

## Mechatronics

### Credentials

Mechatronics Skills Certificate	18 cr.
Mechatronics Certificate	39 cr.
Mechatronics AAS Degree	63-67 cr.

### Major Description

The Mechatronics program focuses on the integration of mechanical, electrical (electronics), fluid power (hydraulics or pneumatics) and computer technologies to control machine movements. The students' studies begin with courses in mechanics, sensors, basic electronics, pneumatics, control logic and robot programming and control.

The program is not directly aimed at specific products. With the multiplicity of equipment presently in use, and the rapid advance and change in technology, the department stresses the development of a broad background that will enable students to find employment and be able to further their skills in a diversified number of industries.

Protective shop clothing and eye protection supplies required for the program will be purchased by the student.

All courses are not offered each semester. Students should work with an academic advisor to develop a schedule that will work for them. Students who satisfactorily complete all college and program requirements qualify for an associate in applied science degree.

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## **Mechatronics Skills Certificate**

Schoolcraft program code # CRT.00326

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The mechatronics skills certificate introduces learners to the basic skills needed for employment in today's complex manufacturing environments. These classes all apply to the mechatronics certificate and associate degree.

Protective shop clothing and eye protection supplies required for the program will be purchased by the student.

Students who satisfactorily complete the program requirements qualify for a certificate of program completion. All program required courses must have been completed with a grade of 2.0 or better.

Not all courses are offered each semester. Students should work with an academic advisor to develop a schedule that will work for them. Students planning to transfer should check the transfer institution's requirements/guides or discuss their options with an academic advisor. Number of credits may vary depending on the course selection.

### **SAMPLE SCHEDULE OF COURSES**

#### **First Year - Fall Semester**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
ELECT 131	<b>Basic Measurement and Reporting Skills</b>	3
MATH 113	<b>Intermediate Algebra for College Students</b>	4
MFG 102	<b>Basic Machining Processes</b>	3
	<b>Total Credits: 10</b>	

#### **First Year - Winter Semester**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
ELECT 137	<b>DC Circuits and Mathematical Modeling</b>	5
CAD 120	<b>Mechanical Blueprint Reading with Sketching</b>	3
	<b>Total Credits: 8</b>	

**PROGRAM TOTAL 18 CREDITS**

## **Mechatronics Certificate**

Schoolcraft program code # 1YC.00225

The mechatronics certificate is designed to address basic competency in skills needed for employment in today's complex manufacturing environments. These classes all apply to the mechatronics associate degree. The program is not directly aimed at specific products. With the multiplicity of equipment presently in use, and the rapid advance and change in technology, the department stresses the development of a broad background that will enable students to find employment and be able to further their skills in a diversified number of industries.

Protective shop clothing and eye protection supplies required for the program will be purchased by the student. Students who satisfactorily complete the program requirements qualify for a certificate of program completion.

Not all courses are offered each semester. Students should work with an academic advisor to develop a schedule that will work for them. Students planning to transfer should check the transfer institution's requirements/guides or discuss their options with an academic advisor. Number of credits may vary depending on the course selection.

### **SAMPLE SCHEDULE OF COURSES**

#### **First Year - Fall Semester**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
ELECT 131	<b>Basic Measurement and Reporting Skills</b>	3
ELECT 145	<b>Fluid Power</b>	4
MATH 113	<b>Intermediate Algebra for College Students</b>	4
MFG 102	<b>Basic Machining Processes</b>	3
	<b>Total Credits: 14</b>	

#### **First Year - Winter Semester**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
ELECT 137	<b>DC Circuits and Mathematical Modeling</b>	5
ELECT 251	<b>Programmable Logic and Industrial Controls</b>	4
CAD 120	<b>Mechanical Blueprint Reading with Sketching</b>	3
OSH	<b>Select one:</b>	2
OSH 111	<b>Occupational Safety and Health for General Industry</b>	
OSH 112	<b>Occupational Safety and Health for Construction</b>	
	<b>Total Credits: 14</b>	

