
MIDDLESEX

COUNTY COLLEGE

COURSE SYLLABUS

Department:	Engineering Technologies
Programs:	Electrical Engineering Technology Mechanical Engineering Technology
Course Number:	ELT 105
Title of Course:	Foundations of Electrical and Electronics Technology
Curriculum Coordinator:	James Finne
Designation:	Required Course

Course Description:

A study of electrical and electronic devices and circuits. Topics include: current and voltage, energy and power, AC/DC and elementary electronic circuits, electrical safety, wiring and electric motors. Computers are used for simulation and analysis of electric circuits. Theory is supplemented by laboratory experimentation.

Prerequisite:

MAT 013 Algebra I

Co-requisite:

MAT 014 Algebra II

Textbooks and /or other required material:

Electronics Technology Fundamentals by Paynter and Boydell, Pearson, 3rd Ed
Scientific Calculator

Course Learning Outcomes and their relationships to Student Outcomes:

1. Demonstrate knowledge of electric quantities, principles and devices.
2. Apply laws and rules of electricity to the solution of DC circuits. **(SO a)**
3. Apply electrical principles to the analysis and load calculations of AC devices and circuits.
4. Demonstrate as an individual and as a team member, problem solving, written and oral communications skills, as well as, the use of computers, calculators, and simulation software in the analysis of electric circuits.
5. Demonstrate knowledge of and skill in using laboratory equipment in experiments and projects. **(SO c)**
6. Demonstrate an understanding and commitment to address professional and ethical responsibilities through the use of the National Electric Code.

Topics Covered:

- Basic Electric Principles, Components and Circuit Measurements
- Electrical Components and Circuit Measurements cont. & Ohm's Law, Energy and Power
- Introduction to Alternating Current (AC)-AC Quantities-relationships between instantaneous, peak, peak-peak, RMS values and average power, period and frequency
- Series and parallel, and series-parallel circuits; Kirchhoff's current and voltage laws
- Introduction to diodes and diode circuits
- Voltage and Current Sources, Thevenin's and Norton's Theorems and Maximum Power Transfer
- Inductors and Transformers – Inductance and Reactance
- Capacitors – Capacitance and Capacitive Reactance
- DC and AC Motors
- Introduction to Ladder Logic Diagrams and Protective Devices
- Introduction to Transistors – BJT and FET

Laboratory Topics:

- Laboratory procedures and requirements
- Electrical Instrumentation
- Resistors and other resistance devices
- Ohm's Law and Power in a resistive circuit
- Series and parallel circuits-Kirchhoffs Laws
- Series-parallel circuits
- Sinusoidal wave properties measurements
- Capacitors and inductors
- Transformer circuits
- Motors
- Motor control devices

Class/Laboratory schedule. Number of sessions each week and duration of each session:

3 lecture hours per week for 14 weeks

3 laboratory hours per week for 14 weeks

Criterion 5 Contribution:

Technical Content

Prepared By:	Jack L. Waintraub, P.E.	Date:	3/27/2008
Rev 1:	T. Sabol	Date:	4-15-2010
Rev 2:	J. Waintraub	Date:	1-12-2011
Rev 3:	S. Foster	Date:	5-10-2011
Rev 4 & 5:	S. Foster	Date:	2-7-2012
Rev 6:	J. Waintraub Updated mapping of course outcomes to ABET 2014-2015 student outcomes. Updated course learning outcomes.	Date:	3/26/14
Rev 7:	General Update	Date:	3/15/21