

1 Course Information

Instructor

J. W. McDaniel

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Office Hours: R 12-2 pm (RIL 112)

and by appointment

Teaching Assistants

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Office Hours: MF 2-4 pm (DEH 426)

and by appointment

Prerequisites

MATH 3113 - Differential Equations

MATH 2934/2443 - Vector Calculus

ECE 2723 - Circuits I

Course Website

<https://canvas.ou.edu>

Credit

3 undergraduate/graduate hours

Class Times / Location

TR 9-10:15 a.m. / Gallogly Hall 127

Textbook

Required:

Field and Wave Electromagnetics

Cheng 2nd ed.

A student's guide to Maxwell's Equations

Fleisch

Supplementary:

Engineering Electromagnetics

Demarest

Schaum's Outlines: Electromagnetics

Edmister

Class Format

This class will not be pure lecture. There will be class discussion and activities. Participation is expected.

2 Course Objectives

To provide students with mathematical tools and physical knowledge required to comprehend the electrical phenomena that enables the operation of electrical and computer systems. Topics of discussion for this class are vector analysis, electrostatic fields in a vacuum and within a material media, magnetostatic fields in a vacuum and within a material media, electromagnetic fields and Maxwell's equations for static and time-varying sources, and the relationship between field and circuit theory.

3 Class Policies

1. Maintain collegial atmosphere in classroom

- Participate in discussion
- Be respectful of other students
- Put cell phones on silent
- Do not use cell phones or laptops in class
- Ask questions
- Let me know when you are lost

2. Class preparation

- Come prepared to class! Complete the assigned readings before class. It will not only help you to understand the material better, but will help you follow the class lectures.

3. Contact with the instructor

- E-mail is the best way to contact me for a quick question
- For long questions please come to office hours
- If you can't come to office hours e-mail me for an appointment

4. Extra Credit

- No extra credit will be given in this course.

5. Attendance

- Class attendance is expected
- Make every attempt to be on-time to class
- If late to class please try to minimize the distraction that you create

6. Late Assignments

- No late assignments will be accepted for this course (exception noted in Homework section).
- If you will not be in town when an assignment is due, either give the assignment to another student to turn in for you, or turn in the assignment before you leave town.

7. Academic Integrity

- It is your responsibility to read and understand the Academic Integrity Policy (<http://www.ou.edu/provost/integrity/>).
- The Provost's web pages include information on expectations for academic integrity. Please review the material at http://integrity.ou.edu/students_guide.html. It is the aim of the faculty of the University of Oklahoma to foster a spirit of complete honesty and a high standard of integrity as well as academic excellence. Any attempt by students to present as their own any work that they have not honestly performed is regarded by the faculty and administration as a serious offense and renders the offenders liable to serious consequences, possibly suspension.

8. Reasonable Accommodation

- The University of Oklahoma is committed to providing reasonable accommodation for all students with disabilities. Students with disabilities who require accommodations in this course are requested to speak with the professor as early in the semester as possible. Students with disabilities must be registered with the Office of Disability Services prior to receiving accommodations in this course. The Office of Disability Services is located in the University Community Center, 730 College Ave., (405) 325-3852 (Voice), (405) 325-4173 (TDD), (405) 325-4491 (Fax), and Email: drc@ou.edu.

9. Religious Holidays

- It is the policy of the University to excuse the absences of students that result from religious observances and to provide without penalty for the rescheduling of examinations and additional required classwork that may fall on religious holidays.

4 Assignments

4.1 Grading

<i>Homework:</i>	10%
<i>Quizzes:</i>	5%
<i>Midterm Exam I:</i>	25%
<i>Midterm Exam II:</i>	25%
<i>Final Exam:</i>	35%

The Undergraduate and Graduate grading will be completely separate. The grading scheme is shown below:

90-100	A
80-89	B
70-79	C
60-69	D
59 and below	F

4.2 Homework

- Homework will be posted in canvas under the assignment tab.
- Homework should be turned in at the beginning of class on the due date listed at the top of the assignment.
- You may collaborate with other students on homework (I in fact encourage you to do so!); however, there is a line between collaboration and copying. If students are caught copying, then both students will receive a zero on the assignment. If caught twice, I will report you both to the disciplinary committee.
- Late Policy: After the due date, homework will be accepted until the end of the following class at 15% off. It will not be accepted after that unless the student has a University accepted excuse.
- Assignments are expected to be turned in before a student leaves town if a student must miss class the day the assignment is due. In this case, the assignment can also be scanned and emailed to me.
- There will be homework problems assigned from the book and handouts of problems written by me.
- Homework will be a completion grade. Essentially, if you write something reasonable down for each problem and box an answer you will receive full-credit.
- Homework solutions will be posted on canvas.

4.3 Quizzes

There will be periodic quizzes throughout the semester that will take place at the end of the class. Essentially, if you understood the homework, you will be fine for the quiz.

4.4 Midterm Exams

The midterm exam will be in-class exams. You will be given formula sheets for the exam that are posted on canvas. If you will be out of town for exam dates, notify me as soon as possible. You will need to take the exam before you leave town. To take the exam after you return, you will need to show unimpeachable proof

that you did not know that you would be out of town for the time of the exam for less than 24 hours before the exam. If you cannot produce this proof, you will receive a zero on the exam.

