Power Electronics II

EEL 4930 / EEL6246   Section XXXX
Class Periods: Tuesday 10 5:10pm-6pm and Thursday 10, 11 5:10pm-7:05pm
Location: LAR 330
Academic Term: Spring 2020

Instructor:
Shuo Wang
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352-392-4961
Office Hours: Tuesday and Thursday, 2:40PM-3:40PM, NEB 533

Teaching Assistant/Peer Mentor/Supervised Teaching Student:
Please contact through the Canvas website
- N/A

Course Description

3 credit hour course

Power electronics II covers important topics on the state-of-the-art applications of power electronics in the electrification of transportation, consumer electronic product, residential and industry applications, energy, and medical applications, etc. The topic-based lectures will integrate the power electronics theory with applications so students will have great interests in these lectures. The evaluation methods of the course include literature research projects, final exam, and class attendance.

Course Pre-Requisites / Co-Requisites
EEL 4242C / EEE 5317C (Introduction to Power electronics Circuits / Power Electronics I)

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
- Do literature research on select topics
- Write literature research reports
- 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 analyze actual power electronics designs with the power electronics knowledge
- Be ready to work as a design engineer in power electronics companies or as a researcher in power electronics research

Materials and Supply Fees
N/A

Professional Component (ABET):

This course consists of 1.5 credits of Engineering Design and 1.5 credits of Engineering Science

Relation to Program Outcomes (ABET):

Outcome	Coverage*
1. An ability to identify, formulate, and solve engineering problems by applying principles of engineering, science, and mathematics.	Medium
2. An ability to apply both analysis and synthesis in the engineering design process, resulting in designs that meet desired needs.	Medium
3. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.	
4. An ability to communicate effectively with a range of audiences	Medium
5. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.	
6. An ability to recognize the ongoing need for additional knowledge and locate, evaluate, integrate, and apply this knowledge appropriately.	
7. An ability to function effectively on teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty	

*Coverage is given as high, medium, or low. An empty box indicates that this outcome is not covered or assessed in the course.

Required Textbooks and Software

The course slides will be developed by the instructor and distributed in the class.
Besides lectures, students will be required to do some literature research from academic books or papers.

Recommended Materials

Course Schedule

Week 1 - 3:   Topics on the power electronics in electrification of transportation
Week 4 - 6:   Topics on the power electronics in consumer electronic products
Week 7 – 9:   Topics on the power electronics in residential applications
Week 10-12:   Topics on the power electronics in industry applications
Week 13-15:   Topics on the power electronics in energy conversion and integration

Attendance Policy, Class Expectations, and Make-Up Policy

Attendance is required and will be monitored. Attendance will be part of the final grade. Literature research project reports and final exam will be evaluated for the final grade. Late submissions will not be allowed unless it is consistent with university policies in the undergraduate catalog (https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx) and provided with required appropriate documentation.

Evaluation of Grades

Assignment	Total Points	Percentage of Final Grade
Attendance	10	10%
Literature research reports	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 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 (ii) 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

More information on UF grading policy may be found at:
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

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.

Course Evaluation

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

University Honesty Policy
UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Commitment to a Safe and Inclusive Learning Environment
The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:
• Your academic advisor or Graduate Program Coordinator
• Robin Bielling, Director of Human Resources, 352-392-0903, rbielling@eng.ufl.edu
• Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
• Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

Software Use
All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy
There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: https://registrar.ufl.edu/ferpa.html

Campus Resources:

Health and Wellness

U Matter, We Care:
Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: http://www.counseling.ufl.edu/cwc, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence
If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

Sexual Assault Recovery Services (SARS)
Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or http://www.police.ufl.edu/.

Academic Resources

E-learning technical suppor*t*, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. https://lss.at.ufl.edu/help.shtml.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. https://www.crc.ufl.edu/.

Library Support, http://cms.uflib.ufl.edu/ask. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. https://teachingcenter.ufl.edu/.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers. https://writing.ufl.edu/writing-studio/.

Student Complaints Campus*:* https://care.dso.ufl.edu

On-Line Students Complaints*:* http://www.distance.ufl.edu/student-complaint-process.