

**ECE 3317**  
**Applied Electromagnetic Waves**  
**Fall 2023**

**Section 15871**

**Class Time**

Tu, Th 2:30-4:00 p.m., room W-122 D3 (Engineering Building 2)

**Instructor**

Prof. David R. Jackson, W318-D3, phone: 713-743-4426, fax: 713-743-4444, email: djackson@uh.edu. Office hours will be posted on the class Canvas site and on the instructor's door. Information for the TA (grader) will be posted on the Canvas site.

**Canvas**

This class will use Canvas for the distribution of class material and assignments. You are responsible for checking the Canvas site often for important announcements (found under the "Announcements" link). You are responsible for any information that is posted there. All of the homework and handouts will be posted on the Canvas site. The class lecture notes from last year (Fall 2022) are all available on the Canvas site. These notes will be updated on a continuing basis for the Fall 2023 semester (usually the updates will be minor). Please do not consider the class notes to be final until at least a few days after they have been completely presented in class. Until then, they are subject to changes.

**Email**

In addition to checking the Announcements section of the Canvas site, it is your responsibility to configure your UH email alias properly in myUH (PeopleSoft) to receive email from the university. The ECE Department will use your UH email alias for all official correspondence. Occasionally the instructor will also send important emails to the class using the UH email aliases and it is your responsibility to make sure that you are able to receive these emails. The UIT website giving information about updating your UH email alias is:

<http://www.uh.edu/infotech/services/accounts/email/update-student-address/index.php>

**Catalog Description**

Applied Electromagnetic Waves. Cr. 3 (3-0). Prerequisites: Credit for or concurrent enrollment in ECE 3337. Maxwell's equations in time and frequency domains, Poynting's theorem, plane wave propagation, reflection and transmission in lossless and lossy media, transmission lines, waveguides and antennas.

## Texts and Class Materials

The following texts are recommended:

- W. H. Hayt and J. A. Buck, *Engineering Electromagnetics*, 9th Edition, McGraw-Hill, 2019.
- L. C. Shen and J. A. Kong, *Applied Electromagnetism*, 3rd Edition, PWS, 1995.

A copy of the Hayt & Buck book may be found on the Canvas site, as part of the BryteWave tool (assuming that you are participating in this optional program).

The textbooks will also be on reserve in the Library (listed under ECE 3317). The Shen & Kong book is now out of print, so if you want to get this one, you will have to search for it yourself from Amazon or another book seller.

A set of class notes will be placed on the Canvas site. The class notes are what will be presented in class during the lectures. The class notes are based on the textbooks, but there may be some differences between the class notes and the textbooks, e.g., in the notation that is used. Please note that the class notes are subject to change until after they have been completely presented in class.

## Recommended Supplements

J. A. Edminister, *Schaum's Outline on Theory and Problems of Electromagnetics*, 4th Ed., McGraw-Hill, 2014.

S. A. Nasar, *Schaum's Outline on 2008+ Solved Problems in Electromagnetics*, McGraw-Hill, 2008.

H. M. Schey, *Div, Grad, Curl, and All That: an Informal Text on Vector Calculus*, 4th Ed., W. W. Norton and Company, 2005.

M. R. Spiegel, *Schaum's Outline on Vector Analysis*, McGraw-Hill, 1959.

D. Fleisch, *A Student's Guide to Maxwell's Equations*, Cambridge University Press, 2008.

These will be put on reserve in the Library (listed under ECE 3317).

## Online Texts

In addition to the above traditional textbooks, an online textbook is available free of charge from the Open Textbook Library at the University of Minnesota. The textbook is: S. W. Ellingson, *Electromagnetics*, VT Publishing, Blacksburg, VA, 2018. The website is: <https://open.umn.edu/opentextbooks/subjects/engineering>.

Also, Students at UH have access to the McGraw-Hill online engineering library system called *Access Engineering* at [www.accessengineeringlibrary.com](http://www.accessengineeringlibrary.com). One online book that may be found there is S. M. Riad and Iman M. Salama, *Electromagnetic fields and Waves: Fundamentals of Engineering*.

## Prerequisites

You must have earned a C- or better in ECE 3337 or be taking it now. A waiver of this prerequisite is only possible through a petition to the Director of Undergraduate Studies, Prof. Len Trombetta (ltrombetta@uh.edu).

