

ECE 210: Circuit Analysis I

Spring 2023 Course Syllabus

Course Information

- Description:** DC and AC steady-state circuit analysis.
- Course Topics:** Current, Voltage, Energy, and Power
Kirchoff's Current and Voltage Laws, Ohm's Law
Resistance Combination, Voltage and Current Division, Wye-Delta Transformation
Nodal Analysis, Mesh Analysis, Superposition, Source Transformation
Thevenin/Norton Equivalent Circuits, Maximum Power Transfer
Operational Amplifiers (Op Amps)
Capacitors and Inductors, Sinusoids, Phasor Analysis
Instantaneous and Average Power, RMS Values, Complex Power
- Prerequisites:** A grade of C or better in MATH 150.
- Modality:** Classes are in-person and meet in the Engineering Building, room 2011 on Tuesday and Thursday from 9:30AM to 10:45AM.
- Textbook:** **Fundamentals of Electric Circuits (6th Edition)**, Alexander and Sadiku. CRC Press, ISBN 978-0078028229.

Instructor Information

- Name:** Jon D. Klingensmith, Ph.D. (jokling@siue.edu)
- Office:** EB 3055 **Phone:** 618-650-2800
- Office Hours:** Thursday 2:30PM - 4:30PM or by appointment
- Discord:** Class assignments and out-of-classroom interaction may take place on my Discord server. You are required to be a member of my server for the duration of your enrollment in this class and you must also check for new posts on the class channels at least once per day and also approximately 30 minutes before class starts.
- Communication:** We will be using Discord for class communication and you can either reach me via Discord Direct Message (DM) or by posting a message in the **#210-chat** channel. You may also email me if necessary.
- Blackboard:** I do not plan to post materials on Blackboard this semester.

Class Policies

- Attendance:** You are expected to be present and seated before the start of class and remain present until the class period is over. If you miss a lecture, you are required to let me know, preferably before the start of class, but absolutely by 6PM of the same day. Failure to notify me of your absence will double the penalty to your *Participation & Professionalism* points. In the event of an emergency, exceptions to this notification policy will be handled on a case-by-case basis. Also, as per SIUE's Academic Policies and Requirements, "... failure to actively participate [in a class] may result in a reduction or removal of financial aid."

Attendance will be taken using StarFish at the beginning of class. If you are late for class, I will mark you absent. I am using StarFish so that if you are persistently absent, somebody from the Office of Retention and Student Success may follow up with you and can help work through any issues you may be experiencing.

More than three unexcused absences throughout the term puts you at risk of being dropped from the class as per SIUE's [Course Enrollment Policies](#). However, this is not an acceptable method of dropping this class should you decide to do so.

You will not be penalized due to absences related to career advancement (e.g. advisement, job fair, interview, etc.), provided you notify me before the missed lecture.

Students who must miss class for official university business must follow SIUE's [Student Academic Standards and Performance](#) policy:

Students who are absent from class due to official University Business (e.g., athletic events, music, theater, dance productions, academic field trips, Student Senate) will be excused for up to 15 percent of the scheduled contact hours of their classes. Such an excuse is contingent, however, on the student and the sponsoring unit informing the instructor(s) and advisor in writing at least one week in advance of the anticipated absence.

Reading: Reading assignments may be made occasionally throughout the semester. It is essential that you read the assigned sections by the specified date. Some homework problems require you to know and apply concepts that are covered in the reading assignment but might not be discussed thoroughly in class due to large amount of material to be covered.

Assignments: Assignments and class-related information (e.g. homework, quiz dates, SI sessions, etc.) may be posted to the class' Discord channels. It is your responsibility to check to see if there are any new messages so that you do not miss anything that might impact your grade.

Homework: A list of homework problems will be assigned for each topic and subsequent quiz. Although you will not be turning them in, you should **work all of the problems** in the homework set because every question on the associated quiz will be a modified version of one of those homework problems. In addition, you are allowed to look at your homework while taking the quiz, subject to the conditions outlined in the *Quizzes* policy section.

Exams: The only exam in this class is an optional comprehensive final exam given during finals week.

Quizzes: Timed quizzes are given frequently, with each quiz covering a specific topic and homework set. The total number of quizzes given in a particular semester will vary, but nominally, we expect one per week for a total of 15. However, I reserve the right to add or remove scheduled quizzes. I also reserve the right to assign take-home quizzes that will be done as homework and turned in for a quiz grade. In addition, inclement weather could impact the quiz schedule.

