



# COURSE OUTLINE

## ELR622

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| <b>Course Code: Title</b>                                     | ELR622: INSTRUMENTATION - LEVEL 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Program Number: Name</b>                                   | 6540: IND.ELECT. - BASIC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Department:</b>                                            | ELEC. APPRENTICES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Semester/Term:</b>                                         | 17F                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Course Description:</b>                                    | This course is an introduction to instrumentation symbols and terminology. Temperature and pressure measurement will be studied in detail.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Total Credits:</b>                                         | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Hours/Week:</b>                                            | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Total Hours:</b>                                           | 24                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Essential Employability Skills (EES):</b>                  | <p>#1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.</p> <p>#2. Respond to written, spoken, or visual messages in a manner that ensures effective communication.</p> <p>#3. Execute mathematical operations accurately.</p> <p>#4. Apply a systematic approach to solve problems.</p> <p>#5. Use a variety of thinking skills to anticipate and solve problems.</p> <p>#6. Locate, select, organize, and document information using appropriate technology and information systems.</p> <p>#7. Analyze, evaluate, and apply relevant information from a variety of sources.</p> <p>#8. Show respect for the diverse opinions, values, belief systems, and contributions of others.</p> <p>#9. Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals.</p> <p>#10. Manage the use of time and other resources to complete projects.</p> <p>#11. Take responsibility for ones own actions, decisions, and consequences.</p> |
| <b>Course Evaluation:</b>                                     | Passing Grade: 50%, D                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Other Course Evaluation &amp; Assessment Requirements:</b> | <p>Grade<br/>                     Definition Grade Point Equivalent<br/>                     A+ 90 - 100% 4.00<br/>                     A 80 - 89%<br/>                     B 70 - 79% 3.00<br/>                     C 60 - 69% 2.00</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

D 50 - 59% 1.00  
F (Fail) 49% and below 0.00

CR (Credit) Credit for diploma requirements has been awarded.  
S Satisfactory achievement in field /clinical placement or non-graded subject area.  
U Unsatisfactory achievement in field/clinical placement or non-graded subject area.  
X A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.  
NR Grade not reported to Registrar's office.  
W Student has withdrawn from the course without academic penalty.

**Evaluation Process and Grading System:**

| Evaluation Type         | Evaluation Weight |
|-------------------------|-------------------|
| Assignments and quizzes | 10%               |
| Labs                    | 20%               |
| Practical Tests         | 20%               |
| Written Tests           | 50%               |

**Books and Required Resources:**

Lab Volt

**Course Outcomes and Learning Objectives:**

**Course Outcome 1.**

Describe Instrumentation and Process Control and understand Related terminology.

**Learning Objectives 1.**

- Explain what Instrumentation is.
- Explain what Process Control is.
- Describe the major components of a process control loop.
- Draw the block diagram of a process control loop.
- Understand instrumentation units, symbols and terminology.(I.S.A.)

**Course Outcome 2.**

Understand temperature measurement, devices and applications

**Learning Objectives 2.**

- Understand the difference between temperature and heat.
- Convert from one temperature scale to another.
- Describe the physical and operating characteristics of Filled system thermometers, thermocouples, resistance
- Temperature detectors and thermistors.
- Calibrate and explain the operation of thermocouple and RTD transmitters
- Describe methods of measuring temperature.
- Select, install and calibrate temperature measurement devices

**Course Outcome 3.**

Understand pressure measurement, devices and applications

### **Learning Objectives 3.**

- Define the term fluids and fluid mechanics
- Derive units of force, energy and pressure in SI and English units
- Perform unit conversions and calculations
- Describe methods of measuring pressure

**Date:**

Monday, January 22, 2018

Please refer to the course outline addendum on the Learning Management System for further information.