



9055

INTRODUCTION TO ELECTRICAL  
TRADES TECHNOLOGY (10)

20S/20E/20M

An Electrical Trades Technology Course



# 9055: INTRODUCTION TO ELECTRICAL TRADES TECHNOLOGY (10) 20S/20E/20M

## 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.

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**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.
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**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)
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**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)

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**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).

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**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)
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**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.

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**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.

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**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.

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

**GLO 8.1:** **Read, interpret, and communicate** information.

No applicable SLOs.

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**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)

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**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)

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

No applicable specific learning outcomes.

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**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.

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**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.

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**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.

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**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.

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**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.

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**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)

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**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.

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**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.

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**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.

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**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.

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**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.

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