



**SIR C R REDDY COLLEGE OF ENGINEERING**  
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**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**  
**Course Outcomes (A.U 2015-2019 & 2016-2020)**

**I Year Semester – I:**

<b>COURSE</b>	<b>CO NO</b>	<b>COURSE OUTCOME DESCRIPTION</b>
English	C111.1	Apply the four language learning skills-listening, speaking, reading, writing (LSRW) for professional success.
	C111.2	Employ knowledge of grammatical structures and vocabulary in speech and writing
	C111.3	Apply effective communication skills to enhance professional possibilities.
	C111.4	Develop acceptable personality traits suitable for chosen profession.
Mathematics I	C112.1	Apply the partial differentiation techniques to solve certain problem arise in engineering.
	C112.2	Solve the Differential Equations of first order and first degree related to various engineering applications.
	C112.3	Solve the linear higher order differential equations with constant coefficients.
	C112.4	Examine the nature, interval of convergence of infinite series.
Mathematics II	C113.1	Solve system of linear simultaneous equations of various matrix methods.
	C113.2	Apply Eigen value computation techniques to reduce a given quadratic to canonical form
	C113.3	Apply Laplace transforms functions for solving ordinary differential equations.
	C113.4	Apply special functions to evaluate improper integrals.
Physics	C114.1	Learn the laws of Thermodynamics, efficiency of heat engine and their importance in Engineering.
	C114.2	Study the importance of Maxwell equations in electromagnetic fields.
	C114.3	Gains the knowledge of optical phenomena and identify their importance in Engineering.
	C114.4	Understand the working of Lasers & its propagation through Optical fibers and importance of Ultrasonic waves in engineering applications.
	C114.5	Acquire the knowledge of Superconductors, Nanomaterials and their utilization in various applications.
Engineering Graphics	C115.1	Construct polygons and draw curves used in engineering applications
	C115.2	Construct scales, Apply concept of orthographic projection to project points and lines parallel to one reference planes.
	C115.3	Produce orthographic projections of lines inclined to both the reference planes.
	C115.4	Produce orthographic projections of planes inclined to both the reference planes.
	C115.5	Produce orthographic projections of regular solids inclined to both the reference planes.
PEHV	C116.1	Understand the values in education and real life
	C116.2	Understand the values in respective professions and analyze the ethical role of engineers
	C116.3	Understand the concept of harmony in life and moral responsibility of engineers
Physics Lab	C117.1	Apply the knowledge of different phenomena of light like interference, diffraction and handle various optical measuring instruments.
	C117.2	Verify the laws of thermo dynamics, electro magnetism and stretched string.
	C117.3	Draw the relevance between theoretical knowledge and the means to imply it in a practical manner by performing various relative experiments
Workshop	C118.1	Follow necessary safety precautions while operating equipment and tools to avoid accidents in workshop.
	C118.2	Apply wood working knowledge in making simple wood joints by selecting appropriate carpentry tools.
	C118.3	Apply development of surfaces concept in producing simple sheet metal works with the use appropriate sheet metal tools.
	C118.4	Prepare simple fitting joints with the use of proper fitting tools

