Introduction to basic concepts in engineering electromagnetics, including static electric and magnetic fields using vector analysis and fields of steady currents, Maxwell's equations and boundary value problems, and basic principles of plane waves, transmission lines and radiation.

**Instructor:**
Chung-Tse Michael Wu
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Email: ctmwu@wayne.edu
Phone: 313-577-3841
Office Hour: Monday 6:30-7:20PM, Wednesday 6:30-7:20PM.

**Learning Objectives:**
1. Understand and compute basic problems in vector algebra, including dot product, cross product, gradient, curl, divergence, etc.
2. Understand and analyze Electrostatic fields and currents.
3. Understand and analyze Static Magnetic fields and currents.
4. Understand and analyze time varying fields using Maxwell’s equations.
5. Understand and explain basic principles of plane wave propagation and transmission lines.

**ABET Outcome Coverage**
ABET is responsible for accrediting engineering degree programs throughout the USA. This course has coverage in the following ABET objectives. For more information on ABET objectives, visit www.abet.org.

(a) An ability to apply knowledge of mathematics, science, and engineering.
This course is heavy on vector mathematics and calculus, and principles in mathematics will be used to derive some of the important relationships. Accordingly, a portion of the course time will be devoted to reviewing these concepts, and if you understand these principles well, you will find that they will apply directly to electromagnetic phenomena.

(k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
In electromagnetics it is important to understand vector math and 3D visualization.

(h) The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
Electromagnetics is a fundamental topic necessary to understand electrical and electronic devices/phenomena.

(e) An ability to identify, formulate, and solve engineering problems
Electromagnetics is a challenging course in problem solving. In this course you will learn groups of techniques used to solve canonical problems in electrostatics and magnetostatics. In exams and homework, there may be more than one way to solve the problem, and you will need to choose which approach is most appropriate for problems.

Other useful references:
David K. Chen, Fundamentals of Engineering Electromagnetics
Nannapaneni Narayana Rao, Elements of Engineering Electromagnetics
John D. Jackson, Classical Electrodynamics (advanced)

Midterm: Monday Oct. 26 2015
Final: Wednesday Dec. 16 2015

Grading Policy:

The final numerical grade will be determined according to the following percentages:
5 Homeworcks: 25%
1 Quiz: 5% (~30 minutes in class)
1 Midterm: 30%
1 Final: 40%

No late homework will be accepted, unless for true emergency reasons (illness, etc.), and in these cases you must present supporting documentation (from a doctor, dean, etc.).

The final letter grade will be derived from the final numerical grade.
Grading scale (subject to change)

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Attendance Policy:
Students are required to attend class, and attendance will be taken if necessary. However, on exam dates, attendance is absolutely mandatory. No makeup exams will be given, so please email me within the first week of classes if you have a conflict on the dates given in the course calendar.

Cheating Policy and Penalty for Cheating:
Cheating is defined by the University as “intentionally using or attempting to use, or intentionally providing or attempting to provide, unauthorized materials, information, or assistance in any academic exercise.” This includes any group efforts on assignments or exams unless specifically approved by the professor for that assignment/exam. Evidence of fabrication or plagiarism, as defined by the University in its brochure Academic Integrity, will also result in downgrading for the course. Students who cheat on any assignment or during any examination will be assigned a failing grade for the course.

WSU Academic Integrity Policy: Wayne State University is committed to the highest standards of academic integrity. You are expected to conduct yourself in accordance with these standards. To the extent that this course relies on project reports and independent research papers, be especially aware of proper attribution and citation standards to avoid even the appearance of plagiarism. Per the Student Code of Conduct, any violations of academic integrity will be handled via a combination of downgrading (up to and including failing the course) and prosecution via the Dean of Students and College of Engineering's Judicial Officer, which can result in permanent transcript notations or even expulsion from the University. Be sure you are familiar with the material on the following links:

• http://www.doso.wayne.edu/student-conduct/Student_Code_Conduct.html
• http://www.trc.wayne.edu/node/48

Blackboard:
We will use the WSU blackboard website in this course. Please log on to http://blackboard.wayne.edu and make sure you have access to the course website.

Dropping or Withdrawing from Classes
Students must drop classes via the Web by logging into Academica (https://login.wayne.edu/). If a student has a hold and needs help dropping a class then they should send an e-mail request from their WSU e-mail account to registration@wayne.edu with the appropriate course information. Students may drop a class (for fifteen week classes) through the end of the fourth week of class. Classes that are dropped do not appear on the transcript. Beginning the fifth week of class students are no longer allowed to drop but must withdraw from classes via Academica. It is the student’s responsibility to request the withdrawal. The withdrawal period for full-term classes ends at the end of the tenth week of the term. See the Academic Calendar for specific information on when the withdrawal period ends: http://reg.wayne.edu/students/calendar.php
**Educational Accessibility Services**
If you feel that you may need an accommodation based on the impact of a disability, please feel free to contact me privately to discuss your specific needs. Additionally, the Office of Educational Accessibility Services (EAS) coordinates reasonable accommodations for students with documented disabilities. The Office is located in 1600 David Adamany Undergraduate Library, phone: 313-577-1851 (Voice) / 577-3365 (TTD).