

1st Year M.E. Electrical Power System
Semester -II: Course Outcomes as per CBCS Scheme

2EPS01 Advanced Protection of Power System

Course Outcomes

After completing this course, student will be able to

- CO 1:** Understand and apply the fundamental principles of power system protection.
- CO 2:** Analyze and evaluate static and numerical relay systems for power system protection.
- CO 3:** Develop skills to set and coordinate relays for efficient power system protection.
- CO 4 :** Design and implement protection schemes for transmission lines.
- CO 5 :** Assess and apply protection schemes for synchronous generators.
- CO 6 :** Examine and implement protection schemes for power transformers.

2EPS02 Power System Dynamics

Course Outcomes:

By the end of this course, students will be able to

- CO 1 :** Develop mathematical models of synchronous machines using both a-b-c coordinates and Park's transformation.
- CO 2 :** Develop and analyze appropriate state variables for low and high-order state models , response of a SMIB system to large disturbances , mechanical and electrical torques.
- CO 3 :** Interpret and Apply the Clarke diagram for two-machine systems with lossy and lossless system to assess stability under different system conditions.
- CO 4 :** Understand and Examine the effect of inertia , governor action , saliency, saturation, and SCR on system stability.
- CO 5 :** Analyze and Examine the effect of Modes of Oscillations in Unregulated Multi-Machine Systems, excitation on generator power limits, transients, and dynamic stability.
- CO 6 :** Analyze and Examine dynamic stability using Routh's Criterion , supplementary stabilizing signals , linear analysis of a stabilized generator.

2EPS03 Computer Aided Power System Analysis

Course Outcomes

Upon successful completion of this course, students will be able to:

CO 1: Model Power System Components and will demonstrate proficiency in modeling single-phase and three-phase power systems, employing matrix representation techniques for various admittance and impedance matrix.

CO 2 : Conduct Load Flow and Short Circuit Analysis to formulate and solve load flow problems using various techniques.

CO 3 : Analyze Faults and Sequence Networks to identify and categorize different types of faults, apply symmetrical components and sequence networks for balanced and unbalanced fault analysis, and implement computer programming approaches for large system analysis, including sparse matrix techniques and optimal node ordering.

CO 4 : Perform State Estimation and Network Observability for applying state estimation techniques using maximum likelihood concepts and weighted least-squares methods to detect and identify bad measurements.

CO 5 : Allocate and Schedule Reactive Power to understand and apply concepts related to reactive power sources and capability curves

CO 6 : Apply Advanced Control and Scheduling Techniques by utilizing concepts of load frequency control and optimal hydrothermal scheduling to manage power systems effectively.

2EPS04 Artificial Neural Network

Course Outcomes:

By the end of this course, students will be able to

CO 1 : Understand the basic structure and function of biological neurons , various types of learning paradigms and learning mechanisms in artificial neural networks.

CO 2 : Describe Architecture of a Single-Layer , Multilayer Feed Forward Neural Network , Perceptron Training Algorithm, Backpropagation Algorithm, Learning Rate and Momentum Coefficient.

CO 3 : Understand the Basics of Unsupervised Learning : Counter propagation networks, Hopfield's networks

CO 4 : Understand the Basics of Associative Memory Network, Architecture, Hebb's Rule and Delta Rule for Pattern Association.

CO 5 : Understand Probabilistic Neural Networks , Boltzmann Machine , Support Vector Machine

CO 6 : Understanding of various applications of ANN in power system areas such as forecasting, classification, planning, operation, control and protection.