4.5 Final Exam

There will be a cumulative final exam during the final exam period for this course - Thursday December, 12th from 8-10:00 am. You will be given the same formula sheet for your midterms and final exam.

5 Additional Policies

5.1 Adjustments for Pregnancy/Childbirth Related Issues

Should you need modifications or adjustments to your course requirements because of documented pregnancy-related or childbirth-related issues, please contact me as soon as possible to discuss. Generally, modifications will be made where medically necessary and similar in scope to accommodations based on temporary disability. Please see www.ou.edu/content/eoo/pregnancyfaqs.html for commonly asked questions.

5.2 Title IX Resources

For any concerns regarding gender-based discrimination, sexual harassment, sexual misconduct, stalking, or intimate partner violence, the University offers a variety of resources, including advocates on-call 24.7, counseling services, mutual no contact orders, scheduling adjustments and disciplinary sanctions against the perpetrator. Please contact the Sexual Misconduct Office 405-325-2215 (8-5) or the Sexual Assault Response Team 405-615-0013 (24.7) to learn more or to report an incident.

6 Course Schedule

Please find course schedule on next page.

Topic	Subtopic	Class	Day	Assigned Reading	Homework	Exam	
Syllabus	Syllabus Day	1	20-Aug				
Vector Analysis	Vector Analysis	2	22-Aug	2.1-2.2 (pgs. 11-12)			
	Vector Addition and Subtraction	3	27-Aug	2.2-2.3 (pgs. 12-19)			
	Product of Vectors	4	29-Aug		HW1 (Due Sept. 5th)		
	Orthogonal Coord. Systems	5	3-Sept	2.4 (pgs. 20-36)			
	Orthog. Coord. Systems cont.	6	5-Sept				
	Orthog. Coord. Systems cont.	7	10-Sept		HW2 (Due Sept. 17th)		
Electromagnetic Sources, Forces, and Fields	Calc. of Scalar and Vector Fields	8	12-Sept	2.5-2.10 (pgs. 37-61)			
	Calc. of Scalar and Vector Fields cont.	9	17-Sept	2.12 (pgs. 63-66)			
	Conservative and Solenoidal Vector Fields	10	19-Sept		HW3 (Due Sept. 26th)		
	Static E-Fields & Steady Electric Currents	11	24-Sept	3.1-3.2 (pgs. 72-77) & 5.1-5.2 (pgs. 198-205)			
	Law of Charge Conservation / Coulomb's and Ampere's Law	12	26-Sept	5.4 (pgs. 208-210) & 3.3 (pgs. 69-71) 6.1 (pgs. 196-197) & 6.13 (pgs. 246-248)	HW 4 (Due Oct. 3rd)		
	Electric, Magnetic, and Lorentz Force	13	1-Oct	3.2 (pgs. 86-87) & 6.1 (pgs. 196-197)			
	Maxwell's Equations Intro and Exam Review	14	3-Oct	7.1 (pgs. 307-308)			
	Exam I		15	8-Oct			MTE1
	Electrostatic Fields in Free Space	Maxwell's Equations for Electrostatics & Coulomb's Law	16	10-Oct	3.2-3.4 (pgs. 74-86)		
		E-Fields Calculations using Coulomb's	17	15-Oct			
E-Field Calcs using Gauss' Law / Voltage and Electric Potential		18	17-Oct	3.5 (pgs. 92-96)	HW 5 (Due. Oct 24th)		
Poisson and Laplace's Equations		19	22-Oct	4.2 (pgs. 152-154)			
Electrostatic Fields in Material Media	E-Fields in Material Media (Conductors and Dielectrics)	20	24-Oct	3.6-3.8 (pgs. 100-106 & 109-114)			
	Boundary Conditions / Electrostatic Boundary Value	21	29-Oct	3.9 (pgs. 116-117)	HW 6 (Due Nov. 5th)		
	Capacitance	22	31-Oct	3.10 (pgs. 121-125)			
	Electrostatic Energy and Charge Dist. And Energy Storage	23	5-Nov	3.11 (133-139)			
Magnetostatics in Free Space	Maxwell's Equations for Magnetostatics	24	7-Nov	6.2 (226-228)	HW 7 (Due Nov. 14th)		
	Magnetic Vector Potential / Biot Savart and Ampere's Law	25	12-Nov	6.3-6.4 (pgs. 232-236)			
	Magnetic Dipole and Exam Review	26	14-Nov	6.5 (pgs. 239-243)			
	Exam II		27	19-Nov			MTE2
Magnetostatic Fields in Material Media	Magnetic Materials and Boundary Conditions	28	21-Nov	6.6-6.7 (pgs. 243-246 & 249-251)			
	Thanksgiving Break	29	26-Nov				
	Magnetostatic Boundary Value	30	28-Nov	6.10 (pgs. 262-265)	HW 8 (Due Dec. 5th)		
Inductance	Faraday's Law of Induction / Inductance	31	3-Dec	7.2 (pgs. 308-309) & 6.11 (266-269)			
	Maxwell's Equations for Time-Varying Fields	32	5-Dec	7.3 (pgs. 321-325)			
Final Exam	8:00 am - 10:00 am in Gallaogly Hall 127	33	12-Dec			FE1	