## Course Topics

- Complex vectors
- Maxwell's equations
- Transmission lines
- Smith charts
- Plane waves
- Reflection and transmission of plane waves
- Waveguides
- Antennas

## Exams

There will (tentatively) be two regular exams and a comprehensive final exam. The dates and formats for the regular exams will be announced at least one week before they are given. The three-hour final exam will be given on Tuesday, Dec. 7, from 2:00 p.m. - 5:00 p.m. All exams will take place in the assigned classroom unless otherwise noted.

## Grading Policy

The tentative grading scheme is shown below.

Homework	15%
Project	10%
Exam 1	20%
Exam 2	20%
Final exam	35%

Any items that require re-grading must be brought to the TA or the instructor within one week from the time the item is returned in class. After that, grades will not be changed.

## Withdrawal Policy

The withdrawal dates are listed in the Academic Calendar. For fall 2023 the last day to drop a course without receiving a W grade is Sept. 6. After this date and before Nov. 15, you may drop with a W if you have not exceeded your total 6W limit. Do not assume that you will be dropped by the instructor if you stop attending class. You are responsible for completing the withdrawal procedure. After Nov. 15 you are not allowed to drop the class.

Please be aware that students are only allowed to attempt required engineering courses (which includes required ECE courses) two times. Staying in a course past the first drop deadline (Sept. 6) constitutes an attempt.

Grades of Incomplete (I) will be given only when a small portion of the course has not been completed for a good reason that can be documented, such as a medical emergency. If the material has been completed, an "I" grade cannot be given. Detailed information about these issues is available in the *UH Undergraduate Catalog*.

### **Exam Policy**

No make-up exams will be given. If an extreme emergency prevents you from taking the exam on exam day, you must notify the instructor immediately (within 24 hours at the most) and provide documentation to verify the emergency. If the emergency is legitimate and documented, then you may be allowed to replace the exam grade with an extrapolated grade based on the grade you receive on the other exam and the final exam, as the instructor deems appropriate. You must take the final exam in order to pass the course. After the exams have been graded and handed back to the class, students must see the instructor within one week if they wish to have any problem on their exam regraded.

### **Homework Policy**

Students are expected to work individually on the homework. The homework that you turn in must represent your own work entirely. Do not obtain answers from anyone, or give answers to anyone, and do not work together with anyone on the homework. Do not try to obtain answers from previous semesters. To do otherwise will be considered a violation of the UH Academic Honesty Policy. Having discussions with others about general concepts and methods is fine, and is even encouraged, but what you put on your assignment must be completely your own work. Homework is due at the beginning of class on the due date. **NO LATE HOMEWORK IS ACCEPTED.** Please make sure that you staple all of the pages together, fold it (vertically), and then write clearly on the outside your name, the course number, the instructor, and the assignment number.

### **Attendance Policy**

Attendance at every class is expected. Class attendance may be taken at any time. If a student misses three classes they will be subject to being dropped or failing the class.

### **Academic Honesty Policy**

Students in this course are expected to follow the Academic Honesty Policy of the University of Houston. It is your responsibility to know and follow the policy, as described in the *UH Undergraduate Catalog*: <http://www.uh.edu/academic-honesty-undergraduate>.

You must sign the *Academic Honesty and Syllabus Form* that is on the class Canvas site and submit it to the instructor by Aug. 31, 2023. If you fail to do this you may be dropped from the course.

### **Responsibilities**

All students must be thoroughly familiar with all the requirements, regulations, and responsibilities described in the *UH Student Handbook*. Unless otherwise specified, these provisions will be followed as described in the Handbook.

## **Religious Holy Days**

Students whose religious beliefs prohibit class attendance on designated dates may request an excused absence. To do this, you must request the excused absence by submitting a request to the instructor in writing, by Aug. 31, 2023. Please submit a written request to your instructor by this deadline to allow the instructor to make appropriate arrangements. For more information, see the online *UH Student Handbook*.

## **Students with Disabilities**

Students with recognized disabilities will be provided reasonable accommodations, appropriate to the course, upon documentation of the disability with a Student Accommodation Form from the Justin Dart, Jr. Student Accessibility Center (formerly the Center for Students with Disabilities). To receive these accommodations, you must request them by submitting a request to the instructor in writing by Aug. 31, 2023. Students who fail to submit a written request will not be considered for accommodations. For more information, see the online *UH Student Handbook*.

