

Cover Sheet: Request 13174

EEL 4XXX Fundamentals of RF and Power Electronic Devices

Info

Process	Course New Ugrad/Pro
Status	Pending at PV - University Curriculum Committee (UCC)
Submitter	Shannon Chillingworth schill@ece.ufl.edu
Created	10/12/2018 2:21:42 PM
Updated	12/5/2018 3:52:25 PM
Description of request	New Course Request.

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	ENG - Electrical and Computer Engineering 011905000	Robert Fox		10/12/2018
EEL4XXX_Fund_RF_Power_Dev_UCC_1_Syll.docx					10/12/2018
EEL5XXX_Fund_RF_Power_Dev_UCC_1_Syll.docx					10/12/2018
College	Approved	ENG - College of Engineering	Heidi Dublin	Approved by the Curriculum Committee and HWCOE Faculty Council.	12/5/2018
No document changes					
University Curriculum Committee	Pending	PV - University Curriculum Committee (UCC)			12/5/2018
No document changes					
Statewide Course Numbering System					
No document changes					
Office of the Registrar					
No document changes					
Student Academic Support System					
No document changes					
Catalog					
No document changes					
College Notified					
No document changes					

Course|New for request 13174

Info

Request: EEL 4XXX Fundamentals of RF and Power Electronic Devices

Description of request: New Course Request.

Submitter: Shannon Chillingworth schill@ece.ufl.edu

Created: 10/12/2018 2:09:37 PM

Form version: 1

Responses

Recommended Prefix EEL

Course Level 4

Number XXX

Category of Instruction Advanced

Lab Code None

Course Title Fundamentals of RF and Power Electronic Devices

Transcript Title Fund Rf/Pwr Elec Dev

Degree Type Baccalaureate

Delivery Method(s) On-Campus

Co-Listing Yes

Co-Listing Explanation This course is co-listed with the graduate class. The homework portion of the graduate section will involve additional work and more advanced concepts with respect to the undergraduate section. The exams will also involve additional questions for the graduate section with respect to the undergraduate section.

Grading for the homework and projects are different from the undergraduate course. The graduate and undergraduate sections will be graded separately, for which the graduate section has additional problems and different weights for all problems.

Effective Term Fall

Effective Year 2019

Rotating Topic? No

Repeatable Credit? No

Amount of Credit 3

If variable, # min 0

If variable, # max 0

S/U Only? No

Contact Type Regularly Scheduled

Weekly Contact Hours 3

Course Description The course is designed to introduce important semiconductor device technologies for high speed electronics, power electronics and energy harvesting applications.

Prerequisites EEE 3396C

Co-requisites None

Rationale and Placement in Curriculum This course builds on concepts of solid-state devices. It introduces students to important semiconductor device technologies.

Course Objectives The students are expected to develop fundamental understanding on the device physics of the most important semiconductor devices for these applications, and develop the capability to analyze device characteristics based on fundamental device theories. The students are also expected to appreciate the technological applications of the devices.

Course Textbook(s) and/or Other Assigned Reading Required Textbooks and Software

- Title: Fundamentals of Power Semiconductor Devices
- Author: J. Baliga
- Publication date, edition, and publisher: 2nd edition, Springer, 2008
- ISBN number: 978-0387473130
- Software: None

Recommended Materials

- Title: Semiconductor Device Physics and Design

- Author: U. Mishra and J. Singh
- Publication date, edition, and publisher: 1st edition, Springer, 2014
- ISBN number: 9789400797789

Weekly Schedule of Topics Course Schedule

Week 1:	Semiconductor material
Week 2:	PN junction (homework 1 due, Quiz 1)
Week 3-4:	PIN Power diodes
Week 5:	Solar cell for energy harvesting (homework 2 due, Quiz 2)
Week 6-7:	Power MOSFET (homework 3 due, Quiz 3)
Week 8-9:	Bipolar junction transistor (BJT)
Week 9:	Midterm Exam
Week 10-11:	Heterojunction bipolar transistor (HBT) for RF electronics (homework 4 due, Quiz 4)
Week 12-13:	High electron mobility transistor (HEMT) for RF electronics
Week 14:	IGBT (homework 5 due, Quiz 5)
Week 15-16:	Final project and presentation

