Midland College Syllabus

2018 - 2019
ENGR 2305
Electrical Circuits I
3 Semester Credit Hours
(3 Lecture/0 Lab)

Instructor Information
Instructor:  Dr. Brian Flowers       Office: AHSF 113
Phone:  (432) 685-4586            Email: bflowers@midland.edu
Office Hours: Open Door Policy or By Appointment

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 or Co-requisite: MATH 2320 Differential Equations Prerequisites: PHYS 2326/PHYS 2126, or PHYS 2426 University Physics I (lecture + lab); MATH 2414 Calculus II

Text, References and Supplies:
  o ISBN: 978-0134746968

Student Learning Outcomes:
Upon successful completion of this course, students will:
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 Contributions, Responsibilities and Class Policies:
Students will be expected to comply with the policies outlined in the Midland College Catalog. Instructor policies concerning attendance and academic behavior are consistent with the policies in the catalog. Regular attendance is required to do well in this class.

Students will be evaluated based on the results of assessments outlined in the syllabus and Instructor Handout.

Attendance Policy:
It is the responsibility of the students to know the policies and procedures associated with absences. These policies are set by instructors. Excused absences may include, but are not limited to, illness, severe weather, and death in the family. Instructors will determine whether or not an absence is excused. Please visit the Midland College Catalog

Your lecture instructor will inform you on the first day of class as to the tentative dates and content for each exam. Students are expected to complete each exam. Your instructor will inform you on the first day of class as to make-up procedures for missed exams and any exemption procedures if they apply (See Instructor Handout).

Scholastic Dishonesty:
Midland College does not tolerate scholastic dishonesty or academic misconduct in any form. Please read the Student Rights & Responsibilities section in the Midland College Catalog for more information.

Withdrawal Policy:
Students who have enrolled in a Texas public institution of higher education as a first-time freshman in fall 2007 or later are permitted to drop no more than six courses during the entire undergraduate career. This limit includes all transfer work taken at a Texas institution of higher education and to second baccalaureate degrees. This statute was enacted by the State of Texas in spring 2007 (Texas Education Code 51.907). Any course that a student drops after Census Day is counted toward the six-course limit if “(1) the student was able to drop the course without receiving a grade or incurring an academic penalty; (2) the student’s transcript indicates or will indicate that the student was enrolled in the course; and (3) the student is not dropping the course in order to withdraw from the institution.” Please visit the Midland College Catalog
Evaluation of Students:
Evaluation of Students: The grade distribution for assignments in this class and numerical grading scale are as follows.

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<tr>
<th>Assessments</th>
<th>Percentage of Grade</th>
<th>Grade Range</th>
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<tr>
<td>Homework and Quizzes</td>
<td>35%</td>
<td>90-100 A</td>
</tr>
<tr>
<td>Exams</td>
<td>40%</td>
<td>80-89 B</td>
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<tr>
<td>Comprehensive Final Exam</td>
<td>25%</td>
<td>70-79 C</td>
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<td></td>
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<td>60-69 D</td>
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<td></td>
<td>0-59 F</td>
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ADA Statement:
Midland College provides services for students with disabilities through Student Services. In order to receive accommodations, students must place documentation on file with the Counselor/Disability Specialist. Students with disabilities should notify Midland College prior to the beginning of each semester. More information can be found at the [Midland College Catalog](#), or by contacting the Midland College Disability Specialist at 685-4505.

Student Services will provide each student with a letter outlining any reasonable accommodations. The student must present the letter to the instructor at the beginning of the semester.

Math/Science Division Information:
Division Dean: Dr. Margaret Wade 125 AHSF (432) 685-4615
Department Chair: Dr. Brian Flowers 113 AHSF (432) 685-4586
Division Secretary: Ms. Sarah Anderson 124 AHSF (432) 685-6896
Division Clerk:

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