## **Counseling and Psychological Services (CAPS)**

Counseling and Psychological Services (CAPS) can help students who are having difficulties managing stress, adjusting to college, or feeling sad and hopeless. You can reach CAPS (<http://www.uh.edu/caps>) by calling 713-743-5454 during and after business hours for routine appointments, or if you or someone you know is in crisis. Also, there is no appointment necessary for the "Let's Talk" program, which is a drop-in consultation service:

<https://uh.edu/caps/outreach/lets-talk/index.php#hours>.

## **Cougar Cupboard**

Having trouble making ends meet? The Cougar Cupboard provides free groceries for all students, with no requirements. More information is available on their website:

<https://uh.edu/dsa/cougarcupboard>.

## **Important Dates**

First day of classes: Aug. 21 (Monday)

Last day to add a course: Aug. 28 (Monday)

Labor Day Holiday: Sept. 4 (Monday)

Last day to drop (without receiving a W): Sept. 6 (Wednesday)

Last day to drop a course (with a W): Nov. 15 (Wednesday)

Thanksgiving Holiday: Nov. 22–25 (Wednesday–Saturday)

Last day of classes: Dec. 2 (Saturday)

Final exam: Thursday, Dec. 7, 2:00–5:00 pm

**Useful Websites**

Department of ECE: <http://www.ee.uh.edu>

College of Engineering: <http://www.egr.uh.edu>

University of Houston: <http://www.uh.edu>

Student Handbook: <http://www.uh.edu/dos/resources/student-handbook>

Undergraduate Student Catalog: <http://publications.uh.edu/index.php?catoid=36>

Undergraduate Course Listing: <http://publications.uh.edu/content.php?catoid=31&navoid=11769>

Academic Calendar: <http://publications.uh.edu/index.php?catoid=46>

Final Exam Schedule:

<https://uh.edu/academics/courses-enrollment/final-exam-schedules>

# UNIVERSITY OF HOUSTON SYLLABUS LANGUAGE: FALL 2023

## Mental Health and Wellness Resources

The University of Houston has a number of resources to support students' mental health and overall wellness, including [CoogsCARE](#) and the [UH Go App](#). UH [Counseling and Psychological Services \(CAPS\)](#) offers 24/7 mental health support for all students, addressing various concerns like stress, college adjustment and sadness. CAPS provides individual and couples counseling, group therapy, workshops and connections to other support services on and off-campus. For assistance visit [uh.edu/caps](http://uh.edu/caps), call 713-743-5454, or visit a [Let's Talk](#) location in-person or virtually. [Let's Talk](#) are daily, informal confidential consultations with CAPS therapists where no appointment or paperwork is needed.

The [Student Health Center](#) offers a Psychiatry Clinic for enrolled UH students. Call 713-743-5149 during clinic hours, Monday through Friday 8 a.m. - 4:30 p.m. to schedule an appointment.

The [A.D. Bruce Religion Center](#) offers spiritual support and a variety of programs centered on well-being.

## **Need Support Now?**

**If you or someone you know is struggling or in crisis, help is available. Call CAPS crisis support 24/7 at 713-743-5454, or the National Suicide and Crisis Lifeline: call or text [988](tel:988), or chat [988lifeline.org](https://988lifeline.org).**

## Academic Honesty Policy

High ethical standards are critical to the integrity of any institution, and bear directly on the ultimate value of conferred degrees. All UH community members are expected to contribute to an atmosphere of the highest possible ethical standards. Maintaining such an atmosphere requires that any instances of academic dishonesty be recognized and addressed. The [UH Academic Honesty Policy](#) is designed to handle those instances with fairness to all parties involved: the students, the instructors, and the University itself. All students and faculty of the University of Houston are responsible for being familiar with this policy.

## Title IX/Sexual Misconduct

Per the UHS Sexual Misconduct Policy, your instructor is a "responsible employee" for reporting purposes under Title IX regulations and state law and must report incidents of sexual misconduct (sexual harassment, non-consensual sexual contact, sexual assault, sexual exploitation, sexual intimidation, intimate partner violence, or stalking) about which they become aware to the Title IX office. Please know there are places on campus where you can make a report in confidence. You can find more information about resources on the Title IX website at <https://uh.edu/equal-opportunity/title-ix-sexual-misconduct/resources/>.

