# UNIVERSITY OF HOUSTON

**Department of Electrical and Computer Engineering ECE 2201 – Circuit Analysis I**

**Spring Semester 2024**

***Course*:** ECE 2201, Sections 12459 and 15781, 4:00 – 5:30pm, TuTh, Room CBB 110, 4242 Martin Luther King Boulevard, face-to-face class

ECE 2201, Sections 10758 and 15780, 1:00 – 2:30pm, TuTh, Room W205-D3, 4222 Martin Luther King Boulevard, face-to-face class

***Instructor:*** Dr. Dave Shattuck, Email: [dshattuc@central.uh.edu](mailto:dshattuc@central.uh.edu) or [shattuck@uh.edu](mailto:shattuck@uh.edu)

Office: Room N336-D, (4226 Martin Luther King Boulevard, formerly called Engineering Building 1)

***Office Phone:*** 713 743-4422; Mobile Phone: 713-498-6888

***Office Hours:*** Tuesdays and Thursdays 9:30-11am (starting January 16), or by appointment set up by email. Zoom meetings can be scheduled on request, by email. In all cases, it works best if you suggest a time and date in the email message, with your preferences.

### Required Text

We will be using the custom-built interactive Top Hat Textbook Circuit Analysis, ISBN 978-1- 77412-150-4, along with the Top Hat One Semester, ISBN 978-0-9866151-0-8, for this course.

You can register by simply visiting the course website that corresponds with your section of the course:

<https://app.tophat.com/e/011536> for the 4pm section or

<https://app.tophat.com/e/577418> for the 1pm section.

The Join Code is 011536 for the 4pm section, and is 577418 for the 1pm section. If you opted into the CTAP (Cougar Textbook Access Program), you will not incur any additional cost for using Top Hat. If you opted out of the program you will be responsible for paying for the use of Top Hat once the university takes the fall census. Should you require assistance with Top Hat at any time, please contact their Support Team directly by way of email ([support@tophat.com](mailto:support@tophat.com)), the in-app support button, or by calling 1-888-663-5491.

We will also have the textbook Electric Circuits, by Nilsson & Reidel, as a resource. This should also be included under the CTAP. If you opted out of the CTAP, please wait to buy this resource until we have discussed it in our first class.

### Recommended Materials for Supplementary Self-Study

Sets of past exams and quizzes, as well as self-study materials, are available on the web <http://courses.egr.uh.edu/ECE/ECE2201/>. Other good circuit analysis textbooks include ones from the following authors: Irwin; Alexander & Sadiku; Dorf & Svoboda, and Hayt, Kemmerly & Durbin. The University of Houston is committed to student success, and provides information to optimize the online learning experience through our [Power-On](https://uh.edu/power-on/learning/) website. Please visit this website for a comprehensive set of resources, tools, and tips including: obtaining access to the internet, AccessUH, and Canvas; requesting a laptop through the Laptop Loaner Program; 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)

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### Prerequisites and CFORI requisites

The following requirements must be met before enrolling in Circuit Analysis. In each course you must have earned a grade of "C-" or better, except the English courses for which a "D-" or better is required.

***Prerequisites***

##### ENGI 1100 or equivalent ENGI 1331 or equivalent

ENGL 1301 or equivalent ENGL 1302 or equivalent

***Credit For or Registration in (CFORI) Requisites***

MATH 3321 – Engineering Mathematics PHYS 2326 – University Physics II

MATH 2415 – Calculus III PHYS 2126 – Physics Laboratory II

***Web Materials and Email***

We will be using the Canvasweb site available on the web through AccessUH for posting of grades, and to post certain documents. Please explore both the Canvas site and the course website (<http://courses.egr.uh.edu/ECE/ECE2201/> ) for materials of interest. 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](https://uh.edu/infotech/services/office365/how-to-login/) to your Microsoft 365 account with your Cougarnet credentials. Visit [University Information Technology (UIT)](https://uh.edu/infotech/services/accounts/email/email-faq/) for instructions on how to connect your Cougarnet e-mail on a mobile device. We will assume that you check your email messages regularly.

***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](https://uh.edu/power-on/learning/) website. Please visit this website for a comprehensive set of resources, tools, and tips including: obtaining access to the internet, AccessUH, 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).

