



**SIR C R REDDY COLLEGE OF ENGINEERING**  
**ELURU-534007, WEST GODAVARI DIST, ANDHRA PRADESH, INDIA**  
**(Approved by AICTE, New Delhi & Affiliated to JNTUK, Kakinada)**  
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**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**  
**Course Outcomes(JNTUK, R16 Regulation)**

**I Year Semester – I:**

COURSE	CO NO	COURSE OUTCOMES DESCRIPTION
English-I	R161101.1	Maximize the practice of four language learning skills-listening, speaking, reading, writing (LSRW)
	R161101.2	Analyse the basic concepts of grammar and usage
	R161101.3	Build vocabulary to facilitate good communication
	R161101.4	Develop acceptable personality traits to become leaders
Mathematics-I	R161102.1	Apply the ordinary differential equation of first order, higher order differential equations and concerned applications
	R161102.2	Solve Laplace Transforms and apply to linear differential equations
	R161102.3	Understand Apply the partial differentiation in physical problem
	R161102.4	Solve linear PDE with constant coefficients and classifying second order PDE.
Applied Chemistry	R161106.1	"Understand the advantages and limitations of plastic materials and their use in day to day life. "
	R161106.2	Identify the fuels which are commonly used and their economics, advantages and limitations.
	R161106.3	Select the suitable methods of corrosion control.
	R161106.4	Recognize the need of awareness of materials like nano materials, liquid crystals and their uses.
	R161106.5	Apply the knowledge of various conducting materials used in electronic devices.
	R161106.6	Apply the knowledge for utilization of non conventional energy sources
Engineering Mechanics	R161111.1	Calculate frictional force by resolving the forces into components, moment of force
	R161111.2	Draw complete and correctly labelled Free Body Diagrams of rigid bodies or systems of rigid bodies in static equilibrium
	R161111.3	Compute the Centroid and the Centre of gravity of 2-D bodies using the method of composite area
	R161111.4	Analyse the properties of surfaces & solids in relation to moment of inertia.
	R161111.5	Apply fundamental concepts of kinematics and kinetics of particles to the analysis of simple, practical problems
	R161111.6	Determine the complete motion of a rigid body resulting from an application of a system of forces, using work energy and impulse momentum principles

Computer Programming	R161107.1	Gains the knowledge on Computer Hardware, Software concepts, Writing Algorithms, Drawing Flowcharts, Writing, Compiling and Executing simple C programs in Linux environment.
	R161107.2	Distinguishes branching, iteration and data representation using Arrays and Strings.
	R161107.3	Constructs programs using Modular programming and Recursive solution formulation.
	R161107.4	Explains working with pointers and how they are used to allocate memory dynamically and Uses miscellaneous aspects like enum, typedef, structure and union types in applications.
	R161107.5	Explains operations on files and working with different types of files.
Environmental Studies	R161108.1	Ability to acquire knowledge about the importance of environment & availability of resources.
	R161108.2	Understand different environmental challenges induced due to anthropogenic activities as well as nature.
	R161108.3	Able to identify the solutions to the environmental problems for the sake of healthy life by protecting our natural resources.
	R161108.4	Create awareness on the social issues, environmental protection acts.
Applied/Engineering Chemistry Laboratory-I	R161122.1	Analyze the knowledge of volumetric analysis to find out the concentration of given compounds using various indicators.
	R161122.2	Demonstrate various analytical instruments used for quantitative analysis.
English-Communication Skills Laboratory-I	R161114.1	To make students recognize the sounds of english through audio visual aids
	R161114.2	To help students build their confidence and help overcome their inhibitions and self consciousness while speaking in english
	R161114.3	To familiarize the students with stress and intonation and enable them to speak english effectively.
C Programming Laboratory	R161119.1	Understand various computer components, Installation of software. C programming development environment, compiling, debugging, and linking and executing a program using the development environment.
	R161119.2	Analyzing the complexity of problems, Modularize the problems into small modules and then convert them into programs.
	R161119.3	Construct programs that demonstrate effective use of C features including arrays, strings, structures, pointers and files.
	R161119.4	Apply and practice logical ability to solve the real world problems.
<b><u>I Year Semester – II:</u></b>		
<b>COURSE</b>	<b>CO NO</b>	<b>COURSE OUTCOMES DESCRIPTION</b>
English-II	R161201.1	Maximize the practice of four language learning skills – Listening, Speaking, Reading and Writing (LSRW Skills)
	R161201.2	Analyze the basic concepts of grammar and usage
	R161201.3	Build vocabulary to facilitate good communication
	R161201.4	Develop acceptable personality traits to become leaders
Mathematics-II	R161202.1	Solve system of linear algebraic equations and Apply Newton's forward & backward interpolation for equal intervals, Lagrange's formulae for unequal intervals
	R161202.2	Describe the concept of numerical integration and numerical solutions of differential equations
	R161202.3	Apply Fourier series to the given function and also apply the concept of Fourier transform to evaluate the given integral
	R161202.4	Solve the problems of Wave, Heat and Laplace equation using partial differential equations

