

ADVANCED MANUFACTURING TECHNOLOGY: MECHATRONICS

Award: Associate of Applied Science Degree

Major: Advanced Manufacturing Technology

Specialization: Mechatronics

Additional Program Information: <https://www.brcc.edu/academics/programs/advanced-manufacturing/>

Additional Potential Funding Information: <https://www.brcc.edu/g3/>

The Mechatronics specialization is a blend of mechanical systems, instrumentation, electronics, robotics, automation, computers, and control systems integrated to address needs of highly automated manufacturing processes. Mechatronics Technicians use systems approach analysis and troubleshooting skills to install, maintain, and repair advanced automated equipment found in manufacturing operations. Jobs as Technicians include: Engineering, Mechanical Manufacturing, Industrial Engineering, Instruments and Controls, Operations, Field Service, Production Line. BRCC's mechatronics courses are included in certain Virginia Registered Apprenticeship programs.

Required Courses Curriculum

First Semester		Credit Hours
ELE 123	Electrical Applications I	2
ETR 113	D.C. and A.C. Fundamentals I	3
MAC 156	Mechanisms I	3
MEC 161	Basic Fluid Mechanics - Hydraulics/Pneumatics	4
Select one of the following:		3
MTH 111	Basic Technical Mathematics	
MTH 161	Precalculus I	
SDV (https://catalog.brcc.edu/programs-study/sdv/)	Student Development	1
Credit Hours		16
Second Semester		Credit Hours
ELE 124	Electrical Applications II	2
ETR 237	Industrial Electronics I	3
MAC 157	Mechanisms II	3
Select one of the following:		2-3
CAD 140	Technical Drawing	
CAD 161	Blueprint Reading I	
Select one of the following:		3
ENG 111	College Composition I	
ENG 115	Technical Writing	
Credit Hours		13-14
Third Semester		Credit Hours
BUS 200	Principles of Management	3
ELE 156	Electrical Control Systems	3
IND 165	Principles of Industrial Technology I	4
INS 110	Principles of Instrumentation	3
Literature/Humanities/Fine Arts Elective (https://catalog.brcc.edu/programs-study/general-education-aas/#literature)		3
Credit Hours		16
Fourth Semester		Credit Hours
IND 181	World Class Manufacturing I	3
IND 251	Automated Manufacturing Systems I	3
Select one of the following:		3-4
ETR 114	D.C. and A.C. Fundamentals II	
ETR 177	Industrial Robotics and Robotics Programming	
ETR 286	Principles & Applications of Robotics	
ITN 106	Microcomputer Operating Systems	

ITN 208	Protocols and Communications TCP/IP	
General Education Elective (https://catalog.brcc.edu/programs-study/general-education-aas/)		3-4
Social/Behavioral Science Elective (https://catalog.brcc.edu/programs-study/general-education-aas/#social)		3
Credit Hours		15-17
Total Credit Hours		60-63

Certificates

Applied Mechatronics I

Award: Career Studies Certificate

Potential Additional Funding Information: <https://www.brcc.edu/g3/>

Purpose: To provide a broad overview of the major areas involved in the day-to-day operations of a manufacturing facility, including leadership, process improvement, financial management, and information systems. The completed career studies certificate will provide a foundation for those students seeking further study in the area of manufacturing management.

Code	Title	Credit Hours
ELE 123	Electrical Applications I	2
ETR 113	D.C. and A.C. Fundamentals I	3
MAC 156	Mechanisms I	3
MEC 161	Basic Fluid Mechanics - Hydraulics/Pneumatics	4
Select one of the following:		3
MTH 111	Basic Technical Mathematics	
MTH 161	Precalculus I	
SDV (https://catalog.brcc.edu/programs-study/sdv/)	Student Development	1
Total Credit Hours		16

Applied Mechatronics II

Award: Career Studies Certificate

Potential Additional Funding Information: <https://www.brcc.edu/g3/>

Purpose: To provide students who already possess an understanding of electrical and mechanical fundamentals further instruction in the areas of mechanics and electrical systems. This career studies certificate prepares students for entry level positions as mechanical or electrical technicians in manufacturing.

Code	Title	Credit Hours
Select one of the following:		2-3
CAD 161	Blueprint Reading I	
CAD 140	Technical Drawing	
ELE 124	Electrical Applications II	2
ETR 237	Industrial Electronics I	3
ETR 177	Industrial Robotics and Robotics Programming	3
IND 181	World Class Manufacturing I	3
MAC 157	Mechanisms II	3
Total Credit Hours		16-17

Mechatronics I

Award: Career Studies Certificate

Additional Program Information: <https://www.brcc.edu/academics/programs/advanced-manufacturing/>

Purpose: To provide the student with a basic understanding of electrical and mechanical operations. Included is foundational math instruction. This career studies certificate prepares students for entry level positions in industrial maintenance.

Code	Title	Credit Hours
ELE 123	Electrical Applications I	2
ETR 113	D.C. and A.C. Fundamentals I	3
MAC 156	Mechanisms I	3
MEC 161	Basic Fluid Mechanics - Hydraulics/Pneumatics	4
Select one of the following:		3
MTH 111	Basic Technical Mathematics	
MTH 161	Precalculus I	
Total Credit Hours		15

Mechatronics II

Award: Career Studies Certificate

Additional Program Information: <https://www.brcc.edu/academics/programs/advanced-manufacturing/>

Purpose: To provide students who already possess an understanding of electrical and mechanical fundamentals further instruction in the areas of mechanics and electrical systems. This career studies certificate prepares students for entry level positions as mechanical or electrical technicians in manufacturing.

Code	Title	Credit Hours
Select one of the following:		2-3
CAD 161	Blueprint Reading I	
CAD 140	Technical Drawing	
ELE 124	Electrical Applications II	2
ETR 114	D.C. and A.C. Fundamentals II	3
ETR 237	Industrial Electronics I	3
MAC 157	Mechanisms II	3
Total Credit Hours		13-14

Mechatronics III

Award: Career Studies Certificate

Additional Program Information: <https://www.brcc.edu/academics/programs/advanced-manufacturing/>

Purpose: To provide students who already possess an understanding of electrical fundamentals, further instruction in the areas of electronics, programmable logic control, and robotics programming. This career studies certificate prepares students for technical level positions as controls or instrument technicians.

Code	Title	Credit Hours
BUS 200	Principles of Management	3
ELE 156	Electrical Control Systems	3
IND 165	Principles of Industrial Technology I	4
INS 110	Principles of Instrumentation	3
Total Credit Hours		13

Mechatronics IV

Award: Career Studies Certificate

Additional Program Information: <https://www.brcc.edu/academics/programs/advanced-manufacturing/>

Purpose: To provide students, who already possess an advanced understanding of electrical and mechanical systems, further instruction in the areas of process and business operations of a manufacturing facility. This career studies certificate prepares students for project lead and/or entry level engineering positions in a manufacturing operation.

Code	Title	Credit Hours
IND 251	Automated Manufacturing Systems I	3
Select one of the following:		3
EGR 206	Engineering Economics	
IND 181	World Class Manufacturing I	
ETR 177	Industrial Robotics and Robotics Programming	3
Select one of the following:		3-4
ETR 114	D.C. and A.C. Fundamentals II	
ETR 286	Principles & Applications of Robotics	
ITN 106	Microcomputer Operating Systems	
ITN 208	Protocols and Communications TCP/IP	
Total Credit Hours		12-13

Mechatronics Certificates I, II, III and IV are to be taken in progression.