Links and Policies Attendance Policy, Class Expectations, and Make-Up Policy

Excused absences are consistent with university policies in the undergraduate catalog (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>) and require appropriate documentation

Grading Policy:

Percent Grade	Grade	Grade Points
93.0 - 100	A	4.00
90.0 - 92.9	A-	3.67
87.0 - 89.9	B+	3.33
83.0 - 86.9	B	3.00
80.0 - 82.9	B-	2.67
77.0 - 79.9	C+	2.33
73.0 - 76.9	C	2.00
70.0 - 72.9	C-	1.67
67.0 - 69.9	D+	1.33
63.0 - 66.9	D	1.00
60.0 - 62.9	D-	0.67
0 - 59.9	E	0.00

A "C-" will not be a qualifying grade for critical tracking courses. In order to graduate, students must have an overall GPA and an upper-division GPA of 2.0 or better (C or better). Note: A "C-" average is equivalent to a GPA of 1.67, and therefore, it does not satisfy this graduation requirement.

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 feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu/evals>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/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://www.dso.ufl.edu/sccr/process/student-conduct-honor-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.

Software Use

All faculty, staff and student 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.

Campus Resources:

Health and Wellness

U Matter, We Care:

If you or a friend is in distress, please contact umatter@ufl.edu or 352-392-1575 so that a team member can reach out to the student.

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 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 support, 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://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf.

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

Grading Scheme Evaluation of Grades:

Assignment	Percentage of Final Grade
Homework Sets (5)	10%
Quizzes (5)	10%
Midterm Exam	30%
Final presentation	50%

Instructor(s) Dr. Jing Guo

Fundamentals of RF and Power Electronic Devices

EEL 4XXX Section #XXX

Class Periods: TBD

Location: TBD

Academic Term: TBD

Instructor

- Name: Jing Guo
- Email Address: guoj@ufl.edu
- Office Phone Number: NEB 551
- Office Hours: TBD

Teaching Assistants:

Please contact through the Canvas website

- Name of TA, email address, office location, office hours
- Name of TA, email address, office location, office hours

Course Description

The course is designed to introduce important semiconductor device technologies for high speed electronics, power electronics and energy harvesting applications. 3 credits.

Course Pre-Requisites / Co-Requisites

EEE 3396C

Course Objectives

The students are expected to develop fundamental understanding on the device physics of the most important semiconductor devices for these applications, and develop the capability to analyze device characteristics based on fundamental device theories. The students are also expected to appreciate the technological applications of the devices.

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)

Engineering Criteria

- a - an ability to apply knowledge of mathematics, science, and engineering
- b - an ability to design and conduct experiments, as well as to analyze and interpret data
- e - an ability to identify, formulate, and solve engineering problems
- f - an understanding of professional and ethical responsibility
- j - a knowledge of contemporary issues

EE Program Criteria:

- EE2 - knowledge of mathematics, basic and engineering sciences necessary to analyze and design complex systems
- EE3 - knowledge of advanced mathematics including linear algebra, complex variables and discrete mathematics

Required Textbooks and Software

- Title: Fundamentals of Power Semiconductor Devices

EEL 4XXX- Fundamentals of RF and Power Electronic Devices

Dr. Jing Guo, TERM YEAR

- Author: J. Baliga
- Publication date, edition, and publisher: 2nd edition, Springer, 2008
- ISBN number: 978-0387473130
- Software: None

Recommended Materials

- Title: Semiconductor Device Physics and Design
- Author: U. Mishra and J. Singh
- Publication date, edition, and publisher: 1st edition, Springer, 2014
- ISBN number: 9789400797789