I Year Semester – II:		
COURSE	CO NO	COURSE OUTCOME DESCRIPTION
Mathematics III	C121.1	Apply the concept of lines, planes, spheres and the students are through in defining and evaluating geometric figure.
	C121.2	Solve double and triple integrals to find areas and volumes.
	C121.3	Apply special functions to evaluate improper integrals.
	C121.4	Compute Fourier series for different function and also half range series certain types of functions.
Chemistry	C122.1	Select the methods used for purification of water for domestic and industrial purposes
	C122.2	Identify the advantages and limitations of plastics, building materials and their use in day to day life
	C122.3	Select the suitable methods of corrosion control.
	C122.4	Identify the fuels which are commonly used and their economics, advantages and limitations.
Computer Programming Numerical Methods	C123.1	Students will be able to identify appropriate C language constructs to solve problems
	C123.2	Understand the concepts of homogeneous data types to solve different problems
	C123.3	Apply the concepts of function modules, its usage and memory allocation using pointers
	C123.4	Understand the concepts of heterogeneous data types and file handling feature in C
	C123.5	Solve system of linear algebraic equations and apply Newton's forward & backward interpolation for equal intervals, Lagrange's formulae for unequal intervals
	C123.6	Describe the concept of numerical integration and numerical solutions of differential equations
History Science &Technology	C124.1	Able to understand about the scientific history of India, a particular period's of Indian cultural habitats and the how to improvements of science and tech.
	C124.2	Able to understand about policy resolution statements of India, and CSIR activities.
	C124.3	Able to understand the applications Bio-technology & its applications like DNA finger printing, cloning, Tissue culture.
	C124.4	Able to understand about the Indian Defense research and their imp. & ocean development and biological resources, & research institutions. understand about the Indian satellites, launch vehicle technology, types of satellites etc., technology transfer and fore casting
Engineering Mechanics &Strength of Materials	C125.1	Analyze the system of forces acting on rigid bodies by FBD's
	C125.2	Apply laws of friction to find friction forces acting on the rigid bodies
	C125.3	Find Moment of Inertia of plane laminas by locating its Centroid
	C125.4	Analyze the frames and trusses to find internal forces in rigid members
	C125.5	Analyze motion parameters of bodies both in translation and rotation(D Alemberts Principle)
	C125.6	Apply work- Energy and Impulse-momentum methods to find motion parameters of a moving bodies.
Chemistry Lab	C126.1	Select the methods used for purification of water for domestic and industrial purposes
	C126.2	Identify the advantages and limitations of plastics, building materials and their use in day to day life
	C126.3	Select the suitable methods of corrosion control.
	C126.4	Identify the fuels which are commonly used and their economics, advantages and limitations.
	C126.5	Obtain the knowledge of semiconductors, super conductors and liquid crystals
CPNM Lab	C127.1	Students will have a fundamental idea about computer programming concept
	C127.2	Students will have a fundamental idea to prepare algorithm and flowchart to solve simple engineering problems
	C127.3	Students will have a fundamental idea to write C program to solve simple engineering programs using control statements, arrays and functions
	C127.4	Students will have a fundamental idea to write C program to solve simple engineering programs using pointers, function call by value and function call by reference
	C127.5	Students will have a fundamental idea to write C program to solve simple engineering programs using structures and files
	C127.6	Students will have a fundamental idea about sources of errors in numerical methods
English Language Lab	C128.1	Recognize the sounds of English with the help of audio visual aids
	C128.2	Build confidence and overcome inhibitions while speaking in English.
	C128.3	Demonstrate acquired language skills in performing the designated activity.

