COURSE ELT1080: CONTROL SYSTEMS 1

Level: Introductory

Prerequisite: ELT1010: Electro-assembly 1

Description: Students construct process control systems, demonstrate their basic operation and demonstrate procedures for testing them.

Parameters: Access to digital/analog multimeters, pressure devices and related resources.

Outcomes: The student will:

1. **identify how control systems are used in residential and commercial applications**
   - 1.1 draw and explain a process control system using block diagrams depicting each functional component and the flow of signals through the systems
2. **identify basic process control systems and explain how they function**
   - 2.1 explain the difference between open-loop and closed-loop control systems
3. **construct basic process control circuits, using passive devices**
   - 3.1 construct a basic process control system using passive devices including:
     - 3.1.1 thermistor
     - 3.1.2 pressure sensor
     - 3.1.3 proximity switch
     - 3.1.4 light control resistor
     - 3.1.5 float switch
     - 3.1.6 reed switch
     - 3.1.7 photocell
   - 3.2 explain process control terms including:
     - 3.2.1 precision
     - 3.2.2 standard
     - 3.2.3 calibration
     - 3.2.4 accuracy
     - 3.2.5 sensor
     - 3.2.6 transducers
     - 3.2.7 distortion
     - 3.2.8 transients
     - 3.2.9 sampling
     - 3.2.10 interrupt
     - 3.2.11 frequency
   - 3.3 demonstrate knowledge in measuring voltage, current and resistance in any control system using analog and digital instruments
   - 3.4 explain how to test process control circuit(s), voltage, current, continuity, opens and shorts
4. **demonstrate established laboratory procedures and safe work practices**
   - 4.1 demonstrate safe and correct procedures in measuring voltage, current and resistance using digital and analog meters

5. demonstrate basic competencies

5.1 demonstrate fundamental skills to:
- 5.1.1 communicate
- 5.1.2 manage information
- 5.1.3 use numbers
- 5.1.4 think and solve problems

5.2 demonstrate personal management skills to:
- 5.2.1 demonstrate positive attitudes and behaviours
- 5.2.2 be responsible
- 5.2.3 be adaptable
- 5.2.4 learn continuously
- 5.2.5 work safely

5.3 demonstrate teamwork skills to:
- 5.3.1 work with others
- 5.3.2 participate in projects and tasks

6. make personal connections to the cluster content and processes to inform possible pathway choices

6.1 complete/update a personal inventory; e.g., interests, values, beliefs, resources, prior learning and experiences

6.2 create a connection between a personal inventory and occupational choices