315.1		Design the sectional views of Transformers, DC machines and Alternators.					
C315.2		Develop a layout for substation using the standard symbols for substation equipment					
C315.3		To interpret the notations and formulas required and design the winding diagrams of AC and DC machines.					
DEPARTMENT	**EEE**	**SEMESTER**	**6**	**COURSE CODE**	**15EE653**	**COURSE ID**	**C316**
COURSE TITLE		**Energy Audit and Demand Side Management (Professional Elective-II)**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C316.1		Calculate energy audit parameters for HVAC, boiler, furnaces, motors, building and lighting systems.					

C316.2		Describe the concepts in energy auditing of electrical and mechanical systems, demand side management.					
C316.3		Explain energy audit, energy scenario, electrical load management, survey instrumentation and energy conservation.					
C316.4		Conduct energy audit of different systems, equipment and buildings.					
DEPARTMENT	**EEE**	**SEMESTER**	**6**	**COURSE CODE**	**15EE661**	**COURSE ID**	**C317**
COURSE TITLE		**Artificial Neural Networks and Fuzzy logic (Open Elective)**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C317.1		Relate Fuzzy sets, Crisp sets and define Fuzzification and Defuzzification methods.					
C317.2		Demonstrate the Artificial Neural Network architectures and Illustrate its learning methods.					
C317.3		Choose the tuning parameters for Neural Network architectures and apply ANN algorithms for classification, function approximation and time series prediction problems.					
DEPARTMENT	**EEE**	**SEMESTER**	**6**	**COURSE CODE**	**15EE662**	**COURSE ID**	**C318**
COURSE TITLE		**Sensors and Transducers (Open Elective)**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C318.1		Understand the operating principle of different sensors, transducers.					
C318.2		Apply the knowledge of sensors and transducers to measure non electrical parameters.					
C318.3		Analyze and evaluate the performance of different sensors, transducers based systems					
C318.4		Create a systems using appropriate sensor for measuring Electrical and non Electrical quantities					
DEPARTMENT	**EEE**	**SEMESTER**	**6**	**COURSE CODE**	**15EEL67**	**COURSE ID**	**C319**
COURSE TITLE		**Control System Laboratory**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C319.1		Use software package or discrete components in assessing the time and frequency domain reposes of a given second order system and to study the effect of P, PI, PD and PID controller and Lead compensator on the step response of the system.					
C319.2		Design and analyze Lead, Lag and Lag – Lead compensators for given specifications					
C319.3		Write a script files to plot root locus, bode plot, Nyquist plots to study the stability of the system using a software package.					
C319.4		Determine the performance characteristics of ac and dc servomotors and synchro-transmitter receiver pair used in control systems					
DEPARTMENT	**EEE**	**SEMESTER**	**6**	**COURSE CODE**	**15EEL68**	**COURSE ID**	**C3110**
COURSE TITLE		**Digital Signal Processing Laboratory**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C3110.1		Give physical interpretation of sampling theorem					
C3110.2		Evaluate the impulse response of a system.					
C3110.3		To solve the Difference Equation					
C3110.4		Perform convolution of given sequences to evaluate the response of a					

	system.						
C3110.5	Compute DFT and IDFT of a given sequence using the basic definition and/or fast methods.						
C3110.6	Design and implement IIR and FIR filters						
DEPARTMENT	**EEE**	**SEMESTER**	**8**	**COURSE CODE**	**15EE81**	**COURSE ID**	**C411**
COURSE TITLE	**Power System Operation and Control**						
COURSE OUTCOME NO	**COURSE OUTCOME STATEMENTS**						
C411.1	Illustrate the concepts of operation, monitoring, control, security and reliability of power system.						
C411.2	Apply the numerical, analytical and optimal solutions of power system problems.						
C411.3	Analyze the economic operation, control by AGC and LFC, contingency, state estimation and stability of power system.						
C411.4	Model LFC, AGC and AVR for single and two area power systems.						
DEPARTMENT	**EEE**	**SEMESTER**	**8**	**COURSE CODE**	**15EE82**	**COURSE ID**	**C412**
COURSE TITLE	**Industrial Drives and Applications**						
COURSE OUTCOME NO	**COURSE OUTCOME STATEMENTS**						
C412.1	Analyze the performance of electric drives and stability limits.						
C412.2	Examine the speed control, multi-quadrant operation, braking and starting methods for different types of drives using power electronic controllers.						
C412.3	To calculate drive parameters and control parameters for the given situation						
DEPARTMENT	**EEE**	**SEMESTER**	**8**	**COURSE CODE**	**15EE833**	**COURSE ID**	**C413**
COURSE TITLE	**Integration of Distributed Generation (Professional Elective-V)**						
COURSE OUTCOME NO	**COURSE OUTCOME STATEMENTS**						
C413.1	Evaluate the quantum of power that can be harnessed from different sources of energy.						
C413.2	Examine the impact of distributed generation on power quality, overloading of lines and voltage.						
C413.3	Apply numerical and probabilistic approach for the design of distribution feeder integrated with distributed generation and statistical approach for hosting capacity determination.						
DEPARTMENT	**EEE**	**SEMESTER**	**8**	**COURSE CODE**	**15EE831**	**COURSE ID**	**C414**
COURSE TITLE	**Smart Grid (Professional Elective-V)**						
COURSE OUTCOME NO	**COURSE OUTCOME STATEMENTS**						
C414.1	To acquire the knowledge and design concepts of smart grid						
C414.2	To learn D C distribution concept and intelligent grid architecture for the smart grid						
C414.3	To acquire entrepreneurial qualities and their role in Dynamic energy system						
C414.4	To acquire end use electric efficient technology alternatives, market implementation and their policies.						
DEPARTMENT	**EEE**	**SEMESTER**	**8**	**COURSE CODE**	**15EE84**	**COURSE ID**	**C415**

