



9054

EXPLORATION OF ELECTRICAL
TRADES TECHNOLOGY (9)

15S/15E/15M

10S/10E/10M

An Electrical Trades Technology Course

9054: EXPLORATION OF ELECTRICAL TRADES TECHNOLOGY (9) 15S/15E/15M AND 10S/10E/10M

Course Description

This is an optional course intended for students wishing to sample the electrical trades. The emphasis is on hands-on activities. 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 9.1.1.1: Identify safety and health requirements. (A2.1)

- overview of *The Workplace Safety and Health Act* (“the Act”)
 - rights and responsibilities of employees under the *Act*
 - rights and responsibilities of employers under the *Act*
 - rights and responsibilities of supervisors under the *Act*
- fourteen (14) regulations
- codes of practice
- guidelines
- right to refuse
 - explanation of right to refuse process
 - rights and responsibilities of employees
 - rights and responsibilities of employers
 - rights and responsibilities of supervisors under the *Act*

SLO 9.1.1.2: Describe the importance of using personal protective equipment (PPE), and identify PPE and procedures related to PPE. (A2.2) (TSA 16)

- employer and employee responsibilities as related to personal protective equipment.
- standards: Canadian Standards Association (CSA), American National Standards Institute (ANSI) and guidelines
- work protective clothing and danger if it fits poorly.
- gloves—importance of proper glove selection (when handling chemicals, cold items, slivers, etc.)
- headwear—appropriate protective headwear when required and the approved type of headwear.

- eye protection—comparison and distinction of everyday eyeglasses, industrial safety glasses and safety goggles
 - foot protection—when required according to safety standards
 - hearing protection
 - hazards of various noise levels (hearing protection must be worn)
 - laws
 - types of hearing protection
 - respiratory protection—types, overview of proper selection
 - fall protection—Manitoba requirements standards guidelines
 - ANSI (U.S.A. standards), etc.
 - ladders and scaffolding
 - safety principles for working with or around industrial trucks site-specific (forklifts, pallet trucks, etc.)
- SLO 9.1.1.3: Outline the safety principles for working on and around electrical equipment. (A2.3) (TSA 18)
- effects of electric current on the human body
 - three factors that affect the severity of an electric shock
 - the effects of arc and blast on the human body and equipment
 - work with energized equipment
- SLO 9.1.1.4: Identify fire safety and outline workplace fire safety principles. (A2.4) (TSA 19)
- types of fires
 - types of firefighting equipment
 - classifications of fire extinguishers (A, B and C)
 - location of fire extinguishers and fire exits
 - fire alarms and drills
- SLO 9.1.1.5: Recognize and control hazards. (A2.6)
- safe work practices
 - basic risk assessment
 - injury prevention and control measures
 - identification of hazards involved in pneumatic tool use and explanation of how to guard against them

- SLO 9.1.1.6: Identify the hazards in confined spaces and the preparation needed to work in a confined space. (A2.7) (TSA 20)
- identification of a confined space
 - hazards of a confined space
 - physical
 - biological
 - working in a confined space
 - emergency response plan
 - self-contained breathing apparatus (SCBA)
- SLO 9.1.1.7: Identify first aid/CPR. (A2.8)
- overview of first-aid regulation
 - obligations of employers regarding first aid
 - Who is certified to provide first aid?
 - What to do while waiting for help?
 - Where is first-aid kit?
 - describe basic first-aid requirements and techniques
 - scope and limits of first-aid intervention
 - specific interventions (cuts, burns, abrasions, fractures, suffocation, shock, electrical shock, etc.)
 - What is it?
 - interface with other services and agencies (e.g. Workers Compensation claims)
 - describe basic cardiopulmonary resuscitation (CPR) requirements and techniques
 - How do you get certified?
 - scope and limits of CPR intervention (include varieties of CPR certification)
- SLO 9.1.1.8: Explain the Workplace Hazardous Material Information System (WHMIS), and identify the safety requirements as they apply to WHMIS. (A2.9) (TSA 13)
- WHMIS is a system
 - provincial regulation under *The Workplace Safety and Health Act*
 - each province has a WHMIS regulation
 - Federal *Hazardous Products Act*
 - WHMIS generic training:
 - WHMIS defined and the format used to convey information about hazardous materials in the workplace

- information found on supplier and workplace labeling using WHMIS
- hazardous materials in accordance with WHMIS
- compliance with government safety standards and regulations
- description of WHMIS (include varieties of WHMIS Certification)
 - typology of WHMIS labels, symbols, and classifications
 - scope and use of Materials Safety Data Sheets (MSDS)

SLO 9.1.1.9: Identify and control hazards (A2.10)

- basic control measures (injury prevention)
- safe work procedures
- explanation on the importance of industrial housekeeping
- employer responsibilities
- how and where to store materials
- safety measures related to walkways, stairs and floor openings
- explanation of how to protect the worker and others when working in traffic paths

SLO 9.1.1.10: 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*.

No applicable SLOs.

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

SLO 9.2.1.2: Demonstrate the safe and appropriate maintenance and management of equipment and tools.

SLO 9.2.1.3: Demonstrate awareness of DC instruments.

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 9.3.1.1: Correctly identify devices and materials.

SLO 9.3.1.2: Maintain and manage devices and materials.

SLO 9.3.1.3: Interpret information (including colour) found on cables and conductors.

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

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

SLO 9.4.1.1: Demonstrate awareness of Ohm's law.

SLO 9.4.1.2: Demonstrate awareness of the theory behind and the differences between series and parallel circuits.

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.**

No applicable SLOs.

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.**

SLO 9.6.1.1: Construct circuits.

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 9.7.1.1: Troubleshoot circuits.

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**.

No applicable SLOs.

GLO 8.3: Apply the knowledge and skills from the **sciences**.

SLO 9.8.3.1: Describe fundamental terms such as current, voltage, resistance, and power.

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

No applicable SLOs.

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.

No applicable SLOs.

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.

No applicable SLOs.

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

SLO 9.10.1.1: Minimize wastage of materials.

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

No applicable SLOs.

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**.

No applicable SLOs.

GLO 11.2: Demonstrate an understanding of **electrical codes**.

SLO 9.11.2.1: Demonstrate problem-solving skills.

GLO 11.3: Demonstrate respectful interactions with individuals of different **cultures**.

No applicable SLOs.

Goal 12: Demonstrate **employability skills**.

GLO 12.1: Demonstrate fundamental **employability skills**.

SLO 9.12.1.1: Demonstrate regular and punctual attendance.

SLO 9.12.1.2: Demonstrate the ability to communicate respectfully and effectively with teachers, supervisors, co-workers, and students.

SLO 9.12.1.3: Demonstrate accountability by taking responsibility for their actions.

SLO 9.12.1.4: Demonstrate adaptability, initiative, and effort.

SLO 9.12.1.5: Demonstrate teamwork skills.

SLO 9.12.1.6: Demonstrate the ability to stay on task and effectively use time in class and work environments.

SLO 9.12.1.7: Demonstrate the responsible use of wireless communication devices.

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

No applicable SLOs.

GLO 12.3: Demonstrate an understanding of the **business operation** of an electrical trades facility.

SLO 9.12.3.1: Participate in classroom and workstation cleanup.

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

SLO 9.12.4.1: Demonstrate an awareness of the need for critical thinking and problem solving.

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.

No applicable SLOs.
