**Vision**

To be in the forefront in advanced research in emerging areas of Electrical & Electronics Engineering, be proactive with industry in technology development and mould the department
into a centre of academic excellence.

**Mission**

- To produce high quality Electrical and Electronics Engineering graduates with the requisite theoretical and practical knowledge.
- To undertake research & development and extension activities in the field of Electrical and Electronics Engineering in the area of relevance for immediate application as well as for establishing and strengthening the fundamental knowledge.
- To create social awareness and ethical values in the graduates so as to contribute in the progress of the society.

**PROGRAM EDUCATIONAL OBJECTIVES**

| | |
|---|---|
| PEO1 | Design and develop innovative products and services in the field of Power Electronic and Drives. |
| PEO2 | Communicate effectively to propagate ideas and promote teamwork and keep abreas with the latest technology and toolset. |
| PEO3 | Attain intellectual leadership skills to cater to the changing needs of power indust academia, society and environment. |
| PEO4 | To become socially and ethically responsible and pursue life-long learning. |

**PROGRAM OUTCOMES:** At the end of the program the student will be able to:

| | |
|---|---|
| **PO1** | The graduate will be able to acquire in depth knowledge in the area of Power electronics and Drives. |
| **PO2** | The graduate will attain the lateral thinking and problem solving capabilities in the area of Power Electronics and Drives. |
| **PO3** | The graduate will obtain the capabilities of critical thinking, analyzing real world problems and handling the complexities to arrive feasible and optimal solutions considering societal and environmental factors. |
| **PO4** | The graduate will be able to extract information through literature survey and apply appropriate research methodologies, techniques and tools to solve Power Electronics and Drives problems. |
| **PO5** | The graduate will be able to use the state-of-the-art tools for modelling, simulation and analysis of problems related to Power Electronics and Drives. |

**PO6**

The graduate will be trained to assess social, health, safety, legal, cultural issues and She/he will also be trained on the consequent responsibilities relevant to the professional engineering
practices.

**PO7**

To sensitize the graduate about the impact of professional engineering solutions in social and environmental contents and demonstrates the knowledge of, and need for sustainable developments.

**PO8**

The graduate will become socially responsible and follow ethical practices to contribute to the community for sustainable development of society.

**PO9**

The graduate will be able to independently observe and examine critically the outcomes of his actions and reflect on to make corrective measures subsequently and move forward positively by learning through mistakes.

**PO10**

The graduate will be able to communicate confidently, make effective presentations and write good reports to engineering community and society.

**PO11**

The graduate will demonstrate knowledge and understanding of high voltage engineering with emphasis on power system and management principles and apply the same for efficiently carrying out projects with due consideration to economical and financial factors.

**PO12**

The graduate will recognize the need for life-long learning and have the ability to do it independently.

**PROGRAMME SPECIFIC OUTCOMES (PSOS):**

**PSO1** Able to apply the knowledge during the course of the program from basic computing and social science in general and all electrical courses in particular to identify, formulate and solve real life problems faced in industries and/or during research work..

**PSO2** Development of environment-conscious, new technologies to enhance the quality of human life.

| Course Code | **Power System Operation & Control** |
|---|---|
| R19PC1101 | |

**COURSEOUTCOMES**

After completion of course, students would be able to:

CO1 Determine the unit commitment problem for economic load dispatch.
CO2 Get the knowledge of load frequency control of single area and two area systems with and without control.
CO3 Get the knowledge of load frequency control of two area systems with and without control.
CO4 Know the effect of generation with limited energy supply.
CO5 Determine the interchange evaluation in interconnected power systems.

| Course Code | **Renewable Energy Technologies** |
|---|---|
| R19PC1102 | |

**COURSEOUTCOMES**

After completion of course, students would be able to:

CO1 Understand various general aspects of renewable energy systems.
CO2 Analyze and design induction generator for power generation from wind.
CO3 Design MPPT controller for solar power utilization.
CO4 Utilize fuel cell systems for power generation.

| Course Code | **Electrical Distribution Automation (Elective-I)** |
|---|---|
| R19PC1103A | |

**COURSEOUTCOMES**

After completion of course, students would be able to:

CO1 Analyse a distribution system.
CO2 Design equipment for compensation of losses in the distribution system.
CO3 Design protective systems and co-ordinate the devices.
CO4 Understand of capacitive compensation.
CO5 Understand of distribution automation..

