

South Plains College
Common Course Syllabus: ENGR 2305
Revised December 2022

Department: Mathematics, Engineering, and Computer Science

Discipline: Engineering

Course Number: ENGR 2305

Course Title: Electrical Circuits I

Available Formats: conventional

Campuses: Downtown Center

Course Description: Principles of electrical circuits and systems. Basic circuit elements (resistance, inductance, mutual inductance, capacitance, independent and dependent controlled voltage, and current sources). Topology of electrical networks; Kirchhoff's laws; node and mesh analysis; DC circuit analysis; operational amplifiers; transient and sinusoidal steady-state analysis; AC circuit analysis; first- and second-order circuits; Bode plots; and use of computer simulation software to solve circuit problems.

Prerequisite/Corequisite: Successful completion of 'C' or better in PHYS 2426 and MATH 2414 and enrollment in MATH 2320

Credit: 3 **Lecture:** 3 **Lab:** 1

Textbook:

Supplies: Please see the instructor's course information sheet for specific supplies.

This course partially satisfies a Core Curriculum Requirement: None

Core Curriculum Objectives addressed:

- **Communications skills**—to include effective written, oral and visual communication
- **Critical thinking skills**—to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
- **Empirical and quantitative competency skills**—to manipulate and analyze numerical data or observable facts resulting in informed conclusions

Student Learning Outcomes: Upon completion of this course and receiving a passing grade, the student will be able to:

1. Explain basic electrical concepts, including electric charge, current, electrical potential, electrical power, and energy
2. Apply concepts of electric network topology: nodes, branches, and loops to solve circuit problems, including the use of computer simulation.
3. Analyze circuits with ideal, independent, and controlled voltage and current sources.
4. Apply Kirchhoff's voltage and current laws to the analysis of electric circuits.
5. Explain the relationship of voltage and current in resistors, capacitors, inductors, and mutual inductors.
6. Derive and solve the governing differential equations for a time-domain first-order and second-order circuit, including singularity function source models.
7. Determine the Thévenin or Norton equivalent of a given network that may include passive devices, dependent sources, and independent sources in combination.
8. Analyze first and second order AC and DC circuits for steady-state and transient response in the time domain and frequency domain.
9. Derive relations for and calculate the gain and input impedance of a given operational amplifier circuit for both DC and frequency domain AC circuits using an ideal operational amplifier model.
10. Apply computer mathematical and simulation programs to solve circuit problems.

Student Learning Outcomes Assessment: A pre- and post-test questions will be used to determine the extent of improvement that the students have gained during the semester

Course Evaluation: There will be departmental final exam questions given by all instructors.

Attendance/Student Engagement Policy: Attendance and engagement are the most critical activities for success in this course. The instructor maintains records of the student's attendance and submission of assignments throughout the semester. The student is expected to attend at least eighty percent (80%) of the **total** class meetings **and** submit at least eighty percent (80%) of the **total** class assignments to have the best chance of success. If the student fails to meet these minimum requirements, the instructor may remove the student from the class with an X, upon their discretion, to help the student from harming their GPA. If the student can not receive an X, the instructor will assign an F.

Plagiarism violations include, but are not limited to, the following:

1. Turning in a paper that has been purchased, borrowed, or downloaded from another student, an online term paper site, or a mail order term paper mill;
2. Cutting and pasting together information from books, articles, other papers, or online sites without providing proper documentation;
3. Using direct quotations (three or more words) from a source without showing them to be direct quotations and citing them; or
4. Missing in-text citations.

Cheating violations include, but are not limited to, the following:

1. Obtaining an examination by stealing or collusion;
2. Discovering the content of an examination before it is given;
3. Using an unauthorized source of information (notes, textbook, text messaging, internet, apps) during an examination, quiz, or homework assignment;
4. Entering an office or building to obtain an unfair advantage;
5. Taking an examination for another;
6. Altering grade records;
7. Copying another's work during an examination or on a homework assignment;
8. Rewriting another student's work in Peer Editing so that the writing is no longer the original student's;
9. Taking pictures of a test, test answers, or someone else's paper.

Student Code of Conduct Policy: Any successful learning experience requires mutual respect from the student and the instructor. Neither the instructor nor the student should be subject to others' rude, disruptive, intimidating, aggressive, or demeaning behavior. Student conduct that disrupts the learning process or is deemed disrespectful or threatening shall not be tolerated and may lead to disciplinary action and/or removal from class.

