

EEE6374: Radiofrequency Circuits and Systems, Spring 2018

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EEE 6374 – Radiofrequency Circuits and Systems

Instructor: Joaquin Casanova (jcasa@ufl.edu)

MWF 4th BLK 315

Office Hours: MWF 2nd NEB 565

Course Description

RF regulations, system specifications, modulations, architectures, and link budget analysis. An overarching description of RF systems to go from standards and regulations to component specifications

Course Objectives

The course objective is to let students learn: Overall picture of RFIC and wireless systems, RFIC specifications and system specifications, Transceiver architectures, How to derive RFIC specifications from wireless communication standards, Design and simulation of RF transceivers using EDA tools

Materials and Supply Fees

None

Required Textbooks and Software

None

Recommended Materials

Razavi, B., RF Microelectronics, Wiley 2013.

Pozar, D.M., Microwave and RF System Design, Wiley 2000.

Course Schedule

The course schedule will depend on the specific interests and ability of the class.

The following topics will be covered:

RF Overview – Definition of RF and FCC Regulations

RF Propagation and Antennas

Wireless Standards, Digital Modulations

RF System-Level Specifications

Noise and Linearity in Receiver

RF Transceiver Architectures – Receiver and Transmitter

RF System Design EDA Tutorial

RFIC Specifications, Case Study

Emerging Applications

Overview of RFIC Technologies, Packaging, and System Integration

RF Testing – Spectrum Analyzer

Attendance Policy, Class Expectations, and Make-Up Policy

Participation is a crucial part of the course. Further, notes are usually on the blackboard, thus attendance is critical. Exams and homeworks can be made up in special circumstances.

Evaluation of Grades

10% class participation, 25% each of two tests, 15% homework, 25% final project.

Grading Policy

The standard letter grade scale will be used. More information on UF grading policy may be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

[\(https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx\)](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> (<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/> (<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 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:

<http://registrar.ufl.edu/catalog0910/policies/regulationferpa.html>

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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> (<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/> (<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> (<https://lss.at.ufl.edu/help.shtml>).

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

Library Support, <http://cms.uflib.ufl.edu/ask> (<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/> (<https://teachingcenter.ufl.edu/>).






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











Student Complaints Campus: https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf
https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf.





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

Course Summary:

Date	Details	12am
Mon Jan 8, 2018	 Intro/RF (https://ufl.instructure.com/calendar?event_id=622996&include_contexts=course_347071)	12am
Wed Jan 10, 2018	 FCC/Safety (https://ufl.instructure.com/calendar?event_id=623016&include_contexts=course_347071)	12am
Fri Jan 12, 2018	 Smith Chart/TL (https://ufl.instructure.com/calendar?event_id=623017&include_contexts=course_347071)	12am
Wed Jan 17, 2018	 ADS Intro (https://ufl.instructure.com/calendar?event_id=623018&include_contexts=course_347071)	12am
Fri Jan 19, 2018	 Antennas/Propagation (https://ufl.instructure.com/calendar?event_id=623021&include_contexts=course_347071)	12am
Mon Jan 22, 2018	 Antennas/Propagation (https://ufl.instructure.com/calendar?event_id=623022&include_contexts=course_347071)	12am
Wed Jan 24, 2018	 Antennas/Propagation (https://ufl.instructure.com/calendar?event_id=623023&include_contexts=course_347071)	12am
Fri Jan 26, 2018	 Modulation (https://ufl.instructure.com/calendar?event_id=623026&include_contexts=course_347071)	12am
Mon Jan 29, 2018	 Modulation (https://ufl.instructure.com/calendar?event_id=623028&include_contexts=course_347071)	12am
Wed Jan 31, 2018	 Multiple access (https://ufl.instructure.com/calendar?event_id=623030&include_contexts=course_347071)	12am

