9055
Introduction to Electrical Trades Technology (10)

20S/20E/20M

An Electrical Trades Technology Course
Course Description

Students will be introduced to basic electrical concepts. They will begin to design and wire circuits. Students are introduced to safety, tools, and equipment for electrical/electronic systems.

Goal 1: Describe and apply health and safety practices.

GLO 1.1: Describe and apply health and safety practices.

SLO 10.1.1.1: Identify safety and health requirements. (A2.1)
SLO 10.1.1.2: Describe the importance of using personal protective equipment (PPE), and identify PPE and procedures related to PPE. (A2.2) (TSA 16)
SLO 10.1.1.3: Outline the safety principles for working on and around electrical equipment. (A2.3) (TSA 18)
SLO 10.1.1.4: Identify fire safety and outline workplace fire safety principles. (A2.4) (TSA 19)
SLO 10.1.1.5: Recognize and control hazards. (A2.6)
SLO 10.1.1.6: Identify the hazards in confined spaces and the preparation needed to work in a confined space. (A2.7) (TSA 20)
SLO 10.1.1.7: Identify first aid/CPR. (A2.8)
SLO 10.1.1.8: Explain the Workplace Hazardous Material Information System (WHMIS), and identify the safety requirements as they apply to WHMIS. (A2.9) (TSA 13)
SLO 10.1.1.9: Identify and control hazards (A2.10)
SLO 10.1.1.10: Create and maintain a safe and organized working environment.
GLO 1.2: Demonstrate awareness of electrical safety as it pertains to the *Trade Safety Awareness Manual*.

SLO 10.1.2.1: Explain the importance of trade safety and health in reducing injuries and fatalities to young employees in Manitoba. (TSA 1)

SLO 10.1.2.2: Describe the rights and responsibilities of employees, employers, and supervisors under the Workplace Safety and Health Act. (TSA 2)

SLO 10.1.2.3: Describe the steps to use in the Right to Refuse process. (TSA 3)

SLO 10.1.2.4: Explain how and where to find information on workplace safety and health. (TSA 4)

SLO 10.1.2.5: Demonstrate how to handle a potentially dangerous work situation. (TSA 5)

SLO 10.1.2.6: Explain the S.A.F.E. acronym. (TSA 6)

SLO 10.1.2.7: Define workplace safety and health hazards. (TSA 7)

SLO 10.1.2.8: Give examples of trade-specific workplace safety and health hazards. (TSA 8)

SLO 10.1.2.9: Give examples of five types of safety and health hazards. (TSA 9)

SLO 10.1.2.10: Define workplace safety and health risk. (TSA 10)

SLO 10.1.2.11: Give examples of trade-specific workplace safety and health risks. (TSA 11)

SLO 10.1.2.12: Explain the principles of hazard recognition and control as they apply to the electrical trades. (TSA 12)

SLO 10.1.2.13: Match the WHMIS hazardous materials symbols and their meanings. (TSA 14)

SLO 10.1.2.14: Describe the importance of the Material Safety Data Sheets (MSDS). (TSA 15)

SLO 10.1.2.15: Demonstrate proper selection and use of a variety of personal protective equipment and fall protection systems. (TSA 17)
**Goal 2:** Demonstrate the safe and appropriate identification, selection, operation, maintenance, and management of equipment and tools.

**GLO 2.1:** Demonstrate the safe and appropriate identification, selection, operation, maintenance, and management of equipment and tools.

SLO 10.2.1.1: Demonstrate the safe and appropriate identification, selection, and operation of equipment and tools.

SLO 10.2.1.2: Demonstrate the safe and appropriate maintenance and management of equipment and tools.

SLO 10.2.1.3: Describe DC instruments (including the operation of direct current measuring instruments, as well as their construction and use). (A8.3)

**Goal 3:** Demonstrate the safe and appropriate identification, selection, installation, maintenance, and management of devices and materials.

**GLO 3.1:** Demonstrate the safe and appropriate identification, selection, installation, maintenance, and management of devices and materials.

SLO 10.3.1.1: Correctly identify devices and materials.

SLO 10.3.1.2: Maintain and manage devices and materials.

SLO 10.3.1.3: Interpret information (including colour) found on cables and conductors.

SLO 10.3.1.4: Select and install devices and materials according to the Canadian Electrical Code (CEC).

**Goal 4:** Demonstrate an understanding of electrical theory (fundamentals).

**GLO 4.1:** Demonstrate an understanding of electrical theory.

SLO 10.4.1.1: Define terminology and describe basic concepts associated with electrical theory and circuitry. (A7.1)

SLO 10.4.1.2: Describe battery theory, installation, and maintenance. (A7.2)

SLO 10.4.1.3: Describe AC wave forms. (A7.4)

SLO 10.4.1.4: Describe and apply principles and laws that govern electrical circuits. (A8.1)
Goal 5: Demonstrate an understanding of the design, layout, and interpretation of branch circuits and systems.

GLO 5.1: Demonstrate an understanding of the design, layout, and interpretation of branch circuits and systems.

