Course Syllabus

 ELCT 102 – Electrical Science

Course Coordinator

 Undergraduate Program Committee

Catalog Description

Fundamentals of electrical and electronic components. Basic network laws. Mathematical and computer tools for network analysis.

Credit Hours 3

Prerequisite(s) by course

MATH 141 (or coreq)

Prerequisite by topics

Calculus of single variables I

Required Textbooks and other materials

1. CIRCUITS, Third Edition by Fawwaz T. Ulaby, Michel M. Maharbiz, and Cynthia M. Furs. ISBN: 978-1-934891-19-3

or cost-free version of the book downloadable from
https://www.publishing.umich.edu/publications/ee/

Note that this book will also be used in ELCT 221, ELCT 222

1. Analog Discovery Kit 2, which can be purchased at the University bookstore or online at

https://store.digilentinc.com/analog-discovery-2-100msps-usb-oscilloscope-logic-analyzer-and-variable-power-supply/ Note that this kit will be used throughout your program of study in EE

All readings/materials comply with copyright/fair use policies.

Learning Outcomes:

Students who successfully complete the course will at least be able to:

1. Solve basic problems on potential, voltage, current and finding equivalent resistances in DC resistive electric circuits.
2. Analyze DC resistive circuits using nodal and mesh analysis, Thevenin and Norton transformation.

1. Solve problems on power dissipation in resistive DC circuits

1. Use MATLAB to apply matrix methods to analyze DC circuits using nodal and mesh analysis and Thevenin and Norton transformations.

Learning Outcomes for ELCT102 are equivalent for all delivery methods.

Course Topics:

1. Basic concepts of electric circuits: potential, voltage, current
2. Resistive circuits: Ohm’s law, Kirchhoff’s Laws, equivalent circuits
3. DC circuit analysis techniques: nodal analysis, mesh analysis, superposition, Thevenin and Norton transformations
4. DC circuit analysis with dependent sources and operational amplifiers (Opamps)

Course Contribution to ABET Student Outcomes:

ELCT 102 contributes to an achievement of:

* Outcome 1 – an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics (Learning outcomes 1 – 4)

**Course Delivery**

* Typical class structure consists of PowerPoints, PDF notes, Videos, Readings, Lectures, HW Assignments, Quizzes, Exams, Projects.
* To succeed in this class, students must be extremely self-motivated and well organized. Reliable Internet access is essential for successful completion of the course.
* All discussion board posts and emails will be responded to within 24 hours. Feedback will be provided on all assignments within 48 hours.
* Students will submit all assignments and take all quizzes and exams through Electrical Engineering Lon Capa servers at https://loncapa1.cec.sc.edu, https://loncapa2.cec.sc.edu, or https://loncapalib.cec.sc.edu.
* The results and feedback on submitted homework and tests will be provided no later than within a week after submission.

Student-Instructor and Student-Student Interaction

* Student-to-Instructor (S2I) interaction. Students can contact instructor via email (provided in this syllabus), via Blackboard chat or Blackboard Discussion board. Students can request a meeting with instructor using Blackboard Collaborate tool.
* Student-to-Student (S2S) interactions include email correspondence, Blackboard chat or Discussion board.
* Student-to-Content (S2C) Interactions include accessing the posted lectures on Blackboard and reading the corresponding content of the textbook.
* I will be communicating with you regarding any questions of the course content. If you need to get in touch with me, the best method is via email. You may also post questions pertaining to the course on the Blackboard Discussion Board.
* I will have in person or virtual office hours each week on MW: 4:00-5:00 pm or by appointment via email. To schedule an office visit, contact me via email with the date and time and I will post the link and invite using Outlook. I encourage you to use my office hours for questions and concerns regarding the course content. If needed, a virtual meeting may be scheduled outside of office hours if requested by email.
* Students are encouraged to collaborate and communicate with each other for understanding the course concepts and the generalized problem solution methods. However, actual assignment solutions are expected to be the sole effort for each student.
* There will be activities, group discussions, and group projects, where students share responsibility for learning with each other, discuss divergent understandings, and shape the direction of the class.
* Peer-to-peer interaction is an expected and important part of this course. Discussion boards, breakout groups, voice threads, and group assignments will be used so that students can share their ideas and learning with their classmates.

Attendance Policy

ELCT102 is a course in which regular attendance and active participation are critical to your learning and the experience of your classmates. Research has shown that regular attendance is a strong predictor of your academic success. Therefore, you are expected to be in class, on time, each day. Per University policy, for each unexcused absence after 1 or 2 (depending on number of course days), 3% will be deducted from your final course grade. Absences for a number of University-approved situations, including, but not limited to illness or injury, participation in University-sponsored events, required military duty, or observance of a religious practice or holy day will be excused with appropriate documentation as described in the Undergraduate Bulletin. If you will not be in class due to one of the University-approved excusable situations, you must contact us as early as possible to discuss a plan for obtaining and submitting documentation to excuse the absence. If you are absent, you are responsible for learning the material covered in class and for completing assignments that were due or assigned in your absence.

This course participates in the progress report initiative through the Student Success Center (SSC). At key points throughout the semester, the instructor may alert the SSC of students who may not be meeting criteria that’s been established for both attendance and/or course grade performance. Students who receive an alert will get an e-mail, then be contacted via the SSC Call Center, in which they’re encouraged to connect with additional academic support resources.