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COURSE TITLE		**Internship / Professional Practice**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C415.1		Gain practical experience within industry in which the internship is done					
C415.2		Apply knowledge and skills learned to classroom work.					
C415.3		Develop a greater understanding about career options while more clearly defining personal career goals.					
C415.4		Develop and refine oral and written communication skills					
DEPARTMENT	**EEE**	**SEMESTER**	**8**	**COURSE CODE**	**15EEP85**	**COURSE ID**	**C416**
COURSE TITLE		**Project Work Phase -II**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C416.1		Demonstrate an ability to identify and formulate a hypothesis for a given problem and test through appropriate experiments.					
C416.2		Apply relevant modern tools to solve the chosen technical problem.					
C416.3		Analyze and evaluate the experimental results and propose suitable modifications to improve performance.					
C416.4		Work effectively as a member or a leader of a team.					
C416.5		**Communicate technical content effectively through written report and oral presentations.**					
DEPARTMENT	**EEE**	**SEMESTER**	**8**	**COURSE CODE**	**15EES86**	**COURSE ID**	**C417**
COURSE TITLE		**Seminar**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C417.1		Attain, use and develop knowledge in the field of electrical and electronics engineering and other disciplines through independent learning and collaborative study.					
C417.2		Identify, understand and discuss current, real-time issues					
C417.3		Improve oral and written communication skills					
C417.4		Explore an appreciation of the self in relation to its larger diverse social and academic contexts.					
M.Tech							
DEPARTMENT	**EEE**	**SEMESTER**	**2**	**COURSE CODE**	**18EPS21**	**COURSE ID**	**C111**
COURSE TITLE		**Insulators for Power System**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C111.1		Choose material composition and testing standards for porcelain, glass and non-ceramic insulators.					
C111.2		Analyze attributes and cost of line with different types of insulators.					
C111.3		Evaluation of characteristics of pollutants & ice and dielectric performance of different types of insulators under pollution and icing condition.					
C111.4		Prepare specifications for insulators of the future					
DEPARTMENT	**EEE**	**SEMESTER**	**2**	**COURSE CODE**	**18EPS22**	**COURSE ID**	**C112**
COURSE TITLE		**Switching in Power Systems**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C112.1		Compare special switching situations and mitigation of over voltages.					
C112.2		Illustrate the performance of different circuit breakers during closing on to					

		faults at different situations and its interruption in different mediums.					
C112.3		Apply analytical and numerical methods to estimate switching transients.					
C112.4		Describe the switching phenomena, switching devices and their classifications, faults and their impact on system and components, their limitation and interruptions, properties of different dielectric mediums, reliability of vacuum switch gear.					
DEPARTMENT	**EEE**	**SEMESTER**	**2**	**COURSE CODE**	**18EPS23**	**COURSE ID**	**C113**
COURSE TITLE		**FACTS Controllers**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C113.1		Apply the knowledge of power system controllers, different types of FACTS devices and their modeling to the control of power system operations.					
C113.2		Choose a suitable controller to overcome a known instability problem.					
C113.3		Analyze the effect of different FACTS controllers(SVC and TCSC) on stability of power system					
DEPARTMENT	**EEE**	**SEMESTER**	**2**	**COURSE CODE**	**18EPS241**	**COURSE ID**	**C114**
COURSE TITLE		**EHV AC Transmission (Professional elective-1)**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C114.1		Estimate corona related parameters using corona cage, different line losses related to corona, and arrester rating.					
C114.2		Design of EHV lines combining the effects of state and transient voltage limits					
C114.3		Analyze distribution of charges and voltage gradient on spheres and sub-conductor of bundle, travelling and standing waves. Lightning and switching over voltages.					
C114.4		Compute temperature rise of conductors, GMR and transmission line and ground parameters and generalized line constants, conductor surface voltage gradient, corona power loss, lightning and switching over voltages. Describe need for EHV lines and their different standard rated voltage levels, understand wind induced mechanical problems					
DEPARTMENT	**EEE**	**SEMESTER**	**2**	**COURSE CODE**	**18EPS253**	**COURSE ID**	**C115**
COURSE TITLE		**Power Quality Problems and Mitigation (Professional Elective-2)**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C115.1		Learn causes, effects of PQ problems and classification of mitigation techniques for PQ problems, PQ standards ,terminology and monitoring requirements through numerical problems					
C115.2		Discuss passive shunt and series compensation using lossless components, mitigation of power quality problems due to non linear loads.					
C115.3		Design, operation and modeling of active shunt and series compensation equipment.					
DEPARTMENT	**EEE**	**SEMESTER**	**2**	**COURSE CODE**	**18EPSL26**	**COURSE ID**	**C116**
COURSE TITLE		**Power System Laboratory - 2**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C116.1		Describe Model a power system and performance transient stability and small signal stability studies, automatic voltage regulator and governor to study their effects on stability ,transmission line, lighting impulse and					

	surge arrester, CT and CVT for transient analysis of over using surge arrester and RC network.
C116.2	Explain the Model of a power system and performance transient stability and small signal stability studies, automatic voltage regulator and governor to study their effects on stability ,transmission line, lighting impulse and surge arrester, CT and CVT for transient analysis of over using surge arrester and RC network.
C116.3	Demonstrate the various numerical techniques and modeling to perform transient stability and transmission line, lighting Impulse and surge arrester, CT and CVT for transient analysis of over using surge arrester and RC network power system using Mipower simulation software.

