ENGR 76A: SEMICONDUCTOR TECHNOLOGY & SOCIETY

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2025
Units:	1
Hours:	1 lecture per week (12 total per quarter)
Degree & Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Non-GE
Transferable:	CSU
Grade Type:	Letter Grade (Request for Pass/No Pass)
Repeatability:	Not Repeatable

Student Learning Outcomes

- Students will be able to discuss the role of semiconductor devices in everyday life.
- Students will be able to explain the general process for creating a semiconductor device.

Description

This course provides an exciting first look at the process of fabricating semiconductor wafers, which are present in almost all of our electronic devices and gave Silicon Valley its name. The course looks at both the technical side and the social implications of the widespread development of semiconductors, from the local to global scale.

Course Objectives

The student will be able to:

1. Identify and explain the basic steps that a semiconductor device undergoes
2. Demonstrate knowledge of contamination in the cleanroom and its effects
3. Identify and explain the key elements used in semiconductor manufacturing and the humanitarian and political issues surrounding their use
4. Build a model of a transistor
5. Describe photolithography
6. Troubleshoot in a team setting

Course Content

1. The basic steps that a semiconductor device undergoes
    a. Process steps
    b. Global transportation
    c. Logistical challenges
2. Contamination
    a. Personal protective equipment (PPE)
    b. Positive pressure environments
    c. Static electricity and electrostatic grounding
3. Key elements used in semiconductor manufacturing
    a. Conflict minerals are used in cell phones and other electronic devices
    b. The basic internal components of cell phones and how semiconductors are used to make cell phones work
4. Semiconductor circuit elements
    a. Diodes
    b. Transistors
5. Photolithography
    a. Manufacturing steps
    b. Basic printed circuit board manufacturing steps
6. Troubleshooting
    a. Troubleshooting methods
    b. Teamwork skills
    c. Design process

Lab Content

Not applicable.

Special Facilities and/or Equipment

When taught via Foothill Global Access, on-going access to computer with email software and hardware; email address.

Method(s) of Evaluation

Methods of Evaluation may include but are not limited to the following:

Written responses
Group discussions
Presentations
Projects

Method(s) of Instruction

Methods of Instruction may include but are not limited to the following:

Hands on activities
Small and large group discussions
Interactive assignments
Mini-lectures

Representative Text(s) and Other Materials

No textbook; all course materials provided by instructor.

Types and/or Examples of Required Reading, Writing, and Outside of Class Assignments

Reading articles and watching videos outside of class will prepare students for the in-class activities and discussions.

Discipline(s)

Engineering