

# ADVANCED SEMICONDUCTOR 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 Semiconductor 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

- Program Coordinator: **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 and engineering technologists and technicians, except drafters, all other**

- 2.1% slower than the average
- 91,600 number of jobs
- \$64,190 potential earnings

### Semiconductor processing technicians

- 0.7% little or no change
- 30,800 number of jobs
- \$40,500 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.

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
IT 11000	INTRODUCTION TO OFFICE PRODUCTIVITY APPS	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
<b>Minimum Total Credit Hours:</b>		<b>34</b>

## 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 major. However, 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
IT 11000	INTRODUCTION TO OFFICE PRODUCTIVITY APPS	3
<b>Credit Hours</b>		<b>17</b>
Semester Two		Credits
EERT 12001	ELECTRIC CIRCUITS II	3
EERT 12010	INTRODUCTION TO ELECTRONICS	4
EERT 22004	DIGITAL SYSTEMS	4
MATH 10041	INTRODUCTORY STATISTICS (KMCR)	3-4
or	or QUANTITATIVE REASONING (KMCR)	
MATH 10051	or ALGEBRA FOR CALCULUS (KMCR)	
or		
MATH 11010		
MERT 12000	ENGINEERING DRAWING	3
<b>Credit Hours</b>		<b>17</b>
<b>Minimum Total Credit Hours:</b>		<b>34</b>

## 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 computers in daily manufacturing process environment.
12. Demonstrate problem-solving, critical thinking and communication skills.

## Full Description

The Advanced Semiconductor 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 semiconductor manufacturing technicians help engineers to manufacture 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.