| Course Code | Analysis of Power Electronic Converters (Elective-I) |
|---|---|
| R19PC1103B | |

**COURSEOUTCOMES**

After completion of course, students would be able to:

CO1 Describe and analyze the operation of AC-DC, DC-AC and AC-AC power converters.
CO2 Analyze the operation of power factor correction converters.
CO3 Analyze the operation of three phase inverters with PWM control.
CO4 Study the principles of operation of multi level inverters and their applications.

| Course Code | Artificial Intelligent Techniques (Elective-I) |
|---|---|
| R19PC1103C | |

**COURSEOUTCOMES**

After completion of course, students would be able to:

CO1 Differentiate between Algorithmic based methods and knowledge based methods.
CO2 Use the soft computing techniques for power system problems.
CO3 Use appropriate AI framework for solving power system problems.
CO4 Apply GA to power system optimization problems.

| Course Code | Power Quality and Custom Power Devices (Elective-I) |
|---|---|
| R19PC1103D | |

**COURSEOUTCOMES**

After completion of course, students would be able to:

CO1 Identify the issues related to power quality in power systems.
CO2 Address the problems of transient and long duration voltage variations in power systems.
CO3 Analyze the effects of harmonics and study of different mitigation techniques.
CO4 Identify the importance of custom power devices and their applications.
CO5 Acquire knowledge on different compensation techniques to minimize power quality disturbances.

| Course Code | HVDC Transmission (Elective-II) |
|---|---|
| R19PC1104A | |

**COURSEOUTCOMES**

After completion of course, students would be able to:

CO1 Understand various general aspects of renewable energy systems.
CO2 Understand the basic HVDC transmission equipment.
CO3 Understand the control of HVDC systems.
CO4 Understand the interaction between HVAC and HVDC system.
CO5 Understand the various protection schemes of HVDC engineering.
CO6 Understand the various schemes of HVDC transmission.

| Course Code | Generation & Measurement of High Voltages (Elective-II) |
|---|---|
| R19PC1104B | |

**COURSEOUTCOMES**

After completion of course, students would be able to:

CO1 Understand numerical computation of electrostatic problems.
CO2 Understand the techniques of generation of high AC, DC and transient voltages.
CO3 Measure high AC, DC and transient voltages.
CO4 Measure high AC, DC and transient currents.

| Course Code | Advanced Power Systems Protection(Elective-II) |
|---|---|
| R19PC1104C | |

**COURSEOUTCOMES**

After completion of course, students would be able to:

CO1 Know the classifications and applications of static relays.
CO2 Understand the application of comparators.
CO3 Understand the static version of different types of relays.
CO4 Understand the numerical protection techniques.

| Course Code | Power System Reliability(Elective-II) |
|---|---|
| R19PC1104D | |

**COURSEOUTCOMES**

After completion of course, students would be able to:

CO1 Understand reliability analysis applied to power systems.
CO2 Understand Markov Chains and application to power systems.
CO3 Perform stability analysis of generation systems.
CO4 Understand decomposition techniques applied to power system.

| Course Code | Power System Simulation Laboratory – I |
|---|---|
| R191106 | |

**COURSEOUTCOMES**

After completion of course, students would be able to:

CO1 Distinguish between different load flow methods.
CO2 Analyze Y-bus & Z-bus algorithm.
CO3 Analyze symmetrical & unsymmetrical faults.
CO4 Understand importance of Load flow control
CO5 Understand importance of Economic load dispatch and transient stability analysis.

| Course Code | Power Systems Laboratory |
|---|---|
| N3303 | |

**COURSEOUTCOMES**

After completion of course, students would be able to:

CO1 Distinguish between sequence impedances of alternator and transformer.
CO2 Understand the Ferranti effect.
CO3 Analyze performance and importance of transmission line parameters.
CO4 Understand the operation of various protection relays.

| Course Code | Power System Dynamics and Stability |
|---|---|
| N3305 | |

**COURSEOUTCOMES**

After completion of course, students would be able to:

CO1 Determine the model of synchronous machines.
CO2 Know the stability studies of synchronous machines.
CO3 Get the knowledge of solution methods of transient stability.
CO4 Know the effect of different excitation systems in power systems.

