

Washtenaw Community College Comprehensive Report

ELE 206 Semiconductor Manufacturing Effective Term: Fall 2025

Course Cover

College: Advanced Technologies and Public Service Careers

Division: Advanced Technologies and Public Service Careers

Department: Advanced Manufacturing

Discipline: Electricity/Electronics

Course Number: 206

Org Number: 14430

Full Course Title: Semiconductor Manufacturing

Transcript Title: Semiconductor Manufacturing

Is Consultation with other department(s) required: No

Publish in the Following:

Reason for Submission:

Change Information:

Rationale: New course

Proposed Start Semester: Fall 2025

Course Description: In this course, students will study the fundamentals of manufacturing semiconductor devices, such as integrated circuits (ICs), microprocessors, and memory chips. Students will explore the manufacturing process from materials and chemistry to the methods and technologies used in production. Students will gain experience working in a clean room manufacturing environment, as well as hands-on training in the operation and maintenance of vacuum systems.

Course Credit Hours

Variable hours: No

Credits: 2

Lecture Hours: Instructor: 15 **Student:** 15

Lab: Instructor: 30 **Student:** 30

Clinical: Instructor: 0 **Student:** 0

Total Contact Hours: Instructor: 45 **Student:** 45

Repeatable for Credit: NO

Grading Methods: Letter Grades

Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

College-level Reading & Writing

College-Level Math

Requisites

Prerequisite

ELE 111 minimum grade "C"

General Education

Request Course Transfer

Proposed For:**Student Learning Outcomes**

1. Identify the major concepts of the semiconductor manufacturing industry.

Assessment 1

Assessment Tool: Outcome-related exam questions

Assessment Date: Fall 2027

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Answer key

Standard of success to be used for this assessment: 70% of students will score 70% or higher.

Who will score and analyze the data: Departmental faculty

2. Demonstrate proper procedures for working in a clean room manufacturing environment.

Assessment 1

Assessment Tool: Outcome-related demonstration

Assessment Date: Fall 2027

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Checklist

Standard of success to be used for this assessment: 70% of students will score 70% or higher.

Who will score and analyze the data: Departmental faculty

3. Explain the purpose and operation of vacuum systems in semiconductor manufacturing.

Assessment 1

Assessment Tool: Outcome-related exam questions

Assessment Date: Fall 2027

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Answer key and rubric

Standard of success to be used for this assessment: 70% of students will score 70% or higher.

Who will score and analyze the data: Departmental faculty

4. Describe the proper steps for performing vacuum system leak tests.

Assessment 1

Assessment Tool: Outcome-related demonstration

Assessment Date: Fall 2027

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Checklist

Standard of success to be used for this assessment: 70% of students will score 70% or higher.

Who will score and analyze the data: Departmental faculty

Course Objectives

1. Define what a semiconductor is and explain what semiconductors are used for.
2. Identify safety hazards associated with semiconductor manufacturing.
3. Identify materials used in the semiconductor manufacturing industry.
4. Describe semiconductor devices such as diodes, transistors, and integrated circuits.
5. Explain the methods involved in manufacturing semiconductor wafers.

6. Explain International Organization for Standardization (ISO) clean room standards and contamination control protocols.
7. Demonstrate proper gowning and removal procedures.
8. Demonstrate the use of various tools wearing clean room clothing (including gloves).
9. Explain the importance of vacuum systems in semiconductor manufacturing.
10. Describe the operating principles of vacuum systems components.
11. Identify parts of the vacuum system equipment where leaks are likely to occur.
12. Describe the methods used to perform leak checks.
13. Explain the safety procedures to follow when performing leak checks.
14. Demonstrate a vacuum leak check.
15. Demonstrate repairs of leak in a vacuum system.

New Resources for Course

Course Textbooks/Resources

Textbooks
Manuals
Periodicals
Software

Equipment/Facilities

<u>Reviewer</u>	<u>Action</u>	<u>Date</u>
Faculty Preparer: <i>Zachary Goldenberg</i>	<i>Faculty Preparer</i>	<i>Oct 28, 2024</i>
Department Chair/Area Director: <i>Allan Coleman</i>	<i>Recommend Approval</i>	<i>Oct 29, 2024</i>
Dean: <i>Eva Samulski</i>	<i>Recommend Approval</i>	<i>Oct 30, 2024</i>
Curriculum Committee Chair: <i>Randy Van Wagnen</i>	<i>Recommend Approval</i>	<i>Feb 11, 2025</i>
Assessment Committee Chair: <i>Jessica Hale</i>	<i>Recommend Approval</i>	<i>Feb 13, 2025</i>
Vice President for Instruction: <i>Brandon Tucker</i>	<i>Approve</i>	<i>Feb 14, 2025</i>