

# E157 Syllabus

Fall 2020

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Welcome to E157! I am very excited about this material and very excited to have you in the class. A wide array of logistics is found below. I hope the learning goals are especially helpful, please review them and try to reinforce those goals for yourself throughout the course.

## Schedule

Lecture	2:30-3:45	M/W	Discord
Office Hours	2:30-3:45	M/W	Discord

## Electronic Communication

Mailing List: [eng-157-1-2020-fa@g.hmc.edu](mailto:eng-157-1-2020-fa@g.hmc.edu)

Class Site: <http://pages.hmc.edu/m Spencer/fa20/e157>

We are also using Sakai, Gradescope, Discord and YouTube. Access these services in Sakai.

## Text

There are a few texts I'll be using as references for the class. They are listed in descending order of importance. Owning them is very optional, but the Lee books are great textbooks.

Planar Microwave Engineering, Lee

The Design of CMOS Radio-Frequency Integrated Circuits, 2E, Lee

RF Integrated Circuit Design, Razavi

Links will be provided to an assortment of online supplemental materials.

## Course Description

Design and analysis high speed communication circuits, with an emphasis on microwave design, measurement techniques, and communication links.

Big picture learning goal:

- A student of this class should be able to complete a clinic project involving high speed board designs or antenna characterization.

Essential skills:

- Identify when RF theory and techniques are important
- Understand the use common RF equipment and simulations, which includes understanding cabling effects and common output formats like smith charts
- Make a link budget for a communication system
- Design a printed circuit board with fast signals on it

## Schedule

The most up to date version is maintained on the course website.

## Assignments and Grading

### Quizzes:

- There will be an in-class quiz every lecture.
- The quiz will be carried out first individually and second as a team picked by me.

### Labs:

- Labs are due about every two weeks. See the schedule for details.
- Each lab has two deliverables: a problem write-up (see warm-up problems, below) and a completed digital lab notebook. Lab notebooks are less formal than reports, as will be discussed in class. I suggest Evernote for keeping a notebook. Submit PDFs of your notebook to Gradescope.
- Labs will be carried out individually, but discussion on Discord is encouraged.

### Warm-Up Problems:

- Each lab comes with a set of warm-up problems that are due at the same time as the lab. Submission instructions will be discussed in class.
- Warm-up problems are self-graded. Submission instructions will be discussed in class.
- Warm-up problems will be carried out individually, but discussion on Discord is encouraged.

### Design Projects:

- Two projects will be presented to you, these are less structured than labs and offer you considerable design freedom.
- The deliverable for design projects is a brief report. This report must introduce the design process, explain the final design, describe the testing process for the circuits, compare calculated, simulated and measured performance of the design, and explain any discrepancies between these quantities. A template will be provided.
- Design reports should be no longer than five pages, fewer is acceptable. Use IEEE citation format and ensure that every figure has a caption.
- The audience for the design report is another student of the class: you may use sophisticated technical language, and you don't need to introduce basic calculations.

### Grading:

- |             |     |
|-------------|-----|
| • Quizzes   | 10% |
| • Warmups   | 10% |
| • Labs      | 20% |
| • Design #1 | 20% |
| • Design #2 | 20% |
| • Midterm   | 10% |
| • Final     | 10% |

## Harassment

I am committed to making this class a safe space for people of all genders, sexual orientations, races, cultures, religions, disabilities, political affiliations and socioeconomic classes. Please be kind to one another and try to form an inclusive community. Please report any instances of harassment which might undermine or harm our community to me.

## **Academic Honesty**

It goes without saying that I expect the honor code to be followed carefully during this class. Any instances of academic dishonesty will be handled through the honor board.

Specific academic honesty pitfalls for this class:

- Modifying your homework after solutions have been distributed
- Copying another student's design during lab
- Unattributed schematics or reference designs (from data sheets or the internet) in lab notebooks or project reports.

## **Academic Accommodations**

If you would like to request academic accommodations due to temporary or permanent disability, contact [ability@hmc.edu](mailto:ability@hmc.edu): the coordinator for student disability resources.

Appropriate accommodations are considered after you have conferred with the Office of Student Disability Resources and presented the required documentation of your disability.

## **Title IX**

If I learn of any potential violation of our gender-based misconduct policy (rape, sexual assault, dating violence, domestic violence or stalking) by any means, I am required to notify the HMC Title IX Coordinator, Deborah Kahn. Students can request confidentiality from the institution, which I will communicate to the Title IX Coordinator if I am reporting to her. If students want to speak to someone confidentially, the resources listed below are available. Speaking with a confidential resource does not preclude students from making a formal report to the Title IX Coordinator at a later time.

- EmPOWER Center (909) 607-2689
- Monsour Counseling Center (909) 621-8202
- McAlister Chaplains (909) 621-8685