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Please, click on the following link to access A&M-Commerce Covid 19 Information, https://new.tamuc.edu/coronavirus/

EE 340 ELECTROMAGNETICS

3 Credit Hours

COURSE SYLLABUS: SPRING 2024

INSTRUCTOR INFORMATION

Instructor: Redha M. Radaydeh, PhD
Assistant Professor, Electrical Engineering
Department of Engineering and Technology
Office Location: AGET 208.
Office Hours: Monday 10:00-12:50, Monday 14:15-15:15, Wednesday 14:15-15:15, or with appointment. Virtual meetings can be scheduled.
Office Phone: 903-886-5471
Office Fax: 903-886-5960
University Email Address: Redha.Radaydeh@tamuc.edu
Preferred Form of Communication: email.
Communication Response Time: within 24 hours (weekdays) to email.

COURSE INFORMATION

Class Meeting Schedule: 1/10/2024 through 5/10/2024.
Class Meeting Dates: Weekly meetings; Monday and Wednesday 13:00-14:15.
Classroom: AGIT 214. Lectures will be given on campus in AGET 214 Lab.
Course Format: This course contains lectures, technology briefs and practical applications.

Materials – Textbooks, Readings, Supplementary Readings

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Textbook Required:

- F. T. Ulaby and U. Ravaioli, *Fundamentals of Applied Electromagnetics*, 7th Edition, Pearson, 2015.

Optional References:

- M. N. O. Sadiku, *Elements of Electromagnetics*, 5th Edition, Oxford University Press, 2010.
- D. K. Cheng, *Field and wave electromagnetic*, 2nd Edition, Addison-Wesley, 1989.
- J. Edminister, *Schaum's Outline of Electromagnetics*, 3rd Edition, McGraw-Hill Professional, 2010.

Software Recommended:

- Microsoft Office - MS Word, Excel, PowerPoint.
- MATLAB, LABVIEW, and/or EM & TL simulators.

Course Description

The course presents the principles of electromagnetic (EM) fields and their propagation, power and energy contents, and their properties in guided and unguided structures. It aims to bridge between circuit theory and the EM fields through detailed treatment of guided structure, particularly transmission lines. The course introduces Maxwell's equations for the general case of time-varying and dynamic EM fields. Characterization of electrostatics, magnetostatics and dynamic fields and their associated laws and principles are discussed, and the electric and magnetic boundary conditions are also explained in detail. The course is supported by simulation software (e.g. MATLAB, LABVIEW).

Prerequisites: Lvl U PHYS 2426 Min Grade C and Lvl U MATH 315 Min Grade C or Lvl U MATH 2320 Min Grade C and Lvl U MATH 2415 Min Grade C or Lvl U MATH 314 Min Grade C and Lvl U EE 309 Min Grade C.

Learning Outcomes of Instruction:

1. Bridge the gap between circuit theory and electromagnetics.
2. Apply the knowledge of orthogonal systems and coordinates.
3. Acquire knowledge on wave propagation in a guided structure.
4. Practice the use of Maxwell's equations and their applications.
5. Describe the characteristics of statics and dynamic electromagnetic fields.
6. Practice boundary conditions for analyzing and interpreting electric and magnetic fields.
7. Demonstrate effective oral and written communication skills through teamwork discussions.
8. Use software and numerical techniques to solve EM problems.

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COURSE REQUIREMENTS

Minimal Technical Skills Needed

- Microsoft Office - MS Word, Excel, PowerPoint.
- MATLAB, LABVIEW, and/or EM & TL simulators.

Instructional Methods

The instructional methods will include lectures, discussions, assignments, problem solving, exercises, and simulations using software. Instructions will be based on the course textbook. Course materials, announcements, and lecture notes will be posted on the course website.

Student Responsibilities or Tips for Success in the Course

Student must attend classes, participate in class work and discussions, and perform required course assessments supporting the anticipated learning objectives. Students are expected to regularly log into the course website to downloads course material, submit their course works as instructed, and follow up on new announcements. This course covers advanced contents that requires at least 6 hours of study per week.

" *Texas A&M University-Commerce acknowledges that there are legitimate uses of Artificial Intelligence, ChatBots, or other software that has the capacity to generate text, or suggest replacements for text beyond individual words, as determined by the instructor of the course.*

Any use of such software must be documented. Any undocumented use of such software constitutes an instance of academic dishonesty (plagiarism).

Individual instructors may disallow entirely the use of such software for individual assignments or for the entire course. Students should be aware of such requirements and follow their instructors 'guidelines. If no instructions are provided the student should assume that the use of such software is disallowed.

In any case, students are fully responsible for the content of any assignment they submit, regardless of whether they used an AI, in any way. This specifically includes cases in which the AI plagiarized another text or misrepresented sources.

13.99.99.R0.03 Undergraduate Academic Dishonesty

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13.99.99.R0.10 Graduate Student Academic Dishonesty "

GRADING

Final grades in this course will be based on the following scale:

A = 90%-100%
B = 80%-89%
C = 70%-79%
D = 60%-69%
F = 59% or Below

Assessments

The following assessments will be performed during this course to assess individual progress towards learning outcomes:

Assessment	Weight	Due time
Midterm Exam	25 %	Week 8 • Closed book closed notes exam. • You can have one A4 paper sheet notes and write on both sides during the exam. • Exam will be given during class time.
Final Exam	25 %	Week 16 • Closed book closed notes exam. • You can have one A4 paper sheet notes and write on both sides during the exam. • Exam will be given during finals week. • Optional course project can be considered to replace final exam upon instructor approval.
Assignments	50 %	• Five assignments will be given each of 10% weight. • Extra credit may be given.

