



Annamacharya Institute of Technology and Sciences, Tirupati
(AUTONOMOUS)
Department of Electrical and Electronics Engineering
Course Outcomes (COs)
AK22 Regulations

AK22 PG Course Outcomes:

Course Name	Course Outcomes:
POWER SYSTEMS ANALYSIS (22DPC8201)	CO1: Calculate voltage phasors at all buses , given the data using various methods of load flow
	CO2: Calculate fault currents in each phase
	CO3: Rank various contingencies according to their severity
	CO4: Estimate the bus voltage phasors given various quantities viz. power flow, voltages, taps , CB status etc
	CO5: Estimate closeness to voltage collapse and calculate PV curves using continuation power flow
Power Systems Dynamics-I (22DPC8202)	CO1: Understand the modeling of synchronous machine in details.
	CO2: Carry out simulation studies of power system dynamics using MATLAB-SIMULINK, MI-POWER.
	CO3: Carry out stability analysis with and without power system stabilizer (PSS).
	CO4: Understand the load modeling in power system.
Renewable Energy Systems (22DPE8201)	CO1: Knowledge about renewable energy
	CO2: Understand the working of distributed generation system in autonomous/grid Connected modes
	CO3: Know the Impact of Distributed Generation on Power System
Smart Grids (22DPE8202)	CO1: Appreciate the difference between smart grid & conventional grid
	CO2: Apply smart metering concepts to industrial and commercial installations
	CO3: Formulate solutions in the areas of smart substations ,distributed generation and wide area measurements
	CO4: Come up with smart grid solutions using modern communication technologies
High Power Converter (22DPE8203)	CO1: Analyze various single phase and three phase power converters.
	CO2: Select and design DC - DC converter topologies for a broad range of power conversion applications.
	CO3: Develop improved power converters for any stringent application requirements.
	CO4: Design AC - AC converters for variable frequency applications.
Wind & Solar Systems (22DPE8204)	CO1: Appreciate the importance of energy growth of the power generation from the renewable energy sources and participate in solving these problems
	CO2: Demonstrate the knowledge of the physics of wind power and solar power generation and all associated issues so as to solve practical problems
	CO3: Demonstrate the knowledge of physics of solar power generation and the associated issues
	CO4: Identify, formulate and solve the problems of energy crises using wind and solar energy



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Electrical Power Distribution System (22DPE8205)	CO1: Knowledge of power distribution system
	CO2: Study of Distribution automation and its application in practice
	CO3: To learn SCADA system
Mathematical Methods for Power Engineering (22DPE8206)	CO1: Knowledge about vector spaces, linear transformation, eigen values and eigenvectors of linear operators
	CO2: To learn about linear programming problems and understanding the simplex method for solving linear programming problems in various fields of science and technology
	CO3: Acquire knowledge about nonlinear programming and various techniques used for solving constrained and unconstrained nonlinear programming problems
	CO4: Understanding the concept of random variables, functions of random variable and their probability distribution
	CO5: Understand stochastic processes and their classification
Pulse Width Modulation for PE Converters (22DPE8207)	CO1: Use the knowledge of PWM techniques in controlling different power electronic converters.
	CO2: Apply the knowledge of power electronics in design and analysis of DC-PWM converters.
	CO3: Design and analyze DC-AC and AC-DC converters and control their operation using PW techniques.
	CO4: Design and analyze different resonant converters and their control circuits
	CO5: Analyze AC – AC converters and multilevel converters.
Electric and Hybrid Vehicles (22DPE8208)	CO1: Acquire knowledge about fundamental concepts, principles, analysis and design of hybrid and electric vehicles.
	CO2: To learn electric drive in vehicles / traction.
Research Methodology and IPR (22MBA0110)	CO1: Understand the research problem and research process.
	CO2: Understand research ethics.
	CO3: Prepare a well -structured research paper and scientific presentations.
	CO4: Explore on various IPR components and process of filing.
	CO5: Understand the adequate knowledge on patent and rights.
English for Research Paper Writing (22DMC9901)	CO1: Improve Writing skills and level of readability
	CO2: Learn what to write in each section, avoiding plagiarism.
	CO3: Understand the review of research literature
	CO4: apply skills in writing a title, abstract and literature
	CO5: learn the skills of drafting summations.
Disaster Management (22DMC2001)	CO1: Learn to demonstrate a critical understanding of key concepts in disaster risk reduction and humanitarian response.
	CO2: Critically evaluate disaster risk reduction and humanitarian response policy and practice from multiple perspectives.
	CO3: Develop an understanding of standards of humanitarian response and practical relevance in specific types of disasters and conflict situations.
	CO4: Critically understand the strengths and weaknesses of disaster