Mathematics-III	R161203.1	Apply the Matrix methods to reduce a given Quadratic form into Canonical form
	R161203.2	Solve double and triple integrals to find areas and volumes
	R161203.3	Apply special functions to evaluate improper integrals
	R161203.4	Apply the concept of vector differentiation and vector integration theorems to find scalar potential
Applied Physics	R161207.1	Able to apply the knowledge of different phenomena of light in daily life.
	R161207.2	Characterize the coherent sources over ordinary sources and gain knowledge in the basic concepts and different structures of crystals.
	R161207.3	Able to differentiate the properties of the materials based on the response in electric and magnetic fields.
	R161207.4	Analyse the theories developed in the study of electron transport mechanism of metals in the view of quantum picture of sub atomic world.
	R161207.5	Ability to gain the basic knowledge in semiconductor physics.
Electrical Circuits Analysis-I	R161208.1	To Understand passive and active elements for electric networks
	R161208.2	To observe the waveforms for single phase circuits using AC
	R161208.3	To study the RLC series and parallel waveforms
	R161208.4	To Understand magnetic circuits using Dot convention
	R161208.5	To solve the Electric circuit problems using different theorems
Engineering Drawing	R161206.1	Construct polygons and draw curves used in engineering applications
	R161206.2	Construct scales, Apply concept of orthographic projection to project points and lines parallel to one reference planes.
	R161206.3	Produce orthographic projections of lines inclined to both the reference planes.
	R161206.4	Produce orthographic projections of planes inclined to both the reference planes.
	R161206.5	Produce orthographic projections of regular solids inclined to both the reference planes.
	R161206.6	Represent objects in 3D view through isometric views from orthographic views and vice versa
English-Communication Skills Laboratory-II	R161221.1	To make students recognize the sounds of english through audio visual aids
	R161221.2	To help students build their confidence and help overcome their inhibitions and self consciousness while speaking in English
	R161221.3	To familiarize the students with stress and intonation and enable them to speak english effectively.
Applied / Engineering Physics Laboratory	R161225.1	Apply the knowledge of different phenomena of light like interference, diffraction and handle various optical measuring instruments.
	R161225.2	Analyze various electronic circuits and its components and verify the laws of stretched string.
	R161225.3	Draw the relevance between theoretical knowledge and the means to imply it in a practical manner by performing various relative experiments