South Plains College policies concerning diversity, disabilities, non-discrimination, Title IX Pregnancy Accommodations, and Campus Concealed Carry Statements can be found here: <https://www.southplainscollege.edu/syllabusstatements/>.

South Plains College policies, return to campus plan, and protocols regarding COVID-19 can be found here: <https://www.southplainscollege.edu/emergency/covid19-faq.php>.

SPC Bookstore Price Match Guarantee Policy: If you find a lower price on a textbook, the South Plains College bookstore will match that price. The difference will be given to the student on a bookstore gift certificate! The gift certificate can be spent on anything in the store.

If students have already purchased textbooks and then find a better price later, the South Plains College bookstore will price match through the first week of the semester. The student must have a copy of the receipt and the book has to be in stock at the competition at the time of the price match.

The South Plains College bookstore will happily price match BN.com & books on Amazon noted as *ships from and sold by Amazon.com*. Online marketplaces such as *Other Sellers* on Amazon, Amazon's Warehouse Deals, *fulfilled by Amazon*, BN.com Marketplace, and peer-to-peer pricing are not eligible. They will price match the exact textbook, in the same edition and format, including all accompanying materials, like workbooks and CDs.

A textbook is only eligible for price match if it is in stock on a competitor's website at time of the price match request. Additional membership discounts and offers cannot be applied to the student's refund.

Price matching is only available on in-store purchases. Digital books, access codes sold via publisher sites, rentals and special orders are not eligible. Only one price match per title per customer is allowed.

Note: The instructor reserves the right to modify the course syllabus and policies, as well as notify students of any changes, at any point during the semester.



ENGR2305 – Electrical Circuits Section 601

Room: Lubbock Downtown Center, B032
T/R: 6:00 PM – 7:45 PM

Contact

Instructor: Mr. Vargas

Email: evargas@southplainscollege.edu

Phone: (806) 716-4673

Office Hours:

T/R: 11:00 AM – 2:00 PM (M101, Math Building)

F: 12:30 PM – 2:30 PM (B011 Downtown Center)

Supply List

- Pencils, erasers, paper.
- Non-graphing calculator.
- *Fundamentals of Engineering Circuits* by Charles Alexander
 - **ISBN: 978-0078028229**
 - McGraw Hill Connect Inclusive Access purchased from Bookstore OR online – **Required**

Grading

Grading Scale:

A: 90-100	Pass
B: 80-89	Pass
C: 70-79	Pass
D: 60-69	Pass
F: 0-59	Fail

Weights:

Homework	10%
Quiz	10%
Exams (4)	15% each
Final Exam	20%
Total	100%

Homework

Assigned through **Connect**. Homework enables students to receive feedback immediately as progress is made through each assignment.

- Physical homework is not required to turn in.
- Unlimited try attempts before the due date without penalty.
- Cannot be made up after the due date.

Quiz

Assigned through **Connect**. Quizzes cover topics from the Homework.

- 1-hour (60 min) time limit with only one attempt.
- Must be completed by the due date.
- Make-up quizzes are not given under any circumstances.

Exam

Assigned **in-class**. Exams cover material from Homework, Quizzes, and Lectures.

- Full class time
- Covers Conceptual and Application problems.
 - Conceptual: True/False and Fill in the Blank
 - Application: Show ALL work relating to simplifying, solving, and graphing.

Final Exam

Final Exam is scheduled on **Tuesday, May 9th @ 7:45 PM – 9:45 PM**

- **Failure to attempt the Final Exam will result in a failing grade for the course regardless of current letter grade.**
- Replaces **one (1) missed Exam OR lowest Exam score.**
- **Final Exam is comprehensive.**

Extra Credit

Offered for Homework and Exams:

- Up to 10% Extra credit for completing all Review Homework Assignments on Mastering Engineering.
- Up to 10% Extra credit on each Examination as a Bonus question(s).
- Up to 10% Extra credit on the Final Examination as a Bonus question(s).
- Plus more throughout the semester!

Class Policies and Information



Attendance Policy

The student is expected to **submit at least eighty percent (80%)** of the class assignments to have the best chance of success. If the student fails to meet these minimum requirements, the instructor can remove the student from the class.



