

Course Syllabus

EERF 6355 RF & Microwave Amplifier Design

Fall 2016, Section 001

Fridays 4:00 p.m. - 6:45 p.m. Room: ECSS 2.201

Professor Contact Information

Dr. Ricardo Saad

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Office hours: Fridays 8:45 am 9:45 am or by appointment

TA Contact Information

Mr. Xiangyu Xu

Office Hours: Tuesday and Thursdays 4pm-5 pm or by appointment. Room ECSN 3.104

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Problem sessions: Tuesdays, 7 pm-9 pm Room ECSN 2.110

Course Pre-requisites, Co-requisites, and/or Other Restrictions

[EERF 6311](#) or equivalent.

Course Description

Design of narrow band, and broadband amplifiers. Study of stability on amplifiers. Study of noise figure, noise parameters and noise sources. Low noise amplifier design. Study of distortion on amplifiers. Introduction to power amplifiers. Microwave amplifier design in integrated circuits.

Student Learning Objectives/Outcomes

- Ability to design narrow and broadband RF and microwave amplifiers circuits
 - Ability to integrate RF and Microwave designs techniques to the design of RF and Microwaves Amplifiers
 - Ability to understand non-linearities in RF and microwaves Amplifiers
 - Ability to understand fundamental concepts on power amplifiers
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Required Textbooks and Materials

- Class notes (posted in eLearning).
- Microwave Transistor Amplifiers: Analysis and Design, 2nd ed. By Guillermo Gonzalez
Prentice Hall, SBN: 0-13-254335-4
- RF Power Amplifiers, 2nd ed., by Marian K. Kazimierczuk, Wiley ISBN: 978-1-118-84430-4

Microwave Office is utilized for RF simulations. It is available in the computer labs of the department and can also be downloaded in the company website.

Assignments & Academic Calendar

1. Two-port networks

- The impedance, admittance , hybrid and ABCD Matrices
- Transmission line concepts
- Scattering Parameters

2. RF and Microwave Amplifier Design

- Power Gain Equations
- Stability Considerations
- Two port matching
- Bias Networks
- Different type of amplifiers

3. Noise in Amplifiers

- Noise in two port networks
- Noise Figure
- Low Noise amplifiers
- Constant Noise Figure Circles

4. Non-linear analysis in RF and Microwave Amplifiers

- Single tone Analysis
- Two-tone Analysis

5. Introduction to Power Amplifiers

- Amplifier Classes
- Distortion in Amplifiers

Grading Policy

Quizzes/Assignments	10 %
Project 1:	20 %
Project 2:	15 %
Exam 1:	25 %
Exam 2:	30 %

Exam 1 and 2 dates will be announced in eLearning at least 1 week prior to the exam.

Quizzes can be given at any time during class.

All grades are final **one week** after the graded exams, quizzes, and projects are posted or they are given back in class, whatever happens first.

Course & Instructor Policies

Homework problems will be assigned approximately weekly. **Late homework will not be accepted.**

Homework will be collected at the **beginning** of the class period on the date it is due. Students should keep a copy of their homework in case they need it for reference (or in preparing for exams) before they can be graded and returned

No exam grades will be dropped. Make-up exams will be given **only in very special circumstances and at the discretion of the instructor.**

Student must solve the homework problems in **Engineering Paper**

Problem sessions are offered for almost every assignment by the TA of the course. Attendance is not mandatory but highly recommended.

Projects will be done in groups of 3 students. The instructor (at its discretion) may accept a group composed by 4 students.

Attendance to class is mandatory.

Classroom Citizenship: General good behavior with **cell phones silenced** required. **Questions are encouraged!**

Off-campus Instruction and Course Activities

There will be no off-campus activities for this course

Comet Creed

This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same:

“As a Comet, I pledge honesty, integrity, and service in all that I do.”

UT Dallas Syllabus Policies and Procedures

The information contained in the following link constitutes the University’s policies and procedures segment of the course syllabus.

Please go to <http://go.utdallas.edu/syllabus-policies> for these policies.

The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.