



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 Course Outcomes

Regulation: R19

Course Outcomes

No. of Courses: 34

I-Sem	Course:Power System Operation and Control
CO-1	Determine the unit commitment problem for economic load dispatch.
CO-2	Knowledge of load frequency control of single area system with and without control.
CO-3	Knowledge of load frequency control of two area system with and without control.
CO-4.	Know the effect of generation with limited energy supply.
CO-5	Determine the interchange evaluation in interconnected power systems
I-Sem	Course:Analysis of Power Electronic Converters
CO-1	Describe and analyze the operation of ac-dc converters
CO-2	Analyze the operation of power factor correction converters
CO-3	Analyze the operation of three phase inverters with pwm control
CO-4.	Study the principles of operation of multi- level inverters and their applications
CO-5	The role power electronics play in the improvement of energy usage efficiency and the applications of power electronics in emerging areas.
I-Sem	Course:Electrical Distribution Automation
CO-1	Analyse a distribution system.
CO-2	Design equipment for distribution system and sub-stations
CO-3	Design protective systems and co-ordinate the devices.
CO-4	Understand of capacitive compensation.
CO-5	Understand of distribution automation.
I-Sem	Course:Renewable Energy Technologies
CO-1	Understand various general aspects of renewable energy systems.
CO-2	Analyze and design induction generator for power generation from wind.
CO-3	Design mppt controller for solar power utilization
CO-4	Utilize fuel cell systems for power generation.



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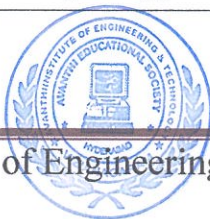
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CO-5	Understand the applications of different renewable energy sources like ocean thermal, hydro, geothermal energy etc.
I-Sem	Course:Power System Deregulation
CO-1	Understand of operation of deregulated electricity market systems
CO-2	Typical issues in electricity markets
CO-3	Analyse various types of electricity market operational and control issues using new mathematical models.
CO-4	Understand Imp's wheeling transactions and congestion management
CO-5	Analyse impact of ancillary services
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-Sem	Course: Advanced Power Systems 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	Analyze and comment on technical research papers related to power system protection
I-Sem	Course: Power System Reliability
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.





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CO-5	After completing the course, the student shall have a thorough understanding of the main principles in power system reliability analysis as well as knowledge of different methods and tools for reliability analysis
I-Sem	Course: Research Methodology and IPR
CO-1	Understand the research problem and research process.
CO-2	Understand research ethics
CO-3	Prepare a well-structured research paper and scientific presentations
CO-4	Explore on various ipr components and process of filing.
CO-5	Understand the adequate knowledge on patent and rights
I-Sem	Course: Power System Simulation Laboratory – I
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-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
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	Investigate voltage stability and conditions for voltage collapse
II Sem	Course: Real Time Control of Power Systems
CO-1	Understand state estimation, security and contingency evaluation



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CO-2	Understand about supervisory control and data acquisition.
CO-3	Real time software application to state estimation.
CO-4	Understand application of ai in power system.
CO-5	Understand scada system, voltage stability and application of ai and ann techniques in power systems.
II Sem	Course: EHVAC Transmission
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	Analyse voltage control and compensation problems in ehv and uhv transmission systems.
CO-5	Understand reactive power compensation using svc and tcr
II Sem	Course: Flexible AC Transmission Systems
CO-1	Know the performance improvement of transmission system with facts.
CO-2	Get the knowledge of effect of static shunt and series compensation
CO-3	Know the principle of operation and various controls of upfc
CO-4	Determine an appropriate facts device for different types of applications
CO-5	Select an appropriate facts device for a particular application
II Sem	Course: Hybrid Electric Vehicles
CO-1	Know the concept of electric vehicles and hybrid electric vehicles.
CO-2	Familiar with different motors used for hybrid electric vehicles
CO-3	Understand the power converters used in hybrid electric vehicles
CO-4	Know different batteries and other energy storage systems.
CO-5	Investigate and model the issues in mathematical domain related to grid interconnections of electric and hybrid vehicle
II Sem	Course: Generation and Measurement of High Voltages
CO-1	Understand numerical computation of electrostatic problems
CO-2	Understand the techniques of generation of high ac, dc and transient voltages.



