VE 411 Microwave Circuits

Fall 2021

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Canvas Pages:

1. https://umjicanvas.com/courses/2251

Office Hours: After class, or by email appointment, or post your questions in Feishu groups.

Main References: This is a restricted list of various interesting and useful books that will be touched during the course. You need to consult them occasionally.

- David M. Pozar, *Microwave Engineering.*
- Thomas Lee, *The Design of Radio-Frequency Integrated Circuits.*
- Behzad Razavi, *Design of Analog CMOS Integrated Circuits*
- Constantine A. Balanis, *Antenna Theory: Analysis and Design*
- More to be updated throughout the semester.

Objectives: This course is primarily designed for senior undergraduate students interested in microwave circuits. We will cover the fundamentals of both microwave engineering and high-frequency circuits.

Prerequisites: An undergraduate-level understanding of basic analog circuits, such as VE 311 or VE 330, is expected. We will review the important concept in electromagnetics, analog circuits and digital circuits. Understanding of electronic devices is appreciated, such as VE 320.

Tentative Course Outline:

- A holistic review of the communication system.
- A review of basic electromagnetism.
- Transmission line theory.
- Impedance matching.
- Two port networks.
- Smith Chart.
- Waveguide and Transmission line.
- Review of semiconductor devices.
- Review of analog amplifier design.
- High frequency circuit design basics.
- Power amplifiers.
- Radio-frequency resonators.
- Antenna theory.
- Microwave couplers and filters.

Downloadable ebook versions are available on https://booksonweb.files.wordpress.com/2011/11/digital-integrated-circuits-a-design-perspective-by-jan-m-rabaey.pdf.

Grading Policy: Assignments (40%), Midterm (15%), Final (15%), Final project (30%).

Important Dates:

Midterm ..... TBD
Final ..... TBD
Final project report ..... due by TBD

Assignments: Assignments include written Homework and Labs.

To be announced.

Class Policy: Regular attendance is encouraged.

Home Late Policy: 20% points deducted per day. More than 5 day late submission not accepted.

Academic Honesty: Lack of knowledge of the academic honesty policy is not a reasonable explanation for a violation.