

Electromechanical Systems DIPLOMA

Program Overview

Electromechanical systems, also referred to as mechatronics, is a new and rapidly growing field that integrates electronics, mechanics, pneumatics, hydraulics, and computer control systems to create new and improved automated manufacturing production systems. This program is designed for people who are interested in plant maintenance (troubleshooting & repair), process set up, installation, and commissioning.

Electromechanical Systems move beyond simply cross-training employees, as the discipline recognizes that individuals need to be trained in five areas: mechanical, electrical, fluid power, process control, and industrial programming.

Students/electricians that previously acquired a diploma/AAS degree in the study of electricity may transfer in credits toward the Electromechanical Systems diploma. Students should have an interest and aptitude in applied algebra, trigonometry, drawing and science. Good eyesight and color vision are important.

Career Opportunities

The Electromechanical Systems program prepares students for careers requiring specialized skills in electricity, electronics, instrumentation, programmable logic controllers, microprocessors, automation and robotics. Students will become multi-skilled technicians capable of solving the many complex problems of manufacturing automation. Students will be prepared for a wide variety of careers including: Instrument Technician, Electrical Technician, Electromechanical Technician, Robotics Technician, Electronics Mechanic, Machine Repair & Maintenance, Motor Installer, Instrumentation Calibration Technician, Industrial Programmer, PLC Programmer, and Field Service.

These jobs are found in a wide range of fields including: oil refineries, water treatment, wastewater treatment, manufacturing plants, chemical, medical, electronics, agriculture, biotechnology and automotive industries.

Program Outcomes

1. Graduates will have the ability to communicate and conduct themselves in a professional manner with the customers and co-workers.
2. Graduates will have the skills for performing entry level tasks required of an apprentice electrician in residential, commercial and industrial construction.
3. Graduates will have knowledge of the National Electric Code, enabling them to legally and safely install electrical services with supervision.
4. Graduates will have the ability to apply electrical theory to practical applications.
5. Graduates will meet the MN Department of Labor and Industry's electrical program requirement of specific curriculum and 95% course attendance policy.

Program Faculty

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Program Delivery

While addressing the general education needs of the program, students will be working within the Electrical Technology program in second semester. Third and fourth semester consist of online course delivery with hands-on labs to reinforce the lessons learned as well as one-on-one with instructors.

Additional Program Requirements/Costs

- Student must attend orientation.
- Textbooks are required the first day of class. Go to www.saintpaulcollegebookstore.com for textbook information.
- Students are responsible for having their own Personal Protective Equipment (PPE) to participate in the labs.

Program Requirements

Check off when completed

Certain classes must be taken concurrently and certain classes are prerequisites to other classes.

Course	Cr
<input type="checkbox"/> CMAE 1514 Safety Awareness	2
<input type="checkbox"/> CMAE 1518 Manufacturing Process and Production	2
<input type="checkbox"/> CMAE 1522 Quality Practices	2
<input type="checkbox"/> CMAE 1526 Maintenance Awareness	2
<input type="checkbox"/> EMEC 1510 AC/DC Fundamentals	3
<input type="checkbox"/> EMEC 1520 Electrical Motors	3
<input type="checkbox"/> EMEC 1530 Motor Controls	4
<input type="checkbox"/> EMEC 1540 Motor Drives	4
<input type="checkbox"/> EMEC 2610 Fluid System Fund. - Pneumatics	3
<input type="checkbox"/> EMEC 2615 Fluid System Fund. - Hydraulics	3
<input type="checkbox"/> EMEC 2620 Mechanical Fundamentals I	4
<input type="checkbox"/> EMEC 2625 Mechanical Fundamentals 2	4
<input type="checkbox"/> EMEC 2740 Electromechanical Troubleshooting & Maintenance	3
<input type="checkbox"/> EMEC 2751 Automated Process Control	4
<input type="checkbox"/> EMEC 2760 Programming for Robotic Manufacturing	4
<input type="checkbox"/> EMEC 2770 Advanced PLC Programming	4
Subtotal	51

General Education/MnTC Requirements Cr

Refer to the Minnesota Transfer Curriculum Course List for each Goal Area

<input type="checkbox"/> ENGL 1730 Introduction to Technical Writing	3
<input type="checkbox"/> Goal 4: Mathematical/Logical Reasoning	3
General Education Requirements	6

Total Program Credits **57**

Program Start Dates

Fall, Spring

Course Sequence

This course sequence is recommended for a full-time student; however, this sequence is not required. Students should consult with the Program Advisor each semester.

Not all courses are offered each semester; a selection of courses is offered summer term.

Fall Semester

CMAE 1514 Safety Awareness	2
CMAE 1518 Manufacturing Process and Production	2
CMAE 1522 Quality Practices	2
CMAE 1526 Maintenance Awareness	2
ENGL 1730 Introduction to Technical Writing	3
Goal 4	3
Total Semester Credits	14

Spring Semester

EMEC 1510 AC/DC Fundamentals	3
EMEC 1520 Electrical Motors	3
EMEC 1530 Motor Controls	4
EMEC 1540 Motor Drives	4
Total Semester Credits	14

Fall Semester

EMEC 2610 Fluid System Fund. - Pneumatics	3
EMEC 2615 Fluid System Fund. - Hydraulics	3
EMEC 2620 Mechanical Fundamentals I	4
EMEC 2625 Mechanical Fundamentals 2	4
Total Semester Credits	14

Spring Semester

EMEC 2740 Electromechanical Troubleshooting & Maintenance	3
EMEC 2751 Automated Process Controls	4
EMEC 2760 Programming for Robotic Manufacturing	4
EMEC 2770 Advanced PLC Programming	4
Total Semester Credits	15

Total Program Credits **57**

*Information is subject to change.
This Program Requirements Guide is not a contract.*

Minimum Program Entry Requirements

Students entering this program must meet the following minimum program entry requirements:

Reading: Score of 60+ or grade of "C" or better in READ 0721

Writing: Score of 60+ or grade of "C" or better in ENGL 0921

Arithmetic: Score of 52+

Assessment Results and Prerequisites: Students admitted to Saint Paul College programs may need to complete additional courses based on assessment results and course prerequisite requirements. Certain MATH, READ, and ENGL courses have additional prerequisites.