EE 905 ADVANCED POWER ELECTRONICS

Total Credits: 03

Lecture/Recitation/Discussion Hours: (3-0)

Course objective:

Analysis and design of power electronic systems, power sources, electric motor controls.

Course topics/outline:

1 Introduction to power semiconductor devices, circuits and applications
2. Switching semiconductor devices: diodes, transistors and thyristors
3. Power converters and PWM inverters, their modeling, analysis and design
4. Basic control of power converters and PWM inverters
5. Power conversion systems, their control, analysis and design
6. Switching functions, circuit models, and simulation
7. Automotive and utility applications

Prerequisite:

Undergraduate level courses on electronics, power electronics and electrical energy conversion.

Textbook:

Mohan, Undeland, and Robbins, *Power Electronics: Converters, Applications and Design (3rd edition)*, John Wiley & Sons, 2002.

Reference books:

- M. Rashid, Power Electronics, Circuits, Devices, and Applications, 3e, Prentice-Hall 2003
- P. T. Krien, *Elements of Power Electronics, 1st* Edition, Oxford University Press, 1998
- D. W. Hart, *Introduction to Power Electronics* 1st Edition, Prentice-Hall, 1998.