While taking a quiz, you are not allowed to look at your class notes, textbook, or online resources; however, you can look at your homework solutions during the quiz, provided you adhere to the following conditions:

- The material only contains homework problems from the assigned homework set
- It is your own handwritten work and not a printout or copy of someone else's work
- It is either written in a spiral-bound notebook or stapled together *before* the start of class
- You *must* hold it out for me to look at before I will accept your quiz

In general, make-up quizzes are not given. If you are unable to take a quiz for an excusable reason (e.g. an urgent medical situation), then that quiz will not be included in your total quiz grade. However, this effectively makes your other quizzes weigh more heavily in your total quiz

grade. If you do not have an excusable reason, then the missed quiz will be recorded with a score of zero.

Mathematical Tools: Many of the calculations needed in this class require the solving of algebraic and trigonometric equations, sometimes with three or more variables. Later in the semester, these variables will be complex-valued. Although calculus is not used extensively, you may be required to use it on occasion. Since you have passed the prerequisite math classes, what is important to me is that you can formulate the equations that need to be solved rather than getting mired in the details of solving them. This means that **you must have a suitable math solver for the homework, quizzes, and final exam**. I will likely be using both *WolframAlpha* and *MATLAB* for all of my calculations during class, and I encourage you to use both of these too; however, you may also use any suitable calculator (e.g. TI-Nspire), but it is your responsibility to figure out how to use it.

Laptops, Tablets, & Phones: You are allowed to use a laptop, tablet, or phone during class, but only if they are used in a manner that is not disruptive to those around you.

I may use both *WolframAlpha* and *MATLAB* for my calculations in class. If you have a laptop, I encourage you to bring it to class and use it to replicate my calculations so you can become proficient with these tools.

You can also use your laptop while taking a quiz or exam, subject to the following conditions. Note that violating any of these will result in you receiving a zero on the quiz or exam:

- You only use it for calculations with either *WolframAlpha* and/or *MATLAB*
- You do not look at any online references, including Discord or our class' channels
- You do not use it to communicate with anyone
- You make an effort to keep your screen from being seen by people sitting next to you
- You do not try to hide your screen from me as I walk around the class
- You immediately show me all applications that you have running if I ask to see them and make no attempt to close or hide them while doing so

If you do not have a laptop or if you forget to bring it for a quiz, I might permit you to use a tablet or phone provided you get my approval for the specific apps or websites that you will be using.

ACCESS: Students needing accommodations because of medical diagnosis or major life impairment will need to register with Accessible Campus Community and Equitable Student Support (ACCESS) and complete an intake process before accommodations will be given. Students who believe they have a diagnosis but do not have documentation should contact ACCESS for assistance and/or appropriate referral. The ACCESS office is located in the Student Success Center, Room 1270. You can also reach the office by e-mail at myaccess@siue.edu or by calling 618-650-3726. For more information on policies, procedures, or necessary forms, please visit the ACCESS website at www.siue.edu/access.

Grading Policies

Summary: All grading will consider (but will not necessarily be limited to) use of correct theory or equation, proper application of theory or equation, mathematical correctness, reasonable degree of accuracy, adequate labeling of sketches, organization, neatness, necessary assumptions, and correct conclusions. Basically, the points you earn for your solution are a measure of *how correct the entire solution is in both the approach used and the results shown*. Grading is not a simple checklist of points to be gained or lost; details are covered in the Partial Credit section.

Quizzes: All quizzes are worth 10 points each. As stated earlier, we expect approximately 15 quizzes throughout the semester. Your two lowest quiz scores are excluded from your grade calculation *except for the last two quizzes of the semester*; the last two quizzes will count towards your total quiz score and *cannot be skipped*. This means that, if there are $N+2$ quizzes given during the

semester, your total quiz score is the sum of your best $N-2$ quiz scores on the first N quizzes, plus your scores on the last 2 quizzes of the semester. To help illustrate this, suppose that 15 quizzes are given this semester. Your total quiz score would be equal to the sum of your 11 best scores on quizzes 1 through 13 plus your scores on quizzes 14 and 15.