II- Year Semester – I:		
COURSE	CO NO	COURSE OUTCOME DESCRIPTION
Mathematics-IV	C211.1	Apply the concept of vector differentiation and find scalar potential.
	C211.2	Apply the concept of vector integration theorems to find scalar potential.
	C211.3	Analyze and Apply the partial differentiation in physical problems
	C211.4	Apply the concept of Fourier transform to evaluate the given integral
Network Theory	C212.1	Develop an understanding of the basic fundamental electrical laws, elements of electric Networks.
	C212.2	Apply the basic theorems to solve DC Circuits
	C212.3	Analyze the basic concepts of DC Transients
	C212.4	Analyze the concepts of sinusoidal steady state analysis and resonance
	C212.5	Apply the Laplace transform techniques to solve electrical network problems
	C212.6	Determine various network parameters for the given two port networks
Electro Magnetic Fields	C213.1	Acquire knowledge on Coordinate systems, electrostatics, Magneto statics, Basic Laws, Maxwell's equations, Basic properties of materials
	C213.2	Ability to calculate electric field and magnetic field for different charge configurations.
	C213.3	Illustrate Electrostatics and Magneto statics Boundary conditions.
	C213.4	To differentiate and analyze energy stored in the electromagnetic fields by using the Electrostatics & Magneto statics.
	C213.5	Ability to learn the concepts on time varying fields and get ability to calculate energy of electromagnetic wave by using EMF concepts
Electronic Devices & Circuits	C214.1	Able to describe the basic concept of diodes and transistors.
	C214.2	Able to summarize the operation of rectifiers with and without filters
	C214.3	Ability to analyze various characteristics of different configurations of transistor
	C214.4	Able to analyze oscillators and amplifiers
	C214.5	Able to express the concepts of MOSFET, IGBT, FET.
Fluid Mechanics and Hydraulic Machines	C215.1	Familiarize the concepts of continuum, properties of fluid, pressure variation and measurement, pressure on submerged bodies, Hydraulic machines.
	C215.2	Explain various flow lines, types of flows, fluid kinematics, equations of functions.
	C215.3	Apply conservation laws to fluid flow problems in engineering applications.
	C215.4	Calculate and solve flow problems.
	C215.5	Design the working proportions of hydraulic machines.
Thermal Prime Movers	C216.1	To apply basic laws and concepts of Thermodynamics
	C216.2	To understand the constructional features operational details of various components of thermal prime movers
	C216.3	To analyze steam properties by standard steam data tables and charts
	C216.4	To determine the performances of various thermal prime movers based on the thermodynamic properties of its working substance
Networks Lab	C217.1	Apply Kirchhoff's current and voltage law to simple circuits and Solve complex circuits using Mesh & Nodal Methods
	C217.2	Apply Network theorems to solve simple and complex linear circuits
	C217.3	Solve the Series and Parallel resonance circuit; analyze the performance of single & double tuned circuits
	C217.4	Develop the Transient response of RLC circuits using Laplace Transform; Explain the characteristics of Two port networks
Electronic Devices & Circuits Lab	C218.1	Analyse the operation of devices like diodes, transistors and FETs practically
	C218.2	Design electronic circuits using basic devices
	C218.3	Design rectifier circuits with and without filters
FM&HM Lab	C219.1	Able to apply fluid properties and principles to various flow measuring devices
	C219.2	Able to calibrate flow measuring devices
	C219.3	Analyze the performance of hydraulic turbine and pumps under different working conditions

II- Year Semester – II:		
COURSE	CO NO	COURSE OUTCOME DESCRIPTION
Electrical Machines-I	C221.1	summarize the basics and principle of operation of DC machines and Transformer
	C221.2	Distinguishing the fundamental parts of DC machines and Transformer
	C221.3	Assessing the Performance of DC machines and Transformer
	C221.4	identify possible applications of different DC machines and Transformers for a given requirement
Electrical Measurements	C222.1	Ability to illustrate about Electrical Measurements and classify various analog meters.
	C222.2	Ability to illustrate about Magnetic Measurements
	C222.3	Able to identify, design & decide various Bridge Methods to measure Resistance, Inductance, Mutual Inductance, Capacitance & Frequency parameters.
	C222.4	Ability to detect Potentiometers for particular measurement and applications.
	C222.5	Ability to explain Instrument Transformers and their errors
Digital Logic Design	C223.1	Acquiring knowledge on different numbering systems, binary addition and subtraction, 2's complement representation and operations with this representation and understand the different binary codes.
	C223.2	Explain switching algebra theorems and apply them for logic functions
	C223.3	Identify the importance of SOP and POS canonical forms in the minimization or other optimization of Boolean formulas in general and digital circuits. .
	C223.4	Evaluate functions using various types of minimizing algorithms like Boolean algebra, Karnaugh map or tabulation method.
	C223.5	Analyze the design procedures of Combinational & sequential logic circuits.
Signals, Systems and Synthesis	C224.1	Students will be able to identify the different types of signals and systems.
	C224.2	Students will be able to evaluate the Fourier Series of periodic signals.
	C224.3	Students will be able to apply Fourier Transforms of signals by making use of properties and also able to apply sampling theorem for converting a continuous time signal to the discrete time domain.
	C224.4	Students will be able to use z-transform for analyzing discrete time signals and systems.
	C224.5	Students will be able to analyze a discrete time LTI system using discrete linear convolution and also able to Synthesize a given network.
Analog Electronic circuits	C225.1	Analyze the various multistage and feedback amplifier circuits.
	C225.2	Calculate the frequency of oscillation for various Oscillator circuits
	C225.3	Differentiate various types of power amplifiers and tuned amplifiers
	C225.4	Describe the parameters and applications of operational amplifiers.
Environmental Science	C226.1	Ability to acquire knowledge about the importance of environment & availability of resources
	C226.2	Describe different environmental challenges induced due to anthropogenic activities as well as nature.
	C226.3	Able to identify the solutions to the environmental problems for the sake of healthy life by protecting our natural resources.
	C226.4	Create awareness on the social issues, environmental protection acts
	C226.5	Able to understand the environmental impact of developmental activities.
Electrical Machines-I Lab	C227.1	Examining the characteristics of different dc machines transformers and predict specific applications of those machines accordingly.
	C227.2	compare the speed control method of different types of DC motors
	C227.3	estimating the parameters of equivalent circuit of transformers
	C227.4	Measuring various losses in dc machines and transformers by conducting suitable tests.
Thermal Prime movers Lab	C228.1	Perform experimental investigation on a 4 cylinder 4 Stroke diesel engine to determine FP, IP and BP.
	C228.2	Conduct load tests on single and twin cylinder diesel engines to calculate Power and efficiencies.
	C228.3	Conduct a test on a single cylinder diesel engine to draw heat balance sheet .
	C228.4	Determine the economical speed by conducting experiment on a 4S 4 cylinder diesel engine.
	C228.5	Draw valve timing diagram of 4S diesel engine. .
	C228.6	Describe Boilers, IC Engines, Steam engines and Gas Turbines.
Analog Electronic Circuits Lab	C229.1	Analyze various amplifier circuits and observe the frequency response.
	C229.2	Compute the frequency for various Oscillator circuits
	C229.3	Design the various applications and compute different parameters of Op-amp.

