



# COURSE OUTLINE

## ELR114

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Prepared: A. Gooderham    Approved: Corey Meunier

<b>Course Code: Title</b>	ELR114: MEASUREMENT & SHOP PRACTICE
<b>Program Number: Name</b>	4026: ELECTRICAL TN-PROC
<b>Department:</b>	ELECT./INSTRUMENTATION PS
<b>Semester/Term:</b>	17F
<b>Course Description:</b>	This course provides an understanding of the operating principles, characteristics, and application of electrical/electronic measuring instruments. Component testing and identification, soldering, wire-wrapping and hand tool exercises will be practiced in a lab setting.
<b>Total Credits:</b>	3
<b>Hours/Week:</b>	2
<b>Total Hours:</b>	30
<b>Vocational Learning Outcomes (VLO's):</b>  Please refer to program web page for a complete listing of program outcomes where applicable.	<ul style="list-style-type: none"><li>#1. Interpret and produce electrical and electronics drawings including other related documents and graphics.</li><li>#2. Analyze and solve routine technical problems related to electrical systems by applying mathematics and science principles.</li><li>#3. Use, verify, and maintain instrumentation equipment and systems.</li><li>#4. Assemble, test, modify and maintain electrical circuits and equipment to fulfill requirements and specifications under the supervision of a qualified person.</li><li>#6. Verify acceptable functionality and apply troubleshooting techniques for electrical and electronic circuits, components, equipment, and systems under the supervision of a qualified person.</li><li>#8. Use computer skills and tools to solve routine electrical related problems.</li><li>#10. Prepare and maintain records and documentation systems.</li><li>#12. Apply health and safety standards and best practices to workplaces.</li><li>#13. Perform tasks in accordance with relevant legislation, policies, procedures, standards, regulations, and ethical principles.</li><li>#14. Configure installation and apply electrical cabling requirements and system grounding and bonding requirements for a variety of applications under the supervision of a qualified person.</li><li>#16. Select electrical equipment, systems and components to fulfill the requirements and specifications under the supervision of a qualified person.</li><li>#17. Apply project management principles to assist in the implementation of projects.</li></ul>
<b>Essential Employability Skills (EES):</b>	<ul style="list-style-type: none"><li>#1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.</li></ul>



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- #2. Respond to written, spoken, or visual messages in a manner that ensures effective communication.
- #3. Execute mathematical operations accurately.
- #4. Apply a systematic approach to solve problems.
- #5. Use a variety of thinking skills to anticipate and solve problems.
- #6. Locate, select, organize, and document information using appropriate technology and information systems.
- #7. Analyze, evaluate, and apply relevant information from a variety of sources.
- #8. Show respect for the diverse opinions, values, belief systems, and contributions of others.
- #9. Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals.
- #10. Manage the use of time and other resources to complete projects.
- #11. Take responsibility for ones own actions, decisions, and consequences.

**General Education Themes:** Science and Technology

**Course Evaluation:** Passing Grade: 50%, D

**Other Course Evaluation & Assessment Requirements:**

- All lab reports required for submission, a passing grade on the practical test and the power supply report must be completed and handed-in or an Incomplete grade will result.
- Rewrites are permitted for the practical test with a maximum grade of 60% possible.

Grade  
Definition Grade Point Equivalent  
A+ 90 – 100% 4.00  
A 80 – 89%  
B 70 - 79% 3.00  
C 60 - 69% 2.00  
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.

- All lab reports are to be submitted in a three-tab duo tang folder,



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NOT a three-ring binder.

### Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Lab Reports	50%
Power Supply Project	25%
Practical Lab Test	25%

### Books and Required Resources:

Parts Package  
•First Year Electronic Parts Package ( Breadboard, Components, Safety Glasses, etc)  
AVAILABLE FROM INSTRUCTOR

Basic Tools  
•Basic Hand Tools ( Not in Parts Package - List will be supplied by Instructor)

### Course Outcomes and Learning Objectives:

#### Course Outcome 1.

Accurately identify common electronic components, their electrical characteristics and testing procedures.

#### Learning Objectives 1.

- Correctly identify common components via their physical properties.
- Correctly identify electrical characteristics of common components.
- Accurately identify and draw the schematic symbol of common components.
- Accurately perform common testing of components.
- Recall and accurately apply the Resistor / Capacitor / Inductor Colour Code.

#### Course Outcome 2.

Correctly and accurately measure AC and DC Voltage, Current and Resistance using common Test Equipment.

#### Learning Objectives 2.

- Recall and apply basic techniques for measuring voltage, current and resistance.



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- Accurately measure V, I, and R in Series Circuits, Parallel Circuits and Combination Resistive Circuits.
- Define and understand the term "Loading Effect".
- Correctly wire and test a switch, light and receptacle
- Correctly wire and test a 3-way switch and light.
- Correctly wire and test a split receptacle and a switched receptacle
- Correctly calibrate and accurately use an oscilloscope to measure amplitude and period of sinusoidal waveforms.

### Course Outcome 3.

Correctly and safely identify and use typical hand tools, soldering and de-soldering equipment to repair and maintain electronic equipment.

### Learning Objectives 3.

- Correctly identify common hand tools and their use.
- Correctly and safely use common hand tools.
- Correctly and safely use soldering/de-soldering equipment to make simple wire connections, cables and to remove/insert components on printed circuit boards (PCB's)

### Course Outcome 4.

Use soldering, wiring and assembly techniques to build a working DC power supply for electronic equipment.

### Learning Objectives 4.

- Correctly insert components on the PCB.
- Correctly solder components on the PCB.
- Connect and demonstrate the operation of the completed supply noting simple wire connections, including cabinet completion.

**Date:**

Friday, September 1, 2017

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



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