



El Camino College
COURSE OUTLINE OF RECORD – Official

Course Acronym:	ETEC
Course Number:	14A
Descriptive Title:	Electronics for Engineering Technologists I
Division:	Industry and Technology
Department:	Engineering Technology
Course Disciplines:	Electronics, Engineering Technology
Catalog Description:	<p>This is the first of two courses in which students are introduced to the application of electronics in engineering technology. The topics studied include safety, Ohm's Law, engineering notation, direct current circuits, capacitance, inductance, reactance, and impedance. Techniques in computer simulation and electrical measurements will be stressed.</p> <p>Note: The two-course sequence Engineering Technology 14A and Engineering Technology 14B is the same as Engineering Technology 14.</p>
Prerequisite:	
Co-requisite:	
Recommended Preparation:	
Enrollment Limitation:	
Hours Lecture (per week):	1
Hours Laboratory (per week):	2
Outside Study Hours:	2
Total Course Hours:	54
Course Units:	1.5
Grading Method:	Letter Grade only
Credit Status:	Credit, degree applicable
Transfer CSU:	Yes
Effective Date:	12/15/2008
Transfer UC:	No
Effective Date:	
General Education:	ECC

	Term:
	Other:
	CSU GE:
	Term:
	Other:
	IGETC:
	Term:
	Other:
Student Learning Outcomes:	<p>SLO #1 Logic Circuit</p> <p>Using discrete TTL or CMOS Logic Gates to design, construct, and demonstrate a logic circuit which displays the students Birth Date using three toggle switches, various logic gates, and a single seven segment common anode LED display.</p> <p>SLO #2 Karnaugh Map</p> <p>Given a 4 bit (16 items) binary truth table, generate a Karnaugh Map to find a simplified solution.</p> <p>SLO #3 Unsigned Binary Conversion</p> <p>Given an unsigned binary number, convert this number to base 10.</p> <p>SLO #4 Series Circuit Resistance & Current</p> <p>Given a series circuit with several resistors, calculate the total resistance; and given a voltage across this series circuit, calculate the current.</p>
Course Objectives:	<ol style="list-style-type: none"> 1. Distinguish the causes and dangers of electrical shock and methods of prevention. 2. Describe the sequences in building and analyzing a simple circuit. 3. Explain how Ohm's Law is used in analyzing an electrical circuit. 4. Compare and contrast the difference between Electromotive Force (EMF) and Counter Electromotive Force (CEMF). 5. Interpret electronic schematic symbols and determine use. 6. Analyze circuits using circuit simulation software.
Major Topics:	<p>I. Overview of Materials and Safety (1 hours, Lecture)</p> <ol style="list-style-type: none"> A. Material instructions B. Safety instructions <p>II. Safety Lab (2 hours, Lab)</p> <ol style="list-style-type: none"> A. Electrical shock B. Proper component handling

III. Schematic Symbols (4 hours, Lecture)

- A. Recognizing circuit symbols
- B. Circuit simulation software

IV. Schematic Symbols and Circuit Simulation Software Lab (8 hours, Lab)

- A. Schematics symbols exercise
- B. Circuit simulation exercise

V. Electrical Quantities (4 hours, Lecture)

- A. Resistors and color code
- B. Ohm's Law
- C. Engineering notations
- D. Power ratings

VI. Electrical Quantities Lab (8 hours, Lab)

- A. Resistor exercise
- B. Ohm's Law exercise

VII. Electrical Measurements for DC Circuits (4 hours, Lecture)

- A. Series circuits, parallel circuits
- B. Compound circuits

VIII. Electrical Measurements for DC Current Lab (8 hours, Lab)

- A. Series circuits exercise
- B. Parallel circuits exercise

IX. Alternating Current (AC) Waveforms (2 hours, Lecture)

- A. Using signal, pulse and function generators
- B. Amplitud

X. AC Waveforms Lab (4 hours, Lab)

- A. Signal and pulse generators exercise
- B. Function generator exercise

XI. Solid-State Devices (3 hours, Lecture)

- A. Diodes
- B. Transistors
- C. Amplifiers
- D. Integrated analog circuits

XII. Solid-State Devices Lab (6 hours, Lab)

- A. Diodes exercise

	B. Transistor exercise
Total Lecture Hours:	18
Total Laboratory Hours:	36
Total Hours:	54
Primary Method of Evaluation:	2) Problem solving demonstrations (computational or non-computational)
Typical Assignment Using Primary Method of Evaluation:	Given a group of fifty assorted resistors, test each resistor and determine if good or bad by matching measured values within limits of tolerance. On a one-page lab record the in tolerance and out of tolerance resistors. Submit lab report to the instructor.
Critical Thinking Assignment 1:	Given the analysis of a sample circuit, use a schematic diagram to "bread board" a circuit. Use both a digital multimeter and simulation program to verify parameters of the sample circuit. Record findings on a one-page lab report and submit to the instructor.
Critical Thinking Assignment 2:	Design a circuit to control a seven segment display with a decimal to Binary Coded Decima (BCD) decoder and a display driver. Simulate and verify the circuit operation. Consult instructor for evaluation.
Other Evaluation Methods:	Class Performance Completion Laboratory Reports Matching Items Multiple Choice Other Exams Performance Exams Quizzes Term or Other Papers True/False Written Homework
Instructional Methods:	Demonstration Lab Lecture Multimedia presentations
If other:	Computer simulations
Work Outside of Class:	Journal (done on a continuing basis throughout the semester) Problem solving activity Required reading, Study
If Other:	
Up-To-Date Representative Textbooks:	Bob Diaz. The Digital Connection. 2020 ed. El Camino College Bookstore. 2020.
Alternative Textbooks:	Project Lead the Way (PTLW) handouts Thomas Floyd, Digital Fundamentals, Eleventh Edition, Prentice Hall/Pearson, 2015 M. Morris Mano, Digital Design, Prentice Hall/Pearson, 5th edition, 2013

Required Supplementary Readings:	
Other Required Materials:	
Requisite:	
Category:	
Requisite course(s): List both prerequisites and corequisites in this box.	
Requisite and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s).	
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Enrollment Limitations and Category:	
Enrollment Limitations Impact:	
Course Created by:	Steve Cocca
Date:	09/23/2015
Original Board Approval Date:	12/15/2008

Last Reviewed and/or Revised by:	Robert Diaz
Date:	10/19/2021
Last Board Approval Date:	