# GENERAL INFORMATION

### Catalog Description

Circuit Analysis I. Cr. 2 (1-3). Prerequisites: ENGI 1100 or ECE 1100 or ECE 1111, ENGI 1331, ENGL 1301 or ENGL 1309, ENGL 1302 or ENGL 1310, MATH 2413, MATH 2414, PHYS 2325 and PHYS 2125.and credit for or concurrent enrollment in MATH 2415, MATH 3321, PHYS 2126 and PHYS 2326.

Analysis of resistive circuits, including node voltage and mesh current methods, and Thevenin and Norton equivalent circuits.

**Course Topics**

* Voltage, Current, Power, Energy
* Kirchhoff’s Laws and Ohm’s Law
* Circuit Analysis Concepts
* Systematic Equation Writing
* Thévenin’s and Norton’s Theorems

### Expected Course Outcomes:

Students who successfully complete this course are expected to attain the following course outcomes.

* Students will add to their knowledge-base in the fundamentals of electrical engineering, especially in the area of circuit analysis, in part by gaining a greater understanding of key engineering concepts, such as equivalent circuits. Students will use this knowledge and understanding to solve circuits problems such as arise in electrical engineering. (ABET Student Outcome 1)
* Students will further develop their basic skills of problem solving and critical thinking by learning techniques such as the systematic writing and solution of simultaneous equations. They will apply this knowledge of mathematics, science and engineering to efficiently solve circuit analysis problems. (ABET Student Outcome 1)
* Students will continue to develop their ability to choose between various approaches and to learn to take systematic approaches to difficult problems, and therefore identify, formulate, and solve engineering problems efficiently. (ABET Student Outcome 1)
* Students will demonstrate an appropriate level of attention to detail and the use of clear, appropriate notation, which will facilitate their ability to communicate effectively with technical colleagues. (ABET Student Outcome 3)

***Circuit Analysis*** is designed to introduce you to fundamental concepts in circuit analysis and, more generally, in electrical engineering. Since you will be using these ideas in all aspects of your career as an electrical or computer engineer, both in the classroom and in the workplace, it is important that you learn the conceptual framework presented in ***Circuit Analysis*** as thoroughly as possible.

There is no laboratory formally associated with this class. The section shown as (Laboratory) that you signed up for is a bureaucratic placeholder that allows us to meet for three hours a week while only charging you for two semester-credit-hours. However, there is a corresponding laboratory course, *Circuit Analysis Laboratory*, ECE 2100, which is usually taken along with ECE 2202 *Circuit Analysis II*.

***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 this policy. You***must*** sign the Academic Honesty Statement on the last page of this handout, detach it, and submit it to your instructor by ***Thursday, January 25, 2024***. If you fail to do this, you may be dropped from the course. See the policy on the web at <http://publications.uh.edu/content.php?catoid=49&navoid=18552>.

***Religious Holy Days***

Students whose religious beliefs prohibit class attendance on designated dates or attendance at scheduled exams may request an excused absence. To do this, you are **strongly encouraged** to request the excused absence, in writing, by the fifth class day. Please submit this written request to your instructor to allow the instructor to make appropriate arrangements. For more information, see the catalog at <http://publications.uh.edu/content.php?catoid=49&navoid=18420>.

***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. For more information, see the web at <https://uh.edu/accessibility/> .

***Homework***

There will be regular homework assignments; the problems will be available on Canvas, and will be submitted there as well. Copies of the homework assignments are also available on the course web page, <http://courses.egr.uh.edu/ECE/ECE2201/Homework/> .

Since doing homework is important, we will be collecting and grading it. The instructors believe that it is beneficial for students to work together on the homework, in a constructive manner. Some students may be tempted to copy their homework from a fellow student, which obviously defeats the purpose of doing homework. At the end of the semester, the grades you obtained on your homework assignments will count a few percent toward your final average. We will make the final determination of exactly how much they count at the end of the semester. However, it is important for you to understand that you cannot pass the course on the basis of homework assignment grades. Our experience is that if you are copying the homework, or simply not doing it, you will not do well on the exams and quizzes. Since the exams and quizzes will count far more than the homework assignments, the homework grade cannot raise your average sufficiently for you to pass the course.

***Attendance***

Attendance at all classes is expected and required. The instructor may take attendance in any class, at any time during the class. The instructor may do this as many times per class period as she/he chooses, without warning. The attendance grade can be included in the grade for the course.

***Exams***

There will be two examinations, given on the dates listed below. These two examinations will last for 100 minutes. The final exam will last 100 minutes.

