Advanced Manufacturing Systems

HAGERSTOWN COMMUNITY COLLEGE

What is the Advanced Manufacturing Systems Program?

The Advanced Manufacturing Systems Program (ADM) is designed to prepare students to enter the exciting field of robotics and automation. 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 program allows students to earn one or more certificates that can be applied towards employment and 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. This confluence of technologies is known as mechatronics.

Why choose the Advanced Manufacturing Systems Program?

Manufacturing is undergoing a change known as "The Fourth Industrial Revolution", or "Industry 4.0" (Wikepedia). The manufacturing industry now incorporates mechatronics 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

PROGRAM OPTIONS

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

CAREER OUTLOOK

MEDIAN SALARY

$59K

for Electro-Mechanical Technicians

EMPLOYMENT

13,400 jobs
460-1,970 MD Jobs

(source: www.bls.gov/ooh)

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.

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
- Cybersecurity
- Food and drink processors
- Packaging manufacturers
- Wire and thread industries
- Electronics assemblers
- Engine, transmission, and vehicle OEMs
- Aircraft and associated systems
- Consumer Products
- Additive manufacturing (3D Print)
- Smart Manufacturing Systems

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. Students wishing to continue their education beyond the A.A.S. degree in the areas of manufacturing engineering and management will benefit from the program as well.

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	130	Introduction to Scripting Fundamentals Using Python	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. Basic mechanical and electrical theory as well as functionality and maintenance are covered. This certificate is beneficial for production operators as well as 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 Elctronics 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 22 credits

ELE	101	Industrial Networking	3
ELE	102	Analog Electronics	3
ELE	106	Digital Electronics	3
		OR	
ELE	158	Circuits, Schematics, and Test Equipment	3
ELE	110	Fundamentals of Electricity	4
ELE	113	Instrumentation and Process Control I	3
ADM	258	Advanced Motors, Machines, and Devices	3
		OR	
ELE	204	Electrical Machines	3
INT	102	Introduction to PLCs	3

Certificate Requirement.....22

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. This program focuses extensively on hands-on practice and quality control.

Program Requirements 9 credits

INT	106	Welding	3
INT	116	Welding Layout and Fabrication	3
INT	206	AWS Welding Certification Preperation	3

Letter of Recognition Requirement.... 9

18060 03/22

Contact Information:

Edward Bass
Instructor, Advanced Manufacturing Systems
240-500-2465
eabass@hagerstowncc.edu

www.hagerstowncc.edu/adm