

ELECTRICAL CIRCUIT ANALYSIS – ESE271
SPRING 2025

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LECTURE:

Tuesday and Thursday 11:00 am to 12:20 pm, in Frey Hall 309

OFFICE HOURS:

Tuesday and Thursday 1 pm to 3 pm

COURSE WEBSITE:

The course is registered with the [Brightspace](#)

TEXTBOOK:

Fundamentals of Electric Circuits, 7th edition. Charles K. Alexander and Matthew N.O. Sadiku, McGraw Hill (2017) **ISBN10:** 1264144016 | **ISBN13:** 9781264144013

GRADING POLICY:

The course grade will be calculated using the following weights:

| | |
|---------------------|-----|
| Test 1 | 20% |
| Test 2 | 20% |
| Comprehensive Final | 60% |

HOMEWORK:

Homework will be assigned on a regular basis but NOT graded for credit. However, it will be collected and evaluated for common misunderstandings. You are strongly advised to do the homework assignments by the specified time.

TEST POLICY:

- All tests will be **Closed book**.
- Student photo ID must be available for inspection.
- NO make-up tests.
- Zero tolerance for academic dishonesty.

TEST SCHEDULE: Test dates are subject to change.

| | |
|--------------------|-------------------------------|
| Test 1 | Feb 25: 11:30 am 12:50 pm |
| Test 2 | April 8: 11:30 am to 12:50 pm |
| Final - cumulative | May 13: 11:15 am to 1:45 pm |

4. Course Learning Objectives

Upon completing this course, students will achieve the following learning objectives:

- Fundamental understanding circuit elements (resistors, capacitors, inductors, voltage and current sources)
- Fundamental understanding of ideal active devices such as transistors, operational amplifiers, transformers
- Working knowledge of analyzing 1st and 2nd order circuits using transient analysis, Phasor analysis, s-domain analysis
- Working knowledge of complex power
- Working knowledge of analyzing magnetically coupled circuits.

Weekly lecture topics: [Caution: Topics and test dates subject to change]

| | | |
|---------|---------------|---|
| Week 1 | Lec #1 | Basic concepts: current, voltage, power |
| | Lec #2 | Resistor, Ohm's law, Kirchhoff's laws |
| Week 2 | Lec #3 | Nodal and Mesh analysis |
| | Lec #4 | Circuit theorems |
| Week 3 | Lec #5 | Dependent sources and operational amplifiers |
| | Lec #6 | Circuits with operational amplifiers |
| Week 4 | Lec #7 | Material review |
| | Test 1 | Chapters 1 to 5 |
| Week 5 | Lec #8 | Capacitors |
| | Lec #9 | Inductors |
| Week 6 | Lec #10 | First order RC and RL circuits |
| | Lec #11 | Second order RLC circuits |
| Week 7 | Lec #12 | Second order RLC circuits |
| | Lec #13 | AC circuits, sinusoids and phasors, impedance, RLC circuits |
| Week 8 | | Spring recess |
| Week 9 | Lec #14 | AC steady state, nodal and mesh analysis |
| | Lec #15 | AC steady state, nodal and mesh analysis |
| Week 10 | Lec #16 | AC power analysis, complex power |
| | Lec #17 | Material review for Test 2 |
| Week 11 | Test 2 | Chapters 6 - 11 |
| | Lec #18 | Introduction to three phase circuits |
| Week 12 | Lec #19 | Magnetically coupled circuits, transformers |
| | Lec #20 | Frequency response function, Bode plots |
| Week 13 | Lec #21 | Resonant filters |
| | Lec #22 | Laplace Transform - definition |
| Week 14 | Lec #23 | Laplace Transform - properties |
| | Lec #24 | Laplace Transform - application for circuit analysis |
| Week 15 | Lec #25 | Circuits in s-domain, transfer functions |
| | Lec #26 | Step and impulse response. Poles. Stable circuits. |
| Week 16 | | Cumulative final - date and location TBA |

