ARIZONA WESTERN COLLEGE
SYLLABUS

EGR 207 ELEMENTS OF ELECTRICAL ENGINEERING
Credit Hours: _3_ Lec _3_

PREREQUISITE: PHY 131
PRE or COREQUISITE: MAT 262

COURSE DESCRIPTION
Current and voltage dividers. Resistors, capacitors, inductors. Node voltage and mesh current analysis of circuits. Thevenin and Norton equivalents. AC circuits, phasors, impedance. Electromagnetic fields, electric power, transformers, magnetic materials, generators, and motors. Operational amplifiers, Elements of digital circuits. Sensors and measurements of physical quantities.

1. COURSE GOALS
   - 1.1 Develop student's ability to apply knowledge of mathematics, science, and engineering
   - 1.2 Develop student's ability to design and conduct experiments, as well as to analyze and interpret data
   - 1.3 Provide students with an understanding of important topics and concepts in electrical engineering
   - 1.4 Develop student's ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
   - 1.5 Develop logical and abstract thought processes

2. OUTCOMES
   By the end of this course, the student will be able to:
   - 2.1 solve a resistive network that is excited by an AC or a DC source.
   - 2.2 solve first-order circuits involving resistors and a capacitor or an inductor.
   - 2.3 derive the differential equations associated with a circuit containing one or two energy storage elements.
   - 2.4 derive the complex impedance associated with a resistive, inductive, and capacitive load.
   - 2.5 use the ideal op-amp properties to derive the transfer function of an op-amp circuit.
   - 2.6 select a current limiting resistor in an LED circuit.
   - 2.7 create a transistor-based circuit to supply the necessary current to power a DC motor.
   - 2.8 analyze a circuit containing one or more diodes.
   - 2.9 determine the output of a collection of logic gates for a given input pattern.
   - 2.10 analyze an AC circuit containing resistors, inductors, and capacitors.
   - 2.11 state the current/voltage relationships of resistors, inductors, and capacitors.
   - 2.12 analyze a circuit containing a transformer.
   - 2.13 design a low-pass filter with a particular bandwidth.
   - 2.14 convert between decimal numbers and binary numbers.

3. METHODS OF INSTRUCTION
   - 3.1 Lecture
   - 3.2 Discussions
   - 3.3 Multimedia materials

3.4 Printed materials
3.5 Demonstrations

4. LEARNING ACTIVITIES
   4.1 Class assignments
   4.2 Projects
   4.3 Quizzes
   4.4 Exams

5. EVALUATION
   4.1 Class assignments
   4.2 Projects
   4.3 Quizzes
   4.4 Exams

6. STUDENT RESPONSIBILITIES

6.1 Under AWC Policy, students are expected to attend every session of class in which they are enrolled.

6.2 If a student is unable to attend the course or must drop the course for any reason, it will be the responsibility of the student to withdraw from the course. Students who are not attending as of the 45th day of the course may be withdrawn by the instructor. If the student does not withdraw from the course and fails to complete the requirements of the course, the student will receive a failing grade.

6.3 Americans with Disabilities Act Accommodations: Arizona Western College provides academic accommodations to students with disabilities through AccessABILITY Resource Services (ARS). ARS provides reasonable and appropriate accommodations to students who have documented disabilities. It is the responsibility of the student to make the ARS Coordinator aware of the need for accommodations in the classroom prior to the beginning of the semester. Students should follow up with their instructors once the semester begins. To make an appointment call the ARS front desk at (928) 344-7674 or ARS Coordinator at (928) 344-7629, in the College Community Center (3C) building, next to Advising.

6.4 Academic Integrity: Any student participating in acts of academic dishonesty—including, but not limited to, copying the work of other students, using unauthorized “crib notes”, plagiarism, stealing tests, or forging an instructor’s signature—will be subject to the procedures and consequences outlined in AWC’s Student Code of Conduct.

6.5 Texts and Notebooks: Students are required to obtain the class materials for the course.

6.6 Arizona Western College students are expected to attend every class session in which they are enrolled. To comply with Federal Financial Aid regulations (34 CFR 668.21), Arizona Western College (AWC) has established an Attendance Verification process for "No Show" reporting during the first 10 days of each semester.
Students who have enrolled but have never attended class may be issued a “No Show”

(NS) grade by the professor or instructor and receive a final grade of "NS" on their official academic record. An NS grade may result in a student losing their federal financial aid.

For online classes, *student attendance in an online class is defined as the following* (FSA Handbook, 2012, 5-90):

- Submitting an academic assignment
- Taking an exam, an interactive tutorial or computer-assisted instruction
- Attending a study group that is assigned by the school
- Participating in an online discussion about academic matters
- Initiating contact with a faculty member to ask a question about the academic subject studied in the course