| Course Code | Real Time Control of Power Systems |
|---|---|
| N3306 | |

**COURSEOUTCOMES**

After completion of course, students would be able to:

CO1 Understand state estimation, security and contingency evaluation.
CO2 Understand about Supervisory control and data acquisition.
CO3 Real time software application to state estimation.
CO4 Understand application of AI in power system.

| Course Code | Smart Grid Technologies (Elective-III) |
|---|---|
| N3307 | |

**COURSEOUTCOMES**

After completion of course, students would be able to:

CO1 Understand smart grids and analyze the smart grid policies and developments in smart grids.
CO2 Develop concepts of smart grid technologies in hybrid electrical vehicles etc.
CO3 Understand smart substations, feeder automation, GIS etc.
CO4 Analyze micro grids and distributed generation systems.
CO5 Analyze the effect of power quality in smart grid and to understand latest developments in ICT for smart grid.

| Course Code | |
|---|---|
| **N3308** | **EHVAC Transmission (Elective-III)** |

**COURSEOUTCOMES**

After completion of course, students would be able to:

CO1 Calculate the transmission line parameters.
CO2 Calculate the field effects on EHV and UHV AC lines.
CO3 Determine the corona, RI and audible noise in EHV and UHV lines.
CO4 Analyze voltage control and compensation problems in EHV and UHV transmission systems.
CO5 Understand reactive power compensation using SVC and TCR

| Course Code | |
|---|---|
| **N3309** | **Flexible AC Transmission Systems (Elective-III)** |

**COURSEOUTCOMES**

After completion of course, students would be able to:

CO1 Know the performance improvement of transmission system with FACTS.
CO2 Get the knowledge of effect of static shunt and series compensation.
CO3 Know the principle of operation and various controls of UPFC
CO4 Determine an appropriate FACTS device for different types of applications.

| Course Code | |
|---|---|
| **N3310** | **Hybrid Electric Vehicles (Elective-III)** |

**COURSEOUTCOMES**

After completion of course, students would be able to:

CO1 Know the concept of electric vehicles and hybrid electric vehicles.
CO2 Familiar with different motors used for hybrid electric vehicles.
CO3 Understand the power converters used in hybrid electric vehicles
CO4 Know different batteries and other energy storage systems.

| Course Code | |
|---|---|
| **P3302** | **Power System Deregulation(Elective-IV)** |

**COURSEOUTCOMES**

After completion of course, students would be able to:

CO1 Understand of operation of deregulated electricity market systems
CO2 Typical issues in electricity markets
CO3 Analyze various types of electricity market operational and control issues using new mathematical models.
CO4 Understand LMP's wheeling transactions and congestion management.
CO5 Analyze impact of ancillary services.

| Course Code | High Voltage Testing Techniques(Elective-IV) |
|---|---|
| P3303 | |

**COURSEOUTCOMES**

After completion of course, students would be able to:

CO1 Understand non-destructive testing techniques
CO2 Analyse HV testing of apparatus
CO3 Understand HVAC testing methods.
CO4 Analyse impulse testing electrical equipment's.
CO5 Learn partial discharge measurement techniques.

| Course Code | Evolutionary Algorithms and Applications(Elective-IV) |
|---|---|
| P3304 | |

**COURSEOUTCOMES**

After completion of course, students would be able to:

CO1 State and formulate the optimization problem, without and with constraints, by using design variables from an engineering design problem.
CO2 Apply classical optimization techniques to minimize or maximize a multi- variable objective function, without or with constraints, and arrive at an optimal solution.
CO3 Formulate a mathematical model and apply linear programming technique by using Simplex method. Also extend the concept of dual Simplex method for optimal solutions.
CO4 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.
CO5 Apply Genetic algorithms for simple electrical problems and able to solve practical problems using PSO.

| Course Code | Programmable Logic Controllers & Applications(Elective-IV) |
|---|---|
| POE71 | |

**COURSEOUTCOMES**

After completion of course, students would be able to:

CO1 Understand the PLCs and their I/O modules.
CO2 Develop control algorithms to PLC using ladder logic etc.
CO3 Manage PLC registers for effective utilization in different applications.
CO4 Handle data functions and control of two axis and their axis robots with PLC.
CO5 Design PID controller with PLC.