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.

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**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