

INSTRUMENTATION AND CONTROL OPERATIONS LEVEL 4

ENG/OS/IC/CR/02/4/MA

Install Instrumentation and Control System Component

July/August 2025



TVET CURRICULUM DEVELOPMENT, ASSESSMENT AND CERTIFICATION COUNCIL (TVET CDACC)

PRACTICAL ASSESSMENT

INSTRUCTIONS TO THE CANDIDATE:

1. This unit of competence shall be assessed in four phases.
2. Each assessment session has the duration included in brackets
3. The fourth phase of the assessment shall include a practical session and an oral assessment session.
4. The assessor will take photos and videos as you perform the tasks at critical points during the assessment.
5. Ensure all required resources for the assessment have been provided before beginning the assessment.

1. PRACTICAL ASSESSMENT 1 (4 HOURS)

Element Covered

1. Prepare for installation of instrumentation and control system component.

Tasks

- Observe safety as per IEEE and OSH regulations.
- Identify all components and tools shown in Figure (a).
- Match the components to the symbols in the circuit diagram provided (Figure (b)).
- Label the pin connection for the sensor port and the actuator port.
- Plan layout of the circuit in Figure (a) correctly on Strip board/breadboard.
- Use manufacturer's manual to connect the power supply to Arduino.

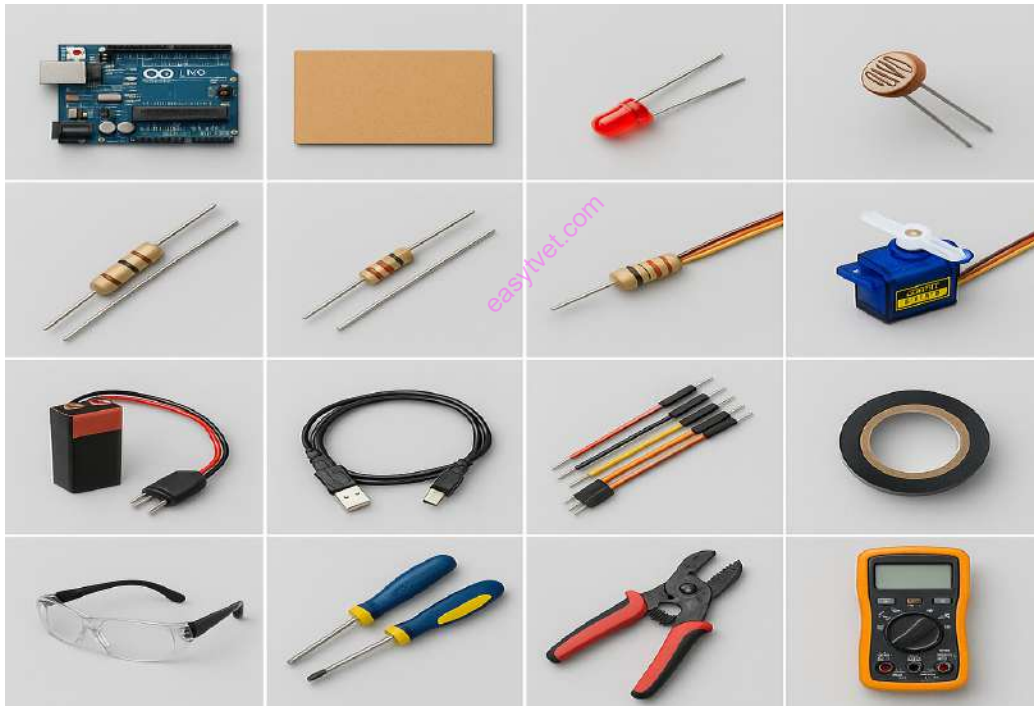


Figure a

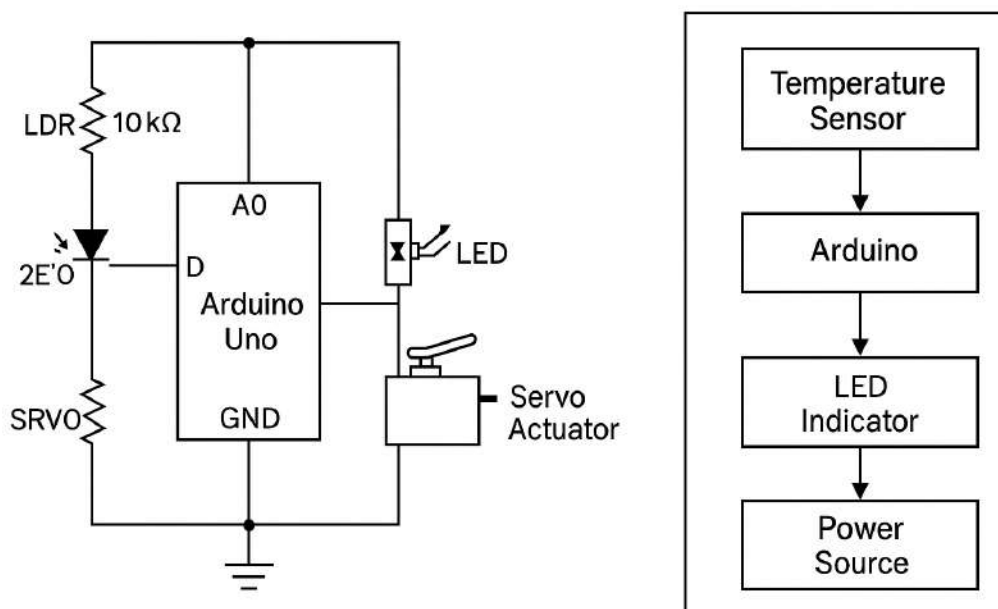


Figure b

2. PRACTICAL ASSESSMENT 2 (4 HOURS)

Element Covered

1. Assemble instrumentation and control system components

Tasks

1. Wire the LDR, LED, and Servo on Strip board/breadboard to Arduino according to the provided circuit, Figure (b).
2. Verify the wiring using a multi-meter.
3. Upload the Arduino program provided in soft copy to read sensor input and control LED and Servo.
4. Compile and test the code provided in soft copy to read sensor input and control LED and Servo.
5. Debug any issues and verify full functionality using the serial monitor.
6. Adhere to IEEE, OSH and NEMA standards throughout the session.

NB. 1. Refer to provided code during practical session 2.

3. PRACTICAL ASSESSMENT 3 (4 HOURS)

Element Covered

1. Test instrumentation and control system component

Tasks

1. Test the system under three different lighting conditions.
2. Record sensor values from the Serial Monitor.
3. Calibrate the threshold to respond to real light levels.
4. Adjust servo angles in code to match response logic.
5. Document outcomes and test observations.
6. Verify consistent system behavior.
7. Adhere to IEEE , OSH and NEMA standards throughout the session

ORAL ASSESSMENT (1 HOUR)

The assessor will now ask you oral questions to assess your understanding of the project and elements covered. You can choose to answer orally or write down your thoughts on a piece of paper.

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