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DEPARTMENT	**EEE**	**SEMESTER**	**1**	**COURSE CODE**	**18ELE13**	**COURSE ID**	**C103**
COURSE TITLE		**BASIC ELECTRICAL ENGINEERING**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C103.1		Analyze DC and AC circuits.					
C103.2		Identify DC and AC machines, domestic wiring and protective devices required for particular application.					
C103.3		Implement electrical and electromagnetic laws to solve problems on DC and AC circuits and machines.					
C103.4		Explain the constructional and working principle of DC and AC machines.					
DEPARTMENT	**EEE**	**SEMESTER**	**1**	**COURSE CODE**	**18ELEL17**	**COURSE ID**	**C107**
COURSE TITLE		**BASIC ELECTRICAL ENGINEERING LABORATORY**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C107.1		Conduct experiments on DC and AC circuits.					
C107.2		Conduct experiments on safety aspects, wiring and consumption of electrical power.					
C107.3		Understand the basic concepts of AC and DC machines, fuses, MCB and UPS					
C107.4		Demonstrate the usage of different electrical measuring instruments.					
DEPARTMENT	**EEE**	**SEMESTER**	**3**	**COURSE CODE**	**18MAT31**	**COURSE ID**	**C201**
COURSE TITLE		**Engineering Mathematics-III**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C201.1		Have the knowledge of Fourier series, Fourier transforms, Z-transforms, Calculus of variations, Numerical and statistical methods					
C201.2		Solve Engineering problems using Fourier series and Fourier transforms Numerical and statistical methods and Calculus of Variation.					
C201.3		Communicate and reflect on applications of Mathematics as tool.					
DEPARTMENT	**EEE**	**SEMESTER**	**3**	**COURSE CODE**	**18EE32**	**COURSE ID**	**C202**
COURSE TITLE		**Electric Circuit Analysis**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C202.1		Apply the various circuit reduction techniques, network theorems, Laplace transform, transient behavior of circuit elements under switching conditions, and concept of series and parallel resonance ,3 phase					

		unbalanced system, two port network to a given electrical network.					
C202.2		Interpret the behavior of series and parallel resonant circuits, circuit elements under switching conditions, different network theorems and two port networks, Laplace transform for various time functions					
C202.3		Identify the sources and networks, State different network theorems, Define Laplace transform for standard test inputs, active and reactive power and two port network parameters.					
DEPARTMENT	**EEE**	**SEMESTER**	**3**	**COURSE CODE**	**18EE33**	**COURSE ID**	**C203**
COURSE TITLE		**Transformers and Generators**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C203.1		Explain the construction, operation of single phase, three phase transformers and synchronous Generators.					
C203.2		Describe and select various transformer connections					
C203.3		Compute the circuit parameters of transformer, synchronous machine					
C203.4		Analyse the performance of the transformers, DC generators and Syn. Generators					
DEPARTMENT	**EEE**	**SEMESTER**	**3**	**COURSE CODE**	**18EE34**	**COURSE ID**	**C204**
COURSE TITLE		**Analog Electronic Circuits**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C204.1		Design electronic circuits.					
C204.2		Analyze electronic circuits based on diodes and transistors with special focus on amplifiers and oscillators.					
C204.3		Solve problems on various applications of diodes and transistors.					
C204.4		Understand construction, working and characteristics of diodes and different types of transistors.					
DEPARTMENT	**EEE**	**SEMESTER**	**3**	**COURSE CODE**	**18EE35**	**COURSE ID**	**C205**
COURSE TITLE		**Digital System Design**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C205.1		Understand the basic principles of Boolean algebra, Combinational, Sequential circuits and Hardware Description Language (HDL) Module.					
C205.2		Apply the different techniques (Boolean algebra, K-Maps and Quine –Mc Clusky Methods and MEV/VEM) to minimize the Combinational and Sequential circuits.					
C205.3		Analyze and evaluate different techniques to realize various Combinational and Sequential circuits.					
C205.4		Design and develop Combinational and Sequential circuits by use of conventional methods and Hardware Description Language (HDL) module.					
DEPARTMENT	**EEE**	**SEMESTER**	**3**	**COURSE CODE**	**18EE36**	**COURSE ID**	**C206**
COURSE TITLE		**Electrical and Electronic Measurements**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C206.1		Illustrate various electrical and electronic instruments used to measure, display and record the different electrical and magnetic parameters.					
C206.2		Compare the different electrical and electronic measuring, display and recording instruments used in electrical and electronics.					

C206.3		Solve numerical involved in measurement of respective electrical parameters.					
C206.4		Analyze the errors in electrical instruments and specify respective minimization techniques.					
DEPARTMENT	**EEE**	**SEMESTER**	**3**	**COURSE CODE**	**18EEL37**	**COURSE ID**	**C207**
COURSE TITLE		**Electrical Machines Laboratory -1**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C207.1		Evaluate the performance of transformers from the test data obtained.					
C207.2		Connect and operate two single phase transformers of different KVA rating in parallel.					
C207.3		Connect single phase transformers for three phase operation and phase conversion.					
C207.4		Compute the voltage regulation of synchronous generator using the test data obtained in the laboratory.					
DEPARTMENT	**EEE**	**SEMESTER**	**3**	**COURSE CODE**	**18EEL38**	**COURSE ID**	**C208**
COURSE TITLE		**Electronics Laboratory**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C208.1		Design and test different diode circuits.					
C208.2		Design and test amplifier and oscillator circuits and analyze their performance.					
C208.3		Use universal gates and ICs for code conversion and arithmetic operations.					
C208.4		Apply the knowledge of counters and sequence generators					
DEPARTMENT	**EEE**	**SEMESTER**	**5**	**COURSE CODE**	**17EE51**	**COURSE ID**	**C301**
COURSE TITLE		**Management and Entrepreneurship**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C301.1		Knowledge on fundamental concepts of Management and Entrepreneurship					
C301.2		Understanding the functions of Managers, Entrepreneurs and their social responsibilities, Compare various types of Entrepreneurs					
DEPARTMENT	**EEE**	**SEMESTER**	**5**	**COURSE CODE**	**17EE52**	**COURSE ID**	**C302**
COURSE TITLE		**Microcontroller**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C302.1		Describe the internal organization, instruction set, data types and addressing modes of 8051.					
C302.2		Develop assembly and embedded C programs for applications of 8051 Microcontrollers.					
C302.3		Analyze and design circuitry to interface peripherals devices with 8051.					
C302.4		Work as an individual or as a team –member to design and implement projects on real time embedded system applications using microcontroller					
DEPARTMENT	**EEE**	**SEMESTER**	**5**	**COURSE CODE**	**17EE53**	**COURSE ID**	**C303**
COURSE TITLE		**Power Electronics**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C303.1		Describe the Power devices, Power electronics circuits with their characteristics and effects.					