III- Year Semester – I:		
COURSE	CO NO	COURSE OUTCOME DESCRIPTION
Power System-I	C311.1	Ability to understand choice of site , merits and demerits of various power generating stations
	C311.2	Ability to identify understand the operational aspects of various power generating stations
	C311.3	Able to understanding the renewable energy technologies
	C311.4	Ability to evaluate various economical and operational aspects of power generation
Pulse & Digital Circuits	C312.1	Recognize the need of linear and non-linear wave shaping circuits
	C312.2	Describe the operation of time base generators and logic families
	C312.3	Apply the concept of synchronization and frequency division in pulse circuits and implement logic gates using diodes and transistors.
	C312.4	Distinguish different multi-vibrators with respect to biasing and triggering schemes
Electrical Machines-II	C313.1	Annotating the construction and principle of operation of different kinds of rotating AC machines
	C313.2	Ability to experimenting on Ac <b>Machines</b> to find the performance characteristics.
	C313.3	Appraise the purpose for parallel operation of generators and learn the conditions to be satisfied for this.
	C313.4	Illustrate the construction, operation and characteristics of commonly used special purpose machines.
Control Systems	C314.1	Able to describe the concepts of Control systems and mathematical modeling of the system.
	C314.2	Able to analyze feedback characteristics of linear control system to reduce the disturbance.
	C314.3	Able to differentiate the basics of linear time-invariant control system.
	C314.4	Able to analyze time response of first and second order control systems for different standard test signals.
	C314.5	Able to perform frequency domain analysis of linear control system using bode plot and nyquist stability criterion
Elective-I LIC Communication Systems DBMS	C315.1	Derive the characteristics of operational amplifiers
	C315.2	Analyze linear and nonlinear applications using operational amplifiers
	C315.3	Analyze and design Butterworth filters using operational amplifiers
	C315.4	Analyze various functional Ics and DACs, ADCs
Elective-II CAO DSP IT	C316.1	Analyse different continuous and discrete time signals
	C316.2	Evaluate concept of Fourier transform, Z-transform to analyze the operations on signals and acquire knowledge about systems.
	C316.3	Select proper tools for analog to digital and digital to analog conversion .also select proper tools for time domain and frequency domain implementations.
	C316.4	Formulate fast Fourier transform(FFT) algorithms for faster realization of signals and systems
	C316.5	Design, implementation and analysis of digital filters for processing of discrete time by use FIR and IIR techniques.
Electrical Machines Lab II	C317.1	Choosing methods for testing of different electrical machines to identify their performance
	C317.2	Estimating equivalent circuit parameters of three phase Induction motor
	C317.3	Experimenting the process of 'synchronization' of a generator to the live bus bar and method of starting a synchronous motor.
	C317.4	Distinguish the operational features of synchronous machines and induction machines.
PDC Lab	C318.1	Observe the output response of linear and non linear wave shaping circuits.
	C318.2	Compute the frequency for various Multi-vibrator circuits and sweep circuits
	C318.3	Design Logic gates with discrete components and observe truth tables.
Electrical Measurements Lab	C319.1	Able to identify ac and dc analog meters
	C319.2	Able to design ac and dc bridges
	C319.3	Able to test dielectric strength of various insulating oils
	C319.4	Able to test induction type energy meter and electro dynamo wattmeter
	C319.5	Able to arrange various types of power measurement circuit by various methods

