

**CUYAMACA COLLEGE**  
**COURSE OUTLINE OF RECORD**

**Electronics Technology 110 – Introduction to Basic Electronics**

3 hours lecture, 3 units  
3 hours laboratory, 1 unit  
Total units: 4

**Catalog Description**

Exploratory course of study in the laws of physics as they relate to electricity and electronics. Topics include: the history of electrical science, atomic structure, basic electrical laws, DC and AC circuits, semiconductors, integrated circuits, amplifiers, wave forms, electrical test equipment, circuit construction, and electrical safety. Background in basic algebra and use of scientific calculators is highly desirable.

**Prerequisite**

None

**Course Content**

- 1) History of electricity
- 2) Career opportunities in the field
- 3) Atomic structure
- 4) Polarity
- 5) Electrical units
- 6) Closed and open circuits
- 7) Direct and alternating current
- 8) Sources of electricity
- 9) Resistors, rheostats and potentiometers
- 10) Ohms law, power formulas
- 11) Series circuits
- 12) Parallel circuits
- 13) Series parallel circuits
- 14) Voltage and current dividers
- 15) Meters
- 16) Kirchhoff's law
- 17) Network theorems
- 18) Conductors and insulators
- 19) Batteries
- 20) Magnetism, magnetic units
- 21) Electromagnetic inductance
- 22) Alternating voltage and current
- 23) Capacitance and capacitive circuits
- 24) Inductance, inductive reactance and inductive circuits
- 25) RC and L/C time constants
- 26) Complex AC circuits
- 27) Resonance and filters
- 28) Electronic devices and circuits
- 29) Integrated circuits

**Course Objectives**

Students will be able to:

- 1) Critique the historical development in the field of electricity/electronics, evaluate career opportunities in the field of electronics and comprehend basic electrical safety principles and practices.
- 2) Distinguish the difference in physical and operating characteristics, and explain how the various electronics components are used in their applications.
- 3) Describe basic atomic structure and explain the role it plays on electrical and electronic systems.
- 4) Describe the difference and evaluate the characteristics between resistance, current and voltage in a circuit, and differentiate between direct and alternating current.
- 5) Calculate total and branch circuits' resistance in series, parallel and series parallel circuits.

**Method of Evaluation**

A grading system will be established by the instructor and implemented uniformly. Grades will be based on demonstrated proficiency in subject matter determined by multiple measurements for evaluation, one of which must be essay exams, skills demonstration or, where appropriate, the symbol system.

- 1) Quizzes, written exams, and hands-on performance exam that measure students' ability to safely: identify, determine the necessary action or repair, diagnose and measure electrical circuits, and perform tasks relating to electrical circuits.
- 2) Evaluation of student progress while working on tasks relating to diagnosis, replacement, testing, and adjustments of electrical circuits and components.

**Special Materials Required of Student**

- 1) Materials for electronics projects
- 2) Scientific calculator
- 3) Safety glasses

**Minimum Instructional Facilities**

- 1) Classroom with tables to perform electrical labs, visual aides
- 2) Software for constructing simulated electronic circuits
- 3) Variety of equipment for demonstration and student lab experiments

**Method of Instruction**

- 1) Lecture and demonstration
- 2) Group discussion
- 3) Laboratory
- 4) Field trip

**Out of Class Assignments**

- 1) Reading assignments
- 2) Written exercises

**Texts and References**

- 1) Required (representative example): Schultz, Mitchel E. *Grob's Basic Electronics*. 12th edition. McGraw-Hill, 2015.
- 2) Supplemental: None

**Exit Skills**

Students having successfully completed this course exit with the following skills, competencies and/or knowledge:

- 1) Identify or perform:
  - a. Various electronic components.
  - b. Tests of electrical circuits.

- c. Analysis of simple and complex circuits through mathematics equations and compare to actual test data.
- 2) Evaluate:
    - a. The effect that electronics has on our society.
    - b. Advantages and disadvantages of various circuit designs.
    - c. The role mathematics plays in the understanding of electronic principles.

**Student Learning Outcomes**

Upon successful completion of this course, students will be able to:

- 1) Critique the historical development in the field of electricity/electronics, evaluate career opportunities in the field of electronics and comprehend basic electrical safety principles and practices
- 2) Distinguish the difference in physical and operating characteristics, and explain how the various electronics components are used in their applications
- 3) Describe basic atomic structure and explain its role in electrical and electronic systems
- 4) Describe the difference and evaluate the characteristics between resistance, current and voltage in a circuit, and differentiate between direct and alternating current
- 5) Calculate total and branch circuits resistance in series, parallel and series parallel circuits