

**Chemeketa Community College**  
4000 Lancaster Drive NE  
PO Box 14007  
Salem, Oregon 97309

**Course Outline**

**Course Identification** \_\_\_\_\_ ELT100 \_\_\_\_\_ **Credits** \_\_\_\_\_ 4 \_\_\_\_\_ **Date** \_\_\_\_\_ 11/05 \_\_\_\_\_

**Course Title:** Electronics Fundamentals for Non-Majors

**Total Instructional Hours, for Course, per Term:**

33 Lecture Hours = 3 Credit(s)  
22 Laboratory Hours = 1 Credit(s)

**Prerequisite Course(s):**

MTH070 Elementary Algebra, high school Algebra 2 or consent of instructor

**Required Text(s):**

Petruzella, Frank D., *Essentials of Electronics : A Survey*; 2<sup>nd</sup> Edition,  
MacMillian/McGraw Hill

**Course Description:**

Introduces the fundamental theories, circuits, and devices used in electronics. Covers direct and alternating current theory, test equipment, semiconductor devices, motors, and generators. Emphasizes practical concepts in both lectures and laboratories. Suitable for those desiring a general knowledge of electronics or exploring electronics as a career.

**Performance Based Learner Outcomes:**

Upon successful completion of the course, the student should be able to:

1. Solve simple circuits using Ohm's Law.
2. Operate a multimeter.
3. Operate an oscilloscope and function generator.
4. Be able to interpret resistor color codes.
5. Identify common electronic circuits and devices.
6. Complete course material and assign tasks in timely manner similar to the pace used in industry.
7. Describe how motors and generators work.
8. Use engineering notation.
9. Solve simple series, parallel, and complex circuits.
10. Construct simple circuits from schematics.
11. Describe how common semiconductors work.
12. Practice static control techniques.
13. Practice safety concepts.
14. Have an intuitive feel for the type of work done in the electronics industry.
15. Explain simple digital concepts.

**Course Content Outline:**

- I. DC Theory and Static Electricity
  - A. Component Operation and Identification
    1. Batteries
    2. Power supplies
    3. Resistors
    4. Capacitors
    5. Inductors
  - B. Ohm's and Power Laws
  - C. DC Circuit Theory and Calculations
    1. Simple series circuits
    2. Simple parallel circuits
    3. Simple complex circuits
    4. RC and LR time constants
  - D. Test Equipment Usage
    1. Voltmeter
    2. Ohmmeter
    3. Ammeter
- II. AC Theory
  - A. Sine Wave and Frequency
  - B. Ohm's and Power Laws
  - C. AC Circuit Theory and Simple Calculations
    1. Series
    2. Parallel
    3. Complex and resonance
  - D. Test Equipment Usage
    1. Function generators
    2. Oscilloscope
  - E. Earth Ground and Electrical Safety
- III. Semiconductor Theory
  - A. Diodes
    1. Symbols
    2. Types
    3. Construction
    4. Operation
    5. Basic circuits
  - B. Transistors and Triggered Devices (Thyristars)
    1. Symbols
    2. Types
    3. Construction
    4. Operation
    5. Basic Circuits

- C. Integrated Circuits, Digital and Analog
  - 1. History
  - 2. Symbols
  - 3. Types
  - 4. Construction
  - 5. Operation
  - 6. Basic Circuits
- D. Photoelectrics
  - 1. Symbols
  - 2. Types
  - 3. Construction
  - 4. Operation
  - 5. Basic Circuits
- E. Microprocessors and Logic Circuits
  - 1. Symbols
  - 2. Types
  - 3. Construction
  - 4. Operation
  - 5. Basic Circuits
- IV. Computers and Programmable Controllers
  - A. ALU, Processor, Memory, and Input/Output
  - B. RAM's, ROM's, PROM's, etc.
  - C. Interfacing Concepts
- V. Motors and Generators
  - A. Theory of Operation
  - B. Types and Construction
  - C. Safety
- VI. Communication Concepts
  - A. Through the Air
  - B. By Conductors