Engg. Workshop & IT Workshop	R161224.1	Apply wood working knowledge in making simple wooden joints
	R161224.2	Apply the development of surfaces concept in producing simple sheet metal works
	R161224.3	Prepare simple fitting joints with the use of proper fitting tools
<b><u>II Year Semester – I:</u></b>		
<b>COURSE</b>	<b>CO NO</b>	<b>COURSE OUTCOMES DESCRIPTION</b>
Electrical circuits analysis-II	R1621021.1	Classify different forms of electrical circuits based on components, supply and structures
	R1621021.2	Determine the response of different electrical circuits
	R1621021.3	Analyze the response of Electrical circuits with different excitations
	R1621021.4	Realize electrical equivalent network for the given transfer function & network parameters
	R1621021.5	Apply Laplace and Fourier Transforms to electrical circuits.
Electrical machines – I	R1621022.1	summarize the basics and principle of operation of DC machines and Transformer
	R1621022.2	Distinguishing the fundamental parts of DC machines and Transformer
	R1621022.3	Assessing the Performance of DC machines and Transformer
	R1621022.4	identify possible applications of different DC machines and Transformers for a given requirement
Basic electronics and devices	R1621023.1	Demonstrate the concepts of Semiconductor physics
	R1621023.2	Illustrate the operational characteristics of various Semiconductor devices
	R1621023.3	Analyze the operation of rectifiers ,filters ,Oscillators and Amplifiers.
	R1621023.4	classify different power semiconductor devices
Electromagnetic fields	R1621024.1	Acquire knowledge on Coordinate systems, electrostatics, Magneto statics, Basic Laws, Maxwell's equations, Basic properties of materials
	R1621024.2	Ability to calculate electric field and magnetic field for different charge configurations.
	R1621024.3	Illustrate Electrostatics and Magneto statics Boundary conditions.
	R1621024.4	To differentiate and analyze energy stored in the electromagnetic fields by using the Electrostatics & Magneto statics.
	R1621024.5	Ability to learn the concepts on time varying fields and get ability to calculate energy of electromagnetic wave by using EMF concepts
Thermal and hydro prime movers	R1621025.1	To apply basic laws and concepts of Thermodynamics
	R1621025.2	To understand the constructional features operational details of various components of thermal prime movers
	R1621025.3	To analyze steam properties by standard steam data tables and charts
	R1621025.4	To determine the performances of various thermal prime movers based on the thermodynamic properties of its working substance
Managerial economics & Financial Analysis	R1621026.1	Able to determine the objectives and able to know the nature and scope of Managerial Economics.
	R1621026.2	Predict the demand of products and services by using different methods, Examine Optimum Production, economies of scale, production, production functions, and optimum size of the firm, cost, cost behavior and Break Even Point.
	R1621026.3	Gain knowledge on price and market structure, behaviour of consumer and producer under competitive market situations.
	R1621026.4	Differentiate the types of business organizations and scope the methodology involved in their establishment.
	R1621026.5	Discuss the process & principles of accounting and prepare Journal, Ledger, Trial Balance, Manufacturing A/c, Trading A/c., Profit & Loss A/c. and Balance Sheet of an enterprise

Thermal and hydro laboratory	R1621027.1	Perform experimental investigation on a 4 cylinder 4 Stroke diesel engine to determine FP, IP and BP.
	R1621027.2	Conduct load tests on single and twin cylinder diesel engines to calculate Power and efficiencies.
	R1621027.3	Conduct a test on a single cylinder diesel engine to draw heat balance sheet.
	R1621027.4	Determine the economical speed by conducting experiment on a 4S 4 cylinder diesel engine.
	R1621027.5	Draw valve timing diagram of 4S diesel engine..
	R1621027.6	Describe Boilers, IC Engines, Steam engines and Gas Turbines.
Electrical circuits laboratory	R1621028.1	Apply and Verify the Principals of various theorems.
	R1621028.2	Implement and Compute Self & Mutual inductance ,Various Parameter for Electrical Network
	R1621028.3	Evaluate and analyze the characteristics of resonant circuits
<b><u>II Year Semester – II:</u></b>		
<b>COURSE</b>	<b>CO NO</b>	<b>COURSE OUTCOMES DESCRIPTION</b>
Electrical measurements	R1622021.1	Able to choose right type of instrument for measurement of voltage and current for ac and dc.
	R1622021.2	Able to choose right type of instrument for measurement of power and energy – able to calibrate energy meter by suitable method.
	R1622021.3	Able to calibrate ammeter and potentiometer.
	R1622021.4	Able to select suitable bridge for measurement of electrical parameters.
	R1622021.5	Able to use the ballistic galvanometer and flux meter for magnetic measuring instruments and also to measure frequency and phase difference between signals using CRO.
Electrical machines-II	R1622022.1	Annotating the construction and principle of operation of different kinds of rotating AC machines
	R1622022.2	Ability to experimenting on Ac Machines to find the performance characteristics.
	R1622022.3	Appraise the purpose for parallel operation of generators and learn the conditions to be satisfied for this.
	R1622022.4	Illustrate the construction, operation and characteristics of commonly used special purpose machines.
Switching theory and logic design	R1622023.1	Understand concepts of digital circuits i.e. Number Systems logic gates realization & minimization.
	R1622023.2	Apply the principles of Boolean algebra for the design of various Combinational circuits.
	R1622023.3	Apply the concept of Combinational circuits for the design of various sequential circuits, i.e. synchronous and asynchronous sequential circuits.
	R1622023.4	Apply the concept of Boolean algebra for the design of various combination circuits
	R1622023.5	Analysis of various Filp Flops and registers
Control systems	R1622024.1	Ability to derive the transfer function of physical systems and determination of overall transfer function using block diagram algebra and signal flow graphs. Understand the control system Components.
	R1622024.2	Capability to determine time response specifications of second order systems and to determine error constants. o Acquires the skill to analyze absolute and relative stability of LTI systems using Routh's stability criterion and the root locus method.
	R1622024.3	Capable to analyze the stability of LTI systems using frequency response methods.
	R1622024.4	Able to design Lag, Lead, Lag-Lead compensators to improve system performance from Bode diagrams.
	R1622024.5	Ability to represent physical systems as state models and determine the response. Understanding the concepts of controllability and observability.

