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
Standard Occupational Classification (SOC)

<table>
<thead>
<tr>
<th>SOC</th>
<th>Standard Occupational Classification Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>17-3023</td>
<td>Electrical and Electronics Engineering Technicians</td>
</tr>
<tr>
<td>51-9141</td>
<td>Semiconductor Processors</td>
</tr>
</tbody>
</table>

Course Level
Technical

Is this an international course?

Grading Basis
Graded

Grading Procedures

<table>
<thead>
<tr>
<th>Graded Element</th>
<th>% of overall course grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory</td>
<td>40%</td>
</tr>
<tr>
<td>Homework/Quizzes/Exams</td>
<td>40%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>20%</td>
</tr>
</tbody>
</table>

Upload Sample Syllabus

Course Hours

Minimum Credit Hours
3

Maximum Credit Hours
3

Is this course repeatable for credit?
No

Course Components

Lecture
Laboratory

Component Hours, ILUs, and Seats

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

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**

**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

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

**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

General Education/Other

Type of Course

Technical

Core Course Outcomes
Core Course Outcomes

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

Infused Course Outcomes

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

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

Transfer Module:

Transfer Assurance Guide and Career Technical Credit Transfer

Accreditation/Licensure/Certification

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

Additional Resources

Textbooks/OER

Type
Textbook and OER

Required or Optional
Required

ISBN

Title
978-0-387-09511-0

Edition

Copyright Year
2010

Author
Thomas M. Adams, Richard A. Layton

Publisher
Springer New York, NY

URL

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

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