



COURSE OUTLINE: ELR114 - MEASURE & SHOP PRAC

Prepared: A. Gooderham

Approved: Corey Meunier, Chair, Technology and Skilled Trades

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| Course Code: Title | ELR114: MEASUREMENT & SHOP PRACTICE |
| Program Number: Name | 4026: ELECTRICAL TN-PROC 4029: ELECTRICAL TY-PROCES 4127: ELECTRICAL TN-TRADES |
| Department: | ELECT./INSTRUMENTATION PS |
| Semesters/Terms: | 18F |
| Course Description: | 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. |
| Total Credits: | 3 |
| Hours/Week: | 2 |
| Total Hours: | 30 |
| Prerequisites: | There are no pre-requisites for this course. |
| Corequisites: | There are no co-requisites for this course. |
| Vocational Learning Outcomes (VLO's) addressed in this course: Please refer to program web page for a complete listing of program outcomes where applicable. | 4026 - ELECTRICAL TN-PROC VLO 1 Interpret and produce electrical and electronics drawings including other related documents and graphics. VLO 2 Analyze and solve routine technical problems related to electrical systems by applying mathematics and science principles. VLO 3 Use, verify, and maintain instrumentation equipment and systems. VLO 4 Assemble, test, modify and maintain electrical circuits and equipment to fulfill requirements and specifications under the supervision of a qualified person. VLO 6 Verify acceptable functionality and apply troubleshooting techniques for electrical and electronic circuits, components, equipment, and systems under the supervision of a qualified person. VLO 8 Use computer skills and tools to solve routine electrical related problems. VLO 10 Prepare and maintain records and documentation systems. VLO 12 Apply health and safety standards and best practices to workplaces. VLO 13 Perform tasks in accordance with relevant legislation, policies, procedures, standards, regulations, and ethical principles. VLO 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. VLO 16 Select electrical equipment, systems and components to fulfill the requirements and specifications under the supervision of a qualified person. VLO 17 Apply project management principles to assist in the implementation of projects. 4029 - ELECTRICAL TY-PROCES |



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- VLO 1 Analyze, interpret, and produce electrical and electronics drawings, technical reports including other related documents and graphics.
- VLO 2 Analyze and solve complex technical problems related to electrical systems by applying mathematics and science principles.
- VLO 3 Design, use, verify, and maintain instrumentation equipment and systems.
- VLO 4 Design, assemble, test, modify, maintain and commission electrical equipment and systems to fulfill requirements and specifications under the supervision of a qualified person.
- VLO 6 Design, assemble, analyze, and troubleshoot electrical and electronic circuits, components, equipment and systems under the supervision of a qualified person.
- VLO 8 Use computer skills and tools to solve a range of electrical related problems.
- VLO 10 Prepare reports and maintain records and documentation systems.
- VLO 12 Apply and monitor health and safety standards and best practices to workplaces.
- VLO 13 Perform and monitor tasks in accordance with relevant legislation, policies, procedures, standards, regulations, and ethical principles.
- VLO 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.
- VLO 16 Select and recommend electrical equipment, systems and components to fulfill the requirements and specifications under the supervision of a qualified person.
- VLO 17 Apply project management principles to contribute to the planning, implementation, and evaluation of projects.

4127 - ELECTRICAL TN-TRADES

- VLO 1 Interpret and produce electrical and electronic drawings including other related documents and graphics.
- VLO 2 Analyze and solve routine technical problems related to electrical systems by applying mathematics and science principles.
- VLO 3 Use, verify, and maintain instrumentation equipment and systems.
- VLO 4 Assemble, test, modify and maintain electrical circuits and equipment to fulfill requirements and specifications under the supervision of a qualified person.
- VLO 6 Verify acceptable functionality and apply troubleshooting techniques for electrical and electronic circuits, components, equipment, and systems under the supervision of a qualified person.
- VLO 8 Use computer skills and tools to solve routine electrical related problems.
- VLO 10 Prepare and maintain records and documentation systems.
- VLO 12 Apply health and safety standards and best practices to workplaces.
- VLO 13 Perform tasks in accordance with relevant legislation, policies, procedures, standards, regulations, and ethical principles.
- VLO 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.
- VLO 16 Select electrical equipment, systems and components to fulfill the requirements and specifications under the supervision of a qualified person.
- VLO 17 Apply project management principles to assist in the implementation of projects.