It is important we protect the health of all classmates, so please do not come to class if you are sick. If you are absent due to a medical issue, your priority is taking care of yourself and you will not be penalized for any absences related to illness. In the event you are placed under quarantine for being in close contact to someone who has tested positive for COVID-19 or are isolated because you have tested positive, please talk to me so we can work together to ensure you can continue to remain an active participant in class.

Technology Requirements

Every EE class requires routine computer and online skills such as use of Blackboard Learning Management system (LMS), VPN and composition of documents.

In addition, this class has the following requirements:

* Most assignments in the course will require students to have laptops with required software installed on them (i.e. MATLAB, LTSPICE etc. and/or as directed by course instructor).
* Attendance check will also require the response submitted from computer.
* Students are expected to have their laptops at every class session. Windows OS is preferable.

Assignment Submission

* Assignments are due on the specified day and time. Late assignments will NOT be accepted except in cases of emergency.
* Makeup assignment will be allowed only with the instructor approval for an acceptable, documented reason. Acceptable reasons for makeup include severe illness, family emergencies or other unavoidable events of which the instructor must be notified in writing or by email.
* Format and content for makeup assignments may be different from the original ones.
* All assignments must be electronically submitted as specified by instructor through LON-CAPA or Blackboard in a word or PDF format.
* Hard copy submission or email submission will NOT be accepted. Please note that unreadable homework image files can lead you to lose your homework credits.

Expectations for Classroom and Online Behavior

* Please be respectful of each other, the instructor, and any guest presenters while in online class. We are all here to learn! Any disrespectful or disruptive behavior may result in your referral to the Office of Student Judicial Programs.

Expectations of the Instructor

* The instructor is expected to facilitate learning, to answer questions appropriately, to be fair and objective in grading, to provide timely and useful feedback on assignments, to maintain adequate office hours, and to treat students respectfully.

Academic Integrity

As a student of the University of South Carolina, you agree to comply with the University Code of Conduct ([www.sc.edu/policies/ppm/staf626.pdf),](http://www.sc.edu/policies/ppm/staf626.pdf) Honor Code ([www.sc.edu/policies/staf625.pdf](http://www.sc.edu/policies/staf625.pdf)), Carolinian Creed ([www.sc.edu/policies/staf102.pdf](http://www.sc.edu/policies/staf102.pdf)), and all Other policies of the University of South Carolina.

You assume full responsibility for the content and integrity of the academic work you submit. The guiding principle of academic integrity shall be that your submitted work, examinations, reports, and projects must be that of your own work.  Prohibited behaviors include plagiarism, cheating, falsification, and complicity.

Lectures and course materials (which is inclusive of presentations, tests, exams, outlines, and lecture notes) may be protected by copyright. Homework solutions may be copyrighted by the publisher. You are encouraged to take notes and utilize course materials for your own educational purpose. However, you are not to reproduce or distribute this content without expressed written permission from the instructor. This includes sharing course materials to online social study sites like Chegg, CourseHero and other services. Students who publicly reproduce, distribute or modify course content may be in violation of the university’s Honor Code’s Complicity policy.

Deviation from these expectations will result in referral to the Office of Academic Integrity. Students found responsible for violating the Honor Code will be subject to non-academic penalties by the Office of Academic Integrity, as well as an academic penalties ranging from a zero on the assignment to a failing grade in the course.

When a student is uncertain as to whether his/her conduct would violate the Honor Code, it is the responsibility of the student to seek clarification from the instructor or the Office of Student Conduct and Academic Integrity [www.sc.edu/academicintegrity](http://www.sc.edu/academicintegrity).

**Accommodating Disabilities (**[**http://www.sa.sc.edu/sds/**](http://www.sa.sc.edu/sds/)**)**

The University of South Carolina provides high-quality services to students with disabilities, and we encourage you to take advantage of them. Students with disabilities needing academic accommodations should register with and provide documentation to the Student Disability Resource Center in Close-Hipp 102 or 803-777-6142, TDD 803-777-6744, email sasds@mailbox.sc.edu. Discuss with the instructor the type of academic or physical accommodations you need.

**Making up Exams and Assignments**

You are expected to make every effort to take required tests, quizzes, and exams as scheduled. Missed tests will receive a grade of 0 points. Make-up tests may be given for legitimate excusable absences, including illness of the student, accident, mandatory court appearance, military duty, or funeral attendance. Documentation of the circumstances will be required. If you know in advance you will miss a test, please notify the instructor in advance. If you are ill or if other extenuating circumstances cause you to miss a test, you must notify the instructor as soon as possible. Email is preferred.

**Writing Center** (<http://artsandsciences.sc.edu/write/university-writing-center>)

No matter what you choose to do after your college career, you can’t escape spoken or written communication (emojis won’t help you at work). The University Writing Center is an important resource you should use! It's open to help any UofSC student needing assistance with a writing project at any stage of development. The main Writing Center is in Byrnes 703.

Recommended Study Habits

* Read the assigned material before class.
* Bring thoughtful questions to class for discussion.
* Prepare for the exams in study groups.
* Take notes during class discussions and while completing reading assignments.

Deviations

Minor deviations from the syllabus are a normal part of any adaptive teaching and learning process.