**Final Exam:
(Optional)**

Before finals week, I will compute your grade based on the *Non-Comprehensive Grading Scheme* and ask if you would like to keep it as your class grade and opt-out of taking the final exam. If you choose to do this, you must confirm this with me at least two hours before the final exam begins. If you choose to take the final exam or do not opt-out in time and must take it, your class grade will be based on the *Comprehensive Grading Scheme* (shown below right). Note: if you take the final exam, you **will not** have the option of retroactively opting-out even if your score on the final causes you to have a lower grade than the *Non-Comprehensive Grading Scheme*.

**Participation &
Professionalism:**

Being an active participant in the class and conducting yourself in a professional manner comprises 5% of your total class grade (i.e. half a letter grade). If you follow all instructions and requirements and do not have any unexcused absences, you will earn 2.5% of these points. To earn the remaining points, you must show active engagement in the class and being professionally responsible *throughout the semester*. The most effective ways are:

- occasionally asking or answering questions during lecture
- asking or answering questions in an SI session
- being present in an SI session
- asking or answering questions in the #210-chat channel

Points can also be lost for unprofessional behavior. The most common reasons are:

- unexcused absences (e.g. not medical, career, or university business)
- not notifying me of your absence as per the class attendance policy
- not following class policy or directions that are clearly written or are articulated in class
- asking a question without looking to see if the answer is readily available
- a single act of dishonesty will cause you to irredeemably lose all 5% for the semester

Grading Questions:

After work is returned, you have up to 48-hours to ask me questions about how it was graded or if you think there is a grading mistake. I really do want to hear about it; I just need it to be timely. But to be clear, there are no negotiations on “points,” but if there is a grading mistake, I really do want to know about it.

Partial Credit:

If your proposed solution to a particular problem clearly shows that you understand all the concepts involved in solving the problem, but you have made a minor, non-conceptual, error, such as misreading a dimension or failing to convert units correctly, then you will receive partial credit for your work subject to the rubric below. However, partial credit is not awarded for a proposed solution which does not demonstrate knowledge of all the concepts required to solve the problem.

Metaphorically speaking, partial credit is awarded if the cake you bake is edible but not delicious; it is not awarded merely for putting the batter in the pan, but forgetting to turn on the oven, or for setting the oven at the right temperature, but then baking your shoes.

— Mark Rossow, Ph.D

If, in answering any question, you state something that is incorrect, you will be penalized even if you have also put down the correct answer. To extend Dr. Rossow’s metaphor, if you bake a beautiful and delicious cake, and your shoes at the same time, it will cost you points.

Score Range	Description	Example
10	Everything is correct, including all thinking, solutions, and calculations	
8-9	All circuit analysis principles are applied correctly, but there are one or more minor math errors	Incorrect sign from mathematical operation
6-8	There are minor circuit analysis errors	Incorrect sign from KVL or KCL
4-7	There are major circuit analysis errors	Adding V to I, etc.
0-4	There is little or no demonstration of understanding	The problem was not attempted or is mostly blank with only minimal, incorrect information

Grading Scheme

Comprehensive Grading Scheme			Non-Comprehensive Grading Scheme		
Type	Points	Weight	Type	Points	Weight
Quizzes: $Sum(\text{top } N-2 \text{ scores on } Q_1 \text{ to } Q_N) + Q_{N+1} + Q_{N+2}$	10 each	70%	Quizzes: $Sum(\text{top } N-2 \text{ scores on } Q_1 \text{ to } Q_N) + Q_{N+1} + Q_{N+2}$	10 each	95%
Final Exam	TBD	25%	N/A	N/A	
Participation and Professionalism	10 total	5%	Participation and Professionalism	10 total	5%
Grading Breakpoints*:					
A	100% - 90%		*The final grading scale may be adjusted based on the performance of the entire class. However, the scale listed above is a guarantee, that is, if you achieve over 90% for the course, you are guaranteed an A for the course. According to the Catalog, the following grading symbols are used by SIUE: A-Excellent, B-Good, C-Satisfactory, D-Poor, and F-Failure (see Academic Policies and Requirements). The letter grades will strictly comply with these definitions.		
B	89% - 80%				
C	79% - 70%				
D	69% - 60%				
F	0% - 59%				

Joint Work, Outside Help, and Academic Misconduct

The ability to share common interests and ideas is a valuable tool for learning. I *encourage each of you* to discuss the homework problems with your fellow students and to seek whatever help you can find when you do not understand something. Obviously, **this does not apply to the quizzes or exams.**

I assume that all of my students are fundamentally honest and have a high level of integrity. However, if I have reason to suspect that you have had a non-trivial amount of assistance on any graded course work, I will challenge you to solve a similar problem and ask you to explain your solution method as you work it. If you cannot solve the challenge problem or if you refuse to show and explain your methodology, you will receive no points for that work in question. Furthermore, if I find evidence that you have committed [Academic Misconduct](#) (some examples include: looking at information during a quiz or exam that is not permitted; communicating with anyone during a quiz or exam; consulting an expert on *Chegg*

Study; you and another student consistently making the same uniquely-wrong mistakes), I will present my evidence to the Provost's Office and recommend sanctions.