Important Reminders

- **Accessibility:** Each course instructor is responsible for ensuring that course materials are accessible to all enrolled students, regardless of their permanent/temporary disability.
 - The [Student Accessibility Support Center](#) (SASC) coordinates reasonable accommodations for students to ensure equal access to education. All course instructors can access student accommodation information through the [Online Portal](#).
 - If you need help learning how to make your courses accessible, please contact the [Center for Excellence in Learning and Teaching](#) (CELT).
- **Calendars:** Please familiarize yourself with the various University calendars and deadlines, including the [academic calendar](#), which includes add/drop deadlines, course withdrawal deadlines, holidays, etc.
- **Student Absences:** During the semester, students may be required to miss class as a result of their participation in an event or activity sponsored by the University. In such cases, please be prepared to [make necessary accommodations](#).
- **Religious Accommodations:** The University is committed to ensuring that every student will have the right to pursue their education while practicing their faith. The Office of the Registrar hosts guidelines on how instructors can best [support student religious accommodations](#). This includes a listing of upcoming religious holidays, direction on student absences, and how to avoid conflicts with due dates for exams, papers, presentations or other major assignments.
- **Tracking Attendance:** To ensure students maintain their federal financial aid eligibility, instructors must verify that students are [attending classes](#). In the early part of the semester, you will be asked to indicate on the “beginning of term attendance roster” in SOLAR if an enrolled student has never attended class. After final grades have been posted at the end of the semester, you will again be asked if each student has: *Never attended, completed the course, or has not attended since a specific date* (end of term attendance in SOLAR).
- **Student Progress Reports:** Instructors for undergraduate courses are periodically asked to provide feedback on how students are doing in their courses so that students can be connected to support services when needed. Not all instructors will receive a progress report request every semester, but you can provide feedback on students at any time. More information can be found in the [progress report FAQs](#). For Spring 2024, requests for feedback will begin Wednesday, February 21 through Wednesday, March 20.

Resources to Support Student Success

- **Student Success:** To help your students succeed, familiarize yourself with the different resources Stony Brook offers to support our students as they pursue their degrees:
 - [Student Success Resources at Stony Brook](#)
 - [Academic Success and Tutoring Center](#)
 - [Graduate and Postdoctoral Professional Development](#)
- **Health and Wellness:** If you have concerns about a student’s well-being, you can reach out to or refer students to a number of offices:
 - The [Red Book](#), which can help you guide students in mental, emotional, medical, or other distress to the appropriate resources
 - [Student Support Team](#)
 - [Counseling and Psychological Services](#) (CAPS)
 - [Student Health Services](#)
 - [TimelyCare](#), a 24/7 virtual service that provides students access to medical and mental health services
 - [The CARE Team](#), which is a resource for faculty and staff to report concerns about student behavior that may pose a threat to health and safety or disrupts University activity
- **Instructional support:** If you would like support with your teaching, The Center for Excellence in Learning and Teaching (CELT) has many ways to assist you this upcoming semester:
 - Join a [scheduled course, workshop, or panel](#) or explore [CELT’s Teaching Milestones](#)
 - Explore [upcoming events, resources](#), and [guidance](#) on Generative AI/AI writing bots

- Email celt@stonybrook.edu to schedule a [consultation, or a customized workshop](#) for your department or team
- Last spring, a group of faculty were convened to review and potentially modify our course evaluation questions. We are collecting feedback from faculty and instructors to inform this process. Please [share your thoughts on our course evaluation questions](#).
- **Classroom Technology:** DoIT's Classroom Technology and Support Solutions is here to support you! Read [Classroom Technology Updates](#) to find out how to schedule a refresher for using the technology in your classroom and learn about upcoming classroom technology initiatives achieved during the semester. Email classrooms@stonybrook.edu for more information.
- **Technology Support:** Students can also get technical support through the [DoIT Service Desk](#) and academic software support through [Academic Technology Services](#).

SBU Policies

- **Academic Integrity:** All faculty are required to report suspected violations of the [Academic Integrity Policy](#) by undergraduates. In the case of graduate students, please consult the [Grievance and Appeals Procedure](#).
- **FERPA:** To protect student privacy, Stony Brook has developed a [FERPA policy](#) for handling and maintaining student records in accordance with the Family Education Rights and Privacy Act. Please note that without a signed release form, this policy precludes conversations about a student's academic progress with that student's parents/guardians.
- **Disruptions:** In case of classroom disruptions, please review the [relevant policies](#).
- **Instructional and Student Responsibilities:** Please familiarize yourself with the [University's statements of Minimal Instructional and Student Responsibilities](#).

Required Syllabus Content

The University Senate Undergraduate and Graduate Councils have authorized that [these required statements](#) appear in all teaching syllabi (graduate and undergraduate courses) on the Stony Brook Campus.

In addition to these statements, all course syllabi must include measurable Learning Outcomes. If you need help in drafting such outcomes, please [contact CELT](#).

Learning Management System: Brightspace

It is expected that all faculty* use Brightspace as their Learning Management System (LMS) for support purposes. Other course-related software can be linked internally or externally through the LMS.

**Note: Renaissance School of Medicine and the Dental School of Medicine use CBase as their primary LMS, but can also use Brightspace if requested.*

To log into Brightspace, go to <https://brightspace.stonybrook.edu> and click "Launch Brightspace" to log in with your SBU NetID. For more information and support options, visit [DoIT's Brightspace service page](#).

All syllabi must be available to students on or before the first day of classes, preferably before. Upload your syllabi to the appropriate section of your Brightspace site for each of your courses. While you are working on your course in Brightspace, you can make it [unavailable to students](#). [Syllabus templates](#) can be found on CELT's website, and for technical information to add to your syllabus, visit the [Academic Technology Service Blog](#).

Thank you for your continued support in ensuring another successful semester at Stony Brook.