McGraw Hill – Connect

Students are expected to purchase **McGraw Hill's Connect** inclusive access from the bookstore OR online. It is a **required** course material item. A 14-day free trial period is offered if the student needs extra time to purchase the software. Students must have full access to the software by the second week of class. Instructions can be found [here](#).



Office Hours

Office hours will be held at the listed times. Please come prepared with questions and examples of the attempted problem(s)



South Plains College Email Policy

The instructor will respond to all emails **within 36 hours** during the week day. Emails sent after 5:00 PM on Fridays may not be answered until the following Monday morning.



Drop/Withdrawal

Students should submit a [Student Initiated Drop Form](#) online to drop from the course. If the student wishes to withdraw from this or more courses, the student needs to contact the Advising Office.

COVID Syllabus Statement

If you are experiencing any of the following symptoms, please do not attend class and either seek medical attention or test for COVID-19.

- Cough, shortness of breath, difficulty breathing
- Vomiting or diarrhea
- Fever or chills
- New loss of taste and smell
- Muscles or body aches



Please also notify DeEtte Edens, BSN, RN, Associate Director of Health & Wellness, at dedens@southplainscollege.edu or 806-716-2376. Proof of a positive test is required. A home test is sufficient but students must submit a photo of the positive result. The date of test must be written on the test result and an ID included in the photo. If tested elsewhere (clinic, pharmacy, etc.), please submit a copy of the doctor's note or email notification. Results may be emailed to DeEtte Edens, BSN, RN at dedens@southplainscollege.edu.

A student is clear to return to class without further assessment from DeEtte Edens, BSN, RN if they have completed the 5-day isolation period, symptoms have improved, and they are without fever for 24 hours without the use of fever-reducing medication. Students must communicate with DeEtte Edens, BSN, RN prior to their return date if still symptomatic at the end of the 5-day isolation.

Course Calendar

Week 1	Jan 17 th Jan 19 th	1. Basic Concepts: 1.2-1.5,1.6,1.8
Week 2	Jan 24 th Jan 26 th	2. Basic Laws: 2.2-2.6
Week 3	Jan 31 st Feb 2 nd	3. Methods of Analysis: 3.2-3.5 Exam #1 – Review
Week 4	Feb 7 th	EXAM #1 Homework Ch. 1, 2, & 3; Quiz #1, #2, & #3 Due Feb 12 th @ 11:59PM
	Feb 9 th	4. Circuit Theorems: 4.3-4.,6, 4.8
Week 5	Feb 14 th Feb 16 th	5. Operational Amplifiers: 5.2-5.7
Week 6	Feb 21 st Feb 23 rd	6. Capacitors and Inductors: 6.2-6.5
Week 7	Feb 28 th	Exam #2 – Review
	Mar 2 nd	EXAM #2 Homework Ch. 4, 5, & 6; Quiz #4, #5, & #6 Due Mar 5 th @ 11:59PM
Week 8	Mar 7 th Mar 9 th	7. First-Order Circuits: 7.2-7.4
Mar 13 th –17 th		SPRING BREAK
Week 9	Mar 21 st Mar 23 rd	7. First-Order Circuits: 7.5, 7.6 8. Second-Order Circuits: 8.2-8.5
Week 10	Mar 28 th Mar 31 st	8. Second-Order Circuits: 8.6, 8.7 Exam #3 – Review
Week 11	Apr 4 th	EXAM #3 Homework Ch. 7 & 8; Quiz #7 & #7 Due Apr 9 th @ 11:59PM
	Apr 6 th	9. Sinusoids and Phasors: 9.2-9.4
Week 12	Apr 11 th Apr 13 th	9. Sinusoids and Phasors: 9.5, 9.7 10. Sinusoidal Steady-State Analysis: 10.2, 10.3
Week 13	Apr 18 th Apr 20 th	10. Sinusoidal Steady-State Analysis: 10.4-10.6
Week 14	Apr 25 th	Exam #4 – Review
	Apr 27 th	EXAM #4 Homework Ch. 18 & 19; Quiz #7 & #8 Due Apr 30 th @ 11:59PM
Week 15	May 2 nd May 4 th	14. Frequency Response Final Exam – Review
Week 16		FINAL EXAM: Tuesday, May 9 th @ 7:45 PM – 9:45 PM