Date	Details	
Fri Feb 2, 2018	 ADS (https://ufl.instructure.com/calendar?event_id=623032&include_contexts=course_347071)	12am
Mon Feb 5, 2018	 Licensed (https://ufl.instructure.com/calendar?event_id=623033&include_contexts=course_347071)	12am
Wed Feb 7, 2018	 Unlicensed (https://ufl.instructure.com/calendar?event_id=623034&include_contexts=course_347071)	12am
Fri Feb 9, 2018	 5G (https://ufl.instructure.com/calendar?event_id=623035&include_contexts=course_347071)	12am
Mon Feb 12, 2018	 Radar (https://ufl.instructure.com/calendar?event_id=623038&include_contexts=course_347071)	12am
	 RAN/Radar (https://ufl.instructure.com/calendar?event_id=623037&include_contexts=course_347071)	12am
Wed Feb 14, 2018	 Exam review (https://ufl.instructure.com/calendar?event_id=623045&include_contexts=course_347071)	12am
Fri Feb 16, 2018	 Exam 1 (https://ufl.instructure.com/calendar?event_id=623046&include_contexts=course_347071)	12am
Mon Feb 19, 2018	 Noise 1 (https://ufl.instructure.com/calendar?event_id=623050&include_contexts=course_347071)	12am
Wed Feb 21, 2018	 Noise 2 (https://ufl.instructure.com/calendar?event_id=623051&include_contexts=course_347071)	12am
Fri Feb 23, 2018	 Antenna Noise (https://ufl.instructure.com/calendar?event_id=623052&include_contexts=course_347071)	12am
Mon Feb 26, 2018	 Linearity 1 (https://ufl.instructure.com/calendar?event_id=623056&include_contexts=course_347071)	12am
Wed Feb 28, 2018	 Linearity 2 (https://ufl.instructure.com/calendar?event_id=623057&include_contexts=course_347071)	12am
Fri Mar 2, 2018	 ADS (https://ufl.instructure.com/calendar?event_id=623058&include_contexts=course_347071)	12am
Mon Mar 12, 2018	 Amps, filters, mixers (https://ufl.instructure.com/calendar?event_id=623067&include_contexts=course_347071)	12am

Date	Details	
Wed Mar 14, 2018	 Amps, filters, mixers (https://ufl.instructure.com/calendar?event_id=623068&include_contexts=course_347071)	12am
Fri Mar 16, 2018	 Amps, filters, mixers (https://ufl.instructure.com/calendar?event_id=623069&include_contexts=course_347071)	12am
Mon Mar 19, 2018	 RF system specs (https://ufl.instructure.com/calendar?event_id=623070&include_contexts=course_347071)	12am
Wed Mar 21, 2018	 GSM example (https://ufl.instructure.com/calendar?event_id=623071&include_contexts=course_347071)	12am
Fri Mar 23, 2018	 Transceiver architectures (https://ufl.instructure.com/calendar?event_id=623072&include_contexts=course_347071)	12am
Mon Mar 26, 2018	 RX1 (https://ufl.instructure.com/calendar?event_id=623073&include_contexts=course_347071)	12am
Wed Mar 28, 2018	 RX2 (https://ufl.instructure.com/calendar?event_id=623074&include_contexts=course_347071)	12am
Fri Mar 30, 2018	 RX3 (https://ufl.instructure.com/calendar?event_id=623076&include_contexts=course_347071)	12am
Mon Apr 2, 2018	 TX1 (https://ufl.instructure.com/calendar?event_id=623085&include_contexts=course_347071)	12am
Wed Apr 4, 2018	 TX2 (https://ufl.instructure.com/calendar?event_id=623086&include_contexts=course_347071)	12am
Fri Apr 6, 2018	 ADS (https://ufl.instructure.com/calendar?event_id=623087&include_contexts=course_347071)	12am
Mon Apr 9, 2018	 Packaging (https://ufl.instructure.com/calendar?event_id=623088&include_contexts=course_347071)	12am
Wed Apr 11, 2018	 Exam review (https://ufl.instructure.com/calendar?event_id=623089&include_contexts=course_347071)	12am
Fri Apr 13, 2018	 Exam 2 (https://ufl.instructure.com/calendar?event_id=623090&include_contexts=course_347071)	12am
Mon Apr 16, 2018	 SDR (https://ufl.instructure.com/calendar?event_id=623091&include_contexts=course_347071)	12am

Date	Details	
Wed Apr 18, 2018	 FCC testing/equipment (https://ufl.instructure.com/calendar?event_id=623092&include_contexts=course_347071)	12am
Fri Apr 20, 2018	 Presentations (https://ufl.instructure.com/calendar?event_id=623009&include_contexts=course_347071)	12am
Mon Apr 23, 2018	 Presentations (https://ufl.instructure.com/calendar?event_id=623008&include_contexts=course_347071)	12am
Wed Apr 25, 2018	 Presentations (https://ufl.instructure.com/calendar?event_id=623007&include_contexts=course_347071)	12am