University Policies

COVID-19 Pandemic Policies Related to Classroom Instruction (Spring 2023)

Health and Safety

The measures outlined below are required and any student who does not comply may be in violation of the *COVID-19 People-Focused Health and Safety Policy*, as well as the University's *Student Code of Conduct*.

The full text of the *COVID-19 People-Focused Health and Safety Policy* can be found here:

<https://www.siu.edu/policies/Covid.shtml>

Classrooms, Labs, Studios, and Other Academic Spaces

Under current University policy, SIUE will only require masking in campus healthcare settings. See, <https://www.siu.edu/about/announcements/coronavirus/safety-guidelines-support/index.shtml>.

Individual faculty of record may determine that masking will be required in their classrooms and are asked to communicate accordingly with students. Face masks may be required in other campus sites following guidance from governing regulatory agencies.

- Students who forget to wear a face covering when masking is required will be reminded of their obligation to comply with SIUE's *COVID-19 People-Focused Health and Safety Policy* and temporarily asked to leave the class until they are able to conform to the policy. Students who forget or lose their face coverings when masking is required may be able to obtain replacements from a friend, a faculty member, or a nearby departmental office. Face coverings are also available for purchase in the Cougar Store (MUC).
- Students who refuse to wear a face covering when masking is required will be asked to leave the classroom and referred to the Dean of Students for non-compliance with community health and safety protocols. Repeated non-compliance may result in disciplinary actions, including the student being administratively dropped from an on-ground/face-to-face course or courses without refund if no alternative course format is available.
- If a student has a documented health condition which makes wearing a face covering medically intolerable, that student should contact ACCESS to explore options with the understanding that ACCESS will not grant accommodations which excuse the need for a face covering while on campus or in the classroom. ACCESS will work with qualifying individuals to find reasonable alternatives, whenever such solutions are available. Please call or contact the ACCESS Office via email to schedule an online appointment to discuss potential alternatives. ACCESS office (Student Success Center, Room 1203, 618-650-3726, and myaccess@siue.edu).

General Health Measures

Students and employees are expected to review the [siue.edu/coronavirus](https://www.siu.edu/coronavirus) website

(<https://www.siu.edu/about/announcements/coronavirus/>) to better understand prevention strategies and safety expectations.

- Students and employees are expected to maintain healthy hygiene practices.
- Students and employees are expected to follow COVID-related guidelines and directions.
- Students and employees are expected to conduct a daily health self-assessment and isolate themselves if COVID-related symptoms are present. COVID-related symptoms include:

- o Fever (100.4 degrees or above) or chills
- o Cough
- o Shortness of breath or difficulty breathing
- o Fatigue
- o Muscle or body aches
- o Headache
- o New loss of taste or smell
- o Sore throat

- o Congestion or runny nose
- o Nausea or vomiting
- o Diarrhea

Recordings of Class Content

Faculty recordings of lectures and/or other course materials are meant to facilitate student learning and to help facilitate a student catching up who has missed class due to illness or quarantine. As such, students are reminded that the recording, as well as replicating or sharing of any course content and/or course materials without the express permission of the instructor of record, is not permitted, and may be considered a violation of the University's Student Conduct Code (3C1), linked here: <https://www.siue.edu/policies/3c1.shtml>.

Potential for Changes in Course Schedule or Modality

As the COVID-19 pandemic continues, there remains a possibility that planned classroom activities will need to be adjusted. Depending on circumstances and following state-issued recommendations, potential changes include alterations to distancing requirements, course modality (e.g., transition from face-to-face to online, hybrid, or hy-flex, mask wearing, in-course activities, etc). These changes would be implemented to ensure the successful completion of the course while preserving health and safety. In these cases, students may be provided with an addendum to the class syllabus that will supersede the original version. If the course schedule or modifications significantly alter expectations, a new syllabus will be issued.