Relationship between Assessments and Course/Student Learning Outcomes

Learning Outcomes of Instruction	Assessment
1. Bridge the gap between circuit theory and electromagnetics.	Assignments, Exams
2. Apply the knowledge of orthogonal systems and coordinates.	Exams
3. Acquire knowledge on wave propagation in a guided structure.	Exams

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4. Practice the use of Maxwell's equations and their applications.	Assignments, Exams
5. Describe the characteristics of statics and dynamic electromagnetic fields.	Exams
6. Practice boundary conditions for analyzing and interpreting electric and magnetic fields.	Assignments, Exams
7. Demonstrate effective oral and written communication skills through teamwork discussions.	Assignments
8. Use software and numerical techniques to solve EM problems.	Assignments

Exams
The exams will be closed book & closed notes. Relevant scientific formulas will be provided in supplementary sheet. The use of personal phone is strictly prohibited during exams. Makeup exam may be offered but an official permit for absence that fulfills University procedures should be available in a timely manner.

Assignments
Solutions should be submitted on the due date. Student will need to submit one solution report per homework assignment. Solutions of an assignment will be due one week from the day it assigned. Unless prior arrangements are made with the instructor, no late submission of assignment solutions will be permitted. Some homework assignments may require the submission of simulation files. Any file that is flagged as infected with malware or viruses will not receive a grade.

TECHNOLOGY REQUIREMENTS

LMS

All course sections offered by Texas A&M University-Commerce have a corresponding course shell in the myLeo Online Learning Management System (LMS). Below are technical requirements

LMS Requirements:
https://community.brightspace.com/s/article/Brightspace-Platform-Requirements

LMS Browser Support:
https://documentation.brightspace.com/EN/brightspace/requirements/all/browser_support.htm

YouSeeU Virtual Classroom Requirements:

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https://support.youseeu.com/hc/en-us/articles/115007031107-Basic-System-Requirements

ACCESS AND NAVIGATION

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@tamuc.edu**.**

Note: Personal computer and internet connection problems do not excuse the requirement to complete all course work in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a computer at a friend's home, the local library, office service companies, Starbucks, a TAMUC campus open computer lab, etc.

COMMUNICATION AND SUPPORT

If you have any questions or are having difficulties with the course material, please contact your Instructor.

Technical Support

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778. Other support options can be found here:

https://community.brightspace.com/support/s/contactsupport

Interaction with Instructor Statement

Students are highly encouraged to participate in class activities, ask questions, and solve technical problems in class. They are also highly encouraged to work in groups during the Lab sessions, prepare full documentations of their Lab work, gain experience on software simulations and hardware work, and gain experience on team work, communication skills, and technical writing.

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COURSE AND UNIVERSITY PROCEDURES/POLICIES

Course Specific Procedures/Policies

Syllabus Change Policy

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

University Specific Procedures

Student Conduct

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the Student Guidebook.
http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum:
https://www.britannica.com/topic/netiquette

TAMUC Attendance

For more information about the attendance policy please visit the Attendance webpage and Procedure 13.99.99.R0.01.
http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/academic/13.99.99.R0.01.pdf

Academic Integrity

Students at Texas A&M University-Commerce are expected to maintain high standards of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see the following procedures:

Undergraduate Academic Dishonesty 13.99.99.R0.03
Undergraduate Student Academic Dishonesty Form

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/documents/13.99.99.R0.03UndergraduateStudentAcademicDishonestyForm.pdf

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Graduate Student Academic Dishonesty Form

http://www.tamuc.edu/academics/graduateschool/faculty/GraduateStudentAcademicDishonestyFormold.pdf

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf

Students with Disabilities-- ADA Statement

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services
Texas A&M University-Commerce
Velma K. Waters Library Rm 162
Phone (903) 886-5150 or (903) 886-5835
Fax (903) 468-8148
Email: studentdisabilityservices@tamuc.edu
Website: Office of Student Disability Resources and Services
http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/

Nondiscrimination Notice

Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

Campus Concealed Carry Statement

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in Texas A&M University-Commerce buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal

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Code (PC) 46.035 and A&M-Commerce Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the Carrying Concealed Handguns On Campus document and/or consult your event organizer.

Web url:
http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&M-Commerce campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

A&M-Commerce Supports Students' Mental Health

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Department or Accrediting Agency Required Content

The Electrical Engineering program is in the process to obtain ABET accreditation. The course material, its expected deliverables, grading policy, organization, and expected learning outcomes are designed to meet the ABET requirements.

COURSE OUTLINE / CALENDAR

The instructor reserves the right to adjust the schedule to serve the needs of the class and any changes will be communicated in a timely manner.

Course schedule: The sequence of chapters follows the textbook.

Week	Topic	Chapter
1-2	Complex numbers, traveling waves, and phasor analysis	1
3-7	Transmission lines, Smith chart, power analysis, and impedance matching	2

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8	Midterm Exam	-
8-10	Vector analysis, orthogonal systems, and coordinates transformation	3
11-13	Electrostatics, Coulomb and Gauss laws, conductors, dielectrics, and electric boundary conditions	4
14-15	Magnetostatics, Bio-Savart and Ampere laws, inductance, and magnetic boundary conditions	5
	Extra Study for Students May 1, 2, and 3	
16	Final Exam (during finals week)	-

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