

## Changes saved but not submitted

# Viewing: MEMS 211 : MICRO-FABRICATION PROCESSING

Last edit: Thu, 29 Sep 2022 17:36:55 GMT

**Is this a fast track change?**

No

**Course ID**

110657

**Subject**

MEMS - Micro-Electromechanical Systems

**Course Number**

211

**Title**

MICRO-FABRICATION PROCESSING

**Division**

Engineering Technologies

**Effective Term**

Spring 2023

**Method of Delivery**

In Person

**Typically Offered**

Offered Fall Term Only

**CIP Code**

15.0616 - Semiconductor Manufacturing Technology/Technician.

**SOC Code**

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*The Ohio Manufacturing Workforce Partnership (OMWP) is a collaboration of The Ohio Manufacturers' Association (OMA) and Ohio TechNet (OTN). Established to address Ohio's manufacturing workforce shortage, the OMWP works directly with a statewide network of manufacturing industry sector partnerships and is focused on meeting local employment and skill needs.*

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**Standard Occupational Classification (SOC)****Standard Occupational Classification Title**

17-3023

Electrical and Electronics Engineering Technicians

51-9141

Semiconductor Processors

**Course Level**

Technical

**Is this an international course?****Grading Basis**

Graded

**Grading Procedures**

Graded Element	% of overall course grade
Laboratory	40%
Homework/Quizzes/Exams	40%
Final Exam	20%

**Upload Sample Syllabus**

## Course Hours

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**Minimum Credit Hours**

3

**Maximum Credit Hours**

3

**Is this course repeatable for credit?**

No

**Course Components**

Lecture

Laboratory

**Component Hours, ILUs, and Seats**

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**Lecture:****Contact Hours****ILUs****Seats**

**Laboratory:  
Contact Hours**

**ILUs**

**Seats**

**Total Course Contact Hours**

## Special Fees

**Special Fee**

Yes

**Type of Fee**

Supplies/Materials

**Amount**

75

## Catalog Information

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**Crosslisted**

**Course Description**

The course focuses strongly on the theory, terminology, application and hands-on industry practices in silicon wafer fabrication and Printed Wiring Board (PWB) fabrication with continued practice in working in a cleanroom. Topics include photolithography, chemical etching, and DC magnetron sputtering. Lab required

**Prerequisite**

MEMS 132 & ELCT 111

**Corequisite**

CHMY 171

**Concurrent**

**Course Placement Policy**

**Topical Outline: Please enter each of the Topical Outline items as a bullet.**

- *Silicon wafer processing – handling, cleaning, and safe chemical processing including HF acid*

- *Silicon material science and semiconductor fabrication processes*
- *Photolithography – Theory, terminology, application, and optimization for both silicon wafers and printed wiring board (PWB)*
- *Wet chemical etching of PCB and PWB Fabrication and the relation to silicon wafer processing*
- *Inspection and metrology of photolithographic processed materials including spectroscopy, profilometry, and general visual inspection*
- *Chemical and material processing including wet chemical etching and plasma etching*
- *Thin film deposition techniques including sputtering and electron beam evaporation*

## College Ready Requirement

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**English**

**Reading**

**Math**

## Course Outcomes and Assessment

**Outcome Number:**

1

**Outcome**

Explain terminology, processes, materials, and standards used in the fabrication of integrated circuits, microelectromechanical system sensors, or bare printed wiring boards.

**Domain**

Cognitive

**Assessment Tools**

Examination

**Assessment Method**

Rubric

**Benchmark %**

70% of students will earn 70% or higher on selected instrument

**Benchmark %**

**Other Benchmark**

## **Corresponding GE Outcomes**

C1 English

C3 Science

In1 Critical Thinking

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### **Outcome Number:**

2

### **Outcome**

Process a silicon wafer with photolithographic artwork.

### **Domain**

Psychomotor

### **Assessment Tools**

Laboratory exercise

### **Assessment Method**

Rubric

### **Benchmark %**

70% of students will earn 70% or higher on selected instrument

**Benchmark %**

**Other Benchmark**

**Corresponding GE Outcomes**

C1 English  
C2 Mathematics  
C3 Science  
In1 Critical Thinking

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**Outcome Number:**

3

**Outcome**

Fabricate a printed wiring board using photolithography and etching techniques that can be soldered as a functional PCB.

**Domain**

Psychomotor

**Assessment Tools**

Laboratory exercise

**Assessment Method**

Rubric

**Benchmark %**

70% of students will earn 70% or higher on selected instrument

**Benchmark %****Other Benchmark****Corresponding GE Outcomes**

C1 English  
C2 Mathematics  
C3 Science  
In1 Critical Thinking

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**General Education/Other**

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**Type of Course**

Technical

**Core Course Outcomes**

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## Core Course Outcomes

C3 Natural Science: Apply scientific concepts and methods of inquiry.

## Infused Course Outcomes

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### Infused Course Outcomes

In1 Critical Thinking: Employ critical thinking skills in addressing issues and problems.

In2 Communication: Demonstrate competence in verbal and nonverbal communication

In5 Health: Identify behaviors that promote health of the individual

## Experiential Learning

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Does this course have an experiential component?

No

Suggested Instructional Method(s) and Technique(s)

Lectures

In-lab demonstrations

Laboratory exercises performed individually

## State Articulation and Transfer

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Transfer Module:

Transfer Assurance Guide and Career Technical Credit Transfer

## Accreditation/Licensure/Certification

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Does this course prepare or substantially prepare a student for a license or certification?

Note: This section applies to an individual course that may have a certification and/or licensure. (e.g. CPR course)

No

## Additional Resources

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Additional Resources

## Textbooks/OER

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Type



Textbook and OER

**Required or Optional**

Required

**ISBN**

Hardcover: 978-0-387-09510-3 eBook ISBN: 978-0-387-09511-0

**Title**

978-0-387-09511-0

**Edition**

**Copyright Year**

2010

**Author**

Thomas M. Adams, Richard A. Layton

**Publisher**

Springer New York, NY

**URL**

<https://link.springer.com/book/10.1007/978-0-387-09511-0>

**Additional Notes**

On LCCC Campus, book can be downloaded as a .pdf for free

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## **Other Materials**

Required Materials

Optional Materials

## **Additional Notes**

Notes

## **Rationale**

Rationale and Dean's Statement of Support

## **Attach Additional Support Documentation**

### **Reviewer Comments**

Key: 1697

Select any proposals you would like to bundle together for approval. Only proposals you have saved are available to bundle.

Bundle Title:

Course:

Proposal A

Program:

Proposal B