MANUFACTURING ENGINEERING TECHNOLOGY - MICROELECTRONIC MANUFACTURING, ONE-YEAR TECHNICAL CERTIFICATE

Curriculum Code #6510

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) one-year technical certificate 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 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. Every course in the one-year technical certificate can be applied to the two-year associate of applied science degree in the MEMS major of the mechatronics program. 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, 4] 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, 4] or DIGITAL ELECTRONICS	4
	Hours	**16**
	Total Hours	**33**

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. Take MEMS 132 or MEMS 136 if student is more interested in manufacturing for semiconductors or in a cleanroom with a more immediate career pathway. Take MEMS 133 or ELCT 121 if student is more interested in design and a 2nd year career pathway.

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/micro-electromechanical-systems-mems-one-year-certificate/)

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. An ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve well-defined
engineering problems appropriate to the discipline of microelectronics. (MEMS).
2. An ability to 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. An ability to 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. An ability to conduct standard tests, measurements, and experiments and
   to analyze and interpret the results.
5. An ability to 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 one year certificate are expected to use skills and techniques in the knowledge of equipment operations, assembly, testing, and troubleshooting of prototyping a PCB and associated microelectronic components.

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