

ECE 6382 Engineering Analysis I

Fall 2023
Section 15465

Class Time: M, W 5:30 – 7:00 pm, E220-D3.

Instructor

David R. Jackson. Office: W318-D3; phone: 713-743-4426; fax: 713-743-4444; email: djackson@uh.edu. Office hours will be posted on the Canvas site and on the instructor's door.

Prerequisites

The official prerequisite is the consent of the instructor. A basic background in the following areas is assumed:

- 1) Differential equations
- 2) Vector calculus
- 3) Linear algebra
- 4) Fourier and Laplace transforms

Course Goals

The goal of this course is to cover some of the basic concepts and tools of applied mathematical analysis that are common to many areas of engineering and science.

Course Content

- ◇ Complex function theory
- ◇ Gamma function
- ◇ Asymptotic series
- ◇ Asymptotic evaluation of integrals
- ◇ Sturm-Liouville theory
- ◇ Green's functions
- ◇ Special functions and applications

Class Canvas Site

This class will use the class Canvas site as the official site for the distribution of all of the class material, including the class lecture notes, homework, project, handouts, and other material. In addition, any important announcements that pertain to the class will be put there in the "Announcements" section of the site. You are responsible for all messages that are placed there. Therefore, it is your responsibility to check the Canvas site often. There is also a public-domain website for the course that has all of the class notes from the previous time the class was taught. The website is: <http://courses.egr.uh.edu/ECE/ECE6382/>.

Required Texts

G. B. Arfken, H. J. Weber, and F. E. Harris, *Mathematical Methods for Physicists*, 7th Ed., Academic Press, 2013.

Texts Recommended for Consultation

Mathematical Physics

- 1) D. G. Dudley, *Mathematical Foundations for Electromagnetic Theory*, IEEE Press, 1994.
- 2) E. Butkov, *Mathematical Physics*, Addison-Wesley, 1968.
- 3) P. Dennery and A. Kryzwicki, *Mathematics for Physicists*, Dover, 1996.
- 4) M. L. Boas, *Mathematical Methods in the Physical Sciences*, 3rd. Ed., Wiley, 2005.
- 5) I. Stakgold, *Boundary Value Problems of Mathematical Physics*, Vol. 1, Society for Industrial and Applied Mathematics (SIAM), 2000.
- 6) H. Jeffreys and B. Jeffreys, *Methods of Mathematical Physics*, Cambridge University Press, 2001.
- 7) R. Courant and D. Hilbert, *Methods of Mathematical Physics*, (Vols. 1 and 2), Wiley-VCH, 1989.

Complex Variables

- 1) J. W. Brown and R. V. Churchill, *Complex Variables and Applications*, McGraw-Hill, 9th Ed., 2013.
- 2) M. R. Spiegel, S. Lipschutz, J. J. Schiller, and D. Spellman, *Complex Variables*, 2nd Ed., Schaum's outline series, McGraw-Hill, 2009.
- 3) J. E. Marsden and M. J. Hoffman, *Basic Complex Analysis*, 3rd Ed., W. H. Freeman, 1998.

Special Functions

- 1) M. Abramowitz and I. A. Stegun, *Handbook of Mathematical Functions with Formulas, Graphs, and Mathematical Tables*, Dover, 1964 (formerly published by the National Bureau of Standards, and then by the Government Printing Office).
- 2) F. W. J. Olver, D. W. Lozier, R. F. Boisver, and C. W. Clark, *NIST Handbook of Mathematical Functions*, National Institute of Standards and Technology (NIST), 2010. An online version called the *NIST Digital Library of Mathematical Functions* is available at <http://dlmf.nist.gov/>.
- 3) N. N. Lebedev, *Special Functions and their Applications* (translated and edited by R. A. Silverman), Dover, 1972.

Grading Policy

The tentative grading policy is as follows:

Homework	30%
Exam I	30%
Exam II	30%
Project	10%

Exams

The tentative policy is that there will be two exams. The dates and format for the exams will be announced at least one week before they are given. The exams will be held in our usual classroom.

Homework

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.

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. The policy may be found at: <https://uh.edu/provost/policies-resources/honesty>.

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 (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)

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>

Graduate Student Catalog: <http://publications.uh.edu>

Graduate Course Descriptions: <http://publications.uh.edu/content.php?catoid=45&navoid=16595>

Academic Calendar: <http://publications.uh.edu>

Final Exam Schedule: <http://www.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, 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.

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.

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 government 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.

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 though.