

Syllabus for EEL 4930/EEL 6246

Power Electronics II

Spring, 2020

Part A - Course Outline

Description: 3 hour credits for Grad and 4 hour credits for Undergrad.

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

Course Objectives:

This is an advanced course so it is organized based on the applications of power electronics. The students will be able to learn and apply the power electronics theory to actual power electronics applications.

In the course, the students will:

- Participate in class, listen and learn from lectures
- Do literature research on select topics
- Write literature research reports and give presentations
- Take a final exam

Upon completing the course, the students will be able to do the following:

- Know state-of-the-art power electronics applications
- Have the ability to understand actual power electronics designs with the power electronics knowledge

Textbook: Lecture slides hard copy will be handed out to students at the beginning of the class; the electronic copy will also be available in Canvas. If you miss the class, you can come to pick up your hardcopy slides in my office within 1 week; besides lectures, students will be required to do some literature research from academic books or papers.

Topics and schedule:

- Week 1 - 3: Topics on the power electronics in electrification of transportation
 - Electric machine and motor drive basics
- Week 4 - 6: Topics on the power electronics in consumer electronic products
 - Soft switching techniques, active clamped flyback converters
- Week 7 – 9: Topics on the power electronics in residential applications
 - Magnetic components, electromagnetic interference and reduction for power electronics systems
- Week 10-12: Topics on the power electronics in industry applications
 - Grid reactive, active and harmonic control using power electronics
- Week 13-15: Topics on the power electronics in energy conversion and integration
 - Power semiconductor devices, Alternative energy sources, integration of Power grid, Photovoltaic, Electric vehicle charging and energy storage integration

Class times:

150 minutes of lecture / week

Tuesday 5:10PM-6:00PM,

Thursday 5:10PM-7:05PM

Classroom: Larsen 0330

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: 10:40AM-11:40AM Tuesday, 1:30PM-2:20PM Thursday or by appointment

Evaluation:

Assignment	Total Points	Percentage of Final Grade
Attendance	10	10%
Literature research reports/projects	60	60%
Final exam	30	30%
		100%

This course is co-listed with the graduate class. The literature research projects and final exam of the graduate section will involve additional work and more advanced concepts with respect to the undergraduate section.

Students will have a choice of selecting 3 from 5 topics in the class schedule section for their literature reports/projects. Literature research projects will be a group assignment. Each group will have 3-4 students. Each student will have an individual task in the group. 50% of the grade will be based on student's performance in the assigned individual task and 50% will be based on the group performance.

The literature research projects and final exam will be graded separately for graduate and undergraduate sections, for which the graduate section has additional problems and different weights for all problems.

The projects will be 3 topics selected by the student from 5 given topics and the project reports consist of the following parts: (i) Motivation (ii) Background, (iii) Technical Approach (iv)

Results, (v) Discussions, and (vi) conclusions. It will be graded according to the following percentages: 30% for parts (i) and (ii), 45% for parts (iii) and (iv), 25% for parts (v) and (vi). Parts (i), (ii) and (v) shall discuss relations and comparisons between various power electronics technologies used in the selected topic which need to be comprehensive, and parts (iii) and (iv) can focus specifically on one power electronics technology which is considered most appropriate to the application.

Grading Policy:

Percent	Grade	Grade Points
93.4 - 100	A	4.00
90.0 - 93.3	A-	3.67
86.7 - 89.9	B+	3.33
83.4 - 86.6	B	3.00
80.0 - 83.3	B-	2.67
76.7 - 79.9	C+	2.33
73.4 - 76.6	C	2.00
70.0 - 73.3	C-	1.67
66.7 - 69.9	D+	1.33
63.4 - 66.6	D	1.00
60.0 - 63.3	D-	0.67
0 - 59.9	E	0.00

Students Requiring Accommodations:

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://www.dso.ufl.edu/drc>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.