

Industrial Education

Mechatronics

Program Description

Mechatronics is the blending of electronics, mechanics, electrical and computers to produce a well-rounded technician capable of handling the complex maintenance and operations tasks demanded by modern manufacturing, transportation, communication, and other industries. The modularization of electro-mechanical devices no longer requires in-depth specialization of a single field of study as more emphasis is placed on troubleshooting and replacement skills for maintenance and generalized knowledge of how systems work together for operations and purchasing and planning.

Certificate of Achievement and Associate in Science Degree

A Certificate of Achievement can be obtained upon completion of the 42-unit major listed below. The Associate in Science Degree can be obtained by completing a total of 60 units, including the 42 unit major, the general education requirements, and electives. All courses in the major must be completed with a grade of C or better or a P if the course is taken on a Pass/No Pass basis.

Program Outcomes

Students who complete the Mechatronics Certificate of Achievement/ Associate Degree will be able to:

1. Safely operate a variety of testing instruments and diagnostic tools.
2. Recognize complex systems and understand their function, operation, advantages and disadvantages.
3. Analyze complex systems and diagnose/troubleshoot problems.

REQUIRED COURSES	Units
CIS 001 Introduction to Computer Science	3
IT 050 Alternative Energy Technologies	3
IT 101 How Things Work	3
IT 151 Vocational Mathematics	3
MT 120 Principles of Analog Electronics	3
MT 122 Principles of Digital Electronics	3
MT 130 Principles of Mechanical Power Systems	3
MT 132 Principles of Fluid Power Systems	3
MT 140 Principles of Industrial Electrical Systems	3
MT 142 Principles of Electrical Machinery	3
MT 162 Robotic Manufacturing Systems	3
MT 164 Programmable Logic Controllers	3
6 units from List A	6
Total Units	42

List A (select 6 units)

ACR 100 Air Conditioning and Refrigeration	3
OR	
ACR 101 Air Conditioning and Refrigeration	3
DRFT 045 Introduction to Computer-Aided Drafting (CAD)	3
DRFT 050 Basic Drafting	3
DRFT 079 Blueprint Reading	3
IT 110 Modern Welding	3
IT 120 Electrical Safety	3
IT 140 Industrial Materials	3
OCED 090 Occupational Work Experience	1 - 8

This is a Gainful Employment Program. For additional information, please visit
http://www.solano.edu/gainful_employment/ and select "Mechatronics."

Industrial Management

IT 050 3.0 Units
Alternative Energy Technologies

Course Advisory: SCC minimum English and Math standards. Introduces the topics of power generation, transmission, and consumption of both conventional and alternative energy sources. Students will be exposed to an in-depth analysis of the design and use of fossil fuel based systems and then compare those systems to alternatives. Energy use in transportation, industrial, commercial, and residential applications will be examined. *Three hours lecture.*

IT 101 3.0 Units
How Things Work

Course Advisory: SCC minimum English and Math standards. Provides an understanding of how the technology in our lives works using only basic concepts and rudimentary mathematics. This course considers objects from our daily environment and focuses on their principles of operation, histories, and relationships to one another. Students learn about common technologies through lecture, classroom discussion, and laboratory experiments. *Two hours lecture, three hours lab.*

IT 110 3.0 Units
Modern Welding

Course Advisory: SCC minimum English standard. Designed to acquaint the student with MIG and TIG welding methods and knowledge necessary to weld in all positions utilizing the mild steel, low hydrogen electrodes, metal inert gas and tungsten inert gas techniques. *Two hours lecture, three hours lab.*

IT 111 3.0 Units
Modern Welding

Prerequisite: IT 110. Designed to acquaint the student with MIG and TIG welding methods and knowledge necessary to weld in all positions utilizing the mild steel, low hydrogen electrodes, metal inert gas and tungsten inert gas techniques. *Two hours lecture, three hours lab.*

IT 120 1.0 to 3.0 Units
Electrical Safety

Course Advisory: SCC minimum English and Math standards. A survey of the proper use, handling, and hazards associated with electrical and electronic equipment. The student will be introduced to the current generally accepted (National Electrical Safety Code) safety practices and procedures associated with power transmission, industrial, and consumer electrical and electronic equipment. This is an Open Entry/Open Exit course. Students may take this course up to the maximum number of units over multiple semesters. *One to three hours lecture.*

IT 130 1.0 Units
Fundamentals of Wire Cabling

Course Advisory: SCC minimum English and Math standards. Presents the principles and practices of copper cable wiring technology. Includes instruction in the design, installation, and maintenance of copper wiring systems for intelligent control systems, lighting and appliance control devices, communication, and networking. Also includes instruction in household and institutional power wiring. *One hour lecture, one hour lab.*

IT 132 1.0 Units
Fundamentals of Fiber Optics

Course Advisory: SCC minimum English and Math standards. Presents the principles and practices of fiber optics and optoelectronic technology. Includes instruction in the design, installation, and maintenance of fiber optic cabling and control systems and optoelectronic control systems for computer communication and networking systems. *One hour lecture, one hour lab.*

IT 134 1.0 Units
Fundamentals of Wireless Communication

Course Advisory: SCC minimum English and Math standards. Presents the principles and practices of wireless communication technology. Includes instruction in the design, installation, and maintenance of wireless communication and network systems. Emphasis is placed on system reliability, security, and cost containment concerns. Formerly ECTN 113. *One hour lecture, one hour lab.*

IT 140 3.0 Units
Industrial Materials

Course Advisory: SCC minimum English standard. A broad overview of the characteristics and comparative qualities of naturally occurring, alloyed and man-made materials used in industry. Testing and practical use of materials are required. *Two hours lecture, three hours lab.*

IT 151 3.0 Units
Vocational Mathematics

Course Advisory: SCC minimum English and Math standards. Focuses on mathematical functions, plane and solid geometry, measurement systems, algebra, and trigonometry applied to specific vocational areas. *Three hours lecture.*