III- Year Semester – II:		
COURSE	CO NO	COURSE OUTCOME DESCRIPTION
Power System-II	C321.1	Student is able to differentiate Various transmission systems and power distribution systems.
	C321.2	Student is able to apply various methods for transmission line modeling and economic aspects
	C321.3	Student is be able to determine Transmission line parameters, power loss due to corona of an electrical power system
	C321.4	Student is able to Evaluate Potential distributions over a string Insulators. Insulation stress present in cables.
	C321.5	Student is able to design power transmission towers for different voltage levels, insulators & climatic conditions.
Microprocessor and Micro-Controllers	C322.1	Ability to draw the basic architecture of 8085, 8086 microprocessors, and 8051 microcontrollers.
	C322.2	Applying an instruction set of 8085 and 8051 to solve the problems
	C322.3	Ability to interfacing the data transfer, data conversion, interrupting, timing, display, and other peripheral devices to 8085MP and 8051MC.
	C322.4	Ability to design and develop 8085 Microprocessor and 8051 microcontroller-based systems for real-time applications using low-level language like ALP
Power Electronics	C323.1	Able to explain the characteristics of various power electronic elements and able to build simple power electronic circuits
	C323.2	Able to analyze theoperation and waveforms for phase controlled converters.
	C323.3	Able to analyze theoperation and waveforms choppers and inverters
	C323.4	Able to describe AC voltage controllers and cyclo converters operation
	C323.5	Able to apply knowledge of modulation techniques for inverters in real time projects
Electric Drives and Traction	C324.1	Ability to explain basics of Electric drives, operating characteristics, loading conditions and torques.
	C324.2	Able to illustrate speed control of dc motors by employing power electronic devices.
	C324.3	Able to illustrate speed control of ac motors by employing power electronic devices.
	C324.4	Ability to explain concepts of electric traction and control of traction motors.
Elective-III Energy Management and Auditing UEE Power Station Practice	C325.1	Illustrate different methods of production of heat and heating systems in industries
	C325.2	Illustrate different methods of welding in industries
	C325.3	Gaining knowledge of different methods of production of light, lighting systems, illumination levels for various purposes light fittings, flood lighting ,street lighting
	C325.4	Conveying the knowledge of air conditioning and refrigeration
	C325.5	Design the house wiring and knowledge of safety precautions
Elective-IV NCES DCS Electrical Machine Design	C326.1	Classify Non-Conventional sources of energy technologies
	C326.2	Compare various Solar energy technologies and Collectors operations
	C326.3	Analyze Photovoltaic systems and their Applications
	C326.4	Emphasize various Wind power sources, bio energy, chemical energy, MHD, geothermal energy,
Control Systems Lab	C327.1	Illustrate to find time response of given control system model
	C327.2	Design of Lead, Lag, Lead-Lag systems in control systems
	C327.3	Plot Root Locus and Bode plots for given control system model
	C327.4	Examine the basic knowledge on practical control system applications on machines & electronic devices like ac servo motor, synchro and magnetic amplifier
	C327.5	Design PID controllers for given control system model
Power Electronics Lab	C328.1	Able to Elucidate the basic operation of various power semiconductor devices and passive components.
	C328.2	Able to analyze the performance of different Ac-Dc power electronic circuits for different loads
	C328.3	Able to analyze the performance of different Dc-Dc power electronic circuits for different loads
	C328.4	Examine the basic knowledge on practical converter applications to Motors

