

**PALOMAR COLLEGE**  
**COURSE OUTLINE OF RECORD FOR**  
**DEGREE CREDIT COURSE**

  X   Transfer Course     X   A.A. Degree applicable course  
(check all that apply)

**COURSE NUMBER AND TITLE:**

ENGR 126/ECHT 126 – Introduction to Electrical &amp; Computer Engineering

**UNIT VALUE:** 4**MINIMUM NUMBER OF SEMESTER HOURS:** 96**BASIC SKILLS REQUIREMENTS:** Appropriate language and computational skills**ENTRANCE REQUIREMENTS****PREREQUISITE:** MATH 140**COREQUISITE:** None**RECOMMENDED PREPARATION:** None**SCOPE OF COURSE:**

Introductory concepts covering a broad range of topics in Electrical and Computer Engineering presented in an integrated approach at a hands-on level. Students work in small teams to analyze, build, and test a small programmable robot for competition at the end of the semester. Provides basic understanding and skills for students to later build their theoretical understanding in more advanced physics and engineering courses.

**SPECIFIC COURSE OBJECTIVES:**

Successful students will be able to:

1. Effectively participate in engineering design processes.
2. Design and build working circuits commonly used in engineering test and measurement systems.
3. Apply electrical engineering principles to solve engineering test and measurement problems.
4. Apply an understanding of the workings of analog and digital circuits to later theoretical models.
5. Identify, analyze, and explain various engineering concepts.
6. Analyze and solve selected problems in engineering design.

**CONTENT IN TERMS OF SPECIFIC BODY OF KNOWLEDGE:****LECTURE:**

- I. Introduction to Electrical and Computer Engineering
  - A. Basic Circuit Elements
  - B. Circuit Construction
  - C. Prototyping
  - D. Circuit Analysis
  - E. Resistive Networks and Equivalent Models
  - F. Diodes and Piecewise Linear Models
  - G. Modeling Bipolar Transistors

- H. Transistor Circuits
- I. Amplifiers and Operational Amplifiers
- J. Binary Logic Circuits
- K. Combinational Logic I: Boolean Algebra
- L. Combinational Logic II: Karnaugh Maps
- M. Flip Flops
- N. Sequential Logic Circuits
- O. Finite State Machines
- P. Microcontrollers and Programmable Logic
- Q. CMOS Programming

**LABORATORY:**

Building a series of robot subsystems, each of which illustrates one or more of the above topics.

**REQUIRED READING:**

Carley, L. Richard and Pradeep Khosla. Experimental Context for Introduction to Electric & Computer Engineering. 2<sup>nd</sup> Ed. New York: McGraw Hill, 1998.

**SUGGESTED READING:**

Mims, Forest. Getting Started in Electronics. LLH Technical Publishing.

**REQUIRED WRITING:**

Written and/or quantitative answers for assigned work and/or examinations may be required.

**OUTSIDE ASSIGNMENTS:**

**Students are expected to spend a minimum of three hours per unit per week in class and on outside assignments, prorated for short-term classes.**

Preparation may include such activities as readings in assigned text, review of lecture material, solving assigned problems, and answering assigned questions.

**INSTRUCTIONAL METHODOLOGY:**

**Check all that apply:**

- lecture
- laboratory
- lecture-laboratory combination
- directed study

**DISTANCE LEARNING:**

**This course may be offered as a distance learning course and meets Title 5 regulations 55370, 55372, 55374, 55376, 55378, and 55380.**

Yes  No

**If yes, check all that apply:**

- Television Course (Video one-way, e.g. ITV, video cassette, etc.)
- Online Course (Text one-way, e.g. newspaper, correspondence, electronic file, etc.)
- Two-Way Video Conferencing (Two-way interactive video and audio)
- One-Way Video Conferencing (One-way interactive video and two-way interactive audio)

\_\_\_\_\_ Computer Assisted Instruction (A specialized form of mediated instruction relying primarily on student access to information and prepared lessons or teaching materials through a computer terminal, but not under immediate supervision of a qualified instructor.)

**GRADING POLICY AND STANDARDS** (include methods of determining whether the stated objectives have been met by students):

Homework assignments      0 - 20%  
Exams                              50 - 75%  
Final exam                        20 - 40%

**IS COURSE REPEATABLE FOR REASON(S) OTHER THAN DEFICIENT GRADE?**

Yes \_\_\_\_\_ No X Number of times course may be taken for credit: 1

If yes, identify specific provision of Title 5 Division 2 section(s), 55761-55763 and 58161 which qualifies course as repeatable:

**CONTACT PERSON:** Daniel Finkenthal

<b>SIGNATURES ON FILE:</b>
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