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	management approaches, planning and programming in different countries, particularly their home country or the countries they work in
Sanskrit for Technical Knowledge (22DMC9902)	CO1: To get a working knowledge in illustrious Sanskrit, the scientific language in the world
	CO2: Learning of Sanskrit to improve brain functioning
	CO3: Understanding basic Sanskrit language
	CO4: Ancient Sanskrit literature about science & technology can be understood
	CO5: Being a logical language will help to develop logic in students
Value Education (22DMC9903)	CO1: Understand value of education and self- development
	CO2: Imbibe good values in students
	CO3: Let the students know about the importance of character
	CO4: Learn the importance of Human values
	CO5: Developing the overall personality
Power System Steady State Analysis Lab (22DPC8203)	CO1: Calculate voltage phasors at all buses , given the data using various methods of load flow
	CO2: Calculate fault currents in each phase
	CO3: Estimate closeness to voltage collapse and calculate PV curves using continuation power flow
Renewable Energy Lab (22DPC8204)	CO1: Knowledge about renewable energy
	CO2: Understand the working of distributed generation system in autonomous/grid Connected modes
	CO3: Know the Impact of Distributed Generation on Power System
Digital Protection of Power System (22DPC8205)	CO1: Learn the importance of Digital Relays.
	CO2: Apply Mathematical approach towards protection
	CO3: Learn to develop various Protection algorithms.
Power System Dynamics-II (22DPC8206)	CO1: Gain valuable insights into the phenomena of power system including obscure ones.
	CO2: Understand the power system stability problem.
	CO3: Analyze the stability problems and implement modern control strategies.
	CO4: Simulate small signal and large signal stability problems.
Restructured Power Systems (22DPE8209)	CO1: Learners will have knowledge on restructuring of power industry.
	CO2: Learners will attain knowledge about locational margin prices and financial.
	CO3: Learners will understand basics of congestion management.
Advanced Digital Signal Processing (22DPE8210)	CO1: Knowledge about the time domain and frequency domain representations as well analysis of discrete time signals and systems
	CO2: Study the design techniques for IIR and FIR filters and their realization structures.
	CO3: Acquire knowledge about the finite word length effects in implementation of digital filters.
	CO4: Knowledge about the various linear signal models and estimation of



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	power spectrum of stationary random
Dynamics of Electrical Machines (22DPE8211)	CO1: Formulation of Electrodynamical equations of all electric machines and analyze the performance characteristics
	CO2: Knowledge of transformations for the dynamic analysis of machines
	CO3:
	CO4: Study about synchronous machine
Power Apparatus Design (22DPE8212)	CO1: To give a systematic approach for modeling and analysis of all rotating machines Under both transient and steady state conditions with the dimensions and material used
	CO2: Ability to model and design all types of rotation machines including special machines
Advanced Micro-Controller Based Systems (22DPE8213)	CO1: To learn how to program a processor in assembly language and develop an advanced processor based system.
	CO2: To learn configuring and using different peripherals in a digital system.
	CO3: To compile and debug a Program.
	CO4: To generate an executable file and use it.
SCADA Systems and Applications (22DPE8214)	CO1: Describe the basic tasks of Supervisory Control Systems (SCADA) as well as their typical applications.
	CO2: Acquire knowledge about SCADA architecture, various advantages and disadvantages of each system.
	CO3: Knowledge about single unified standard architecture IEC 61850.
	CO4: To learn about SCADA system components: remote terminal units, PLCs, intelligent electronic devices, HMI systems, SCADA server.
	CO5: Learn and understand about SCADA applications in transmission and distribution sector, industries etc.
Artificial Intelligence Techniques (22DPE8215)	CO1: Learn the concepts of biological foundations of artificial neural networks
	CO2: Learn Feedback networks and radial basis function networks and fuzzy logics
	CO3: Identifications of fuzzy and neural network
	CO4: Acquire the knowledge of GA
Power Quality (22DPE8216)	CO1: Acquire knowledge about the harmonics, harmonic introducing devices and effect of harmonics on system equipment and loads
	CO2: Develop analytical modeling skills needed for modeling and analysis of harmonics in networks and components
	CO3: To introduce the student to active power factor correction based on static VAR compensators and its control techniques
	CO4: To introduce the student to series and shunt active power filtering techniques for harmonics.
Constitution of India (22DMC9904)	CO1: Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.
	CO2: Discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in



