

Course Syllabus for Engr 2305

Department : Mathematics and Engineering

Instructor : S. G. Smith Office : RC 257

Discipline : Engineering

Phone: (806) 894 – 9611 x 4698

Course Number : Engr 2305

Course Title : Electrical Circuits

Credit : 3 (not a lab course, but includes some laboratory time)

Prerequisites : equivalent knowledge up to Math 2414 and Physics 2426 (or Phys 1402)

Available Formats : conventional (textbook only)

Textbook : Electric Circuits, James Nilsson and Susan Riedel, 10th edit., Prentice Hall 2015

Supplies: standard notebook paper, TI-84 calculator equivalent or better (TI-89 equiv. preferred)

Course Specific Instruction : None

Course Description : This course is designed for students planning to major in engineering. It involves the mathematical techniques required to analyze both AC and DC electrical circuits.

Course Goal : The goal of this course is to provide foundational principles in Electrical Engineering for any branch of engineering at the University level.

Course Requirements : Students should attend every class session, lab, and perform each task as designated by the instructor

Course Evaluation : Daily work is a combination of any lab work, class work, and quizzes. The daily work average will constitute 20% of the course grade. Four major tests will constitute 60% of the total grade, with a comprehensive final being 20% of the course grade.

Average: $.20 \times \text{daily work avg.} + .60 \times \text{test avg.} + .20 \text{ final}$

Makeup exams - Friday mornings, the *same* week as the exam (unless a holiday). No makeups for the final.

Attendance Policy : Attendance and effort are important activities for success in this course. If you are absent, I encourage you to call regarding your assignments as necessary. A student who misses two consecutive weeks of classes or has missed five classes cumulatively may be dropped from this course. Please refer to the sections of your catalog listed as "Class Attendance" and "Drop and Withdrawals". *See final section at the end of the syllabus.*

Student Learning Outcomes/Competencies :

Upon completion of this course, the student will be knowledgeable in the :

1. Use of Ohm's and Kirchoff's laws in DC circuit analysis.
2. Natural and step responses of RC and RL circuits.
3. Steady state response of RLC circuits.
4. Use of complex phase relationships in AC circuit analysis.
5. Power consideration for electrical circuits.

* refer to course outline attachment for detail

Equal Opportunity : South Plains College strives to accommodate the individual needs of all students in order to enhance their opportunities for success in the context of a comprehensive community college setting. It is the policy of South Plains College to offer all educational and employment opportunities without regard to race, color, national origin, religion, gender, disability or age.

ADA Accommodation: Students with disabilities, including but not limited to physical, psychiatric or learning disabilities, who wish to request accommodations in this class should notify the Special 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 Special Services Coordinator. For more information, call or visit the Special Services Office in Reese Center Building 8

Diversity and Learning Environment: 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.

Accordingly, students will be expected to conduct themselves in a respectful and orderly manner conducive with intellectual exchange in a positive learning environment. (This includes no food and drink, cell phones off, or no distracting behavior)

Class Attendance:

Students are expected to attend all classes in order to be successful in a course. The student may be administratively withdrawn from the course when absences become excessive as defined in the course syllabus.

When an unavoidable reason for class absence arises, such as illness, an official trip authorized by the college or an official activity, the instructor may permit the student to make up work missed. It is the student's responsibility to complete work missed within a reasonable period of time as determined by the instructor. Students are officially enrolled in all courses for which they pay tuition and fees at the time of registration. Should a student, for any reason, delay in reporting to a class after official enrollment, absences will be attributed to the student from the first class meeting.

Students who enroll in a course but have "Never Attended" by the official census date, as reported by the faculty member, will be administratively dropped by the Office of Admissions and Records. A student who does not meet the attendance requirements of a class as stated in the course syllabus and does not officially withdraw from that course by the official census date of the semester, may be administratively withdrawn from that course and receive a grade of "X" or "F" as determined by the instructor. Instructors are responsible for clearly stating their administrative drop policy in the course syllabus, and it is the student's responsibility to be aware of that policy.

It is the student's responsibility to verify administrative drops for excessive absences through MySPC using his or her student online account. If it is determined that a student is awarded financial aid for a class or classes in which the student never attended or participated, the financial aid award will be adjusted in accordance with the classes in which the student did attend/participate and the student will owe any balance resulting from the adjustment.

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, please refer to the SPC policy at:

(http://www.southplainscollege.edu/human_resources/policy_procedure/hhc.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.

Additional note: Accordingly, students will be expected to conduct themselves in a respectful and orderly manner conducive with intellectual exchange in a positive learning environment. (This includes no food and drink, cell phones off, or no distracting behavior). See page 22 of the South Plains College General Catalog.

Outline of Specific Course Topics Covered

- Introduction of general electrical parameters: voltage, current, power, work, etc.
- Introduction to Ohm's Law and Kirchoff's Laws for DC circuits
(Analysis of simple series-parallel, bridge or other network circuits)
- Techniques used in DC circuit analysis
 - * Node Voltage Method
 - * Mesh Current Method
 - * Source Transformations
 - * Thevinin and Norton Equivalents
 - * Maximum Power Transfer
 - * Superposition
- Introduction to inductance and capacitance characteristics
- Analysis of natural and step responses in RL and RC circuits (1st order ODE)
- Analysis of natural and step responses in RLC circuits (2nd order ODE)
- Steady-state analysis of AC circuits
 - * Phasors and complex number operations
 - * Circuit characteristics in time and frequency domains
 - * Circuit analysis with techniques as in DC circuit analysis
- Steady-state AC Power analysis