EEL 5427 – Electromagnetic Modeling of Radio Frequency (RF) Structures
Department of Electrical & Computer Engineering
Florida International University
Fall, 2022

Classroom	**:**	EC 1109 – EC2840
Class Time	**:**	Mon. & Wed. 3:00 pm - 4:15 pm
Faculty	**:**	Dr. Constantinos Zekios
Office Hours	**:**	Mon. 12:00 pm - 1:00 pm & Tue. 11:00 am - 12:00 pm
Office	**:**	EC 2965
Phone	**:**	305-348-2270
Email	**:**	kzekios@fiu.edu
Prerequisite	**:**	EEL 3514 Communication Systems, EEL 5437 Microwave
		Engineering, EEL 5467 Antennas for Wireless Communica-
		tion Systems, EEL 5482 Fields and Waves Engineering
Reference books	**:**	J. Volakis, L. Kempel and A. Chatterjee, Finite Element Method for Electromagnetics, IEEE Press, 1998 J. Jin, Theory and Computation in Electromagnetic Fields, IEEE Press, 2010 D. B. Davidson, Computational Electromagnetics for RF and Microwave Engineering, Second Edition, Cambridge Press, 2011 W. C. Gibson, The Method of Moments in Electromagnetics, Second Edition, CRC Press, 2015

Course Description

This course covers three popular numerical methods (integral equation, finite difference and finite element methods), routinely used to solve electromagnetic problems.

Course Objectives

The objective of the course is to provide an introductory level of understanding of these methods and their application to problems in electromagnetics, and other areas of Electrical Engineering. After finishing this course the student will be able to:

1. Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

2. Be able to develop numerical methods for the analysis and study of any electromagnetic component (e.g., filters, antennas, etc.)
3. Be able to understand in depth the operating principles of antennas and microwave components.

ABET Relationship of course to program outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
3. An ability to communicate effectively with a range of audiences.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Topics Covered

1. Electromagnetics principles
2. Finite Difference Method
3. Method of Moments
4. Finite Element Method

Relationship of course to program objectives

In this course, the student will have to show:

1. an ability to apply knowledge of mathematics, science, and engineering,
2. an ability to identify, formulate, and solve engineering problems,
3. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
4. an ability to code.

Grading Scheme

Homework	**40%**
Quizzes	**15%**
Take Home 72hr Midterm	**25%**
Final Project	**20%**
Total	**100%**

Tentative Grading Scale

A	**92-100**	**B+**	**88-90**	**C+**	**78-80**	**D**	**60-69**	**F**	**0-60**
A-	**90-92**	**B**	**82-88**	**C**	**70-78**				
		B-	**80-82**						

University's Code of Academic Integrity

Florida International University is a community dedicated to generating and imparting knowledge through excellent teaching and research, the rigorous and respectful exchange of ideas, and community service. All students should respect the right of others to have an equitable opportunity

to learn and honestly to demonstrate the quality of their learning. Therefore, all students are expected to adhere to a standard of academic conduct, which demonstrates respect for themselves, their fellow students, and the educational Mission of the University. All students are deemed by the University to understand that if they are found responsible for academic misconduct, they will be subject to the Academic Misconduct procedures and sanctions, as outlined in the Student Handbook.
More information can be found at http://academic.fiu.edu/academic_misconduct.html

Department Regulations Concerning Incomplete Grades

To qualify for an Incomplete, a student:

1. Must contact (e.g., phone, email, etc.) the instructor or secretary before or during missed portion of class.
2. Must be passing the course prior to that part of the course that is not completed
3. Must make up the incomplete work through the instructor of the course
4. Must see the Instructor. All missed work must be finished before last two weeks of the following term.

University policies on sexual harassment, and religious holidays, and information on services for students with disabilities

Please visit the following websites:
http://academic.fiu.edu/
http://drc.fiu.edu

Course Policies:

- **Academic Misconduct:** For work submitted, it is expected that each student will submit their own original work. Any evidence of duplication, cheating or plagiarism will result at least a failing grade for the course.
- **Deadlines:** Assignments are due at the beginning of the class period on the date specified.
- **Late Homework:** Late homework will not be accepted and will not be graded.
- Students are encouraged to ask questions and to discuss course topics with the instructor and with each other.
- **Any work submitted should display the student's name and should be signed, as the students' own work, and that no unauthorized help was obtained.**
- Cell phones, communicators, MP3 players, head sets are not allowed to be used in the class.
- **DO NOT** send any assignments, homework or projects by email.
- Attendance is required. Students are required to attend every lecture. You are fully responsible for all materials covered in class.
- The professor reserves the right to change course materials or dates at any time during the semester.
- The professor reserves the right to change or modify the syllabus at any time during the semester.
- The services of Turnitin.com will be used.

- The services of Honorlock will be used. The minimum requirements and the details of Honolock are described at https://fiuhelp.force.com/canvas/s/article/Honorlock-students
- The services of Zoom will be used, and lectures might be recorded based on what the Professor chooses. Zoom is a video conference tool that students can use to interact with the professor and fellow students by sharing screens, chatting, broadcasting live video/audio, and taking part in other interactive online activities. Zoom will be used to conduct lectures, office hours, and questions about the course and assignments.
- Actively participate in class by asking questions, answering instructor's questions and interact with your peers as directed by the instructor. Because this course works like a system your active contribution and participation are essential for the success of the course.
- Do not disturb and disrupt the class by talking to each other, using the classroom computers, typing on the keyboards, engage in other activities that do not relate to the class.
- No food or drinks are allowed in classroom.