

MANUFACTURING ENGINEERING TECHNOLOGY - MICROELECTRONIC MANUFACTURING, ASSOCIATE OF APPLIED SCIENCE

Curriculum Code #6520

Effective May 2026

Division of Engineering, Business and Information Technologies (<http://catalog.lorainccc.edu/academic-programs/engineering-business-information-technologies/>)

The Manufacturing Engineering Technology - Microelectronic Manufacturing (MEMS) major is structured to provide students with the knowledge and skills necessary to work as an entry-level technician. Training is provided in the fundamental concepts of micro-electromechanical systems, microelectronics, semiconductor wafers, electronic printed circuit board (PCB) hardware, and how these devices are manufactured, designed, and fabricated. The student will learn and apply principles in actual cleanroom activities. The program will utilize state-of-the-art laboratory facilities containing equipment for manufacturing, testing, troubleshooting, calibrating, analyzing and designing electronic hardware, microelectronics, and MEMS systems. Lorain County Community College has articulation agreements with colleges and universities including programs offered by Lorain County Community College's University Partnership.

First Year

Fall Semester		Hours
ELCT 111	ELECTRICAL CIRCUITS I ¹	3
ELCT 115	FABRICATION PROCESS FOR ELECTRONICS	2
MEMS 122	INTRODUCTION TO MICRO-ELECTROMECHANICAL SYSTEMS (MEMS)	4
MEMS 124	PRINTED CIRCUIT BOARD TEST & TROUBLESHOOTING ³	3
MTHM 155	TECHNICAL MATHEMATICS I ¹	4
SDEV 101	INTRODUCTION TO THE LCCC COMMUNITY ²	1
Hours		17

Spring Semester

CADD 111	INTRODUCTION TO COMPUTER AIDED DRAFTING ³	2
CADD 216	INTRODUCTION TO 3D MODELING AND PRINTING	1
DFAB 111	INTRODUCTION TO PERSONAL FABRICATION	1
ENGL 161	COLLEGE COMPOSITION I ¹	3
MEMS 132 or MEMS 133	MEMS PACKAGING ^{3,8} or INTRODUCTION TO CIRCUIT BOARD DESIGN	3
MEMS 134	THRU-HOLE MANUFACTURING ³	2

MEMS 136 or ELCT 121	INTRODUCTION TO SEMICONDUCTORS AND CLEANROOM PROCESSING ^{3,8} or DIGITAL ELECTRONICS	4
Hours		16

Second Year

Fall Semester

CHMY 171	GENERAL CHEMISTRY I ¹	5
ELCT 233	ELECTRONIC DEVICES I ³	4
MEMS 211	SEMICONDUCTOR PROCESSING ³	3
MEMS 287	WORK-BASED LEARNING I - MEMS ⁴	1
MTHM 168	STATISTICS ^{1,3}	3
Hours		16

Spring Semester

ENGL 164 or ENGL 162	COLLEGE COMPOSITION II WITH TECHNICAL TOPICS ³ or COLLEGE COMPOSITION II	3
MEMS 221	MICRO-SYSTEM CAPSTONE PROJECT ³	3
MEMS 288	WORK-BASED LEARNING II - MEMS ^{3,4}	1
Arts and Humanities Elective ⁵		3
Social Sciences Elective ⁶		3
Hours		13
Total Hours		62

¹ Indicates that this course requires placement for entrance.

² Required when registering for more than six credit hours or any accumulation of 12 or more credits. **Exceptions** to this requirement include: transfer students with GPA of 2.0 or higher, CCP students with 12 or more credit hours and a GPA of 2.0 or higher; transient students; students registering for audit only; students who have completed an associate degree or higher from an accredited institution recognized by LCCC.

³ Indicates that this course has a prerequisite and/or may be taken concurrently with other courses.

⁴ This course offers an opportunity for experiential learning - student must be first employed within their field of study before taking this class.

⁵ This program requires Arts and Humanities Ohio Transfer 36 (<http://catalog.lorainccc.edu/academic-information/transfer-module-requirements/>) electives.

⁶ This program requires Social Science Ohio Transfer 36 (<http://catalog.lorainccc.edu/academic-information/transfer-module-requirements/>) electives. If the student chooses to take HSTR 260G as part of their associates degree and plan on applying for the MEMS Bachelors Degree, they must take another Social Science elective as part of their bachelors degree.

⁷ ENGL 164 is preferred for accreditation purposes.

⁸ Take MEMS 132 or MEMS 136 if student is more interested in semiconductor manufacturing in a cleanroom or semiconductor research & development (R&D). Take MEMS 133 or ELCT 121 if student is more interested in circuit board design and designing on a computer.

Program Contact(s):

Johnny Vanderford

440-366-4206

jvanderford@lorainccc.edu

For information about admissions, enrollment, transfer, graduation and other general questions, please contact your advising team (<https://www.lorainccc.edu/admissions-and-enrollment/advising-and-counseling/>).

**More program information can be found on our website.
(<https://www.lorainccc.edu/engineering/mechatronics/associate-of-applied-science-in-mechatronics-technology-micro-electromechanical-systems-mems/>)**

Credit for Prior Learning (PLA) options may be available for your program. For more information, please visit our website: www.lorainccc.edu/PLA (<http://www.lorainccc.edu/PLA>)

Program Learning Outcomes

1. Apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve well-defined problems engineering problems appropriate to the discipline of microelectronic manufacturing (MEMS).
2. Design solutions for well-defined technical problems and assist with the engineering design of systems, components, or processes appropriate to the discipline of microelectronics (MEMS).
3. Apply written, oral, and graphical communication in well-defined technical and non-technical environments; and an ability to identify and use appropriate technical literature.
4. Conduct standard tests, measurements, and experiments and to analyze and interpret the results.
5. Function effectively as a member of a technical team.

Objectives

An accreditable program will prepare graduates with technical skills necessary for entry into industry of the manufacturing, inspecting, testing, rework, and troubleshooting of PCB and related microelectronic products. Graduates of the associate degree programs are expected to have strengths in the knowledge of equipment operations, assembly, testing, and troubleshooting of prototyping a PCB and associated microelectronic components with introductory skills in PCB design of schematic and layout.

Program Educational Objectives

1. Use technical skills, techniques, tools and equipment in the field of microelectronics and microsystems.
2. Recognize industry standard terminology materials and processes related to microelectronic manufacturing.
3. Assemble and perform verifications such as inspection, testing, and rework of functioning printed circuit boards
4. Successfully complete a paid internship demonstrating professional and technical responsibilities to working as a part of an engineering team in a quality manufacturing environment.