Course Schedule

- Week 1: Semiconductor material
- Week 2: PN junction (homework 1 due, Quiz 1)
- Week 3-4: PIN Power diodes
- Week 5: Solar cell for energy harvesting (homework 2 due, Quiz 2)
- Week 6-7: Power MOSFET (homework 3 due, Quiz 3)
- Week 8-9: Bipolar junction transistor (BJT)
- Week 9: Midterm Exam
- Week 10-11: Heterojunction bipolar transistor (HBT) for RF electronics (homework 4 due, Quiz 4)
- Week 12-13: High electron mobility transistor (HEMT) for RF electronics
- Week 14: IGBT (homework 5 due, Quiz 5)
- Week 15-16: Final project and presentation

Attendance Policy, Class Expectations, and Make-Up Policy

Excused absences are consistent with university policies in the undergraduate catalog (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>) and require appropriate documentation.

Evaluation of Grades:

Assignment	Percentage of Final Grade
Homework Sets (5)	10%
Quizzes (5)	10%
Midterm Exam	30%
Final presentation	50%

This course is co-listed with the graduate class. The homework portion of the graduate section will involve additional work and more advanced concepts with respect to the undergraduate section. The exams will also involve additional questions for the graduate section with respect to the undergraduate section.

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Grading Policy:

Percent	Grade	Grade Points
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93.0 - 100	A	4.00
90.0 - 92.9	A-	3.67
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80.0 - 82.9	B-	2.67
77.0 - 79.9	C+	2.33
73.0 - 76.9	C	2.00
70.0 - 72.9	C-	1.67
67.0 - 69.9	D+	1.33
63.0 - 66.9	D	1.00
60.0 - 62.9	D-	0.67
0 - 59.9	E	0.00

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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 support, 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/>.

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<https://teachingcenter.ufl.edu/>.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.
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Fundamentals of RF and Power Electronic Devices

EEL 5XXX Section XXX

Class Periods: TBD

Location: TBD

Academic Term: TBD

Instructor:

- Name: Jing Guo
- Email Address: guoj@ufl.edu
- Office Phone Number: NEB 551
- Office Hours: TBD

Teaching Assistants:

Please contact through the Canvas website

- Name of TA, email address, office location, office hours
- Name of TA, email address, office location, office hours

Course Description

The course is designed to introduce important semiconductor device technologies for high speed electronics, power electronics and energy harvesting applications. 3 credit hours

Course Pre-Requisites / Co-Requisites

Solid State Devices

Course Objectives

The students are expected to develop fundamental understanding on the device physics of the most important semiconductor devices for these applications, and develop the capability to analyze device characteristics based on fundamental device theories. The students are also expected to appreciate the technological applications of the devices.

Materials and Supply Fees

NA

Required Textbooks and Software

- Title: Fundamentals of Power Semiconductor Devices
- Author: J. Baliga
- Publication date, edition, and publisher: 2nd edition, Springer, 2008
- ISBN number: 978-0387473130
- Software: None

Recommended Materials

- Title: Semiconductor Device Physics and Design
- Author: U. Mishra and J. Singh
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Course Schedule

Week 1: Semiconductor material

Week 2: PN junction (homework 1 due, Quiz 1)

Week 3-4: PIN Power diodes

Week 5: Solar cell for energy harvesting (homework 2 due, Quiz 2)

Course Title, Prefix, and Number

Course Instructor and Academic Term

- Week 6-7: Power MOSFET (homework 3 due, Quiz 3)
- Week 8-9: Bipolar junction transistor (BJT)
- Week 9: Midterm Exam
- Week 10-11: Heterojunction bipolar transistor (HBT) for RF electronics (homework 4 due, Quiz 4)
- Week 12-13: High electron mobility transistor (HEMT) for RF electronics
- Week 14: IGBT (homework 5 due, Quiz 5)
- Week 15-16: Final project and presentation

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