EE443- Industrial Electronics (Elective Course)

Code and Name: EE 443 Industrial Electronics
Credit Hours: 3 (Lecture: 3, Tutorial: 1)

Textbook:
- Fundamentals of Power Electronics, Robert W. Erickson, Second Edition, 2004

Other References:

Course Description:
Power supplies and DC-DC converters. Basic concepts and steady-state analysis of switching cells, Non-isolated and isolated PWM dc-dc switching cells, Steady-state modeling and switches, different types of Control of PWM converters, Resonant and soft switching converters, applications to computer equipment, distributed power systems, uninterruptible power supplies, and electric drives.

Pre-requisites:
Co-requisites: None

Course Learning Outcomes:
With relation to ABET Student Outcomes (SOs: 1-7)
1. To develop an understanding of Power supplies and DC-DC converters. (1)
2. Apply state analysis of switching cells. (1)
3. Understand non-isolated and isolated PWM dc-dc switching cells, Steady-state modeling and switches. (10
4. To understand different types of Control of PWM converters, Resonant and soft switching converters. (2)
5. Familiarize with the applications to computer equipment, distributed power systems, uninterruptible power supplies, and electric drives. (6)

Topics to be covered:
- Introduction
- Principals of Steady State Converter Analysis
- Steady State Equivalent Circuit Modeling, Losses and Efficiency
- Switch Realization
- The Discontinuous Conduction Mode
- Converter Circuits
- AC Equivalent Circuit Modeling
- Converter Transfer Function
- Controller Design

Grading Policy:
The grading for the course are 60% coursework and 40% Final Exam. The coursework consists of two Midterm Exams, where each midterm exam is worth 20%. It also includes quizzes, homework, and projects for the remaining 20% that is modified by the course instructor.