

1. *Course number and name*

ENGR 455: Power Electronics

2. *Credits and contact hours*

4 credit hours

3. *Instructor's or course coordinator's name*

Instructor: Jin Ye, Ph.D.

Course coordinator: Jin Ye

4. *Text book, title, author, and year*

N.Mohan, *A First Course in Power Electronics*, Wiley, 2012.

a. *other supplemental materials*

Robert W. Erickson and Dragan Maksimovic, *Fundamentals of Power Electronics 2nd Edition*, Springer Science+Business Media, 2001.

5. *Specific course information*

a. *brief description of the content of the course (catalog description)*

Design of switching power-roles. Switch-mode DC-DC converters. Feedback controller design in switch-mode DC-DC converters. Rectification of utility input using diode rectifiers. Switch-mode DC power supplies. Power electronics applications.

b. *prerequisites or co-requisites*

Grades of C or better in Engr 353 and ENGR 301 and ENGR 306

c. *indicate whether a required, elective, or selected elective course in the program*

Elective for Computer and electrical Engineering.

6. *Specific goals for the course*

a. *Specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.*

1. The students will demonstrate their understanding about power electronic devices.
2. The students will demonstrate their ability to analyze and design switch-mode DC-DC converters.

3. The students will demonstrate their ability to design feedback controller for switch-mode DC-DC converters.
- b. *Explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.*

Course addresses ABET Student Outcome(s): a, b, c, k

7. *Brief list of topics to be covered*

1. Introduction to power electronics.
2. Design of switching power-roles.
3. Analysis and design of switch-mode DC-DC converters.
4. Feedback controller design in switch-mode DC-DC converters.
5. Rectification of utility input using diode rectifiers.
6. Switch-mode DC power supplies.
7. Power electronics applications.