DESIGN AND SIMULATION OF POWER ELECTRONIC CIRCUITS
(Elective-II)

Course Code:13EE2217 **L P C**
4 0 3

Pre requisites: Basics of Power Electronics

Course Outcomes:
After completion of the course, the student should be able to
CO1: Differentiate and describe the various simulation methods of analysis of power electronic systems.
CO2: Design & implementation of different types of algorithms for power electronic systems.
CO3: Assess the various types of analysis of power electronic devices.
CO4: Assess the advanced analysis of power electronic systems.
CO5: Examine the simulation of various power electronic circuits for different type of loads.

UNIT-I: SIMULATION TECHNIQUES-I
Importance of Simulation – Methods of analysis of power electronic systems - Analysis of power electronic systems in a sequential manner–coupled and decoupled systems

UNIT-II: SIMULATION TECHNIQUES-II
Various algorithms for computing steady state solution in power electronic systems – Future trends in computer simulation.

UNIT-III: MODELING OF POWER ELCTRONIC DEVICES
Introduction – AC sweep and DC sweep analysis – Transients and the time domain analysis – Fourier series and harmonic components, BJT, FET, MOSFET and its model- Amplifiers and Oscillator – Non- linear devices.

UNIT-IV: SIMULATION OF POWER ELECTRONIC CIRCUITS
Introduction – Schematic capture and libraries – Time domain analysis – System level integration and analysis – Monte Carlo analysis Sensitivity/ stress analysis – Fourier analysis.

UNIT-V: CASE STUDY

Simulation of Converters, Choppers, Inverters, AC voltage controllers, and Cyclo-converters feeding R, R-L, and R-L-E loads, Simulation of Converters, Choppers, Inverters, AC voltage controllers, and Cyclo-converters feeding R, R-L, and R-L-E loads

TEXT BOOKS:

1. Rashid, M., "*Simulation of Power Electronic Circuits using PSPICE*", PHI, 2006.

REFERENCES:

1. Rajagopalan, V. "*Computer Aided Analysis of Power Electronic systems*"- Marcell Dekker Inc., 1987.

2. John Keown "*Microsim, Pspice and circuit analysis*"-Prentice Hall Inc., 1998.