Essential Employability Skills (EES) addressed in this course:

- EES 1 Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.
- EES 2 Respond to written, spoken, or visual messages in a manner that ensures effective communication.
- EES 3 Execute mathematical operations accurately.
- EES 4 Apply a systematic approach to solve problems.
- EES 5 Use a variety of thinking skills to anticipate and solve problems.
- EES 6 Locate, select, organize, and document information using appropriate technology and information systems.
- EES 7 Analyze, evaluate, and apply relevant information from a variety of sources.
- EES 8 Show respect for the diverse opinions, values, belief systems, and contributions of others.
- EES 9 Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals.
- EES 10 Manage the use of time and other resources to complete projects.
- EES 11 Take responsibility for ones own actions, decisions, and consequences.

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,
NOT a three-ring binder.

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)



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| Course Outcomes and Learning Objectives: | Course Outcome 1 | Learning Objectives for Course Outcome 1 | | | | | | | | | | | | | |
|--|--|--|-------------------------|-----------------|-------------------|-------------------------|-------------|-----|--|----------------------|-----|--|--------------------|-----|--|
| | 1. Accurately identify common electronic components, their electrical characteristics and testing procedures. | 1.1 Correctly identify common components via their physical properties. 1.2 Correctly identify electrical characteristics of common components. 1.3 Accurately identify and draw the schematic symbol of common components. 1.4 Accurately perform common testing of components. 1.5 Recall and accurately apply the Resistor / Capacitor / Inductor Colour Code. | | | | | | | | | | | | | |
| | Course Outcome 2 | Learning Objectives for Course Outcome 2 | | | | | | | | | | | | | |
| | 2. Correctly and accurately measure AC and DC Voltage, Current and Resistance using common Test Equipment. | 2.1 Recall and apply basic techniques for measuring voltage, current and resistance. 2.2 Accurately measure V, I, and R in Series Circuits, Parallel Circuits and Combination Resistive Circuits. 2.3 Define and understand the term ... Loading Effect. 2.4 Correctly wire and test a switch, light and receptacle. 2.5 Correctly wire and test a 3-way switch and light. 2.6 Correctly wire and test a split receptacle and a switched receptacle. 2.7 Correctly calibrate and accurately use an oscilloscope to measure amplitude and period of sinusoidal waveforms. | | | | | | | | | | | | | |
| | Course Outcome 3 | Learning Objectives for Course Outcome 3 | | | | | | | | | | | | | |
| Evaluation Process and Grading System: | 3. Correctly and safely identify and use typical hand tools, soldering and de-soldering equipment to repair and maintain electronic equipment. | 3.1 Correctly identify common hand tools and their use. 3.2 Correctly and safely use common hand tools. 3.3 Correctly and safely use soldering/de-soldering equipment to make simple wire connections, cables and to remove/insert components on printed circuit boards (PCBs) | | | | | | | | | | | | | |
| | Course Outcome 4 | Learning Objectives for Course Outcome 4 | | | | | | | | | | | | | |
| | 4. Use soldering, wiring and assembly techniques to build a working DC power supply for electronic equipment. | 4.1 Correctly insert components on the PCB. 4.2 Correctly solder components on the PCB. 4.3 Connect and demonstrate the operation of the completed supply noting simple wire connections, including cabinet completion. | | | | | | | | | | | | | |
| Date: | <table><tr><th>Evaluation Type</th><th>Evaluation Weight</th><th>Course Outcome Assessed</th></tr><tr><td>Lab Reports</td><td>50%</td><td></td></tr><tr><td>Power Supply Project</td><td>25%</td><td></td></tr><tr><td>Practical Lab Test</td><td>25%</td><td></td></tr></table> | | | Evaluation Type | Evaluation Weight | Course Outcome Assessed | Lab Reports | 50% | | Power Supply Project | 25% | | Practical Lab Test | 25% | |
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| Practical Lab Test | 25% | | | | | | | | | | | | | | |
| | August 22, 2018 | | | | | | | | | | | | | | |
| | Please refer to the course outline addendum on the Learning Management System for further information. | | | | | | | | | | | | | | |