History

1. Jul 22, 2018 by Cecilia Balut (cbalut)
2. Jul 28, 2018 by Shawna Giovannazzo (sgiovann)
3. Sep 16, 2018 by Cecilia Balut (cbalut)

Changes saved but not submitted

Viewing: MEMS 132 : MEMS PACKAGING

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Is this a fast track change?
No

Course ID
110659

Subject
MEMS - Micro-Electromechanical Systems

Course Number
132

Title
MEMS PACKAGING

Division
Engineering Technologies

Effective Term
Spring 2023

Method of Delivery
In Person

Typically Offered

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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.

This workforce product was funded by a grant awarded by the U.S. Department of Labor's Employment and Training Administration. The product was created by the recipient and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership. This product is copyrighted by the institution that created it.

Offered Summer and Spring

CIP Code
15.9999 - Engineering/Engineering-Related Technologies/Technicians, Other.

SOC Code

Standard Occupational Classification (SOC)	Standard Occupational Classification Title
NO MATCH	NO MATCH

Course Level
Technical

Is this an international course?
No

Grading Basis
Graded

Grading Procedures

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

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

2
ILUs
2
Seats
12

Laboratory:
Contact Hours
2
ILUs
1.7
Seats
12

Total Course Contact Hours
4

Special Fees

Special Fee
Yes

Type of Fee
Credit Lab
Amount
75.00

Catalog Information

Crosslisted

Course Description
The course focuses on microelectronic integrated circuit (IC) and chip-on-board packaging. The student will be introduced to common packaging techniques and equipment used in the industry such as epoxy die attach, thermosonic wire bonding of 0.001" diameter wire, encapsulation, and microscope metrology.

Prerequisite
MEMS 122

Corequisite
None

Concurrent
None

Course Placement Policy

None

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

- Introduction to Microelectronic Packaging
- Application of MEMS vs. Microelectronic devices in the packaging industry
- Package types:
- Die Attach –
  - General methods, materials, and quality standards
  - Equipment operation: Manual and semi-auto epoxy die attach
- Thermosonic wire bonding
  - Theory, general methods, materials, and equipment terminology
  - Wire bond metallurgy and intermetallic formation
  - Ball vs. Wedge bonding:
  - Equipment operation: Semi-auto thermosonic Au ball bonding
- Equipment operation: Semi-auto thermosonic Al/Au wedge bonding
- Wire bond Pull and Shear Testing
  - methods and quality metric
  - Equipment operation: Semi-auto pull & shear tester
- Encapsulation
- Reliability testing via MilSTD 883

College Ready Requirement

English

Reading

Math

Course Outcomes and Assessment

Outcome Number:
1

Outcome
Explain terminology, processes, materials, and standards used in the manufacturing, testing, and application of microelectronic and MEMS packaging.

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
C2 Mathematics
C3 Science
In1 Critical Thinking

Outcome Number:

2

Outcome

Assemble a functional Chip-on-Board PCB with sensors using standard packaging and PCB manufacturing equipment, processes, and materials.

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

Operate a thermosonic ball bonder quickly and effectively including the full setup for wire bonding 0.001” diameter wire.

Domain

Psychomotor

Assessment Tools

Laboratory exercise
Skills Assessment

Assessment Method

Item Analysis
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

General Education/Other

Type of Course

Technical

Core Course Outcomes

Core Course Outcomes

Infused Course Outcomes

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

Experiential Learning

Does this course have an experiential component?
No

Suggested Instructional Method(s) and Technique(s)
Lectures: Explanation of concepts and applications
Demonstration: Presentation of analysis techniques
Lab Exercises: Conducting lab experiments

State Articulation and Transfer

Transfer Module:
None

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

Other Materials

Required Materials

Materials/documentation provided by the instructor from a variety of current sources.

Optional Materials

Additional Notes

Notes

Rationale

Rationale and Dean's Statement of Support

Attach Additional Support Documentation

Reviewer Comments

Key: 1696

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