

Syllabus for EEL 6246

Power Electronics II

Spring, 2018

Part A - Course Outline

Description: 3 hours credit

Prerequisites: Power Electronics I (EEL 4242C / EEE 5317C)

Textbook: Lecture slides hard copy will be handed out to students at the binning of the class; there is no electronic copy available. If you miss the class, you can come to pick up your slides in my office within 1 week; you may also read related IEEE papers.

Evaluation: 4 Projects

Topics: (1) Resonant converters
(2) Soft switching converters
(3) Electromagnetic interference in power electronics systems
(4) Three-phase power electronics

Class schedule:

150 minutes of lecture / week

Tuesday, 10:40AM-11:30AM

Thursday, 10:40AM-11:30AM & 11:45AM-12:35PM

Classroom: CHE 0316

Part B – General Course Information and Policies

Instructor: Dr. Shuo Wang

Office: NEB 533

Phone: 352-392-4691

Email: shuo.wang@ece.ufl.edu

Office Hours: 11:30AM-12:20PM Tuesday, 1:00PM-2:00PM Thursday or by appointment

Grading: Based on 4 projects, each 25%

Attendance: It is very important to attend every class as important material for projects will usually be covered in these classes.

Submission Requirement: a. Name, assignment number, date submitted on each page.

- b. Neat circuits with appropriate labels
- c. List of given values.
- d. List of starting conditions and equations.
- e. Development of equations that will yield final values.
- f. Numerical substitution into final equations.
- g. Final answer “**Boxed**” where appropriate.

Preliminary Course Outline and Schedule

1. Resonant power converter basics: 3 weeks
 - a. Series resonant converters and design
 - b. Parallel resonant converters and design
 - c. Series-parallel resonant converters
 - d. Constant frequency resonant converters

1 project: design of a series resonant or parallel resonant converter

2. Soft switching basics: 2 weeks
 - a. Zero voltage switched converters and design
 - b. Zero current switched converters and design

1 project: design of a zero voltage or zero current switching converter

3. EMI basics in power electronics systems: 4.5 weeks
 - a. EMI basics for power electronics
 - b. EMI measurement for power electronics
 - c. EMI modeling for power electronics
 - d. EMI reduction for power electronics

1 project: topics on EMI modeling, reduction or measurement

4. Three-phase power electronics basics: 3.5 weeks
 - a. Three-phase power electronics basics
 - b. Space vector representation of three-phase variables
 - c. Three-phase voltage source inverters, average and small signal modeling
 - d. Three-phase current source inverters, average and small signal modeling

1 project: design of a voltage source or current source three-phase inverter