South Plains College
Common Course Syllabus: ENGR 2305
Revised August 2020

Department: Mathematics, Engineering, and Computer Science

Discipline: Engineering

Course Number: ENGR 2305

Course Title: Electrical Circuits I

Available Formats: conventional/flex

Campuses: Reese 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:

Explain basic electrical concepts, including electric charge, current, electrical potential, electrical power, and energy
Apply concepts of electric network topology: nodes, branches, and loops to solve circuit problems, including the use of computer simulation.
Analyze circuits with ideal, independent, and controlled voltage and current sources.
Apply Kirchhoff's voltage and current laws to the analysis of electric circuits.
Explain the relationship of voltage and current in resistors, capacitors, inductors, and mutual inductors.
Derive and solve the governing differential equations for a time-domain first-order and second-order circuit, including singularity function source models.
Determine the Thévenin or Norton equivalent of a given network that may include passive devices, dependent sources, and independent sources in combination.
Analyze first and second order AC and DC circuits for steady-state and transient response in the time domain and frequency domain.

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.
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 effort are the most important activities for success in this course. The instructor maintains records of the student's engagement throughout the semester. The student will be allowed to miss twenty percent (20%) of class assignments for the semester, ***for any reason***. Should this number be exceeded, the instructor has the right to drop the student with a grade of F or an X, depending on the instructor's discretion.

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.

COVID Syllabus Statement: Should be provided by the Vice-President of Student Services over email.

Student Code of Conduct Policy: Any successful learning experience requires mutual respect on the part of the student and the instructor. Neither instructor nor student should be subject to others' behavior that is rude, disruptive, intimidating, aggressive, or demeaning**.** 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.

Diversity Statement: In this class, the teacher will establish and support an environment that values and nurtures individual and group differences and encourages engagement and interaction. Understanding and respecting multiple experiences and perspectives will serve to challenge and stimulate all of us to learn about others, about the larger world and about ourselves. By promoting diversity and intellectual exchange, we will not only mirror society as it is, but also model society as it should and can be.

Disability Statement: Students with disabilities, including but not limited to physical, psychiatric, or learning disabilities, who wish to request accommodations in this class should notify the Disability Services Office early in the semester so that the appropriate arrangements may be made. In accordance with federal law, a student requesting accommodations must provide acceptable documentation of his/her disability to the Disability Services Office. For more information, call or visit the Disability Services Office at Levelland (Student Health &

Wellness Office) 806-716-2577, Reese Center (Building 8) 806-716-4675, or Plainview Center (Main Office) 806-716-4302 or 806-296-9611.

Nondiscrimination Policy: South Plains College does not discriminate on the basis of race, color, national origin, sex, disability or age in its programs and activities. The following person has been designated to handle inquiries regarding the non-discrimination policies: Vice President for Student Affairs, South Plains College, 1401 College Avenue, Box 5, Levelland, TX 79336. Phone number 806-716-2360.

Title IX Pregnancy Accommodations Statement: If you are pregnant, or have given birth within six months, Under Title IX you have a right to reasonable accommodations to help continue your education. To activate accommodations you must submit a Title IX pregnancy accommodations request, along with specific medical documentation, to the Director of Health and Wellness. Once approved, notification will be sent to the student and instructors. It is the student's responsibility to work with the instructor to arrange accommodations. Contact the Director of Health and Wellness at 806-716-2362 or email cgilster@southplainscollege.edu for assistance.

Campus Concealed Carry: Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in South Plains College buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and South Plains College policy, license holders may not carry a concealed handgun in restricted locations. For a list of locations and Frequently Asked Questions, please refer to the Campus Carry page at: http://www.southplainscollege.edu/campuscarry.php
Pursuant to PC 46.035, the open carrying of handguns is prohibited on all South Plains College campuses. Report violations to the College Police Department at 806-716-2396 or 9-1-1.

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.

SOUTH PLAINS COLLEGE
MATHEMATICS, ENGINEERING & COMPUTER SCIENCE

Engineering 2305 – Circuits
Section 201: Monday 2:30 PM – 4:15 PM
Room: Building 2, Room 225, Reese Campus

Instructor Information

Contact Information	**Instructor:** Evan Vargas	
	Phone: (806) 716-4673	
	Email: evargas@southplainscollege.edu	
Office Hours	Agriculture Building, 107, Levelland Campus	
	Tuesday (AG107):	2:30 PM – 4:30 PM
	Wednesday (Virtual):	9:00 AM – 11:00 AM
	Thursday (Virtual):	9:00 AM – 11:00 AM
	Friday (Reese Bldg. 2, 225):	9:00 AM – 11:00 AM

Course Information

Textbook	*Electric Circuits* Nilsson, 11th ed. **ISBN 9780134814117**
Materials	Pencils, erasers, paper, and graphing calculator

Grading Scale:	90-100	**A**	**Weights:**	Homework	10%
	80-89	**B**		Quiz	10%
	70-79	**C**		Exams (4)	15% each
	60-69	**D**		Final Exam	20%
	0-59	**F**		**Total**	**100%**

Online Homework
Homework is assigned online through Mastering Engineering. Physical homework is not required to turn in. Each set of online homework assignments are due at the end of each exam period. Students may attempt the Homework as many times as needed before the due date.

