

Montgomery County Community College  
 EGT 211  
 AC/DC Circuits  
 4-3-3

**COURSE DESCRIPTION:**

This course covers advanced principles of passive DC and AC electrical circuits. The DC network is initially introduced to provide a solid understanding of the relationships of multiple current and voltage supply configurations in multi-loop circuits. The single-phase sinusoidal AC network is then introduced followed by multi-phase AC networks. Basic filtering networks and transformer theory are also covered. Substantial laboratory-based activities are included to reinforce and validate the circuit theory. A basic background in college-level general physics II is required as well as a working knowledge of complex- number mathematics, simultaneous equations, and basic trigonometry to enroll in this course. This course is subject to a course fee. Refer to <http://mc3.edu/adm-fin-aid/paying/tuition/course-fees> for current rates.

**REQUISITES:***Previous Course Requirements*

- EGT 190 Principles of Critical Thinking in Technology
- PHY 122 General Physics II, or equivalent
- MAT 162 Precalculus II

*Concurrent Course Requirements*

None

| LEARNING OUTCOMES<br>Upon successful completion of this course, the student will be able to:  | LEARNING ACTIVITIES   | EVALUATION METHODS  |
|---|---|---|
| 1. Explain the operation of passive DC/AC electrical network circuits.  | Lecture<br>Group Problem Solving<br>Activities<br>Design of Experiments | Exams<br>Design of Experiments<br>Review                  |
| 2. Use appropriate equipment necessary to measure and characterize the behavior of steady-state and dynamic network circuit parameters. | Lecture<br>Group Problem Solving<br>Activities<br>Design of Experiments | Exams<br>Design of Experiments<br>Review                  |
| 3. Successfully design and assemble steady-state and dynamic network circuits.  | Lecture<br>Group Problem Solving<br>Activities<br>Design of Experiments | Term Design/Fabrication<br>Project Presentation<br>Review |

At the conclusion of each semester/session, assessment of the learning outcomes will be completed by course faculty using the listed evaluation method(s). Aggregated results will be submitted to the Associate Vice President of Academic Affairs. The

benchmark for each learning outcome is that *70% of students will meet or exceed outcome criteria.*

#### SEQUENCE OF TOPICS:

1. Review of Algebra and Trigonometry as Applied to Advanced Circuit Evaluation Techniques
2. Symbols and Schematics
3. Series/Parallel Circuit Principles
4. Capacitors and Inductors (Advanced Topics)
5. Electric and Magnetic Field Theory
6. Sinusoidal Voltages and Currents in Complex AC/DC Circuits
7. Admittance and Susceptance
8. Resonant Circuit Evaluation Techniques
9. Non-Sinusoidal Current and Voltage
10. Three Phase Systems

#### LEARNING MATERIALS:

##### Textbook:

Robert Boylestad. *Introductory Circuit Analysis* (12<sup>th</sup> ed.) 2010. Prentice Hall.  
ISBN: 9780137146666

Other learning materials may be required and made available directly to the student and/or via the College's Blackboard course management system.

#### COURSE APPROVAL:

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| Prepared by: William H. Brownlowe<br>Associate Professor of Engineering                | Date: 4/7/2004   |
| Revised by: William H. Brownlowe<br>Associate Professor of Engineering                 | Date: 7/22/2013  |
| VPAA/Provost or designee Compliance Verification:<br>Victoria L. Bastecki-Perez, Ed.D. | Date: 1/15/2014  |
| Revised by: Debbie Dalrymple   | Date: 12/17/2017 |
| VPAA/Provost or designee Compliance Verification:                                      | Date: 1/9/2018   |



*This course is consistent with Montgomery County Community College's mission. It was developed, approved and will be delivered in full compliance with the policies and procedures established by the College.*