Power systems-I	R1622025.1	Identify the different components of thermal power plants.
	R1622025.2	Identify the different components of nuclear Power plants.
	R1622025.3	Distinguish between AC/DC distribution systems and also estimate voltage drops of distribution systems.
	R1622025.4	Classify the different components of air and gas insulated substations.
	R1622025.5	Categorize single core and multi core cables with different insulating materials.
	R1622025.6	Analyze the different economic factors of power generation and tariffs.
Management science	R1622026.1	Able to apply the concepts & principles of management in real life industry, and Able to design & develop organization chart & structure for an enterprise.
	R1622026.2	Able to apply PPC techniques, Quality Control, Work-study principles in real life industry. Able to maintain Materials departments, & Determine
	R1622026.3	Able to apply the concepts of HRM in Recruitment, Selection, Training & Development.
	R1622026.4	Able to develop PERT/CPM Charts for projects of an enterprise and estimate time & cost of project.
	R1622026.5	Able to develop Mission, Objectives, Goals & strategies for an enterprise in dynamic environment.
	R1622026.6	Able to understand & apply modern management techniques MIS, ERP, MRP, TQM, CMM, SCM, BPO, BPR, Bench Marking and Balance Score Card wherever possible.
Electrical machines-I laboratory	R1622027.1	Examining the characteristics of different dc machines transformers and predict specific applications of those machines accordingly.
	R1622027.2	compare the speed control method of different types of DC motors
	R1622027.3	estimating the parameters of equivalent circuit of transformers
	R1622027.4	Measuring various losses in dc machines and transformers by conducting suitable tests.
Electronic devices & circuits Laboratory	R1622028.1	Analyse the operation of devices like diodes, transistors and FETs practically
	R1622028.2	Design electronic circuits using basic devices
	R1622028.3	Design rectifier circuits with and without filters
<b>III Year Semester – I:</b>		
<b>COURSE</b>	<b>CO NO</b>	<b>COURSE OUTCOMES DESCRIPTION</b>
Power Systems – II	R1631021.1	Student is able to differentiate Various transmission systems and power distribution systems.
	R1631021.2	Student is able to apply various methods for transmission line modeling and economic aspects
	R1631021.3	Student is be able to determine Transmission line parameters, power loss due to corona of an electrical power system
	R1631021.4	Student is able to Evaluate Potential distributions over a string Insulators. Insulation stress present in cables.
	R1631021.5	Student is able to design power transmission towers for different voltage levels, insulators & climatic conditions.
Renewable Energy Sources	R1631022.1	Classify Non-Conventional sources of energy technologies
	R1631022.2	Compare various Solar energy technologies and Collectors operations
	R1631022.3	Analyze Photovoltaic systems and their Applications.
	R1631022.4	Emphasize various Wind power sources, bio energy, chemical energy, MHD, geothermal energy, ocean energy systems.