**Mechatronics Certificate (continued)**

**First Year - Spring Session**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
ELECT 138	<b>AC Circuits and Mathematical Modeling</b>	5
ELECT 139	<b>Diodes and Transistors</b>	3
ELECT 218	<b>AC/DC Motors</b>	3
	<b>Total Credits: 11</b>	

**PROGRAM TOTAL 39 CREDITS**

## **Mechatronics AAS Degree**

Schoolcraft program code # AAS.00226

The mechatronics program focuses on the integration of mechanical, electrical (electronics), fluid power (hydraulics or pneumatics) and computer technologies to control machine movements. The students' studies begin with courses in mechanics, sensors, basic electronics, pneumatics, control logic and robot programming and control.

The program is not directly aimed at specific products. With the multiplicity of equipment presently in use, and the rapid advance and change in technology, the department stresses the development of a broad background that will enable students to find employment and be able to further their skills in a diversified number of industries.

Protective shop clothing and eye protection supplies required for the program will be purchased by the student.

Students who satisfactorily complete all college and program requirements qualify for an associate in applied science degree.

Not all courses are offered each semester. Students should work with an academic advisor to develop a schedule that will work for them. Students planning to transfer should check the transfer institution's requirements/guides or discuss their options with an academic advisor. Number of credits may vary depending on the course selection.

### **SAMPLE SCHEDULE OF COURSES**

#### **First Year - Fall Semester**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
ELECT 131	<b>Basic Measurement and Reporting Skills</b>	3
English	<b>Select one:</b>	3
ENG 100	<b>Communication Skills</b>	
ENG 101	<b>English Composition 1</b>	
MATH 113	<b>Intermediate Algebra for College Students</b>	4
MFG 102	<b>Basic Machining Processes</b>	3
OSH	<b>Select one:</b>	2
OSH 111	<b>Occupational Safety and Health for General Industry</b>	
OSH 112	<b>Occupational Safety and Health for Construction</b>	
	<b>Total Credits: 15</b>	

#### **First Year - Winter Semester**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
ELECT 137	<b>DC Circuits and Mathematical Modeling</b>	5
ELECT 145	<b>Fluid Power</b>	4
ELECT 251	<b>Programmable Logic and Industrial Controls</b>	4
CAD 120	<b>Mechanical Blueprint Reading with Sketching</b>	3
	<b>Total Credits: 16</b>	

## Mechatronics AAS Degree (continued)

### First Year - Spring Session

Course #	Course Title	Credits
ELECT 138	AC Circuits and Mathematical Modeling	5
English	Select one:	3
ENG 102	English Composition 2	
ENG 116	Technical Writing	
	<b>Total Credits: 8</b>	

### Second Year - Fall Semester

Course #	Course Title	Credits
ELECT 139	Diodes and Transistors	3
ELECT 218	AC/DC Motors	3
ENGR 100	Introduction to Engineering and Technology	3
Social Science	Select General Education Social Science course	3-4
	<b>Total Credits: 12-13</b>	

### Second Year - Winter Semester

Course #	Course Title	Credits
ELECT 144	Introduction to Microcontrollers	3
Elective	Select from list	3
Humanities	Select General Education Humanities course	1-4
Recommended:	COMA 103 Fundamentals of Speech	
PHYS 123	Applied Physics	5
	<b>Total Credits: 12-15</b>	

### Electives

Course #	Course Title	Credits
CAD 130	Geometric Dimensioning and Tolerance	3
CIS 129	Introduction to Programming Logic	3
MET 103	Introduction to Materials Science	3
MFG 103	Basic Computer Numerical Control (CNC)	3
QM 107	Quality Planning and Team Building	3
ROBAT 101	Robot Tool Handling Operations and Programming	3
WELD 110	Introduction to Welding Basics for Fabrication	3

**PROGRAM TOTAL 63-67 CREDITS**