SLO 10.5.1.1: Read, interpret, and draw basic schematic symbols.
SLO 10.5.1.2: Select materials and devices based on the information found on simple wiring diagrams.

Goal 6: Demonstrate the procedures used to install and terminate branch circuits and systems.

GLO 6.1: Demonstrate the procedures used to install and terminate branch circuits and systems.

No applicable SLOs.

Goal 7: Demonstrate an understanding of the testing, troubleshooting, and documentation of branch circuits and systems.

GLO 7.1: Demonstrate an understanding of the testing, troubleshooting, and documentation of branch circuits and systems.

SLO 10.7.1.1: Demonstrate an understanding of the importance of testing, troubleshooting, and documentation of branch circuits and systems.

Goal 8: Describe and demonstrate the transferable cross-curricular knowledge and skills.

GLO 8.1: Read, interpret, and communicate information.

No applicable SLOs.

GLO 8.2: Apply the knowledge and skills from mathematics.

SLO 10.8.2.1: Describe and solve problems using algebraic equations and formulas. (A4.1)
SLO 10.8.2.2: Describe and solve the rules of significant figures. (A4.2)
SLO 10.8.2.3: Describe and solve basic Ohm’s law circuits (series, parallel, and combination). (A4.3)
GLO 8.3: Apply the knowledge and skills from the sciences.

SLO 10.8.2.1: Describe simple machines, force, and pressure related to electrical trade applications. (A4.6)
SLO 10.8.3.2: Describe Charles’ law and Boyle’s law. (A4.7)

GLO 8.4: Apply the knowledge and skills from information and communication technology.

No applicable specific learning outcomes.

Goal 9: Understand career opportunities and working conditions.

GLO 9.1: Describe apprenticeship, education, career opportunities, professional organizations, and working conditions related to electrical trades technology and associated fields.

SLO 10.9.1.1: Demonstrate an awareness of apprenticeship.
SLO 10.9.1.2: Demonstrate an understanding of various electrical trades and associated occupations.

Goal 10: Demonstrate awareness of sustainability.

GLO 10.1: Describe the impact of human sustainability on the health and well-being of tradespersons working in the electrical trades and those who use their services.

SLO 10.10.1.1: Demonstrate an awareness of the advantages of electricity and the contributions of electrical tradespersons to human well-being.

GLO 10.2: Describe the electrical trade’s sustainability practices and impact on the environment.

SLO 10.10.2.1: Minimize wastage of materials.
SLO 10.10.2.2: Practise reducing, reusing, and recycling materials.

GLO 10.3: Describe sustainable business practices within the electrical trades.

SLO 10.10.3.1: Demonstrate an understanding of the importance of reducing, reusing, and recycling materials.
Goal 11: Demonstrate awareness of ethical and legal standards as they pertain to the electrical trades.

GLO 11.1: Demonstrate awareness of ethical and legal standards.

SLO 10.11.1.1: Demonstrate awareness of ethical standards.
SLO 10.11.1.2: Demonstrate respect for school property, including tools, materials, and equipment.
SLO 10.11.1.3: Demonstrate an understanding of the legal requirements related to the electrical trades.

GLO 11.2: Demonstrate an understanding of electrical codes.

SLO 10.11.2.1: Demonstrate an awareness of code standards in construction.
SLO 10.11.2.2: Describe the objectives and scope of the Canadian Electrical Code (CEC). (A5.1)
SLO 10.11.2.2: Describe residential system voltages and circuitry. (A5.2)

Goal 12: Demonstrate employability skills.

GLO 12.1: Demonstrate fundamental employability skills.

SLO 10.12.1.1: Demonstrate regular and punctual attendance.
SLO 10.12.1.2: Demonstrate the ability to communicate respectfully and effectively with teachers, supervisors, co-workers, and students.
SLO 10.12.1.3: Demonstrate accountability by taking responsibility for their actions.
SLO 10.12.1.4: Demonstrate adaptability, initiative, and effort.
SLO 10.12.1.5: Demonstrate teamwork skills.
SLO 10.12.1.6: Demonstrate the ability to stay on task and effectively use time in class and work environments.
SLO 10.12.1.7: Demonstrate the responsible use of wireless communication devices.

GLO 12.2: Demonstrate an awareness of cultural competence and its importance in the workplace.

SLO 10.12.2.1: Demonstrate an awareness of culture.
**GLO 12.3:** Demonstrate an understanding of the **business operation** of an electrical trades facility.

SLO 10.12.3.1: Participate in classroom and workstation cleanup.

**GLO 12.4:** Demonstrate **critical thinking skills** in planning, procedures, analysis, and diagnosis.

SLO 10.12.4.1: Demonstrate an awareness of the need for critical thinking and problem solving while working in the electrical trades.

**Goal 13:** Understand the **evolution, technological progression, and emerging trends** in the electrical trades.

**GLO 13.1:** Understand the **evolution, technological progression, and emerging trends** in the electrical trades.

SLO 10.13.1.1: Demonstrate an understanding of the history, technological progression, and emerging trends in the electrical trades.