

Course Number: ENGPS 172

Title: Engineering Electromagnetics II

Department/Program: Electronics, Computer and Communications Engineering

School: School of Science and Engineering

Semester and School Year: 1st Semester, August to December 2015

Instructor: Nathaniel Libatique, Ph.D

A. Course Description

This is the second part of the Engineering Electromagnetics sequence. The course starts with Maxwell's equations in both integral and differential forms and the boundary conditions. Examples of time varying fields in dielectric and lossy media will be discussed. Uniform plane wave solutions for the infinite plane sheet antenna will be derived. From this a discussion of transmission lines will be launched from the context of the planar waveguide, including electromagnetic effects in digital circuits, the Smith chart representation and antennas.

B. Learning Outcomes

At the end of the course, students are expected to understand time varying electromagnetic fields and the applications of Maxwell's Equations and boundary conditions, and their use in describing uniform plane wave propagation, the behavior of the infinite flat plane antenna and the principles and applications of simple transmission lines. Extra topics such as radar and antennas will be discussed if time permits.

C. Course Outline

1. Introduction and Review
2. Maxwell's Equations
3. Time Varying Fields and Uniform Plane Waves
4. Transmission Lines and Digital Circuits
5. Transmission Lines II and the Smith Chart
6. Optional: extra topics such as antennas – till the end of the course

D. References

Required Readings

1. NN Rao, Elements of Engineering Electromagnetics, 5th Edition.

Suggested Readings

2. Richard Feynman, Lectures in Physics, Vol. 2.
3. Ulaby, Fundamentals of Applied Electromagnetics, 1997.
4. IEEE Spectrum including IEEE Explore journals and proceedings

E. Course Requirements – grade components

*Long Exams (LE)
Optional Project
Quizzes and Seatwork*

*A minimum of 2 LE's will be given
Equivalent to 1 Long Exam (LE)
Accumulated total will count towards grade.
Weight of this grade component will be a
fraction of the weight of a Long Exam up to a
maximum weight of two LEs, upon the discretion
of the instructor*

Final Exam/Final LE

*Weight is one long exam. Coverage may be
comprehensive (Final Exam) or circumscribed
by last portion of material (final Long Exam).
Instructor reserves the right to determine
exemption from or optional nature of final exam
requirement.*

Homework and Recitation

*Bonus points with a semester's total worth of 4 to
8 percentage points added to the class standing
depending on the instructor's discretion.*

The grade will be composed of at least two long exams. The instructor, upon his discretion, may cancel the lowest of a student's long exams. However he may do this only if at least three major grade components (each of LE weight) of work had been accomplished by the student.

A > 95; B+ > 87; B > 78; C+ > 69; C > 60; D > 50; else F. Note that "C+ > 69" requires a class standing above 71, therefore a 71.00 is a C.

G. Classroom Policies

1. Make up exams. No make up work will be given for absences, **unless previously coordinated with the instructor** via email, handwritten note or advise **before** the scheduled exam. The instructor reserves the right to judge the merits of a request for a make-up exam.
2. Class Attendance. The maximum number of absences is 9 hours. Anybody coming in after the roll call will be marked with a fractional absence.
3. Dishonesty. Any form of dishonesty or falsehood related to the general conduct of the class (exams, homework, project, quizzes, etc.) will be considered a major offense and will be brought before the Associate Dean for appropriate action.
4. Consultation. By appointment.
5. Email: nlibatique@ateneoinnovation.org