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CO-3	Measure high ac, dc and transient voltages.
CO-4	Measure high ac, dc and transient currents.
CO-5	Transient voltages and their propagation characteristics
II Sem	Course: Evolutionary Algorithms and Applications
CO-1	State and formulate the optimization problem, without and with constraints, by using design variables from an engineering design problem
CO-2	Apply classical optimization techniques to minimize or maximize a multi-variable objective function, without or with constraints, and arrive at an optimal solution
CO-3	Formulate a mathematical model and apply linear programming technique by using simplex method. Also extend the concept of dual simplex method for optimal solutions
CO-4	Apply gradient and non-gradient methods to nonlinear optimization problems and use interior or exterior penalty functions for the constraints to derive the optimal solutions.
CO-5	Apply genetic algorithms for simple electrical problems and able to solve practical problems using pso.
II Sem	Course: Programmable Logic Controllers & Applications
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
II Sem	Course: Power System Simulation Laboratory-II
CO-1	Simulate and analyze power flow and load frequency control problems of a power systems
CO-2	Simulate and analyze circuits and power electronic systems
CO-3	Determine optimal power generation & losses of a power system
II Sem	Course: Power Converters Laboratory
CO-1	Upon completing this lab students must be able to correlate theoretical and practical analysis of ac-ac, dc-ac converters and also converter fed to ac&dc drives.
CO-2	Analyze the characteristics of mosfet, igbt, scr and scr firing ckts, this commutation techniques.
CO-3	Students are able to implement the converter and inverters in real time applications.





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III- Sem	Course: Energy Audit Conservation& Management
CO-1	Understand the principle of energy audit and their economic aspects
CO-2	Recommend energy efficient motors and design good lighting system.
CO-3	Understand advantages to improve the power factor.
CO-4	Evaluate the depreciation of equipment
CO-5	Guide the employees of the organization about the need and the methods of energy conservation.
III- Sem	Course: Smart Grid Technologies
CO-1	Understand smart grids and analyze 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	Analyze micro grids and distributed generation systems.
CO-5	Analyze the effect of power quality in smart grid and to understand latest developments in ict for smart grid.
III- Sem	Course: Power Quality and Custom Power Devices
CO-1	Identify the issues related to power quality in power systems.
CO-2	Address the problems of transient and long duration voltage variations in power systems.
CO-3	Analyze the effects of harmonics and study of different mitigation techniques.
CO-4	Identify the importance of custom power devices and their applications.
CO-5	Acquire knowledge on different compensation techniques to minimize power quality disturbances.
III- Sem	Course: Industrial Safety
CO-1	Understand the general industrial requirements like lighting, cleanliness prevention from hazards and accidents.
CO-2	Analyze maintenance requirements of the industry and cost associated
CO-3	Analyze wear and corrosion aspects of the industry and their prevention.
CO-4	Identify the faults prone areas and their repair and periodic maintenance.
CO-5	Prepare them to be comfortable with verbal ability





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III- Sem	Course: Artificial Intelligent Techniques
CO-1	Differentiate between algorithmic based methods and knowledge based methods.
CO-2	Use appropriate ai framework for solving power system problems
CO-3	Design fuzzy logic controllers for power engineering applications
CO-4	Apply selected basic ai techniques; judge applicability of more advanced techniques.
CO-5	Participate in the design of systems that act intelligently and learn from experience
III- Sem	Course: Operations Research
CO-1	Apply the dynamic programming to solve problems of discrete and continuous variables
CO-2	Apply the concept of non-linear programming
CO-3	Carry out sensitivity analysis
CO-4	Model the real world problem and simulate it.
CO-5	Formulate network models for service and manufacturing systems, and apply operations research techniques and algorithms to solve these network problems
III- Sem	Course: Audit 1 and 2: English for Research Paper Writing
CO-1	A basic knowledge of selected literary texts, movements and concepts in literature; the process of research oriented study and critical thinking.
CO-2	Human values and perspectives available in literary texts that embody the essence of multiple societies and cultures;
CO-3	Written and oral communication essential to participate in a global community;
III- Sem	Course: Audit 1 and 2: Sanskrit for Technical Knowledge
CO-1	Understanding basic sanskrit language
CO-2	Ancient sanskrit literature about science & technology can be understood Being a logical language will help to develop logic in students.
CO-3	Being a logical language will help to develop logic in students.
III- Sem	Course: Audit 1 and 2: Value Education
CO-1	Knowledge of self-development
CO-2	Learn the importance of human values 3.developing the overall personality
CO-3	It also helps in developing a strong relationship with family and friends.



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III- Sem	Course: Audit 1 and 2: Constituion of India
CO-1	Discuss the growth of the demand for civil rights in india for the bulk of indians before the arrival of gandhi in indian politics.
CO-2	Discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in india.
CO-3	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
III- Sem	Course: Audit 1 and 2: Pedagogy Studies
CO-1	What pedagogical practices are being used by teachers in formal and informal classrooms in developing countries?
CO-2	What is the evidence on the effectiveness of these pedagogical practices, in what conditions, and with what population of learners?
CO-3	How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy?
III- Sem	Course: Audit 1 and 2: Stress Management by Yoga
CO-1	Develop healthy mind in a healthy body thus improving social health also
CO-2	Improve efficiency
CO-3	The students will gain the ability to manage yoga training classes.
III- Sem	Course: Audit 1 and 2: Personality Development Throuh Life Enlightenment Skills
CO-1	Study of shrimad-bhagwad-geeta will help the student in developing his personality and achieve the highest goal in life
CO-2	The person who has studied geeta will lead the nation and mankind to peace and prosperity study of neetishatakam will help in developing versatile personality of students
CO-3	Perform your duty and abandon all attachment to success or failure.




Principal
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