Online Quiz
Quizzes will be also be assigned online through Mastering Engineering. Quizzes contain material pertaining to Homework Assignments and Lecture Videos. Each Quiz will be timed for 30 minutes with only one (1) attempt. No make-up quizzes will be given under any circumstances.

Examinations
Examinations will be available online through Blackboard and will only be available from 8:00 AM to 11:59 PM on the specified dates from the course itinerary. Each exam will cover material from Homework, Quizzes, and Lectures and will be a combination of open answer, fill in the box, and/or multiple choice. Late examination submissions will not be accepted under *any circumstances* and are *non-negotiable.*

Final Examination
A **comprehensive** Final Examination will be given at the end of the semester. Similar to regular Examinations, the Final Examination will be available online through Blackboard from 8:00 AM to 11:59 PM. Failure to attempt the final exam will result in a failing grade for the course. All grades are rounded from the tenths place, e.g. 80.5 = 81 and 80.49 = 80, upon the submission of grades at the end of the semester. If an Examination is missed due to *any reason,* the Final Examination will replace **one (1)**.

Classroom Policies

Lecture Videos and Class Meeting
Instructional videos will be uploaded by the instructor via Blackboard. It is the student's responsibility to view each lecture video before attempting Quiz Assignments or Examinations. Attending face to face class is not required but recommended if the classroom can accommodate the social distancing capacity. A weekly sign-up form will be emailed. New material will not be presented during face to face class meetings. These meetings are strictly used for further example demonstrations and to help struggling students.

Attendance Policy
Attendance will be recorded through My Math Lab in lieu of physical presence. The student will be allowed to miss twenty percent (20%) of class assignments for the semester, ***for any reason***. Should this number be exceeded, the instructor has the right to drop the student with a grade of F or an X.

Office Hours
Office hours will be held face to face and virtually. Proper face masks must be worn for face to face meetings. Virtual office hours will be held using Zoom. Please email if the listed office hours do not work for you.

South Plains College Email Policy
The instructor will only acknowledge, respond, and send emails to the student assigned South Plains College email. This ensures the intended recipient receives all correspondence from the instructor. It is the students' responsibility to have their email set up and ready to use by the end of the first week of class.

Drop/Withdrawal
Students should submit a Student Initiated Drop Form online to drop from the course. An instructor signature is not required. If the student wishes to withdraw from this or more courses, the student needs to contact the Advising Office.

Syllabus Statement for COVID-19
It is the policy of South Plains College for the Fall 2020 semester that as a condition of on-campus enrollment, all students are required to engage in safe behaviors to avoid the spread of COVID-19 in the SPC community. Such behaviors specifically include the requirement that all students properly wear CDC-compliant face coverings while in SPC buildings including in classrooms, labs, hallways, and restrooms. Failure to comply with this policy may result in dismissal from the current class session. If the student refuses to leave the classroom or lab after being dismissed, the student may be referred to the Dean of Students on the Levelland campus or the Dean/Director of external centers for Student Code of Conduct Violation.

Course Itinerary

Week 1 **Week 2** **Week 3**	• Chapter 1: Circuit Variables • Chapter 2: Circuit Elements • Chapter 3: Simple Resistive Circuits
Week 4	**Sept. 15: Examination 1; 8:00 AM – 11:59 PM**
Week 5 **Week 6**	• Chapter 4: Techniques of Circuit Analysis • Chapter 5: The Operational Amplifier • Chapter 6: Inductance, Capacitance, and Mutual Inductance
Week 7	**Oct. 6: Examination 2; 8:00 AM – 11:59 PM**
Week 8 **Week 9** **Week 10**	• Chapter 7: Response of First Order RL and RC Circuits • Chapter 8: Natural and Step Responses of RLC Circuits • Chapter 9: Sinusoidal Steady-State Analysis
Week 11	**Oct. 27: Examination 3; 8:00 AM – 11:59 PM**
Week 12 **Week 13**	• Chapter 10: Sinusoidal Steady-State Power Calculations • Chapter 12: Introduction to the Laplace Transform • Chapter 13: The Laplace Transform in Circuit Analysis
Week 14	**Nov. 24: Examination 4; 8:00 AM – 11:59 PM**
Week 15	• Chapter 17: The Fourier Transform
Week 16	**Dec. 7: Final Examination: 8:00 AM – 11:59 PM**