C303.2		Compute the performance parameters of different power converters and power devices for given data.					
C303.3		Analyze the behavior of power devices and power converters for different load condition.					
C303.4		Design the triggering and protection circuits for power Converters and devices					
DEPARTMENT	**EEE**	**SEMESTER**	**5**	**COURSE CODE**	**17EE54**	**COURSE ID**	**C304**
COURSE TITLE		**Signals and Systems**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C304.1		Apply the knowledge of mathematics and engineering to analyse and obtain the response of continuous and discrete system.					
C304.2		Analyse LTI system and their properties using impulse response					
C304.3		Apply various transformation techniques to solve difference and differential equations and sketch the block diagram					
C304.4		Analyse continuous time and discrete signals and systems in frequency domain using Fourier analysis tools like CTFS,CTFT,DTFS and DTFT					
C304.5		Analyse discrete time systems using Z-transforms					
DEPARTMENT	**EEE**	**SEMESTER**	**5**	**COURSE CODE**	**17EE553**	**COURSE ID**	**C305**
COURSE TITLE		**Estimation and costing (Professional Elective-I)**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C305.1		Able to explain the general principles involved in estimation costing, market survey, purchase system and general idea about IE rules and act.					
C305.2		Able to calculate the load requirement and size of the cables for single and multi-circuits used in buildings with protective devices.					
C305.3		Able to explain the concept of service connection and estimate the materials required for electrical installation of power circuits.					
C305.4		Able to estimate the materials required for electrical installation of overhead transmission & distribution lines and substations.					
C305.5		Design the optimized lighting system for residential, commercial, industrial applications in order to save electrical energy					
DEPARTMENT	**EEE**	**SEMESTER**	**5**	**COURSE CODE**	**17EE554**	**COURSE ID**	**C306**
COURSE TITLE		**Special Electrical Machines (Professional Elective-I)**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C306.1		Able to understand the principle of operation and power converter for switched reluctance motor and stepper motor					
C306.2		Able to understand construction, principle of operation, theory of torque production in brushless DC motor					
C306.3		Able to understand construction, principle of operation of linear induction drive for electric traction and permanent magnet motors					
C306.4		Able to explain the control aspect of special electrical machines and, features of electric motors for traction applications.					
DEPARTMENT	**EEE**	**SEMESTER**	**5**	**COURSE CODE**	**17EE562**	**COURSE ID**	**C307**
COURSE TITLE		**Programmable Logic Controllers (Open Elective)**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					

C307.1		Understand the importance of PLC, its architecture and the convections to be followed.					
C307.2		Able to analyze the instructions and rules used to build the program.					
C307.3		Able to Identify appropriate operators, delay counter instructions and use the function block diagrams					
C307.4		Able to understand the data handling concept and its application.					
DEPARTMENT	**EEE**	**SEMESTER**	**5**	**COURSE CODE**	**17EE563**	**COURSE ID**	**C308**
COURSE TITLE		**Renewable Energy Systems (Open Elective)**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C308.1		Describe the conventional and non-conventional energy sources.					
C308.2		Explain the working of non-conventional methods of generating electricity.					
C308.3		Calculate the performance of various renewable energy systems and predict their applications.					
C308.4		Analyze the recent technologies for the generation of electrical energy using renewable energy sources.					
DEPARTMENT	**EEE**	**SEMESTER**	**5**	**COURSE CODE**	**17EEL57**	**COURSE ID**	**C309**
COURSE TITLE		**Microcontroller laboratory**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C309.1		Write, simulate and debug 8051 programs using assembly and Embedded C languages.					
C309.2		Demonstrate the control of ancillary devices using 8051 Microcontroller. (speed of a stepper motor, dc motor and the interface ADC, DAC, LCD and Keypad interfacing with 8051)					
C309.3		Design and implement real time embedded system applications using 8051 microcontroller.					
DEPARTMENT	**EEE**	**SEMESTER**	**5**	**COURSE CODE**	**17EEL58**	**COURSE ID**	**C3010**
COURSE TITLE		**Power electronics laboratory**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C3010.1		List and describe various power semiconductor devices, power converters and its applications.					
C3010.2		Explain the characteristics of power semiconductor devices and operation of various power converters for different loads.					
C3010.3		Apply the concept of power electronic converters to control different loads and compute their performance parameters					
DEPARTMENT	**EEE**	**SEMESTER**	**7**	**COURSE CODE**	**15EE71**	**COURSE ID**	**C401**
COURSE TITLE		**Power System Analysis-II**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C401.1		Identify network matrices and models for solving load flow problems and perform steady state power flow analysis of power systems using numerical iterative techniques.					
C401.2		Explain optimal operation of generators on a bus bar, optimal unit commitment, optimal scheduling for hydro-thermal system, power system security and reliability.					
C401.3		Illustrate the use of various numerical techniques applied to power					