## Reasonable Academic Adjustments/Auxiliary Aids

The University of Houston is committed to providing an academic environment and educational programs that are accessible for its students. Any student with a disability who is experiencing barriers to learning, assessment or participation is encouraged to contact the Justin Dart, Jr. Student Accessibility Center (Dart Center) to learn more about academic accommodations and support that may be available to them. Students seeking academic accommodations will need to register with the Dart Center as soon as possible to ensure timely implementation of approved accommodations. Please contact the Dart Center by visiting the website: <https://uh.edu/accessibility/> calling (713) 743-5400, or emailing [jdcenter@Central.UH.EDU](mailto:jdcenter@Central.UH.EDU).

## Excused Absence Policy

Regular class attendance, participation, and engagement in coursework are important contributors to student success. Absences may be excused as provided in the University of

Houston [Undergraduate Excused Absence Policy](#) and [Graduate Excused Absence Policy](#) for reasons including: medical illness of student or close relative, death of a close family member, legal or governmental proceeding that a student is obligated to attend, recognized professional and educational activities where the student is presenting, and University-sponsored activity or athletic competition. Under these policies, students with excused absences will be provided with an opportunity to make up any quiz, exam or other work that contributes to the course grade or a satisfactory alternative. Please read the full policy for details regarding reasons for excused absences, the approval process, and extended absences. Additional policies address absences related to [military service](#), [religious holy days](#), [pregnancy and related conditions](#), and [disability](#).

#### Recording of Class

Students may not record all or part of class, livestream all or part of class, or make/distribute screen captures, without advanced written consent of the instructor. If you have or think you may have a disability such that you need to record class-related activities, please contact the [Justin Dart, Jr. Student Accessibility Center](#). If you have an accommodation to record class-related activities, those recordings may not be shared with any other student, whether in this course or not, or with any other person or on any other platform. Classes may be recorded by the instructor. Students may use instructor's recordings for their own studying and notetaking. Instructor's recordings are not authorized to be shared with anyone without the prior written approval of the instructor. Failure to comply with requirements regarding recordings will result in a disciplinary referral to the Dean of Students Office and may result in disciplinary action.

#### Resources for Online Learning

The University of Houston is committed to student success, and provides information to optimize the online learning experience through our [Power-On](#) website. Please visit this website for a comprehensive set of resources, tools, and tips including: obtaining access to the internet, AccessUH, Blackboard, and Canvas; using your smartphone as a webcam; and downloading Microsoft Office 365 at no cost. For questions or assistance contact [UHOnline@uh.edu](mailto:UHOnline@uh.edu).

#### UH Email

Please check and use your CougarNet email for communications related to this course. Faculty use the CougarNet email to respond to course-related inquiries such as grade queries or progress reports for reasons of FERPA. To access your CougarNet email, [login](#) to your Microsoft 365 account with your CougarNet credentials. Visit [University Information Technology \(UIT\)](#) for instructions on how to connect your CougarNet e-mail on a mobile device.

#### Security Escorts and Cougar Ride

UHPD continually works with the University community to make the campus a safe place to learn, work, and live. The security escort service is designed for the community members who have safety concerns and would like to have a Security Officer walk with them, for their safety, as they make their way across campus. Based on availability either a UHPD Security Officer or Police Officer will escort students, faculty, and staff to locations beginning and ending on campus. If you feel that you need a Security Officer to walk with you for your safety, please call [713-743-3333](tel:713-743-3333). Arrangements may be made for special needs.

Parking and Transportation Services also offers a late-night, on-demand shuttle service called "Cougar Ride" that provides rides to and from all on-campus shuttle stops, as well as the MD Anderson Library, Cougar Village/Moody Towers and the UH Technology Bridge. Rides can be requested through the UH Go app. Days and hours of operation can be found at <https://uh.edu/af-university-services/parking/cougar-ride/>.

#### Syllabus Changes

Please note that the instructor may need to make modifications to the course syllabus. Notice of such changes will be announced as quickly as possible through (specify how students will be notified of changes).