

## Course Syllabus

- Course No. & Title:** EEL 4471, Electromagnetics
- Term & Meeting Info:** Spring, 2008 TR 2:00 – 3:15 pm
- Instructor Info:** Dr. Tom Weller  
[weller@eng.usf.edu](mailto:weller@eng.usf.edu)  
Tel: (813) 974-2440  
Fax: (813) 974-5250  
Office Hours: Tuesday 3:15-4:30 pm and by appt.
- Catalog Description:** Electromagnetic field theory, including static and dynamic electromagnetic fields; applications; environmental effects (effects of radiation, magnetic fields).
- Semesters Offered:** Spring & Fall
- Course Prerequisites:** PHY 2049, General Physics  
MAP 2302, Differential Equations  
ENG 3420, Engineering Analysis
- Course Co-requisites:** None
- Courses that require this as a direct prerequisite:** None
- Level:** UG    **Credits:** 3    **Class Time:** Two - one hour & 15 minutes per week
- Text Info:** *Fundamentals of Applied Electromagnetics*, Fawwaz T. Ulaby, Ed. 2007, Prentice Hall, ISBN 0-13-185089-X
- Reference (Supplemental Reading):** None

### Course Outcomes:

1. Students shall learn the nature of static and dynamic electric and magnetic fields. (Criterion 3(a) (e) (l))
2. Students shall learn the fundamentals of propagation, diffraction, and reflection of electromagnetic waves in media and at interfaces between media. (Criterion 3(a) (e) (l) (m))
3. Students shall develop an understanding of basic electromagnetic field properties (e.g., Maxwell's equations) and related engineering design parameters (e.g., R,L,C,G for transmission lines). (Criterion 3(a) (e) (l) (m))
4. Students shall develop knowledge of commonly encountered field configurations (TEM and uniform plane waves) found in transmission lines, optical fibers, and micro circuits. (Criterion 3(a) (e) (l))

5. Students shall demonstrate the ability to communicate technical ideas effectively through oral presentations (Criterion 3(g))

**Test & Grading Info:** There will be 2 mid-term exams and one final exam (all open notes and open book). Several quizzes (closed note and closed book) will be given in the class, with a one week notice. The lowest quiz score will be dropped. A missed exam or quiz will be graded zero. Make-up exams or quizzes will be allowed at the instructor's consent, only under special circumstances; appropriate documentation in writing must be provided. Suggested homework problems will be provided on a regular basis. A short research project will be assigned toward the latter part of the semester and each student will be required to make a short oral presentation on his/her work.

Grading Breakdown:

Mid-term exams	50% (25% each)
Final exam	25%
Quizzes	15%
Oral presentations	10%

Grading scale:

A	90-100
B	80-89
C	70-79
D	60-69
F	0-60

**Course Topics and Approximate # of Lectures:**

Vector Analysis (4)  
Transmission Lines (6)  
Electrostatics and Magnetostatics (7)  
Time Varying Fields (2)  
Electromagnetic Wave Propagation (4)  
Wave Reflection and Transmission (4)

**Specialization:** This course is required for all Electrical Engineering major.

**Professional Component:** Engineering Science – 90%  
Engineering Design – 10%

**Additional Course Features:** Review session for midterm and final exams.

**Relation of Course to EE Dept. Program Objectives and Outcomes:** This course covers basic theory of static and dynamic electric & magnetic fields and its engineering applications. Students will gain exposure to a number of practical topics, such as transmission lines, free space wave propagation, and wave reflection & transmission. Meanwhile, students shall develop an understanding of the inter-relationships between technical, societal, medical and human/political activities and results that is related to electromagnetics and electrical engineering in general (e.g., medical uses of

electromagnetics). The course lays the foundation for a wide range of electrical engineering courses and provides the students critical knowledge and skills as a future electrical engineer.

**Final Exam Info:** *Scheduled Per Published Exam Matrix*

**Attendance:** You must provide written notification by the second class period if you anticipate being absent from class due to major religious observances. Examinations must be taken as scheduled; requests for make-up exams and quizzes will be considered on individual merit.

**Make-up assignments:** Late work will not be accepted without prior notification (at least two days before the due date) and reasonable justification.

**Academic Dishonesty:** University rules regarding academic dishonesty will be strictly enforced. It is not acceptable to copy, plagiarize or otherwise make use of the work of others in completing homework, project, exam or other course assignments. The minimum penalty for doing so is an automatic zero on the assignment. Unless specified otherwise, scholarly exchange on out-of-class assignments is encouraged. If there are any questions regarding this policy they should be asked. Any student(s) found cheating on an exam receive an F in the course. Any student(s) found cheating on a quiz receive zero points on the quiz grade.

**Property** – you are not granted permission to sell notes or tapes of class lectures.

**Standard Syllabus Prepared by:** T. Weller

**Date of Approval of Standard Syllabus by Area:**