		systems and numerical solution of swing equation for multi-machine stability.					
C401.4		Analyze limit violation in load flow, optimal scheduling of hydrothermal system and short circuit faults in power system.					
DEPARTMENT	**EEE**	**SEMESTER**	**7**	**COURSE CODE**	**15EE72**	**COURSE ID**	**C402**
COURSE TITLE		**Power System Protection**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C402.1		Identify and list various protective components based on the fault condition in power system network.					
C402.2		Understand the construction, working principle and characteristics of different types of relays, circuit breakers and discuss protection against over voltages.					
C402.3		Classify and compare various types of relays, circuit breakers and fuses.					
C402.4		Apply conventional and numerical relays to the protection of rotating machines, bus bars, transformers, transmission lines and distribution network.					
DEPARTMENT	**EEE**	**SEMESTER**	**7**	**COURSE CODE**	**15EE73**	**COURSE ID**	**C403**
COURSE TITLE		**High Voltage Engineering**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C403.1		Evaluation of dielectric performance of high voltage equipment's, PD, RI and corona as per Standards.					
C403.2		Analyze the circuits of AC, DC and transient voltage and currents, Generation and Measurements.					
C403.3		Applying knowledge of dielectric property for insulation coordination of lines and power Equipment's.					
C403.4		Describe the dielectric properties of solid, liquid and gaseous insulating material, causes of overvoltages, corona and their remedial measures.					
DEPARTMENT	**EEE**	**SEMESTER**	**7**	**COURSE CODE**	**15EE742**	**COURSE ID**	**C404**
COURSE TITLE		**Utilization of Electric Power (Professional Elective-III)**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C404.1		Use electrical engineering principles in the analysis of electrical heating, welding, electrolysis, illumination and traction.					
C404.2		Design various heating and lighting systems required for different electrical applications.					
C404.3		Solve various numerical problems related to heating, welding, electrolysis, illumination and electric traction.					
C404.4		Analyze the behavior of heating elements and electric traction under various operating conditions.					
DEPARTMENT	**EEE**	**SEMESTER**	**7**	**COURSE CODE**	**15EE744**	**COURSE ID**	**C405**
COURSE TITLE		**Power System Planning(Professional Elective-III)**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C405.1		Discuss primary components of power system planning; planning methodology for optimum power system expansion as per CERC norms and gain knowledge on forecasting future load requirements.					
C405.2		Describe principles of distribution planning, supply rules, network					

		development and the system studies and contrast methods to mobilize resources to meet the investment requirement for the power sector.					
C405.3		Demonstrate planning and implementation of electric –utility activities, market principles and the norms framed by CERC for online trading and exchange in the interstate power market					
C405.4		Analyze reliability criteria for generation, transmission, distribution and reliability evaluation and analysis, grid reliability, voltage disturbances and their remedies					
DEPARTMENT	**EEE**	**SEMESTER**	**7**	**COURSE CODE**	**15EE751**	**COURSE ID**	**C406**
COURSE TITLE		**FACTS and HVDC (Professional Elective – IV)**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C406.1		To acquire the knowledge on transmission interconnections, flow of Power in an AC System, limits of the loading capability, dynamic stability considerations of a transmission interconnection and controllable parameters.					
C406.2		To acquire basic concepts, definitions of flexible ac transmission systems and benefits from FACTS technology and FACTS controllers					
C406.3		To Describe series Controllers Thyristor-Controlled Series Capacitor (TCSC) and the Static Synchronous Series Compensator (SSSC) for control of the transmission line current and advantages of HVDC power transmission, overview and organization of HVDC system.					
C406.4		To acquire the basic components of a converter, the methods for compensating the reactive power demanded by the converter and converter control for HVDC systems, commutation failure, control functions					
DEPARTMENT	**EEE**	**SEMESTER**	**7**	**COURSE CODE**	**15EE752**	**COURSE ID**	**C407**
COURSE TITLE		**Testing and Commissioning of Electrical Apparatus (Professional Elective – IV)**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C407.1		Discuss different types of tools and apparatus required for installation, maintenance, repair work of electrical equipment and underground cables according to India Electricity Rules.					
C407.2		Identify the specifications, installation and commissioning testing procedure of various electrical equipment and underground cables.					
C407.3		Analyze the specifications, Installation and testing of the electrical equipment and underground cables					
C407.4		Decide the testing and installation methods required for electrical equipment and underground cables depending on the condition of the site.					
DEPARTMENT	**EEE**	**SEMESTER**	**7**	**COURSE CODE**	**15EEL76**	**COURSE ID**	**C408**
COURSE TITLE		**Power System Simulation Laboratory**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C408.1		Describe the parameters of transmission line, synchronous machine, fault, swing curve, load flow analysis and economic load dispatch in the power system					

C408.2		Explain the concepts of transmission line, synchronous machine, fault, swing curve, load flow analysis and economic load dispatch in the power system					
C408.3		Apply various numerical techniques to perform load flow analysis, economic load dispatch problem, different types of faults and calculate various transmission line and synchronous machine parameters of a given power system using Matlab/Mipower.					
DEPARTMENT	**EEE**	**SEMESTER**	**7**	**COURSE CODE**	**15EEL77**	**COURSE ID**	**C409**
COURSE TITLE		**Relay and High Voltage laboratory**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C409.1		Define the operating characteristics of different types of relay, HVAC, HVDC and differentiate different dielectric medium.					
C409.2		Predict the operating time of different types of relay, breakdown strength of air and liquid dielectric medium.					
C409.3		Demonstrate the operating characteristics of different types of relays and spark over characteristics of air and liquid dielectric medium and calculate the capacitance of parallel plate capacitor and co-axial cable.					
DEPARTMENT	**EEE**	**SEMESTER**	**7**	**COURSE CODE**	**15EEP78**	**COURSE ID**	**C4010**
COURSE TITLE		**Project Phase – I + Seminar**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C4010.1		Demonstrate a sound technical knowledge of their selected project topic.					
C4010.2		Undertake problem identification, formulation and solution.					
C4010.3		Design engineering solutions to complex problems utilizing a systems approach					
C4010.4		Communicate with engineers and the community at large in written an oral forms.					
C4010.5		Demonstrate the knowledge, skills and attitudes of a professional engineer.					
M.Tech							
DEPARTMENT	**EEE**	**SEMESTER**	**3**	**COURSE CODE**	**18EPS31**	**COURSE ID**	**C201**
COURSE TITLE		**HVDC Power Transmission**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C201.1		Explain the importance of DC power transmission, the methods for simulation of HVDC systems and its control, the protection of HVDC system and other converter configurations used for the HVDC transmission, the recent trends for HVDC applications ,different converter configurations.					
C201.2		Discuss basic components of a converter, the methods for compensating reactive power demanded by the converter, the elimination of harmonics using filters , the characteristics of the system impedance resulting from AC filter designs, the design techniques for the main components of an HVDC system, commutation failure, interaction between HVDC and AC power systems					
C201.3		Design the main components of an HVDC system, main circuit of hvdc systems, control for HVDC Systems					

