

## PROGRAM OVERVIEW

The Robotics and Advanced Automation program at Sault College will help students gain knowledge, expertise and professional skills related to robotic applications and automation used in various sectors of industry. These industries include manufacturing, food packaging, medical, aerospace and many more. This program features a new, world class laboratory equipped with the latest robotics equipment installed in a simulated manufacturing environment.

### PROGRAM OUTCOMES

The following are the Vocational Learning Outcomes of the Robotics and Advanced Automation Program:

1. Construct and evaluate robotic control programs for various scenarios against which to model the functionality and stability of automation systems.
2. Plan and lead the installation of new industrial equipment and its physical and digital integration with existing systems.
3. Collaborate with health and safety personnel to develop plans and specifications that incorporate, among other elements, safety controls and physical guarding to comply with all applicable regulatory safety designs and standards used in industrial robotic applications.
4. Assist in the assessment and management of robotic systems by applying business principles to the electromechanical environment.
5. Validate and optimize the functioning of motor, drive, control, and robotic systems.
6. Integrate budgetary, technical, functional and safety considerations in the design and optimization of custom automation solutions.
7. Formulate and use a variety of troubleshooting techniques on new and legacy electromechanical equipment, processes, systems and subsystems.

## ADMISSIONS

### MINIMUM ACADEMIC REQUIREMENTS

A College Diploma or University Degree in a related field such as Electrical, Mechanical, Mechatronics or Metal Fabrication.

Candidates with related industry experience may also be granted admission at the discretion of the program Dean.

## CAREER PATHS

This graduate certificate program will prepare students to enter the cutting edge technology field of robotics and automation as a robot programmer, robotic vision technician and robotic welder.

Graduates can find employment in Automotive and Aerospace Manufacturing, Food and Beverage Industries, Pharmaceutical Industries, Original Equipment Manufacturers, System Integrators, and Automation Distribution and Sales.

## OTHER INFORMATION

For more information contact Program Coordinator Ron Chartrand at 705.759.2554 ext 2523 or email [ron.chartrand@saultcollege.ca](mailto:ron.chartrand@saultcollege.ca).

## PROGRAM OF STUDY

### SEMESTER 1

RAA100-5 Introduction to Robotics  
RAA102-2 Computers and Networking  
RAA103-3 Robot Cell Design and Safety  
RAA104-3 Manufacturing Processes  
RAA105-2 Basic Electricity  
RAA106-2 Robot Mechanics  
WLD121-2 Welding

### SEMESTER 2

RAA200-5 Advanced Robotics and Programming  
RAA201-5 Applications of Robotics with Vision  
RAA202-4 PLC and Interfacing  
RAA203-3 Robot Peripherals  
RAA204-3 Project Course

## Course Descriptions

### Semester 1

#### **Introduction to Robotics (RAA100) (5 credits)**

This course deals with an introduction to robot programming, coordinate systems and simulation software. Students will work collaboratively on projects to gain knowledge of robotic concepts.

#### **Computers and Networking (RAA102) (2 credits)**

This course discusses how computers are used in the automation industry and focuses on various fieldbus communications of main and peripheral equipment.

#### **Robot Cell Design and Safety (RAA103) (3 credits)**

Typical cell designs as well as best practices for safety such as lockout/tag-out procedures are discussed in this course. Safety devices such as light curtains, safety mats and scanners are the focus as well as regulatory commissions.

#### **Manufacturing Processes (RAA104) (3 credits)**

This course deals with typical manufacturing processes that utilize robots. The student will analyse various business cases and propose robotic solutions that will increase productivity and achieve beneficial return on investment.

#### **Basic Electricity (RAA105) (2 credits)**

The student will learn essential electrical skills used in the automation and robotics industry.

#### **Robot Mechanics (RAA106) (2 credits)**

This course deals with basic kinematic concepts involved in calculating a robot's position in space as well as tool and base robot frames.

**Welding (WLD121) (2 credits)**

A trades curriculum that has been designed to provide students with a combination of theoretical knowledge and hands-on skill in relation to the safe use and operation of both OFG/SMA welding, cutting and heating equipment.

**Semester 2**

**Advanced Robotics and Programming (RAA200) (5 credits)**

This course is a continuation of RAA100 and extends the students learning of robotics. Students will work collaboratively on projects to gain knowledge of robotic concepts.

**Applications of Robotics with Vision (RAA201) (5 credits)**

The student will learn how to incorporate vision systems into their robot applications as well as learn about proper illumination techniques for cameras.

**PLC and Interfacing (RAA202) (4 credits)**

This course will extend the students' understanding of programmable logic controllers and allow them to communicate to an industrial robot using ladder logic.

**Robot Peripherals (RAA203) (3 credits)**

This course deals with the peripheral equipment used in robotic applications such as grippers, sensors and encoders.

**Project Course (RAA204) (3 credits)**

The student will be able to utilize their knowledge they have gained in robotics to work collaboratively on an automation project and manage a project timeline.