

RF Integrated Circuit Design

ECE 464-01

ECE 589-01

Syllabus (Spring 2024)

Instructor:

- Russell C. Pepe, RCDD
- russell.pepe@atm1.com
- 201-960-6796
- IEEE #: 06888382

Rooms/Time:

- Lecture/Lab:
 - Electrical Engineering Building
 - Room 205 Lecture
 - Room 207 Lab
- Schedule
 - Tuesday
 - 5:40 pm to 8:40 pm

Books:

- Principles of Electronic Communication Systems, Frenzel, Fourth Edition
- Lab Manual

Assignments:

Lecture:

- Read the text book assignments for lectures one week in advance.
- Hand in homework assignment questions and problems one week after assigned. These may be hand written, but must be neat and legible. No credit is given for late homework.
- All homework solutions will be posted.

Lab Reports:

- Lab dates will be announced at least one week in advance.
- Read the lab manual assignment one week in advance.
- Lab reports must be constructed **exactly** as outlined.
- Lab partners work as a team.
- Lab partners may prepare one lab report as a team or may prepare an individual lab report.
- Lab reports are due two weeks after performed.
- Lab reports must be prepared on a pc. Programs such as Microsoft Word and Excel or equivalent may be used.
- Lab reports must be neat, thorough and professional, and must be stapled together. Do not use fancy lab report covers.

Lab Report:

- **Cover Page**
 - Name of Experiment
 - Date Performed (Completed)
 - ECE464-589
 - NJIT
 - Lab Room Number
 - Lab Partner Names
- **Table of Contents**
- **Purpose:** Brief explanation of why you are conducting this experiment and what you plan to accomplish or prove.
- **Procedure:** Short, concise bullets outlining the process required to achieve your goals.
- **Theory:** Brief description of the exercised in the Lab. Site all formulas used.
- **Data:** Tables and graphs clearly displaying data. Title and scale appropriately.
- **Discussion:** Observations and problems experienced. Answer questions in Lab Manual. Must be detailed.
- **Conclusion:** Did you achieve what you set out to do? Why or why not? One paragraph.
- **Equipment List:** Actual list of equipment used, specifying device, manufacturer, model number.
- **Raw Data:** This is the actual hand written data used during the experiment.

Rules:

- No food or drink is allowed in the lab.
- Arrive to class on time. If you plan to be late or miss a class, call me or send me an e-mail in advance.
- Turn off your cell phone prior to arrive to class. Use of cell phones in class is forbidden.

Extra Credit:

- IEEE Seminar related to class

Tests:

- Three tests will be given during the semester.
- You will be given 90 minutes to complete each test.
- A brief review will be given the week before tests.
- Calculators will be permitted.
- All tests are closed book and notes. However, a one-page (8 1/2 x 11”) formula sheet will be allowed.
- Tests will be graded and returned. At that time, the test solutions will be provided during class.

Grading:

- Lab Reports: 40 % (30 % for graduate students)
- Homework: 10 % (5 % for graduate students)
- Class Participation: 10 % (5% for graduate students)
- Attendance 10 %
- Tests (3): 30 %
- Final Exam: 10 % (graduate students only)
- Graduate Seminars: 10 % (graduate students only)

Attendance:

- Attendance will be taken before each class.
- You will find that poor attendance will negatively impact your ability to grasp the material presented in this course.
- You will receive a grade for attendance.
- No credit will be given for lab reports if you were not present for the particular lab.

Final Exam (graduate students only-all students must attend):

- 15-minute Power Point Presentation
- 3 to 5-page typed report.
- Must have at least three sources.
- Topic related to a new technology pertaining to RF/Microwave

Graduate Student Additional Assignments:

View the seminar. Draft a 1-page summary, typed, single-spaced.

Rohde and Schwarz RF Fundamental Seminars (link will be provided)

- Part 1: Introduction to RF (due weeks 3)
- Part 2: RF Transmission Characteristics (due week 3)
- Part 3: RF Components and Measurements (due week 7)
- Part 4: Communications Systems, Signal and Noise (due week 10)
- Part 5: Digital Modulation (due week 14)

Agenda:

	<u>Week</u>	<u>Topic</u>
Lecture:	1	Introduction Review of Lab Reports Chapters 1 (Introduction to Electronic Communications) and 2 (Electronic Fundamentals for Communications)
	2	Chapter 3 (Amplitude Modulation Fundamentals)
	3	Chapter 3 continued
	4	Chapter 5 (Fundamentals of Frequency Modulation)
	5	Chapter 5 continued Test 1
	6	Chapter 7 (Digital Communication Techniques)
	7	Chapter 7 continued
	8	Chapters 10 (Multiplexing and Demultiplexing) and 11 (Digital Data Transmission)
	9	Chapter 13 (Transmission Lines)
	10	Chapter 13 continued Test 2
	11	Chapter 14 Antennas and Wave Propagation)
	12	Chapter 14 continued
	13	Chapter 10 and 11
	14	Chapter 16 (Microwave and Millimeter-Wave Communication) Test 3
	15	Chapter 16 continued
	16	Final Exam
Labs:	2	(Review of Electronic Fundamentals)
	3	(Amplitude Modulation Fundamentals)
	5	(Fundamentals of Frequency Modulation)
	6	(FM Circuits)
	9	(Communication Receivers)
	14	(Antennas and Wave Propagation)