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DEPARTMENT	EEE	SEMESTER	3	COURSE CODE	18EPS322	COURSE ID	C202
COURSE TITLE		Power System Reliability (Professional elective-3)					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C202.1		Evaluate the reliability of complex distribution systems.					
C202.2		Perform power system analysis including different aspects such as need, availability, and adequacy.					
C202.3		Explain various concepts and evaluation techniques that can be used to assess operational risk					
C202.4		Explain probability concepts for generating capacity reliability evaluation.					
DEPARTMENT	EEE	SEMESTER	3	COURSE CODE	18EPS332	COURSE ID	C203
COURSE TITLE		Integration of Renewable Energy (Professional elective-4)					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C203.1		To choose DC architecture or AC architecture for integration of smart grid and inverter control voltage and current in distributed generation systems.					
C203.2		To explain parallel operation of inverters and power converter topologies in distributed generation systems.					
C203.3		To apply voltage and current control to three-phase four wire distributed generation in island mode.					
C203.4		To analyze and assess power flow control of a single distributed generating unit, control of voltage, current in distributed generation system stability and PWM rectifier control for three-phase distributed generation system					
DEPARTMENT	EEE	SEMESTER	3	COURSE CODE	18EPS34	COURSE ID	C204
COURSE TITLE		Evaluation of Project phase -1					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C204.1		Demonstrate an ability to identify and formulate a hypothesis for a given problem and test through appropriate experiments.					
C204.2		Apply relevant modern tools to solve the chosen technical problem.					
C204.3		Analyze and evaluate the experimental results and propose suitable modifications to improve performance.					
C204.4		Work effectively as a member or a leader of a team.					
C204.5		Communicate technical content effectively through written report and oral presentations.					
DEPARTMENT	EEE	SEMESTER	3	COURSE CODE	18EPSI35	COURSE ID	C205
COURSE TITLE		Internship					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C205.1		Gain practical experience within industry in which the internship is done					
C205.2		Apply knowledge and skills learned to classroom work.					
C205.3		Develop a greater understanding about career options while more clearly defining personal career goals.					
C205.4		Develop and refine oral and written communication skills					
DEPARTMENT	EEE	SEMESTER	2	COURSE CODE	18ELE23	COURSE ID	C113
COURSE TITLE		BASIC ELECTRICAL ENGINEERING					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					

C113.1		Analyze DC and AC circuits.					
C113.2		Identify DC and AC machines, domestic wiring and protective devices required for particular application.					
C113.3		Implement electrical and electromagnetic laws to solve problems on DC and AC circuits and machines.					
C113.4		Explain the constructional and working principle of DC and AC machines.					
DEPARTMENT	**EEE**	**SEMESTER**	**2**	**COURSE CODE**	**18ELEL27**	**COURSE ID**	**C117**
COURSE TITLE		**BASIC ELECTRICAL ENGINEERING LABORATORY**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C117.1		Conduct experiments on DC and AC circuits.					
C117.2		Conduct experiments on safety aspects, wiring and consumption of electrical power.					
C117.3		Understand the basic concepts of AC and DC machines, fuses, MCB and UPS					
C117.4		Demonstrate the usage of different electrical measuring instruments.					
DEPARTMENT	**EEE**	**SEMESTER**	**4**	**COURSE CODE**	**18MAT41**	**COURSE ID**	**C211**
COURSE TITLE		**Engineering Mathematics-IV**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C211.1		Identify the numerical techniques to solve the problems, special functions, complex variables, probability, sampling theory and stochastic process.					
C211.2		Compute the solutions using numerical techniques, special functions, complex variables, probability, sampling theory and stochastic process.					
C211.3		Interpret the solutions using numerical techniques, special functions, complex variables, probability, sampling theory and stochastic process.					
DEPARTMENT	**EEE**	**SEMESTER**	**4**	**COURSE CODE**	**18EE42**	**COURSE ID**	**C212**
COURSE TITLE		**Power Generation and Economics**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C212.1		Describe the general layout/arrangement, advantages/Disadvantages, working of major equipment and auxiliaries used in conventional power plants and substations.					
C212.2		Classify substations and explain the importance of grounding.					
C212.3		Sketch Hydrograph, load curve, load duration curve, flow duration curve, mass curve for hydro power plant and Bus bar arrangement schemes in Substations.					
C212.4		Analyze the economic features of Conventional power plants.					
DEPARTMENT	**EEE**	**SEMESTER**	**4**	**COURSE CODE**	**18EE43**	**COURSE ID**	**C213**
COURSE TITLE		**Transmission and Distribution**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C213.1		Analyze the performance of transmission line with the effect of sag, wind, ice & different parameters.					
C213.2		Develop the mathematical models of different types of transmission lines and assess their performance.					
C213.3		Discuss/Describe reliability & quality of distribution systems, advantages of different transmission & distribution system &					

