



AVANTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

(Approved by A.I.C.T.E., New Delhi, & Permanently Affiliated to J.N.T.U-GV, Vizianagaram)

NAAC "B++" Accredited Institute

Cherukupally (Village), Near Tagarapuvalasa Bridge, Vizianagaram (Dist) -531162.

www.aietta.ac.in, principal@aietta.ac.in

Department of Electrical and Electronics Engineering

Program: M.Tech- Power Systems

Regulation: R16

Course Outcomes

No. of Courses: 28

I-I Sem	Course: Microprocessors & Microcontrollers
CO-1	Understand the basic architecture of 8086.
CO-2	Develop assembly language programming using 8086.
CO-3	Understand various peripheral devices to interface processor with different components.
CO-4	Understand the 8051 micro controller and its various modes of operation and its instruction set.
CO-5	Learn the 8051 micro controller and its various modes of operation and its instruction set.
I-I Sem	
Course: HVDC Transmission	
CO-1	Understand the various schemes of HVDC transmission.
CO-2	Understand the basic HVDC transmission equipment.
CO-3	Understand the control of HVDC systems.
CO-4	Understand the interaction between HVAC and HVDC system.
CO-5	Understand the various protection schemes of HVDC engineering.
I-I Sem	
Course: Power System Operation and Control	
CO-1	Determine the unit commitment problem for economic load dispatch.
CO-2	Get the knowledge of load frequency control of single area and two area systems with and without control.
CO-3	Know the effect of generation with limited energy supply.
CO-4	Determine the interchange evaluation in interconnected power systems.
CO-5	Study the effectiveness of interchange evaluation in interconnected power systems.
I-I Sem	
Course: Reactive Power Compensation & Management	
CO-1	Learn various load compensations.
CO-2	Obtain the mathematical model of reactive power compensating devices.
CO-3	Get application of reactive power compensation in electrical traction & arc furnaces.



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CO-4	Know the reactive power compensation has to be done at distribution side. •
CO-5	Know the role of reactive power compensation at electric traction systems and Arc furnaces.
I-I Sem Course: Electrical Distribution Systems (Elective – I)	
CO-1	Analyze a distribution system.
CO-2	Design equipment for compensation of losses in the distribution system.
CO-3	Design protective systems and co-ordinate the devices.
CO-4	Understand of capacitive compensation.
CO-5	Understand of voltage control.
I-I Sem Course: EHVAC Transmission (Elective – I)	
CO-1	Calculate the transmission line parameters.
CO-2	Calculate the field effects on EHV and UHV AC lines.
CO-3	Determine the corona, RI and audible noise in EHV and UHV lines.
CO-4	Analyze voltage control and compensation problems in EHV and UHV transmission systems.
CO-5	have knowledge of voltage control and compensation problems in EHV and UHV transmission systems.
I-I Sem Course: Analysis of Power Electronics Converters (Elective – I)	
CO-1	Have the knowledge on principle of ac voltage controller and their control techniques.
CO-2	Convert ac voltage to dc voltage and different control strategies of the converter.
CO-3	Control the power factor of single phase and three phase ac to dc converters.
CO-4	Understand the conversion of dc to ac and their control strategies.
CO-5	Analyze different multilevel inverters to improve the quality of the output voltage of the inverter.
I-I Sem Course: Renewable Energy Systems (Elective – I)	
CO-1	Identify alternate energy sources.
CO-2	Classify and analyze different renewable energy systems.
CO-3	Adopt different alternate energy sources for power generation.



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CO-4	Adopt optimally usage of different sources and interconnection with grid.
CO-5	Learn alternative energy sources not based on sun.
I-I Sem	
Course: Artificial Intelligence Techniques (Elective – I)	
CO-1	Understand neural networks and analyze different types of neural networks.
CO-2	Design training algorithms for neural networks.
CO-3	Develop algorithms using genetic algorithm for optimization.
CO-4	Analyze and design fuzzy logic systems.
CO-5	Apply AI Techniques in electrical engineering.
I-I Sem	
Course: Power System Security (Elective – II)	
CO-1	Analyze the balanced and unbalanced power system under short circuit conditions.
CO-2	Understand how to minimize the short circuit effect on the power System.
CO-3	Design the power system with more security with real time control.
CO-4	Implant SCADA for power system security.
CO-5	Learn the principles and applications of SCADA.
I-I Sem	
Course: Advanced Digital Signal Processing (Elective – II)	
CO-1	Describe structure of digital filters.
CO-2	Design digital filters with different techniques.
CO-3	Understand the implementation aspects of signal processing algorithms.
CO-4	Know the effect of finite word length in signal processing.
CO-5	Analyze different power spectrum estimation techniques.
I-I Sem	
Course: Generation & Measurement of High Voltages (Elective – II)	
CO-1	Understand numerical computation of electrostatic problems.
CO-2	Understand the techniques of generation of high AC, DC and transient voltages.
CO-3	Measure high AC, DC and transient voltages.
CO-4	Measure high AC, DC and transient currents.
CO-5	Learn the measurement techniques for high AC, DC and impulse currents.



