

# Robotics/Automated Systems Technology

Diploma (D240)

## Required Courses

|                                 |  |        |
|---------------------------------|--|--------|
| MTTS 1264                       | Introduction to Machining Processes .....      | 2 cr   |
| RAST 1101*                      | Industrial Electronics I .....                 | 3 cr   |
| RAST 1102*                      | Industrial Electronics II .....                | 3 cr   |
| RAST 1103*                      | Motors and Drives .....                        | 3 cr   |
| RAST 1104                       | Introduction to Automation .....               | 2 cr   |
| RAST 1109                       | Computers in Industry .....                    | 2 cr   |
| RAST 1110                       | Introduction to Manufacturing.....             | 2 cr   |
| RAST 1111                       | Industrial Electronics Lab I.....              | 2 cr   |
| RAST 1113*                      | Motors and Drives Lab .....                    | 3 cr   |
| RAST 1120                       | Introduction to Engineering Graphics .....     | 2 cr   |
| RAST 1206*                      | Programmable Logic Controllers I .....         | 3 cr   |
| RAST 1212*                      | Industrial Electronics Lab II.....             | 2 cr   |
| RAST 2101*                      | Application Planning & Layout .....            | 2 cr   |
| RAST 2105*                      | Transducers .....                              | 2 cr   |
| RAST 2106*                      | Industrial Electronics III .....               | 2 cr   |
| RAST 2116*                      | Industrial Electronics Lab III.....            | 2 cr   |
| RAST 2132*                      | Robotic Programming.....                       | 3 cr   |
| RAST 2151*                      | Robotic Integration Lab .....                  | 6 cr   |
| RAST 2154*                      | Robot Controller Maintenance.....              | 2 cr   |
| RAST 2165*                      | Fluid Power .....                              | 2 cr   |
| RAST 2355*                      | Programmable Logic Controllers II .....        | 2 cr   |
| RAST 2395*                      | Advanced Robot Controller<br>Programming ..... | 2 cr   |
| RAST 2390*                      | Robotics Internship <b>OR</b>                  |        |
| RAST2399*                       | Independent Study .....                        | 1-3 cr |
| MATH 1500                       | Applied Mathematics (or higher) .....          | 3 cr   |
| General Education Courses ..... |  | 3 cr   |

\*Denotes Prerequisites

## GRADUATION REQUIREMENT - 61 CREDITS

## Description

Robotic Automated Systems Technicians are an integral part of modern manufacturing companies. Technologies such as new-generation robot controllers, sensors, and electrical control systems have created a need for highly specialized training. The Robotics Automated Systems Technology Diploma program prepares students for careers in the industrial robotic and automated manufacturing industry. The program has multiple robot and automation labs utilizing current technology with popular industrial robot models. The program is aligned with advisory board members, industrial partners, and industrial associations to deliver relevant content and instruction. Students are trained on the same robots, controllers, and programming languages used by automated manufacturing companies. The curriculum was created and is maintained by experienced technical faculty, advisory board members, and past graduates to best prepare students for employment in the industrial robotics industry.

## Outcomes

By completing this program, students will achieve the following learning outcomes:

- Identify and apply appropriate safety procedures;
- Apply knowledge and skills in electrical systems;
- Apply knowledge and skills in mechanical systems;
- Apply knowledge and skills in creating program code;
- Analyze and apply specific troubleshooting knowledge and technology in the areas of electrical, mechanical, software and program code;
- Apply effective communication and interpersonal skills as an individual and as a team member.

## Pre-Program Requirements

Some courses may require students to meet College Placement Levels in reading, writing, and/or math. See an advisor for more information.

For insurance purposes, internships may require that students be 18 years old.

## Graduation Requirements

In addition to the program requirements, students must meet the following conditions in order to graduate:

- College Cumulative GPA Requirement: cumulative grade point average (GPA) of credits attempted and completed at CLC must be at least 2.0;
- College Technical Core GPA Requirement: cumulative GPA of credits attempted and completed towards the technical core of the diploma or degree must be at least 2.0;
- Residency Requirement: students must complete 25% of their credits at Central Lakes College.

## Career & Transfer

This program prepares students for careers working for systems integrators, original equipment manufacturers, and robot manufacturers. Career opportunities are available in the automotive, aerospace, medical, machine tool, packaging, welding, and nuclear power industries. Career titles include Robotic Automated Systems Technician, Field Servicing Technician, and Electrical Controls Technician with responsibilities in building, repairing, installing, maintaining, and programming robotics and automated systems.

Courses in this diploma will transfer into the Robotics Automated Systems Technology A.A.S. Degree at Central Lakes College.

## Semester Course Requirements

### Semester One (18 credits)

|                                    |  |      |
|------------------------------------|--|------|
| MTTS 1264                          | Introduction to Machining Processes.....   | 2 cr |
| RAST 1101*                         | Industrial Electronics I.....              | 3 cr |
| RAST 1104                          | Introduction to Automation.....            | 2 cr |
| RAST 1109                          | Computers in Industry.....                 | 2 cr |
| RAST 1110                          | Introduction to Manufacturing .....        | 2 cr |
| RAST 1111                          | Industrial Electronics Lab I .....         | 2 cr |
| RAST 1120                          | Introduction to Engineering Graphics ..... | 2 cr |
| Minnesota Transfer Curriculum..... |  | 3 cr |

### Semester Two (17 credits)

|            |                                       |      |
|------------|---------------------------------------|------|
| RAST 1102* | Industrial Electronics II.....        | 3 cr |
| RAST 1103* | Motors and Drives.....                | 3 cr |
| RAST 1113* | Motors & Drives Lab.....              | 3 cr |
| RAST 1206* | Programmable Logic Controllers I..... | 3 cr |
| RAST 1212* | Industrial Electronics Lab II .....   | 2 cr |
| MATH 1500  | Applied Mathematics (or higher) ..... | 3 cr |

### Semester Three First Year Summer (6 credits)

|            |                                      |      |
|------------|--------------------------------------|------|
| RAST 2101* | Application Planning & Layout .....  | 2 cr |
| RAST 2106* | Industrial Electronics III .....     | 2 cr |
| RAST 2116* | Industrial Electronics Lab III ..... | 2 cr |

### Semester Four (15 credits)

|            |  |      |
|------------|--|------|
| RAST 2105* | Transducers .....                      | 2 cr |
| RAST 2132* | Robotic Programming .....              | 3 cr |
| RAST 2151* | Robotic Integration Lab.....           | 6 cr |
| RAST 2165* | Fluid Power .....                      | 2 cr |
| RAST 2355* | Programmable Logic Controllers II..... | 2 cr |

### Semester Five (5 credits)

|            |   |        |
|------------|---|--------|
| RAST 2154* | Robot Controller Maintenance .....            | 2 cr   |
| RAST 2395* | Advanced Robot Controller<br>Programming..... | 2 cr   |
| RAST 2390* | Robotics Internship <b>OR</b>                 |        |
| RAST2399*  | Independent Study.....                        | 1-3 cr |