Signals and systems	R1631023.1	Characterize the signals and systems and principles of vector spaces, Concept of orthogonality
	R1631023.2	Analyze the continuous-time signals and continuous-time systems using Fourier series, Fourier transform and Laplace transform
	R1631023.3	Apply sampling theorem to convert continuous-time signals to discrete-time signal and reconstruct back
	R1631023.4	Analyze the linear systems in time and frequency domains
	R1631023.5	Apply z-transform to analyze discrete-time signals and systems
Pulse & digital circuits	R1631024.1	Recognize the need of linear and non-linear wave shaping circuits
	R1631024.2	Describe the operation of time base generators and logic families
	R1631024.3	Apply the concept of synchronization and frequency division in pulse circuits and implement logic gates using diodes and transistors.
	R1631024.4	Distinguish different multivibrators with respect to biasing and triggering schemes
Power electronics	R1631025.1	Able to explain the characteristics of various power electronic elements and able to build simple power electronic circuits
	R1631025.2	Able to analyze the operation and waveforms for phase controlled converters.
	R1631025.3	Able to analyze the operation and waveforms choppers and inverters
	R1631025.4	Able to describe AC voltage controllers and cyclo converters operation
	R1631025.5	Able to apply knowledge of modulation techniques for inverters in real time projects
Electrical machines-II laboratory	R1631026.1	Choosing methods for testing of different electrical machines to identify their performance
	R1631026.2	Estimating equivalent circuit parameters of three phase Induction motor
	R1631026.3	Experimenting the process of 'synchronization' of a generator to the live bus bar and method of starting a synchronous motor.
	R1631026.4	Distinguish the operational features of synchronous machines and induction machines.
Control systems laboratory	R1631027.1	Illustrate to find time response of given control system model
	R1631027.2	Design of Lead, Lag, Lead-Lag systems in control systems
	R1631027.3	Plot Root Locus and Bode plots for given control system model
	R1631027.4	Examine the basic knowledge on practical control system applications on machines & electronic devices like ac servo motor, synchro and magnetic amplifier
	R1631027.5	Design PID controllers for given control system model
Electrical measurements Laboratory	R1631028.1	Able to identify ac and dc analog meters
	R1631028.2	Able to design ac and dc bridges
	R1631028.3	Able to test dielectric strength of various insulating oils
	R1631028.4	Able to test induction type energy meter and electro dynamo wattmeter
	R1631028.5	Able to arrange various types of power measurement circuit by various methods
<b><u>III Year Semester – II:</u></b>		
<b>COURSE</b>	<b>CO NO</b>	<b>COURSE OUTCOMES DESCRIPTION</b>
Power Electronics Controllers & Drives	R1632021.1	Able to learn the fundamentals of electric drive and different electric braking methods
	R1632021.2	Able to differentiate the converter control of dc motors in various quadrants.
	R1632021.3	Able to Analyze the concept of speed control of induction motor by using AC voltage controllers and voltage source inverters
	R1632021.4	Able to Implement the speed control mechanism of synchronous motors