		types of conductors & supporting structures.					
C213.4		Describe the various parameters of transmission system, selection of insulators, importance of sag corona & lightening, types of distribution systems & grading.					
DEPARTMENT	**EEE**	**SEMESTER**	**4**	**COURSE CODE**	**18EE44**	**COURSE ID**	**C214**
COURSE TITLE		**Electric Motors**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C214.1		Analyze the performance of AC and DC motors.					
C214.2		Employ the most suitable method of starting and speed control for AC and DC motors and to solve problems on AC and DC motors.					
C214.3		Explain the performance characteristics of AC and DC motors for different modes of operation.					
DEPARTMENT	**EEE**	**SEMESTER**	**4**	**COURSE CODE**	**18EE45**	**COURSE ID**	**C215**
COURSE TITLE		**Electromagnetic Field Theory**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C215.1		Apply the concepts of vectors and its operation in solving problems associated with static, steady and time varying fields.					
C215.2		Apply the laws of Electrostatics, Magnetostatics and Electromagnetics in developing Maxwell's equations for static and time varying fields.					
C215.3		Analyze the performance of electromagnetic fields and waves using Maxwell's equation in different media and also at the boundaries.					
C215.4		Develop the relationship between electric and magnetic fields under steady conditions					
DEPARTMENT	**EEE**	**SEMESTER**	**4**	**COURSE CODE**	**18EE46**	**COURSE ID**	**C216**
COURSE TITLE		**Linear ICs and Applications**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C216.1		Design and develop models using linear integrated circuits for a given specification.					
C216.2		Analyze the working of different applications of op-amps.					
C216.3		Solve problems related to op-amps, timers, voltage regulators and PLL.					
C216.4		Understand the basics of linear integrated circuits (op-amps, timers, voltage regulators and PLL)					
DEPARTMENT	**EEE**	**SEMESTER**	**4**	**COURSE CODE**	18EEL47	**COURSE ID**	**C217**
COURSE TITLE		**Electrical Machines Laboratory**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C217.1		Test DC machines to determine their characteristics and also to control the speed of DC motor					
C217.2		Pre-determine the performance characteristics of DC machines by conducting suitable tests.					
C217.3		Perform load test on single phase and three phase induction motor to assess its performance.					
C217.4		Conduct test on induction motor and on a synchronous motor to pre-determine the performance characteristics.					
DEPARTMENT	**EEE**	**SEMESTER**	**4**	**COURSE**	**18EEL48**	**COURSE ID**	**C218**

				CODE			
COURSE TITLE		**Linear ICs and Applications Laboratory**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C218.1		Design and build various linear integrated circuits.					
C218.2		Troubleshoot and test various linear integrated circuits.					
C218.3		Apply the concepts of electronics of electronic components in designing and building various linear integrated circuits.					
DEPARTMENT	**EEE**	**SEMESTER**	**6**	**COURSE CODE**	17EE61	**COURSE ID**	**C311**
COURSE TITLE		**Control Systems**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C311.1		Develop mathematical models of open loop and closed loop physical systems.					
C311.2		Analyze time response and frequency response of a control system.					
C311.3		Determine the stability of a system in the time and frequency domain through different methods.					
C311.4		Develop a control system model in continuous and discrete time using state variable techniques.					
DEPARTMENT	**EEE**	**SEMESTER**	**6**	**COURSE CODE**	17EE62	**COURSE ID**	**C312**
COURSE TITLE		**Power System Analysis-I**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C312.1		• Describe representation of power system in its equitant circuit and in one line diagram, • Define symmetrical and Unsymmetrical faults and system stability					
C312.2		• Understand per unit system, symmetrical components and classify the faults and its severity. • Explain about power system stability and the dynamics of synchronous machine					
C312.3		Use the tool of symmetrical components and per unit system for fault calculations and equal area criterion for stability calculation.					
C312.4		Analyze different faults in the power system and examine the stability conditions of the system					
DEPARTMENT	**EEE**	**SEMESTER**	**6**	**COURSE CODE**	17EE63	**COURSE ID**	**C313**
COURSE TITLE		**Digital Signal Processing**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C313.1		Apply fast and efficient algorithms for computing DFT and inverse DFT of a given sequence					
C313.2		Design infinite impulse response Butterworth and Chebyshev digital filters using impulse invariant / bilinear transformation technique.					
C313.3		Design FIR filters by use of window function or by frequency sampling method.					
C313.4		Realize a digital IIR filter by direct, cascade, parallel and ladder methods of realization.					
DEPARTMENT	**EEE**	**SEMESTER**	**6**	**COURSE CODE**	17EE64	**COURSE ID**	**C314**
COURSE TITLE		**Electrical Machine Design**					

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COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C314.1		Design overall dimensions of AC and DC machines based on Specific Loadings					
C314.2		To carry out a detailed design of AC and DC machines					
C314.3		Examine various performance indices of the designed AC and DC machines as per specified constraints/standards					
C314.4		Explain the factors to be considered in selecting the materials for design of various parts of electrical machines					
DEPARTMENT	**EEE**	**SEMESTER**	**6**	**COURSE CODE**	**17EE651**	**COURSE ID**	**C315**
COURSE TITLE		**Computer Aided Electrical Drawing (Professional Elective-II)**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C315.1		Design the sectional views of Transformers, DC machines and Alternators.					
C315.2		Develop a layout for substation using the standard symbols for substation equipment					
C315.3		To interpret the notations and formulas required and design the winding diagrams of AC and DC machines.					
DEPARTMENT	**EEE**	**SEMESTER**	**6**	**COURSE CODE**	**17EE663**	**COURSE ID**	**C316**
COURSE TITLE		**Batteries and Fuel Cells for Commercial, Military and Space Applications (Open Elective-II)**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C316.1		Able to discuss the performance capabilities and limitations of rechargeable batteries and fuel cells					
C316.2		Able to discuss fuel cells that are best suited for applications where electrical power requirements vary between several kilowatts (kW) to a few megawatts (MW)					
C316.3		Able to discuss the high-power batteries currently used by EVs and HEVs and various next-generation rechargeable batteries best suited for all-electric cars, EVs, and HEVs.					
C316.4		Able to explain the design aspects and performance characteristics of micro-and nano-batteries best suited for detection, sensing, and monitoring devices.					
DEPARTMENT	**EEE**	**SEMESTER**	**6**	**COURSE CODE**	**17EE662**	**COURSE ID**	**C317**
COURSE TITLE		**Sensors and Transducers (Open Elective-II)**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C317.1		Understand the operating principle of different sensors, transducers.					
C317.2		Apply the knowledge of sensors and transducers to measure non electrical parameters.					
C317.3		Analyze and evaluate the performance of different sensors, transducers based systems					
C317.4		Create a systems using appropriate sensor for measuring Electrical and non Electrical quantities					
DEPARTMENT	**EEE**	**SEMESTER**	**6**	**COURSE CODE**	**17EEL67**	**COURSE ID**	**C318**
COURSE TITLE		**Control System Laboratory**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					

