Course Code EPE 813	Credit Hours (Th-Pr) 3.0-0	**Computer Modelling of Electrical Power Systems (Elective)**	Contact Hrs/Week (Th-Pr) 3.0-0	Total Contact Hrs (Th-Pr) 45-0

Course Outline:

1. This course covers the computer modelling of synchronous machines, transformers, transmission lines, loads, electromagnetic transients, load flow and system stability study under power electronic control.

Eligibility Criteria:

B.E (Electrical Engineering)

Recommended Books:

S. No.	Title	Author(s)	Assigned Code	Remarks
1.	Computer Modelling of Electrical Power Systems	Jose Arrillaga	JA	Text Book
2.	Power System Modelling and Scripting	Federico Milano	FM	Reference Book
3.	Power System Stability : Modelling , Analysis and Control	Abelhay A. Sallam	AA	Reference

Course Objectives:

2. The objective of this course is to develop a sound understanding in the students regarding modelling of different parts of electrical power systems and enable to use different computational tools to model a complete power system and perform different studies

Learning outcome:

3. At the end of the course students shall be able to do the modelling and analysis of power flow and transient studies in the power systems using different simulation software's widely used in the industry.

Topics Covered:

No.	Topics	Book	Contact Hours
1.	**Introduction to theoretical models and computer**	JA	10

	programs		
2.	**Transmission Systems** • Linear transmission techniques • Basic single phase modelling • Three phase system analysis • Three phase model of transmission lines • Evaluation of overhead line parameters • Underground and submarine cables • Three phase model of transformers • Formation of system admittance matrix	JA	13
3.	**Computational load flow analysis** • Nodal method • Conditioning of Z Matrix • Newton Raphson load flow • Fast decoupling load flow • Three phase load flow • Load flow for stability assessment • Load flow under power electronics control	JA	12
4.	**Electromagnetic transients modelling** • Numerical Integrator substitution for resistor, capacitor and inductor • Formulation and solution of system nodal equations • Switching discontinuities and root matching techniques • Synchronous machine and transformer model	JA	12