Power System Analysis	R1632022.1	Analyze Per Unit representation of Power System
	R1632022.2	Formulation of network Matrix and describing Load flow Studies.
	R1632022.3	Solve the Symmetrical Components and Unsymmetrical Components of Power system.
	R1632022.4	Description of the various types of faults on an unloaded alternator.
	R1632022.5	Enumerate the concepts of Power System Stability swing equation, critical clearing angle calculation elementary real world applications.
Micro Processor & Micro Controllers	R1632023.1	Ability to draw the basic architecture of 8086 microprocessor ,8051 and PIC microcontroller.
	R1632023.2	Applying instruction set of 8086 ,8051 and PIC to solve the problems
	R1632023.3	Ability to interfacing the data transfer, data conversion, interrupting, timing, display and other peripheral devices to 8086MP and 8051MC.
	R1632023.4	Ability to design and develop 8086 Microprocessor and 8051 microcontroller based systems for real time applications using low level language like ALP.
Data Structures	R1632024.1	Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented inmemory and used by algorithm
	R1632024.2	Discuss the computational efficiency of the principal algorithms for sorting, searching, and hashing.
	R1632024.3	Demonstrate different methods for traversing trees and Graphs
	R1632024.4	Solve various algorithm design techniques for developing algorithms.
Neural networks & Fuzzy Logic (Open Elective)	R163202E.1	Describe the structure and working of biological and artificial neurons and explain their various models.
	R163202E.2	Describe various ANN architectures and explain their learning rules.
	R163202E.3	Classify classical and fuzzy sets and explain properties, operations, and relations of fuzzy sets.
	R163202E.4	Explain fuzzification and de-fuzzification methods of a Fuzzy logic controler
	R163202E.5	Apply Neural Networks and Fuzzy Logic to typical Electrical Engineering problems.
Power Electronics Laboratory	R1632026.1	Able to Elucidate the basic operation of various power semiconductor devices and passive components.
	R1632026.2	Able to analyze the performance of different Ac-Dc power electronic circuits for different loads
	R1632026.3	Able to analyze the performance of different Dc-Dc power electronic circuits for different loads
	R1632026.4	Examine the basic knowledge on practical converter applications to Motors
Micro Processor & Micro Controllers Laboratory	R1632027.1	Ability to write assembly language program using 8085 micro processor
	R1632027.2	Ability to interface 8085 with I/O and other devices.
	R1632027.3	Ability to write assembly language program using 8051 microcontroller
	R1632027.4	Ability to write assembly language program using 8085 micro processor
Data Structures Laboratory	R1632028.1	To develop skills to design and analyze simple linear and non linear data structures
	R1632028.2	To Strengthen the ability to identify and apply the suitable data structure for the given real world problem
	R1632028.3	To Gain knowledge in practical applications of data structures



**IV Year Semester – I:**

<b>COURSE</b>	<b>CO NO</b>	<b>COURSE OUTCOMES DESCRIPTION</b>
Utilization of Electrical Energy	R1641021.1	Students will be able to interpret appropriate and desirable motors for the working and applications of various drives used by industry for effective utilization of electrical power.
	R1641021.2	Students are able to demonstrate different methods of heating and welding systems in industries
	R1641021.3	Students are able to choose various illumination levels produced by different illuminating sources.
	R1641021.4	Students are able to recommend the most efficient illuminating sources and also be able to design different lighting systems
	R1641021.5	Students are able to determine the Speed-Time characteristics and to estimate energy consumption levels of different types of traction motors.
Linear & Digital IC Applications	R1641022.1	Understand the basic operation & performance parameters of differential amplifiers.
	R1641022.2	Understand & learn the performance parameters of OP-AMP.
	R1641022.3	Learn the linear and non-linear applications of operational amplifiers.
	R1641022.4	Analyze & design of different types of active filters using op-amps.
	R1641022.5	Learn the internal structure, operation and applications of different analog ICs.
	R1641022.6	Learn the concept of differ types of analog to digital & digital to analog converters.
Power System Operation & Control	R1641023.1	Determine optimal scheduling of thermal and hydro-thermal power plants using Lagrange optimisation technique.
	R1641023.2	Solve optimal unit commitment problem in power plants using Priority Ordering and Dynamic Programming techniques.
	R1641023.3	Design an automatic active power/frequency controller (AGC/ALFC) for single area and two area power systems and analyse its performance.
	R1641023.4	Evaluate how reactive power compensation improves the performance of transmission lines.
Switchgear & Protection	R1641024.1	Ability to demonstrate power system protection schemes, relays, switchgear and grounding
	R1641024.2	Able to explain protection schemes of alternators, transmission lines, transformers, over voltage protection, groundings, relays and switchgear
	R1641024.3	Able to compare protection scheme, groundings, relays technology and switchgear
	R1641024.4	Able to sketch model grounding schemes, relays ,circuit breakers and over voltage protective devices
	R1641024.5	Able to identify which type of relay, circuit Breaker, over voltage protective devices and grounding methods are suitable for particular applications.
Advanced Control Systems	R164102B.1	Formulate state model using state space analysis
	R164102B.2	Design state feedback control through pole placement and describe the concepts of Controllability and Observability
	R164102B.3	Analyse Nonlinear Control systems using describing function method, phase plane analysis, lypnov stability analysis.
	R164102B.4	Formulation of Euler laugrange Equation for optimization
	R164102B.5	Solving Linear quadratic optimal regulator problem and Riccati equation.