Exam 1: Saturday, March 2, 2024 at 9am

Exam 2: Saturday, April 6, 2024 at 9am

A comprehensive final exam will be given on Wednesday, May 1, 2024, from 4pm until 6pm.

If you have a conflict with any exam time, you must notify your instructor in writing during the first two weeks of classes.

In addition, ***quizzes*** will be given during the semester. The quizzes will have exam-like questions and will typically last 20 to 40 minutes.

***Conduct of Examinations***

Exams and quizzes are closed book, closed notes, unless otherwise announced. A one-page crib sheet, using both sides of an 8.5” by 11” sheet of paper, will be allowed for each of the exams. Note that the number of crib sheets will not increase during the semester. You may bring any calculator to the exams and quizzes. ***No makeup examinations will be given.* If you have a medical emergency you should call your instructor as soon as possible, preferably before the examination. Medical documentation will be required in all such cases.**

The following items are **not** permitted during the exams: laptop computers; connections to the internet of any kind; communications devices of any kind. For this course, a TI-nspire or equivalent device is considered a calculator, and is therefore permitted. All work must be done on the examination paper provided for that purpose.

The Saturday morning exams and the final exam will be held in large rooms. The seats may be randomly assigned, and there might be people from other courses taking exams in the same room at the same time. There may be more than one version of the exam given. These regulations are designed to reduce the opportunity for unfair advantage on the exams so that each person can operate under the same or similar conditions.

***Grading Policy***

Grades will be determined on the basis of exams, quizzes, attendance, and submitted homework grades with the following range of weights. The actual weights will be fixed at the end of the semester.

Homework 3-10%

Quizzes 10-17%

Exam 1 20-30%

Exam 2 20-30%

Final Exam: 25-35%

***Grade Point Rule***

The following **approximate** grade point scale will be used in determining your grade. This scale may be modified somewhat, but is included here so that you will have a general idea of how well you are doing in the course. The final grade scale will be determined at the end of the semester.

90 - 100: A's 78 - 89.99: B's 66 - 77.99: C's 54 - 65.99: D's below 54: F

***Grade Posting***

The course letter grade will be posted on PeopleSoft at the end of the year. Normally, the grades are available about one week after the final exam. The instructor is not allowed to give out grades over the phone or by email. During the semester, grades will be posted on Canvas. Final grades will also be posted on Canvas at the end of the semester; however, the official grade reporting is done on PeopleSoft, not Canvas.

***Withdrawal Policy***

The withdrawal dates listed in the Academic Calendar will be followed strictly. Please consult this document for appropriate dates. Grades of Incomplete (I) will be given only when a small portion of the course has not been completed for a good reason. If the material has been completed, an “I” grade cannot be given. Detailed information about these issues is available in the *University Catalog*, at <http://publications.uh.edu/content.php?catoid=49&navoid=18418>.

***Documents on the Web***

Some additional materials not on Canvas may be found at: [www.ece.uh.edu/courses](http://www.ece.uh.edu/courses), by clicking on the ‘ECE2201’ link on that webpage. Among the documents that are available on the web sites listed above are old exams and quizzes with solutions, current homework assignments, questions asked by previous students with answers, some lecture notes, and some files such as guided solutions to circuits problems, intended to help students in the role of a computer tutor, in a directory called the **Dr\_Dave\_Project**. Explore and have fun.

Mental Health and Wellness Resources

The University of Houston has a number of resources to support students’ mental health and overall wellness, including [CoogsCARE](https://uh.edu/coogs-care/) and the [UH Go App](https://uh.edu/go/). UH [Counseling and Psychological Services (CAPS)](https://uh.edu/caps/services/) 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](https://uh.edu/caps/), call 713-743-5454, or visit a [Let’s Talk](https://www.uh.edu/caps/outreach/lets-talk/) location in-person or virtually. [Let’s Talk](https://www.uh.edu/caps/outreach/lets-talk/) are daily, informal confidential consultations with CAPS therapists where no appointment or paperwork is needed.

The [Student Health Center](https://uh.edu/healthcenter/services/medical-services/psychiatry-clinic/) 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](https://www.uh.edu/adbruce/) 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](https://uh.edu/provost/policies-resources/honesty/) 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](http://catalog.uh.edu/content.php?catoid=49&navoid=18675) and [Graduate Excused Absence Policy](http://publications.uh.edu/content.php?catoid=50&navoid=19270) 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](http://publications.uh.edu/content.php?catoid=49&navoid=18634), [religious holy days,](http://publications.uh.edu/content.php?catoid=44&navoid=15699)[pregnancy and related conditions](https://www.uh.edu/equal-opportunity/anti-discrimination/policies/), and [disability](https://uhsystem.edu/compliance-ethics/_docs/sam/01/1d9.pdf).

