EE 7000 Computational Electromagnetics
Fall 2016

Instructor: Prof. Georgios (Yorgos) Veronis
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Office Hours: T TH 10:30 a.m. - 1:00 p.m. (2069 LDMC)

Lectures: T TH 3:00 p.m. - 4:20 p.m. in 0112 Tureaud Hall

Course website: We will use Moodle.

Course description: Introduction to numerical techniques for the solution of electromagnetic problems in the time and frequency domains with an emphasis on finite-difference methods.

Content: Review of Electromagnetics and Maxwell's equations. Finite differencing of partial differential equations. One-dimensional wave equation. The Finite-Difference Time-Domain (FDTD) method. Numerical stability and dispersion. Scattered field formulation. Absorbing boundary conditions. The Finite-Difference Frequency-Domain (FDFD) method. Modeling of dispersive materials. Eigenvalue problems.

Recommended textbooks:

1. *Computational Electrodynamics: The Finite-Difference Time-Domain Method*, Third Edition, Allen Taflove and Susan C. Hagness, Artech House, 2005.
2. *Numerical Electromagnetics: The FDTD Method*, First Edition, Umran S. Inan and Robert A. Marshall, Cambridge University Press, 2011.
3. *Numerical Techniques in Electromagnetics with MATLAB,* Third Edition, Matthew N. O. Sadiku, CRC Press, 2009.

Prerequisite: Basic knowledge of electromagnetism at the level of EE3320 Electrical and Magnetic Fields, or equivalent.

Homework and exams: There will be 5 homework assignments, one midterm (possibly 24hr take home), and one final project. You can use any computer language you prefer for the homework assignments, midterm, and final project. The codes in the homework solutions will be written in MATLAB.

Grading: 45% Homework, 20% Midterm, 35% Final

Grading Scale: A+: 97-100**, A:** 93-96**, A-:** 90-92**, B+:** 87-89**, B:** 83-86**, B-:** 80-82**,**
C+: 77-79**, C:** 73-76**, C-:** 70-72**, D+:** 67-69**, D:** 63-66**, D-:** 60-62**, F:** < 60.
Relative standing in class will be factored in prior to arriving at the final letter grade for the course.