ELE125 AC/DC Circuits I Syllabus

Course Information

Credits
Campus
Address
City/State/Zip
Office Fax

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Washburn Institute of Technology
5724 SW Huntoon
Topeka, Kansas 66604
785-273-7080

Description

AC/DC Circuits I addresses the basics of direct and alternating current circuits. The students will perform calculations using Ohm’s law and the study the construction, operation, and purpose of various components of circuits. Students will also gain skills in the use of electrical measuring devices.

Textbooks


Student Learning Outcomes:

A. Communicate effectively
B. Integrate technology
C. Learn effectively
D. Demonstrate cooperative teamwork skills
E. Apply safety in the workplace
F. Think critically and creatively
G. Demonstrate responsible work ethics

Competencies

DC Circuits:
1. Define voltage and identify the ways in which it can be produced.
3. Explain DC theory concepts
4. Explain the difference between conductors and insulators.
5. Explain how voltage, current, and resistance are related to each other.
6. Using the formula for Ohm’s law, calculate an unknown value.
7. Describe the function of resistors and explain their color codes.
8. Explain the different types of meters used to measure voltage, current, and resistance.
9. Using the power formula, calculate the amount of power used by a circuit.
10. Define, demonstrate and apply the characteristics of series, parallel, and combination circuits.
11. Using Kirchhoff's laws, calculate the voltage drop and current in series, parallel and combination circuits.
12. Find the total amount of resistance in series, parallel and series-parallel circuits.

AC Circuits:
13. Explain AC theory concepts.
14. Calculate the peak and effective voltage or current values for an AC waveform.
15. Calculate the phase relationship between two AC waveforms.
16. Describe the voltage and current phase relationship in a resistive AC circuit.
17. Describe the voltage and current transients that occur in an inductive circuit.
18. Define inductive reactance and show how it is affected by frequency.
19. Describe the voltage and current transients that occur in a capacitive circuit.
20. Define capacitive reactance and state how it is affected by frequency.
21. Explain the relationship between voltage and current in the following types of AC circuits: RL circuit, RC circuit, LC circuit and RLC circuit.
22. Explain the following terms as they relate to AC circuits: True Power, Apparent Power, Reactive Power and Power Factor.
23. Explain basic transformer action.
24. Perform and interpret electrical measurements using industry standard equipment.

Guidelines for Success

Assessment Plan
Assessment is an integral part of the educational process at Washburn Tech and accurate feedback is an important tool in continuously improving the institution’s technical programs. Students can expect to participate in assessment activities prior to entry into programs, within specific courses and following program completion for specific fields of study.

Grading Rationale
Student progress is evaluated by means that include, but not limited to: exams (60%), written assignments/labs (30%), and attendance/class participation (10%).

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<tr>
<th>Percentage</th>
<th>Grade</th>
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<tbody>
<tr>
<td>92-100%</td>
<td>A</td>
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<td>84-91%</td>
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Attendance
Classroom attendance is required. Material missed must be made up with instructor.
Disability
The Special Support Services (SSS) Office is responsible for assisting in arranging accommodations and for identifying resources at Washburn Institute of Technology for persons with disabilities. Qualified students with disabilities MUST register and provide documentation with the office to be eligible for services. New requests for accommodations should be submitted two months or more prior to the date services should begin; however, contact the SSS Office as soon as a need may arise. Depending on the accommodation request, four to eight week lead time may be needed for timely and effective provision of services. SSS coordinates and assist in arranging services it deems appropriate of eligible students on a case-by-case basis.

If you are a student with a disability that may substantially limit your ability to participate in this class and believe you will need accommodations, it is your responsibility to contact:

Special Support Services Coordinator
Phone: 785-228-6356
E-Mail: ssscoordinator@washburn.edu