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I-I Sem	Course: Programmable Logic Controllers & Applications (Elective – II)
CO-1	Understand the PLCs and their I/O modules.
CO-2	Develop control algorithms to PLC using ladder logic etc.
CO-3	Manage PLC registers for effective utilization in different applications.
CO-4	Handle data functions and control of two axis and their axis robots with PLC.
CO-5	Design PID controller with PLC.
I-I Sem	Course: Modern Control Theory (Elective – II)
CO-1	Understand the state variable approach is suitable for higher order.
CO-2	Analyze the concepts of controllability and observability.
CO-3	Analyze the various non-linearities through describing functions and phase plane analysis.
CO-4	Know the typical issues of stability and instability of continuous time invariant systems.
CO-5	Study the analysis of stability and instability of continuous time invariant systems.
I-I Sem	Course: Simulation Laboratory
CO-1	Analyse the performance of the various transmission lines at different loading conditions
CO-2	Perform the load flow study on distribution systems
CO-3	Calculate the different line parameters of 3-phase symmetrical and unsymmetrical transmission lines
I-II Sem	Course: Power System Dynamics and Stability
CO-1	Determine the model of synchronous machines.
CO-2	Know the stability studies of synchronous machines.
CO-3	Get the knowledge of solution methods of transient stability.
CO-4	Know the effect of different excitation systems in power systems.
CO-5	Study the effect of different excitation systems.
I-II Sem	Course: Flexible AC Transmission Systems
CO-1	Know the performance improvement of transmission system with FACTS.



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CO-2	Get the knowledge of effect of static shunt and series compensation.
CO-3	Know the effect of UPFC.
CO-4	Determine an appropriate FACTS device.
CO-5	different types of applications for facts device
I-II Sem Course: Real Time Control of Power Systems	
CO-1	Understand state estimation, security and contingency evaluation.
CO-2	Understand about Supervisory control and data acquisition.
CO-3	Learn Real time software application to state estimation.
CO-4	Understand application of AI in power system.
CO-5	Know the applications of AI to power system problems.
I-II Sem Course: Advanced Power System Protection	
CO-1	Know the classifications and applications of static relays.
CO-2	Understand the application of comparators.
CO-3	Understand the static version of different types of relays.
CO-4	Understand the numerical protection techniques.
CO-5	Understand the basic principles and application.
I-II Sem Course: Smart Grid Technologies (Elective – III)	
CO-1	Understand smart grids and analyse the smart grid policies and developments in smart grids.
CO-2	Develop concepts of smart grid technologies in hybrid electrical vehicles etc.
CO-3	Understand smart substations, feeder automation, GIS etc.
CO-4	Analyse micro grids and distributed generation systems.
CO-5	Analyse the effect of power quality in smart grid and to understand latest developments in ICT for smart grid.
I-II Sem Course: Power Quality (Elective – III)	
CO-1	Have the knowledge on causes of power quality, power quality parameters.
CO-2	Understand sources of transient over voltages and providing protection to transient over voltages.



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CO-3	Understand effects of harmonics, sources of harmonics and harmonic minimization.
CO-4	Analyze long duration voltage variations and regulation of voltage variations.
CO-5	Describe power quality aspects in distributed generation and develop solutions to wiring and grounding problems.
I-II Sem Course: Power System Reliability (Elective – III)	
CO-1	Understand reliability analysis applied to power systems.
CO-2	Understand Markov Chains and application to power systems.
CO-3	Perform stability analysis of generation systems.
CO-4	Understand decomposition techniques applied to power system.
CO-5	Basic understanding of network modelling and reliability.
I-II Sem Course: Voltage Stability (Elective – III)	
CO-1	Know the importance of voltage stability.
CO-2	Determine the load modelling of power systems.
CO-3	Get the knowledge of reactive power compensation and voltage control.
CO-4	Determine the modelling of static voltage stability indices.
CO-5	Know the voltage stability margin and its improvement.
I-II Sem Course: High Voltage Testing Techniques (Elective – IV)	
CO-1	Understand different testing procedures on electrical a) Insulating materials b) Insulation Systems.
CO-2	Learn the different testing techniques adopted on electrical power apparatus.
CO-3	Understand non destructive testing methods.
CO-4	Understand commercial and technical testing of different HV power applications.
CO-5	Understand different testing procedures on electrical Power apparatus.
I-II Sem Course: Power System Transients (Elective – IV)	
CO-1	Understand the severity of over voltages due to faults on a given power system.
CO-2	Learn limit of the effects of lightning over voltages in power systems.
CO-3	Understand the various transient over voltages and their effects on power system.



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CO-4	Study the techniques of travelling wave on transmission lines.
CO-5	Study the effect of lightning and switching transients on power systems.
I-II Sem Course: Demand Side Energy Management (Elective – IV)	
CO-1	Understand the principles and application of energy audit.
CO-2	Understand energy economics in utility systems.
CO-3	Understand the principle of energy conservation in lightning schemes.
CO-4	Apply energy audit principles in heating, ventilation and airconditioning etc.
CO-5	Understand the energy conservation aspect in space heating, ventilation, air Condition etc.
I-II Sem Course: Power Systems Laboratory	
CO-1	Analyze the performance of transmission lines and relays
CO-2	Calculate the steady-state power flow in a power system
CO-3	Analyze different types of short-circuit faults which occur in power systems




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