C318.1		Use software package or discrete components in assessing the time and frequency domain reposes of a given second order system and to study the effect of P, PI, PD and PID controller and Lead compensator on the step response of the system.					
C318.2		Design and analyze Lead, Lag and Lag – Lead compensators for given specifications					
C318.3		Write a script files to plot root locus, bode plot, Nyquist plots to study the stability of the system using a software package.					
C318.4		Determine the performance characteristics of ac and dc servomotors and synchro-transmitter receiver pair used in control systems					
DEPARTMENT	**EEE**	**SEMESTER**	**6**	**COURSE CODE**	**17EEL68**	**COURSE ID**	**C319**
COURSE TITLE		**Digital Signal Processing Laboratory**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C319.1		Give physical interpretation of sampling theorem					
C319.2		Evaluate the impulse response of a system.					
C319.3		To solve the Difference Equation					
C319.4		Perform convolution of given sequences to evaluate the response of a system.					
C319.5		Compute DFT and IDFT of a given sequence using the basic definition and/or fast methods.					
C319.6		Design and implement IIR and FIR filters					
DEPARTMENT	**EEE**	**SEMESTER**	**8**	**COURSE CODE**	**15EE81**	**COURSE ID**	**C411**
COURSE TITLE		**Power System Operation and Control**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C411.1		Illustrate the concepts of operation, monitoring, control, security and reliability of power system.					
C411.2		Apply the numerical, analytical and optimal solutions of power system problems.					
C411.3		Analyze the economic operation, control by AGC and LFC, contingency, state estimation and stability of power system.					
C411.4		Model LFC, AGC and AVR for single and two area power systems.					
DEPARTMENT	**EEE**	**SEMESTER**	**8**	**COURSE CODE**	**15EE82**	**COURSE ID**	**C412**
COURSE TITLE		**Industrial Drives and Applications**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C412.1		Analyse the performance of electric drives and stability limits.					
C412.2		Examine the speed control, multi-quadrant operation, braking and starting methods for different types of drives using power electronic controllers.					
C412.3		To calculate drive parameters and control parameters for the given situation					
DEPARTMENT	**EEE**	**SEMESTER**	**8**	**COURSE CODE**	**15EE831**	**COURSE ID**	**C413**
COURSE TITLE		**Smart Grid (Professional Elective-5)**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C413.1		To acquire the knowledge and design concepts of smart grid					
C413.2		To learn D C distribution concept and intelligent grid architecture for the					

	smart grid						
C413.3	To acquire entrepreneurial qualities and their role in Dynamic energy system						
C413.4	To acquire end use electric efficient technology alternatives, market implementation and their policies.						
DEPARTMENT	**EEE**	**SEMESTER**	**8**	**COURSE CODE**	**15EE833**	**COURSE ID**	**C414**
COURSE TITLE	**Integration of Distributed Generation (Professional Elective-5)**						
COURSE OUTCOME NO	**COURSE OUTCOME STATEMENTS**						
C414.1	Evaluate the quantum of power that can be harnessed from different sources of energy.						
C414.2	Examine the impact of distributed generation on power quality, overloading of lines and voltage.						
C414.3	Apply numerical and probabilistic approach for the design of distribution feeder integrated with distributed generation and statistical approach for hosting capacity determination.						
DEPARTMENT	**EEE**	**SEMESTER**	**8**	**COURSE CODE**	**15EE84**	**COURSE ID**	**C415**
COURSE TITLE	**Internship / Professional Practice**						
COURSE OUTCOME NO	**COURSE OUTCOME STATEMENTS**						
C415.1	Gain practical experience within industry in which the internship is done						
C415.2	Apply knowledge and skills learned to classroom work.						
C415.3	Develop a greater understanding about career options while more clearly defining personal career goals.						
C415.4	Develop and refine oral and written communication skills						
DEPARTMENT	**EEE**	**SEMESTER**	**8**	**COURSE CODE**	**15EEP85**	**COURSE ID**	**C416**
COURSE TITLE	**Project Work Phase -II**						
COURSE OUTCOME NO	**COURSE OUTCOME STATEMENTS**						
C416.1	Demonstrate an ability to identify and formulate a hypothesis for a given problem and test through appropriate experiments.						
C416.2	Apply relevant modern tools to solve the chosen technical problem.						
C416.3	Analyze and evaluate the experimental results and propose suitable modifications to improve performance.						
C416.4	Work effectively as a member or a leader of a team.						
C416.5	Communicate technical content effectively through written report and oral presentations.						
DEPARTMENT	**EEE**	**SEMESTER**	**8**	**COURSE CODE**	**15EES86**	**COURSE ID**	**C417**
COURSE TITLE	**Seminar**						
COURSE OUTCOME NO	**COURSE OUTCOME STATEMENTS**						
C417.1	Attain, use and develop knowledge in the field of electrical and electronics engineering and other disciplines through independent learning and collaborative study.						
C417.2	Identify, understand and discuss current, real-time issues						
C417.3	Improve oral and written communication skills						
C417.4	Explore an appreciation of the self in relation to its larger diverse social and academic contexts.						

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Department of Electrical & Electronics Engineering

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M.Tech

DEPARTMENT	**EEE**	**SEMESTER**	**4**	**COURSE CODE**	**18EPS41**	**COURSE ID**	**C211**
COURSE TITLE		**Project work phase -2**					
COURSE OUTCOME NO		**COURSE OUTCOME STATEMENTS**					
C211.1		Demonstrate an ability to identify and formulate a hypothesis for a given problem and test through appropriate experiments.					
C211.2		Apply relevant modern tools to solve the chosen technical problem.					
C211.3		Analyze and evaluate the experimental results and propose suitable modifications to improve performance.					
C211.4		Work effectively as a member or a leader of a team.					
C211.5		Communicate technical content effectively through written report and oral presentations.					