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	India.
	CO3: Discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution.
	CO4: Discuss the passage of the Hindu Code Bill of 1956.
	CO5: Understand the premises informing the twin themes of liberty and freedom from a civil rights perspective.
Pedagogy Studies (22DMC5801)	CO1: What pedagogical practices are being used by teachers in formal and informal classrooms in developing countries?
	CO2: What is the evidence on the effectiveness of these pedagogical practices, in what conditions, and with what population of learners?
	CO3: How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy? Perspective.
	CO4: Review existing evidence on the review topic to inform programme design and policy making undertaken by the DfID, other agencies and researchers.
	CO5: Identify critical evidence gaps to guide the development.
Stress Management by Yoga (22DMC9905)	CO1: Develop healthy mind in a healthy body thus improving social health also
	CO2: Improve efficiency
	CO3: To achieve overall health of body and mind
	CO4: To overcome stress
	CO5: Identify critical evidence gaps to guide the development.
Personality Development through Life Enlightenment Skills. (22DMC9906)	CO1: Study of Shrimad-Bhagwad-Geeta will help the student in developing his personality and achieve the highest goal in life
	CO2: The person who has studied Geeta will lead the nation and mankind to peace and prosperity
	CO3: Study of Neetishatakam will help in developing versatile personality of students.
	CO4: To become a person with stable mind, pleasing personality and determination
	CO5: To awaken wisdom in students
Power System Protection Lab (22DPC8207)	CO1: Analyze the protection of parallel, radial feeders & over voltage induction relay
	CO2: Understand the principle of Reverse Power protection
	CO3: Analyze the functioning of over voltage induction relay & Differential Relay
Artificial Intelligence Lab (22DPC8208)	CO1: Learn the concepts of biological foundations of artificial neural networks
	CO2: Learn Feedback networks and radial basis function networks and fuzzy logics
	CO3: Identifications of fuzzy and neural network



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	CO4: Acquire the knowledge of GA
Power System Transients (22DPE8217)	CO1: Knowledge of various transients that could occur in power system and their mathematical Formulation.
	CO2: Ability to design various protective devices in power system for protecting equipment and Personnel.
	CO3: Coordinating the insulation of various equipments in power system.
	CO4: Modeling the power system for transient analysis
FACTS and Custom Power Devices (22DPE8218)	CO1: Acquire knowledge about the fundamental principles of Passive and Active Reactive Power Compensation Schemes at Transmission and Distribution level in Power Systems.
	CO2: Learn various Static VAR Compensation Schemes like Thyristor/GTO Controlled Reactive Power Systems; PWM Inverter based Reactive Power Systems and their controls.
	CO3: To develop analytical modeling skills needed for modeling and analysis of such Static VARS systems.
Industrial Load Modeling & Control (22DPE8219)	CO1: Know about load control techniques in industries and its application
	CO2: Learn different types of industrial processes and optimize the process using tools like LINDO and LINGO
	CO3: Apply load management to reduce demand of electricity during peak time
	CO4: Apply different energy saving opportunities in industries
Dynamics Of Linear Systems (22DPE8220)	CO1: To learn linear system modeling, analysis and design so as to obtain the ability to apply the same to engineering problems in a global perspective.
	CO2: Knowledge on carrying out detailed stability analysis of both linear and nonlinear systems
	CO3: Design observers and controllers for linear systems
	CO4: Acquire knowledge of discrete time linear systems modeling, analysis and design
	CO5: Develop and utilize modern software tools for analysis and design of linear continuous and Discrete time systems.
Waste to Energy (22DOE2001)	CO1: Able to classify types of wastes
	CO2: Understand the method of pyrolysis
	CO3: Understand the use and application of Biomass gasifiers
	CO4: Design biomass combustors
	CO5: Analyze the properties of Biogas
Project Management (22DOE2002)	CO1: Able to understand the importance of construction project management, organization and leadership capabilities
	CO2: Able to apply theoretical and practical aspects of project management planning techniques to achieve project goals.
	CO3: Possess ideas on contract, tender and arbitration in construction projects.
	CO4: Understand to apply knowledge and skills of quality and safety management in construction.



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	CO5: Have necessary knowledge in resource planning, costing and accounting.
Industrial Safety (22DOE9001)	CO1: Analyze the basics of industrial safety.
	CO2: Understand the Fundamentals of maintenance engineering
	CO3: Apply the methods of prevention of corrosion and wear.
	CO4: Understand the Fault tracing and their applications.
	CO5: Understand the methods of preventive measures and maintenance
Operations Research (22DOE9002)	CO1: Understand the characteristics and phases, types of models, allocation in linear programming
	CO2: Apply the concept of optimal solution, unbalanced problem, degeneracy and Transportation problem & sequencing.
	CO3: Understand the concept of replacement of items and related problems, theory of games related problems
	CO4: Apply the concept of the knowledge of queuing models, inventory management models.
	CO5: Apply the knowledge of dynamic programming, the concept of the simulation and simulation languages.
Business Analytics (22DOE5801)	CO1: Students will demonstrate knowledge of data analytics
	CO2: Students will demonstrate the ability of think critically in making decisions based on data and deep analytics
	CO3: Students will demonstrate the ability to use technical skills in predicative and prescriptive modelling to support business decision-making
	CO4: Students will demonstrate the ability to translate data into clear, actionable insights
Composite Materials (22DOE9004)	CO1: Understanding of basic concepts and characteristics of geometric and physical applications of composites.
	CO2: Explain different reinforcements and their properties.
	CO3: Study of micromechanics and properties of composite material.
	CO4: Study of coordinate transformations of stress and strain laws.
	CO5: Study of elastic behavior of unidirectional composites; Joining Methods and Failure Theories