

# Advanced Manufacturing Systems



## What is the Advanced Manufacturing Systems Program?

The Advanced Manufacturing Systems Program (ADM) is designed to prepare students to enter the advanced manufacturing process and distribution industry. The ADM industry requires multi-skilled professionals to operate, maintain, trouble-shoot, and engineer complex systems used in a variety of today's industries. The ADM degree and certificate program allows students to earn progressive levels of certificates that can be applied towards employment or an associate degree. The coursework within the program consists of critical thinking and soft skills, as well as applied lab work in electrical, electronic, and mechanical technologies, and their interactions in advanced manufacturing systems.

## Why choose the Advanced Manufacturing Systems Program?

The manufacturing industry has changed significantly over the past decade as a result of global competition. This has created a new demand for higher-level base skills than previously required. Jobs that once required basic knowledge have been replaced with automation, many of which are microprocessor and computer-based and often incorporate robotics and pick-and-place units. The need for skilled workers to design, maintain, and trouble-shoot this equipment continues to increase with the development of new technologies.

The type of students who excel in this program are those that enjoy a challenge, have good communication skills, enjoy problem solving, being creative, and working with their hands, as well as their minds.

## What do the advanced manufacturing students learn?

ADM students learn the necessary skills required to support advanced manufacturing systems in a variety of applications. These include:

- Mechanical fundamentals
- Precision alignment and measurements
- Fluid power (hydraulic and pneumatic)



- Computer Numeric Control (CNC)
- Electricity
- Drawings
- Circuits and schematics
- Basic electronics
- Programmable Logic Control (PLC)
- Motors and drives
- Safety
- Lean manufacturing and quality
- Advanced machine concepts
- Robotics
- Automation

## What makes HCC's program special?

HCC is not new to offering state-of-the-art manufacturing and industry training. Over the years, HCC has provided critical training to many companies in the region, offering foundation and special skills. Courses are taught by industry-experienced faculty who continue advancing, along with industry. HCC's experience and continued investments in facilities and state-of-the-art teaching tools offer students the competitive edge needed to succeed in many industries.

## PROGRAM OPTIONS

- A.A.S. Degree, Advanced Manufacturing Systems
- Certificate, Industrial Technology
- Certificate, Electronics Technician
- Letter of Recognition, HVAC and Plumbing
- Letter of Recognition, Welding and Fabrication

## CAREER OUTLOOK

MEDIAN SALARY

**\$58K**

for Electro-Mechanical Technicians

EMPLOYMENT



14,000 Jobs  
370 - 2,510 MD Jobs

(source: [www.bls.gov/ooh](http://www.bls.gov/ooh))

## What other industries does the program support?

The following industries support and offer opportunities in ADM:

- Pharmaceutical and chemical companies
- Warehouse and distribution systems
- CNC machine shops
- Automated building systems
- Smart electrical grid technology
- Cybersecurity
- Food and drink processors
- Packaging manufacturers
- Wire and thread industries
- Electronics assemblers
- Engine, transmission, and vehicle OEMs

A.A.S. Degree

Advanced Manufacturing Systems

The Advanced Manufacturing Systems Program provides a sequence of technical and manufacturing courses for students who are currently in, or plan to enter, today's advanced manufacturing environment where multi-skilled workers are in high demand.

General Education Requirements 18-19 credits

Arts/Humanities

Select from the approved General Education course list.....3

Behavioral/Social Sciences

Select from the approved General Education course list.....3

Biological/Physical Science

(Students intending to transfer should take the General Physics course)

- PHY 112 Applied Physics..... 3
OR
PHY 201 General Physics I.....(4)

Diversity

Select from the approved General Education course list.....3

English

ENG 112 Technical Writing ..... 3
\*minimum grade of "C" or better is required

Mathematics

- MAT 114 Introduction to Applied Algebra..... 3

Program Requirements 40 credits

- ADM 201 Lean Manufacturing and Quality Assurance ..... 2
ADM 258 Advanced Motors, Machines, and Devices ..... 3
CSC 102 Introduction to Information Technology..... 3
CSC 132 Introduction to C and C++ Programming ..... 3
EGT 150 Introduction to CNC Programming 3
ELE 102 Analog Electronics ..... 3
ELE 110 Fundamentals of Electricity..... 4
ELE 113 Instrumentation and Process Control I ..... 3
ELE 140 Introduction to Robotics..... 3
ELE 158 Circuits, Schematics, and Test Equipment ..... 3
ELE 203 PLC Applications ..... 3
INT 101 Introduction to Industrial Technology..... 3
INT 102 Introduction to PLCs ..... 3
INT 120 Introduction to OSHA..... 1

Restricted Electives

1-2 credits

Select Restricted Electives credits from the following:

- ADM 240 Capstone Project for ADM students..... 1-3
ADM 269 Internship..... 1-3
CAD 152 Computer-Aided Design..... 3
EGT 235 Fluid Power..... 3
EGT 250 Advanced CNC ..... 3
STU 106 Professionalism in the Workplace.... 1

Degree Requirement.....60

Certificate

Industrial Technology

The Certificate in Industrial Technology provides students with a fundamental knowledge of the manufacturing environment with a focus on multi-skilled operators and technicians.

Program Requirements 17 credits

- ADM 258 Advanced Motors, Machines, and Devices ..... 3
ELE 110 Fundamentals of Electricity..... 4
ELE 158 Circuits, Schematics, and Test Equipment ..... 3
INT 101 Introduction to Industrial Technology..... 3
INT 102 Introduction to PLCs ..... 3
INT 120 Introduction to OSHA..... 1

Certificate Requirement..... 17

Certificate

Electronics Technician

The Electronics Technician certificate program provides students with the skills required to analyze and repair basic electronics circuits in the manufacturing environment, including evaluating the root cause of component failure to avoid unnecessary equipment down time and repeated failures.

Program Requirements 19 credits

- ELE 101 Industrial Networking..... 3
ELE 102 Analog Electronics ..... 3
ELE 110 Fundamentals of Electricity..... 4
ELE 113 Instrumentation and Process Control I ..... 3
ELE 158 Circuits, Schematics, and Test Equipment ..... 3
INT 102 Introduction to PLCs ..... 3

Certificate Requirement..... 19

Letter of Recognition

HVAC and Plumbing

Students completing the HVAC and Plumbing Letter of Recognition program will have the skills to enter an entry-level or apprentice-level position in the field of HVAC and plumbing.

Program Requirements 10 credits

- ELE 110 Fundamentals of Electricity..... 4
INT 105 Plumbing and Pipefitting ..... 3
INT 107 Heating, Ventilation, Air Conditioning and Refrigeration (HVAC/R) ..... 3

Letter of Recognition Requirement... 10

Letter of Recognition

Welding and Fabrication

Students completing the Welding and Fabrication Letter of Recognition program will be well prepared to enter various industries that require welding skills as all or part of their business.

Program Requirements 9 credits

- INT 106 Welding..... 3
INT 116 Welding Layout and Fabrication ..... 3
INT 206 AWS Welding Certification Preparation..... 3

Letter of Recognition Requirement.....9

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