ADVANCED MICROELECTRONICS MANUFACTURING TECHNICIAN - UNDERGRADUATE CERTIFICATE

College of Applied and Technical Studies
www.kent.edu/cats

About This Program

Dive into the forefront of technological innovation with our Advanced Microelectronics Manufacturing Technician certificate, where high-tech courses propel students into the world of semiconductor fabrication and beyond. From mastering clean room protocols to delving into the intricacies of digital and electronic systems, our program empowers graduates to lead the charge in chip production and circuit board development. As advanced semiconductor manufacturing technicians, they play a pivotal role in product evaluation and testing, utilizing cutting-edge diagnostic tools to fine-tune and repair equipment, shaping the landscape of tomorrow's technology. Read more...

Contact Information

- **Flavia Princess Nesamani Inbanathan, Ph.D.** | finbanat@kent.edu | 330-675-8962
- Speak with an Advisor
- Chat with an Admissions Counselor

Program Delivery

- **Delivery:**
  - Mostly online
  - In person
- **Location:**
  - Trumbull Campus

Examples of Possible Careers and Salaries*

Calibration technologists and technicians

- 4.7% about as fast as the average
- 15,800 number of jobs
- $65,040 potential earnings

Semiconductor processing technicians

- 10.9% much faster than the average
- 31,900 number of jobs
- $51,180 potential earnings

Additional Careers

- Field Service Technician - Semiconductor Equipment
- Industrial Maintenance Mechanic
- Packaging Technician
- Production Associate
- Production Packaging Associate
- Quality Technician
- Semiconductor Process Equipment Technician
- Semiconductor Manufacturing Technician
- Senior Equipment Maintenance Technician - Semiconductors

* Source of occupation titles and labor data comes from the U.S. Bureau of Labor Statistics' Occupational Outlook Handbook. Data comprises projected percent change in employment over the next 10 years; nation-wide employment numbers; and the yearly median wage at which half of the workers in the occupation earned more than that amount and half earned less.

Admission Requirements

The university affirmatively strives to provide educational opportunities and access to students with varied backgrounds, those with special talents and adult students who graduated from high school three or more years ago.

Kent State campuses at Ashtabula, East Liverpool, Geauga, Salem, Stark, Trumbull and Tuscarawas, and the Twinsburg Academic Center, have open enrollment admission for students who hold a high school diploma, GED or equivalent.

Some programs may require that students meet certain requirements before progressing through the program. For programs with progression requirements, the information is shown on the Coursework tab.

International Students: All international students must provide proof of English language proficiency (unless they meet specific exceptions to waive) by earning a minimum 71 TOEFL iBT score, minimum 6.0 IELTS score, minimum 47 PTE score or minimum 100 DET score, or by completing the ELS level 112 Intensive English Program. For more information on international admission visit the admissions website for international students.

For more information on admissions, contact the Regional Campuses admissions offices.

Program Requirements

Code	Title	Credit Hours
ATS 11001	INTRODUCTION TO VACUUM SYSTEMS	3
ATS 11002	OVERVIEW OF MANUFACTURING MAINTENANCE	3
EERT 11000	INTRODUCTION TO SEMICONDUCTOR AND CLEANROOM	4
EERT 12000	ELECTRIC CIRCUITS I	4
EERT 12001	ELECTRIC CIRCUITS II	3
EERT 12010	INTRODUCTION TO ELECTRONICS	4
EERT 22004	DIGITAL SYSTEMS	4
EERT 22014	MICROPROCESSORS AND ROBOTICS	3
MATH 10041	INTRODUCTORY STATISTICS (KMCR)	3-4
or MATH 10051	QUANTITATIVE REASONING (KMCR)	
or MATH 11010	ALGEBRA FOR CALCULUS (KMCR)	

MERT 12000	ENGINEERING DRAWING	3
Minimum Total Credit Hours:		**34**

Graduation Requirements

Minimum Certificate GPA	Minimum Overall GPA
2.000	2.000

Roadmap

This roadmap is a recommended semester-by-semester plan of study for this program. Students will work with their advisor to develop a sequence based on their academic goals and history. Courses designated as critical (!) must be completed in the semester listed to ensure a timely graduation.

Semester One		Credits
ATS 11001	INTRODUCTION TO VACUUM SYSTEMS	3
ATS 11002	OVERVIEW OF MANUFACTURING MAINTENANCE	3
EERT 11000	INTRODUCTION TO SEMICONDUCTOR AND CLEANROOM	4
EERT 12000	ELECTRIC CIRCUITS I	4
EERT 22014	MICROPROCESSORS AND ROBOTICS	3
	Credit Hours	**17**
Semester Two		
EERT 12001	ELECTRIC CIRCUITS II	3
EERT 12010	INTRODUCTION TO ELECTRONICS	4
EERT 22004	DIGITAL SYSTEMS	4
MATH 10041 or MATH 10051 or MATH 11010	INTRODUCTORY STATISTICS (KMCR) or QUANTITATIVE REASONING (KMCR) or ALGEBRA FOR CALCULUS (KMCR)	3-4
MERT 12000	ENGINEERING DRAWING	3
	Credit Hours	**17**
	Minimum Total Credit Hours:	**34**

Program Learning Outcomes

Graduates of this program will be able to:

1. Demonstrate the capability of working safely in a cleanroom and microelectronic manufacturing environment.
2. Articulate how a semiconductor wafer is manufactured and processed to become an integrated circuit.
3. Articulate chemistry and safety awareness in semiconductor manufacturing.
4. Read and follow standard operating procedures/checklists in paper or digital format.
5. Examine maintenance procedures.
6. Articulate basic principles and purpose of quality control and quality systems.
7. Examine the basic concepts of geometric dimensioning, tolerancing, visualization and graphics in engineering technology.
8. Explain the operational mechanisms and process use of vacuum pumps used in the semiconductor industry.
9. Demonstrate the ability to test and troubleshoot a vacuum pump system with a leak.
10. Construct, analyze and troubleshoot DC electric circuits.
11. Demonstrate working with microprocessors and controllers in manufacturing process environment.
12. Demonstrate problem-solving, critical thinking and communication skills.

Full Description

The Advanced Microelectronics Manufacturing Technician undergraduate certificate provides students with a core of high-tech, manufacturing-related courses with a focus on semiconductor fabrication, clean room, vacuum technology, manufacturing and maintenance, digital and electronic systems and the design and development of electrical and electronic circuits.

Advanced microelectronics manufacturing technicians help engineers to manufacture microelectronics/semiconductor chips in the fabrication plant, operate and maintain the vacuum pumps and systems in manufacturing facility, design and develop circuit boards for computers, electrical and electronic equipment. They often work in product evaluation and testing, using measuring and diagnostic devices to adjust, test and repair equipment.

The certificate articulates with the Kent State's Associate of Applied Science in Electrical/Electronic Engineering Technology and Bachelor of Science in Engineering Technology.