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](https://uh.edu/accessibility/). 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.

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/>.

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| **Lecture #** | **Lecture Date** | **Lecture** | **Homework Due, Before Noon** | **Exams or Quizzes  (Quiz dates tentative)** | **Reading Homework Due, Before Noon** |
| 1 | 16-Jan | Class Cancelled |  |  |  |
| 2 | 18-Jan | Course Introduction, Syllabus |  |  |  |
| 3 | 23-Jan | Voltage, Current |  |  | Chapter 1 |
| 4 | 25-Jan | Power, Sign Relationships |  |  |  |
| 5 | 30-Jan | Power, Sign Relationships, Example Problems |  |  |  |
| 6 | 1-Feb | Power, Sign Relationships, Example Problems | HW #1 |  | Chapter 2 |
| 7 | 6-Feb | Sources, Resistors | HW #2 |  |  |
| 8 | 8-Feb | Kirchhoff's Laws |  |  |  |
| 9 | 13-Feb | Kirchhoff's Laws Example Problems |  | Quiz 1 |  |
| 10 | 15-Feb | Kirchhoff's Laws Example Problems |  |  | Chapter 3 |
| 11 | 20-Feb | Series, Parallel, Delta to Wye | HW #3 |  |  |
| 12 | 22-Feb | Series, Parallel, Delta to Wye Example Problems |  |  |  |
| 13 | 27-Feb | VDR, CDR, Device Modeling |  |  |  |
| 14 | 29-Feb | VDR, CDR, Device Modeling, Example Problems | HW #4 | Quiz 2 |  |
|  | 2-Mar |  |  | **Exam 1: Sat., Mar. 2, 9am** |  |
| 15 | 5-Mar | VDR, CDR, Device Modeling, Example Problems |  |  | Chapter 4 |
| 16 | 7-Mar | Node-Voltage Method |  |  |  |
|  | Mar. 9 -- 17 | Spring Break |  |  |  |
| 17 | 19-Mar | Node-Voltage Method | HW #5 |  |  |
| 18 | 21-Mar | Node-Voltage, Example problems |  |  |  |
| 19 | 26-Mar | Node-Voltage, Example problems |  | Quiz 3 | Chapter 5 |
| 20 | 28-Mar | Mesh-Current Method |  |  |  |
| 21 | 2-Apr | Mesh-Current Method, Example problems | HW #6 | Quiz 4 | Chapter 6 |
| 22 | 4-Apr | Source Transformations |  |  | Chapter 7 |
|  | 6-Apr |  |  | **Exam 2: Sat., Apr. 6, 9am** |  |
| 23 | 9-Apr | Thevenin's and Norton's Theorems |  |  |  |
| 24 | 11-Apr | Thevenin's and Norton's Theorems | HW #7 |  |  |
| 25 | 16-Apr | Thevenin and Norton's theorems problems |  | Quiz 5 |  |
| 26 | 18-Apr | Thevenin and Norton's theorems problems |  |  | Chapter 8 |
| 27 | 23-Apr | Maximum power transfer, superposition | HW #8 |  | Chapter 9 |
| 28 | 25-Apr | Maximum power transfer, superposition problems | HW #9 | Quiz 6 |  |
|  | 1-May |  |  | **Final Exam - Wednesday, May 1, 4pm-6pm** |  |

Academic Honesty Statement

I have read the University of Houston Academic Honesty Policy available on the web at <http://publications.uh.edu/content.php?catoid=44&navoid=15831>   
I agree to abide by the provisions of this policy. I understand that academic honesty is taken very seriously and, in the cases of violations, penalties may include suspension or expulsion from the University of Houston. I understand that it is a violation of the policy to do work on quizzes and exams while communicating in any way with anyone. The only exception is that I may communicate with the course instructors during quizzes and exams.

Name: (Please print)

Signature:

Date:

I understand the prerequisites for this course that are listed in this syllabus. I certify that I have appropriate credit for these prerequisites, or have received a waiver of them from Dr. Trombetta.

Name: (Please print)

Signature:

Date:

Print your name clearly, sign and date it. Then, submit it to your instructor by **Thursday, January 25, 2024**. If you fail to do this, you may be dropped from the course.