

Technology Center of DuPage

Robotics and Automation Technology Program

School Year 2020-2021

Two year course sequence consisting of the following modules:

Year 1	Year 2 (in development)
<ul style="list-style-type: none">• Electronics Fundamentals• Introduction to Industrial Robotics• Motors and Generators	<ul style="list-style-type: none">• Hydraulics and Pneumatics• Digital Fundamentals• Student Internship / Work Experience

Module Descriptions

Electronics Fundamentals (12 weeks)

Basic concepts in electronics are studied. Provides an overview of direct and alternating current, circuit laws, components, troubleshooting, and use of test equipment. Hands-on experience, projects, and practical applications are included.

Introduction to Industrial Robotics (12 weeks)

Introduction to the basic theory and operation of robots in industrial automation. Basic robot and work-place design, safety procedures, and robotic applications are studied.

Motor and Generator Fundamentals (12 weeks)

Basic principles for Alternating Current (AC) and Direct Current (DC) motors and generators. Motor and generator theory, operation, ratings, speeds, and enclosures. Analysis of efficiency, power service factors, and frame sizes. Motor control concepts, including ladder and wiring drawings. Control devices, including sensors, control transformers, and starters.

Hydraulics and Pneumatics (12 weeks)

Principles of fluids at rest and in motion. Hydraulic and pneumatic pumps, motors, cylinders, boosters, valves, regulators, and circuitry to transmit and control power.

Digital Fundamentals (12 weeks)

Introduction to basic concepts in digital electronics. Basic discrete electronics, digital logic, circuit laws, components, troubleshooting, and use of test equipment. Hands-on experience, practical applications, and projects. Teamwork, critical thinking, and problem solving are emphasized.

Dual Credit – College of DuPage

ELECT 1100 – Electricity and Electronics Fundamentals (3 credits)

ELMEC 1171 – Introduction to Robotic Technology (3 credits) [Planned]

ELMEC 1110 – Motor and Generator Fundamentals (3 credits) [Planned]

ELECT 1141 – Digital Fundamentals (3 credits)

ELMEC 1141 – Hydraulics and Pneumatics (3 credits) [Planned]

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