

ELEC 1908

An introduction to Engineering Physics. A overview of the field of engineering physics is given in this course. Lecture material covers classical physics, differential equations, numerical analysis of differential equations, quantum mechanics, and optoelectronics. The students will complete labs and assignments in numerical analysis and the use of a commercial electrostatic simulation tool and do an project involving the simulation and experimental analysis of a chaotic circuit.

Course Requirements:

TSE (from ECOR 1010 pass/fail) Fridays at 10:35-11:25 Room UC-231.

You have to go to these lectures (from a different professor) and take a short test at the end of term on the material. You need to pass this test!

Assignments/projects 100%

[Writing A Report](#)

[Sample Assignment](#)

[IEEE Style Guide for citations](#)

Course outline

The first class/meeting will be Jan 9, Tues. 1:30 in ME-3174.

My Labs/Lectures

All subsequent meeting times for the classes with me are Friday 1:30-5:30 (Room MC-6030) where we will do lectures and labs. The class times scheduled for Mon/Wed/Thu are available for you to work on your labs and assignments. I will be available during that time as well as the TA.

TSE Lectures

On Friday 10:35-11:35 you must attend the TSE component in Room: UC 231 provided by Prof.Liu. A detailed week-by-week breakdown follows:

Week	Fri. Lecture 1:30-2:30 (MC 6030)	Fri Lab 2:30-5:30 (MC-6030)
Jan 11 (Tues. ME-3174)	Orientation Calendar: Engineering Physics Courses and PreReqs Tree Differential Equations and Classical Physics	No Lab
Jan 18	Matlab Intro	Instructions Sounds From Matlab
Jan 25	Latex Lecture	Assignment 1 Old Assignment Overleaf
Feb 1	Quantum Mechanics Introduction	Assignment 1
Feb 8	Matlab Heat flow Quantum Demos using numerical analysis Game of Life Intro: Game of Life	Assignment Small program Full program Hints and Pseudocode
Feb 15	Quantum and MEMS and NanoTech	Game of Life
Feb 22	Reading week	Reading week
March 1	Latex sermon and Ansys introduction	Ansys lab
March 8	Field Solvers	Ansys Lab (Due March 12 2018)
March 15	Spice Lecture	Spice Lab Spice Tutorials
March 22	Chaos and Determinism	Chaos Lab Chaos Material Double Pendulum Video
March 29	No Lecture	Chaos Lab
April 5	Optical Systems And Fabrication	Fab tour

To apply for a summer internship you should contact [Me](#) and let me know you are interested.

Labs: 1st lab is a Matlab introduction. 2nd/3rd lab you will learn Latex and use Matlab for plotting. Labs 4-5 are for the Game of Life assignment. Lab 6 is on the numerical solution of Maxwell's equations, 7th lab is on Spice simulation, Final two labs are for experimental study of deterministic chaos.

TA: David Damario (daviddamario 'the normal thing' cmail.carleton.ca)

Course Content Learning Objectives

Upon successful completion of this course students will be able to:

1. Describe the relationship between Classical and Modern Physics
2. Present a basic understanding of Quantum Mechanics and its implications
3. Understand the importance of differential equation to Physics and Engineering
4. Do basic matlab programming
5. Use Latex
6. Use Spice for simple circuits
7. Describe the physics of carrier flow in semiconductors.
8. Use Maxwell-2D and understand the use in general of physical simulators
9. Have basic lab and bread boarding skills
10. Have an understanding of what Engineering Physics is and an overview of the program. Have a an understanding of the role of engineering in society and the importance of health and safety.