Micro-processor and micro-controllers Lab	C329.1	Ability to write assembly language program using 8085 micro processor
	C329.2	Ability to interface 8085 with I/O and other devices.
	C329.3	Ability to write assembly language program using 8051 microcontroller
	C329.4	Ability to write assembly language program using 8085 micro processor
<b>IV- Year Semester – I:</b>		
<b>COURSE</b>	<b>CO NO</b>	<b>COURSE OUTCOME DESCRIPTION</b>
Power System Analysis & Stability	C411.1	Analyze Per Unit representation of Power System.
	C411.2	Formulate network Matrix and solve Load flow Studies
	C411.3	Solve the Symmetrical Components and Unsymmetrical Components of Power system
	C411.4	Analyze the various types of faults on an unloaded alternator
	C411.5	Enumerate the concepts of Power System Stability swing equation, critical clearing angle calculation elementary real world applications
Power System Protection	C412.1	Ability to Define Protection Schemes, Relays and Switch Gear
	C412.2	Able to Explain Protection Schemes of Alternators, Transmission Lines, Transformers, Relays and Switch Gear
	C412.3	Able to Differentiate Protection Schemes, Relays Technology and Switch Gear
	C412.4	Able to Sketch Protection Circuits, AC and DC Relays, Fuses and Circuit Breakers in LV and MV Switch Gear
	C412.5	Able to Predict which type of Relay, Fuse and Circuit Breaker are suitable for a particular application
Engineering Economics	C413.1	Adopt the fundamental Economic concepts for decision making and forward planning. Also know law of demand and its exceptions, to use different forecasting methods for predicting demand for various products and services
	C413.2	Describe causes and features of different types of market structures and business organizations and should be familiar with steps, methods & sources of raising capital by business undertaking.
	C413.3	Ability to learn the concepts and functions of management, scientific management and entrepreneurship, in traditional and modern theories.
	C413.4	Apply the concepts & principles of management in real life industry at different levels like production, marketing, financial etc.
	C413.5	Outline different types of capital, raising methods and depreciation analysis and determine the break-even point
Power Systems Operation and Control	C414.1	Apply optimization techniques for economic operation of thermal and hydro - thermal power plants
	C414.2	Solve unit commitment problem and optimal power flow problem using optimization techniques
	C414.3	Design automatic generation controller (AGC) and automatic voltage regulator (AVR) systems for single area power system and two area power system
	C414.4	Apply security analysis techniques to enhance security level of power systems
	C414.5	Evaluate power system measurement data through state estimation techniques
Elective-V HVDC Transmission ACS EDS	C415.1	Describe the Control System Components like Servomotors, Magnetic Amplifier, Synchro's, Metadyne, Amplidyne etc.
	C415.2	Applications of practical control systems
	C415.3	Analyze the stability of Multi input and Multi output systems
	C415.4	Design the Compensators using Root Locus and Bode Plots
Elective-VI Operations Research FACTS Advanced Power Electronics	C416.1	Analyse conventional & emerging transmission network controls
	C416.2	Explain various FACTS Devices for power flow control
	C416.3	Emphasize various converters employed in FACTS technology
	C416.4	Analyse different series and shunt compensation techniques
	C416.5	Extend the knowledge of active & reactive power flow control with UPFC and IPFC
Power System Simulation Lab	C417.1	Ability to apply iterative techniques for power flow analysis
	C417.2	Ability to model and design stability and dynamics of single and two area bus system in power system
	C417.3	Ability to acquire knowledge on Fault analysis.
	C417.4	Solve the economic dispatch problems

Power System Protection Lab	C418.1	Analyze the performance of transmission lines and relays
	C418.2	Calculate the steady-state power flow in a power system
	C418.3	Analyze different types of short-circuit faults which occur in power systems
	C418.4	Analyze the performance of transmission lines and relays
<b>IV- Year Semester – II:</b>		
<b>COURSE</b>	<b>CO NO</b>	<b>COURSE OUTCOME DESCRIPTION</b>
Internship/ Project Work	C421.1	Apply the electrical knowledge to solve practical problems.
	C421.2	Designing the circuit to implement the projects.
	C421.3	Simulate /Emulate the Electrical and Electronics Models.
	C421.4	Design and implement engineering solutions for real time applications.



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Head of the Dept.  
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