

# **ECE 5317/6351 Microwave Engineering**

**Fall 2019**

**Sections 13706/13785**

## **Class Time**

Tu, Th 5:30 – 7:00 p.m., room 303 AH

## **Instructor**

David R. Jackson. Office: W318-D3; phone: 713-743-4426; fax: 713-743-4444; email: djackson@uh.edu. Office-hours will be posted on the Blackboard site and on the instructor's door.

## **Prerequisites**

ECE 3317, or equivalent (or instructor's permission).

## **Course Goals**

The intent of the lecture portion of this course is to cover the fundamental techniques necessary for the design and analysis of microwave circuits and systems. The emphasis in the course will be on developing a practical understanding of microwave engineering.

## **Course Content**

The tentative topics to be covered are:

- ◇ Transmission Line Theory
- ◇ Practical Transmission Lines
- ◇ Waveguides
- ◇ Microwave Network Analysis
- ◇ Impedance Matching
- ◇ Power Dividers and Directional Couplers
- ◇ Microwave Filters
- ◇ Noise in Microwave Circuits

## **Blackboard**

This class will use Blackboard as the official site for the distribution of all of the class material, including the class lecture notes, homework, project, handouts, and other material. In addition, any important announcements that pertain to the class will be put there in the "Announcements" section of the site. You are responsible for all messages that are placed there. Therefore, it is your responsibility to check the Blackboard site often.

There is also a public-domain website for the course that has all of the class notes from the previous time the class was taught. The website is: <http://courses.egr.uh.edu/ECE/ECE5317>.

## **Text and Class Materials**

The official text is *Microwave Engineering* by David M. Pozar, 4th edition, Wiley, 2011.

In addition to the text, a set of class notes will be placed on the Blackboard site. The class notes are what will be presented in class during the lectures. The class notes are based on the textbook, but there may be some differences. The notes are subject to change until after they have been completely presented in class.

Additional recommended textbooks that make for good supplementary reading are:

*Microwave and RF Design: A Systems Approach*, Michael Steer, Scitech, 2009.

*Time-Harmonic Electromagnetic Fields*, R. F. Harrington, Wiley-IEEE Press, 2001.

*Advanced Engineering Electromagnetics*, C. A. Balanis, John Wiley & Sons, 2nd Ed., 1997.

*Fields and Waves in Communication Electronics*, S. Ramo, J. R. Whinnery, and T. Van Duzer, John Wiley & Sons, 3<sup>rd</sup> Ed., 1994.

## **Tentative Grading Policy**

Exam I	35%
Exam II	35%
Homework	20%
Project	10%

## **Exams**

The tentative policy is that there will be two exams. The dates and format for the exams will be announced at least one week before they are given.

## **Homework**

Students are expected to work individually on the homework. The homework that you turn in must represent your own work entirely. Do not obtain answers from anyone, or give answers to anyone, and do not work together with anyone on the homework. Do not try to obtain answers from previous semesters. To do otherwise will be considered a violation of the UH Academic Honesty Policy. Having discussions with others about general concepts and methods is fine, and is even encouraged, but what you put on your assignment must be completely your own work. Homework is due at the beginning of class on the due date. No late homework is accepted.

## **Lab Section (ECE 5113)**

The lab portion of this course (ECE 5113) is available to students registered in one of the lecture sections, but students are not required to take ECE 5113. ECE 5113 is a numerical simulation experience using Ansys HFSS. Students will learn this commercial electromagnetic simulator, which they will use to analyze a particular practical structure, such as a microwave filter. This will be a self-learning experience based on provided tutorials that help you to gain an understanding of a commercial simulation software that is commonly used in industry.

## **Academic Honesty Policy**

Students in this course are expected to follow the Academic Honesty Policy of the University of Houston. It is your responsibility to know and follow the policy. You must sign the Academic Honesty Statement given by the instructor and submit it to the instructor by Aug. 30, 2019. If you fail to do this you may be dropped from the course. For more information about the UH Academic Honesty Policy, please see the [UH Student Handbook](#)

## **Withdrawal Policy**

The university policy regarding withdrawal from the course will be followed. Grades of “I” will not be assigned except in cases where extreme (and documented) situations (e.g., medical conditions) develop after the last drop date, which prevent the student from finishing the semester.

## **Responsibilities**

All students must be thoroughly familiar with all the requirements, regulations, and responsibilities described in the UH Student Handbook. Unless otherwise specified, these provisions will be followed as described in the Handbook. Attendance at every class is expected. Class attendance may be taken at any time. If a student misses three classes they will be subject to being dropped or failing the class.

## **Religious Holy Days**

Students whose religious beliefs prohibit class attendance on designated dates or attendance at scheduled exams may request an excused absence. To do this, you are required to request the excused absence to the instructor, in writing, by Aug. 30, 2019. For more information, please see the [Student Handbook](#).

## **Students with Disabilities**

Students with recognized disabilities will be provided reasonable accommodations, appropriate to the course, upon documentation of the disability with a [Student Accommodation Form](#) from the [Center for Students With Disabilities](#). To receive these accommodations, you must request the specific accommodations, by submitting them to the instructor in writing, by Aug. 30, 2019. Students who fail to submit a written request will not be considered for accommodations. For more information, please see the [UH Student Handbook](#).

## **Counseling And Psychological Services (CAPS)**

Counseling and Psychological Services (CAPS) can help students who are having difficulties managing stress, adjusting to college, or feeling sad and hopeless. You can reach CAPS ([www.uh.edu/caps](http://www.uh.edu/caps)) by calling 713-743-5454 during and after business hours for routine appointments or if you or someone you know is in crisis. Also, there is no appointment necessary for the “Let’s Talk” program, which is a drop-in consultation service at convenient locations and hours around campus: [http://www.uh.edu/caps/outreach/lets\\_talk.html](http://www.uh.edu/caps/outreach/lets_talk.html).

## Expected Course Outcomes

Students who successfully complete this course are expected to meet the following course outcomes:

- To develop in each student the basic skills of problem solving and critical thinking by solving problems in the field of microwave engineering.
- To develop in each student good writing skills so that they are able to communicate technical material effectively and clearly.
- To give each student the type of real-world design experience that is crucial to the education of an engineer, including an appreciation for technical, economic, and social issues.
- To give each student knowledge of contemporary issues that relate to microwave engineering.

## Important Dates

Aug. 19, 2019 (Monday)	First day of classes
Sept. 2, 2019 (Monday)	Labor Day Holiday
Sept. 4, 2019 (Wednesday)	Last day to drop without receiving a grade
Oct. 31, 2019 (Thursday)	Last day to drop with a W
Nov. 26, 2019 (Tuesday)	Last day of classes

## Useful Websites

Department of ECE: <http://www.ee.uh.edu>

College of Engineering: <http://www.egr.uh.edu>

University of Houston: <http://www.uh.edu>

Student Handbook: <http://www.uh.edu/dos/resources/student-handbook>

Undergraduate Student Catalog: <http://publications.uh.edu>

Graduate Student Catalog: <http://publications.uh.edu>

Course Descriptions: <http://publications.uh.edu/content.php?catoid=31&navoid=11769>

Academic Calendar: <http://publications.uh.edu>

Final Exam Schedule: <http://www.uh.edu/academics/courses-enrollment/final-exam-schedules/>