Electric Power Quality	R164102F.1	Differentiate different types of power quality problems
	R164102F.2	Detect sources of transients, voltage sags, swells, harmonics and long duration voltage variations and study power quality standards
	R164102F.3	Propose solutions for power quality problems
	R164102F.4	Demonstrate the relationship between distributed generation and power quality
	R164102F.5	Explain the power quality monitoring concepts and the usage of measuring instruments.
Electric Simulation Laboratory	R1641027.1	Ability to simulate integrator circuit, differentiator circuit, Boost converter, Buck converter, full convertor and PWM inverter.
	R1641027.2	Ability to simulate transmission line by incorporating line, load and transformer models.
	R1641027.3	Ability to perform transient analysis of RLC circuit and single machine connected to infinite bus(SMIB).
Power Systems & Simulation Laboratory	R1641028.1	Ability to apply iterative techniques for power flow analysis
	R1641028.2	Ability to model and design stability and dynamics of single and two area bus system in power system
	R1641028.3	Ability to acquire knowledge on Fault analysis.
	R1641028.4	Solve the economic dispatch problems
<b><u>IV Year Semester – II:</u></b>		
<b>COURSE</b>	<b>CO NO</b>	<b>COURSE OUTCOMES DESCRIPTION</b>
Digital Control Systems	R1642021.1	Acquire a working knowledge of discrete system science-related mathematics
	R1642021.2	Analyze digital control systems using transform techniques (frequency response)
	R1642021.3	Analyze and design of discrete systems in state variable analysis
	R1642021.4	To relate the concepts of stability analysis and design digital devices to satisfy given specifications and to achieve desired system response.
HVDC Transmission	R1642022.1	Able to explain concepts on hvdc systems, converters, harmonics, filters
	R1642022.2	Able to illustrate control on power flow during normal and abnormal conditions
	R1642022.3	Ability to compare hvdc systems, converters, converter faults, harmonics, filters
	R1642022.4	Able to analyze the adverse effect of harmonics, converter faults, reactive power, filter design, converter circuit on hvdc system
	R1642022.5	Able to predict best hvdc system, converters, control technique for power flow, filters for particular application
Electrical Distribution Systems	R1642023.1	Describe the Control System Components like Servomotors, Magnetic Amplifier, Synchro's, Metadyne, Amplidyne etc.
	R1642023.2	Applications of practical control systems
	R1642023.3	Analyze the stability of Multi input and Multi output systems
	R1642023.4	Design the Compensators using Root Locus and Bode Plots
	R1642023.5	Describe the Control System Components like Servomotors, Magnetic Amplifier, Synchro's, Metadyne, Amplidyne etc.
High Voltage Engineering	R164202A.1	Understand electric field distribution in different electrode configurations and methods of computation.
	R164202A.2	Analyse breakdown mechanism in gaseous, liquid, solid dielectrics
	R164202A.3	Evaluate various methods of generation and measurement of AC, DC and impulse high voltages and high currents.
	R164202A.4	Analyse various methods of non-destructive testing of materials and high voltage testing for electrical apparatus.

Flexible Alternating Current Transmission	R164202B.1	Analyse conventional & emerging transmission network controls
	R164202B.2	Explain various FACTS Devices for power flow control
	R164202B.3	Emphasize various converters employed in FACTS technology
	R164202B.4	Analyse different series and shunt compensation techniques
	R164202B.5	Extend the knowledge of active & reactive power flow control with UPFC and IPFC
Seminar	R1642025.1	Students are able to identify and analyze the real time system problems
	R1642025.2	Students are able to adapt the latest technology and current trends in the field of respective areas
	R1642025.3	Students able to analyze documents and present technical reports
	R1642025.4	Students are able to participate in discussions for assessment of knowledge
	R1642025.5	Students are able to adapt professional ethics
project	R1642026.1	Apply the Electrical Knowledge to solve practical problems
	R1642026.2	Designing the circuit to implement the projects
	R1642026.3	Simulate and Emulate the Electrical and Electronics models
	R1642026.4	Design and Implement Engineering Solutions for real time application