



EE 452 Antenna Theory and Design

3 Credit Hours

COURSE SYLLABUS: Fall 2026

INSTRUCTOR INFORMATION

Instructor: Redha M. Radaydeh, PhD

Associate Professor of Electrical Engineering

Department of Engineering and Technology

Office Location: AGET, Dept. of Engineering and Technology.

Office Hours: Tuesday & Thursday 11:30-12:30 pm, 1:45-2:30 pm or with appointment. Virtual meetings can be also scheduled.

Office Phone: 903-886-5474

University Email Address: Redha.Radaydeh@etamu.edu

Preferred Form of Communication: email.

Communication Response Time: within 24 hours (weekdays) to email.

COURSE INFORMATION

Class Meeting Schedule: Meets 8/20/2026 through 12/11/2026.

Class Meeting Dates: Weekly meetings; Tuesday and Thursday 12:30-1:45 pm.

Classroom: AGET 214. Lectures will be given on campus.

Course Format: This course contains lecture sessions.

Materials – Textbooks, Readings, Supplementary Readings

Textbook:

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

Optional references:

- C. Balanis, Antenna Theory: Analysis and Design, 3rd Ed., Wiley, 2005.
- W. L. Stutzman and G. A. Thiele, Antenna Theory and Design, 3rd Ed., Wiley, 2012.

The syllabus/schedule are subject to change.

Software Required:

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

Course Description

This course presents an advanced material that specifically deals with time-varying electromagnetic (EM) waves and their transmission, propagation, and reflection in dielectric media, conducting media, and guided/unguided structures. The course presents the principles and applications of EM wave radiation and various antenna elements and antenna arrays. The course describes some practical applications of the covered topics, such as satellite systems, target detection, and radar.

Prerequisites: EE 340 with a minimum grade of C.

Student Learning Outcomes:

1. Gain fundamental experience in EM wave radiation and antenna structures and characteristics.
2. Acquire systematic knowledge about Maxwell's equations for time-varying fields.
3. Gain knowledge on plane-wave propagation and polarization modes.
4. Learn the basic concepts of wave transmission and reflection.
5. Explain the EM wave propagation in waveguides and cavity resonators.
6. Learn the basic principles of antennas and EM wave radiation.
7. Describe the basic principles of satellite and radar systems.
8. Use modern software and numerical techniques, to improve teamwork and problem-solving skills.

COURSE REQUIREMENTS**Minimal Technical Skills Needed**

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

Instructional Methods

The instructional methods will include lectures, discussions, technology briefs, assignments, problem solving, and simulations using software. Instructions will be based

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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

Students 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 download course material, submit their course work as instructed, and follow up on new announcements. This course covers more advanced content that requires at least 6 hours of extensive study per week.

" East Texas A&M University 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

13.99.99.R0.10 Graduate Student Academic Dishonesty "

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GRADING

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

A = 90%-100%

B = 80%-89%

C = 70%-79%

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D = 60%-69%

F = 59% or Below

Weights of the assessments in the calculation of the final letter grade.

Assignments	50%
Midterm Exam	25%
Final Exam	25%
TOTAL	100%

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
Final Exam	25%	Week 16
Assignments	50%	Weeks 3, 6, 9, 12, 14

Relationship between Assessments and Course/Student Learning Outcomes

Learning Outcomes of Instruction	Assessment
1. Gain fundamental experience in EM wave radiation and antenna structures and characteristics.	Assignments
2. Acquire systematic knowledge about Maxwell's equations for time-varying fields.	Assignments, Exams
3. Gain knowledge on plane-wave propagation and polarization modes.	Assignments
4. Learn the basic concepts of wave transmission and reflection.	Exams
5. Explain the EM wave propagation in waveguides and cavity resonators.	Assignments
6. Learn the basic principles of antennas and EM wave radiation.	Exams
7. Describe the basic principles of satellite and radar systems.	Assignments
8. Use modern software and numerical techniques, to improve teamwork and problem-solving skills.	Assignments

Exams

The two exams will be closed book & closed notes. Relevant scientific formulas will

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be provided in the supplementary sheet. The use of personal phones is strictly prohibited during exams. Students will need to bring a scientific calculator for the exam. A 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. Students 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 created in Multisim. Any file that is flagged as infected with malware or viruses will not receive a grade.

TECHNOLOGY REQUIREMENTS

LMS

All course sections offered by East Texas A&M University 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:

<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.

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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 sessions, prepare full documentations of their work, gain experience on software simulations and hardware work, gain experience on team work, communication skills, and technical writing.

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).
<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>

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ETAMU 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 East Texas A&M University 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>

[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

East Texas A&M University

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](#)

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<http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/>

Nondiscrimination Notice

East Texas A&M University 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 East Texas A&M University 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 Code (PC) 46.035 and East Texas A&M 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 East Texas A&M campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

East Texas A&M Supports Students' Mental Health

The Counseling Center at East Texas A&M, located in the Halladay Building, Room 203, offers counseling services, educational programming, and connection to community resources for students. Students have 24/7 access to the Counseling Center's crisis assessment services by calling 903-886-5145. For more information regarding Counseling Center events and confidential services, please visit www.tamuc.edu/counsel

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.

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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
1-4	Maxwell's equations for time-varying fields, transformer, and displacement current	6
3	Assignment 1	
5-7	EM plane-wave propagation, polarization, and power density	7
6	Assignment 2	
8-11	EM radiation, antenna structures and characteristics	9
	Assignment 3	
9	Midterm Exam	
12-13	Antenna arrays	9
12	Assignment 4	
14-15	Practical applications: satellite, radar, detection and sensing arrays	10
14	Assignment 5	
16	Final Exam	

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