



9052

MICROPROCESSORS (12C)

40S/40E/40M

An Electronics Technology Course



# 9052: MICROPROCESSORS (12C)

## 40S/40E/40M

### Course Description

This course focuses on the branch of digital logic dealing with programmable devices. Students will learn basic programming control structures and how to use microprocessors to perform rudimentary functions.

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**Goal 1:** Describe and apply appropriate **health and safety** practices.

**GLO 1.1:** Describe and apply appropriate **health and safety** practices.

- SLO 12C.1.1.1: Create and maintain a safe work environment.
  - SLO 12C.1.1.2: Demonstrate awareness of the rights and responsibilities of employees, employers, and supervisors under the Workplace Health and Safety Act (Manitoba).
  - SLO 12C.1.1.3: Demonstrate awareness of the rights and responsibilities of employees, employers, and supervisors as they relate to the right to refuse work as described in the Workplace Health and Safety Act (Manitoba).
  - SLO 12C.1.1.4: Describe and utilize personal protective equipment (PPE) and follow prescribed procedures.
  - SLO 12C.1.1.5: Demonstrate an awareness of electrical safety.
  - SLO 12C.1.1.6: Demonstrate an awareness of fire safety.
  - SLO 12C.1.1.7: Recognize and control hazards.
  - SLO 12C.1.1.8: Identify the safety requirements as they apply to WHMIS for products used in an electronics technology facility.
  - SLO 12C.1.1.9: Demonstrate an understanding of how Ohm's law relates to electrical safety.
  - SLO 12C.1.1.10: Demonstrate awareness of emergency procedures related to electrical shock.
  - SLO 12C.1.1.11: Demonstrate awareness of shop safety procedures.
  - SLO 12C.1.1.12: Demonstrate awareness of accident reporting procedures.
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**Goal 2: Demonstrate the **identification, selection, utilization, and maintenance** of **tools and materials**.**

**GLO 2.1:** Demonstrate the **identification** and **selection** of tools and materials.

SLO 12C.2.1.1: Identify and select appropriate tools and materials.

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**GLO 2.2:** Demonstrate the **utilization** of tools and materials.

SLO 12C.2.2.1: Demonstrate the appropriate utilization of tools and materials.

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**GLO 2.3:** Demonstrate the **maintenance** of tools and materials.

SLO 12C.2.3.1: Demonstrate the appropriate maintenance of tools and materials.

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**Goal 3: Demonstrate the **identification, selection, value determination, and utilization** of **components**.**

**GLO 3.1:** Demonstrate the **identification** and **selection** of components.

SLO 12C.3.1.1: Identify and select appropriate support components related to microprocessors.

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**GLO 3.2:** Demonstrate the appropriate **value determination** of components.

No applicable SLOs.

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**GLO 3.3:** Demonstrate the appropriate **utilization** of components.

SLO 12C.3.3.1: Demonstrate the appropriate utilization of components related to microprocessors.

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**Goal 4: Demonstrate the **utilization and maintenance** of **equipment**.**

**GLO 4.1: Demonstrate the **utilization and maintenance** of **equipment other than diagnostic equipment**.**

SLO 12C.4.1.1: Demonstrate the appropriate utilization and maintenance of equipment other than diagnostic equipment.

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**GLO 4.2: Demonstrate the **utilization and maintenance** of **diagnostic equipment**.**

No applicable SLOs.

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**Goal 5: Demonstrate **schematic reading**.**

**GLO 5.1: Read, understand, and interpret **schematic diagrams**.**

SLO 12C.5.1.1: Read, understand, and interpret flowcharts.

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**GLO 5.2: Demonstrate **rendering**.**

SLO 12C.5.2.1: Render flowcharts.

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**GLO 5.3: Demonstrate **breadboarding**.**

SLO 12C.5.3.1: Demonstrate the appropriate use of solderless breadboards to construct microprocessor systems.

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**Goal 6:** Demonstrate an understanding of **electrical theory** and the **analysis of electrical circuits**.

**GLO 6.1:** Demonstrate an understanding of **electrical theory**.

- SLO 12C.6.1.1: Demonstrate an understanding of basic microprocessor architecture.
  - SLO 12C.6.1.2: Demonstrate an understanding of basic microprocessor output.
  - SLO 12C.6.1.3: Demonstrate an understanding of basic microprocessor input.
  - SLO 12C.6.1.4: Demonstrate an understanding of basic servo control.
  - SLO 12C.6.1.5: Demonstrate an understanding of RC discharge time as used as a microprocessor input.
  - SLO 12C.6.1.6: Demonstrate an understanding of 7-segment LED display control.
  - SLO 12C.6.1.7: Demonstrate an understanding of the use of light sensors as microprocessor input.
  - SLO 12C.6.1.8: Demonstrate an understanding of signal generation as microprocessor output.
  - SLO 12C.6.1.9: Demonstrate an understanding of microprocessor/digital interfacing.
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**GLO 6.2:** Demonstrate the procedures for **analyzing electrical circuits**.

- SLO 12C.6.2.1: Analyze the operation of basic microprocessor output.
  - SLO 12C.6.2.2: Analyze the operation of basic microprocessor input.
  - SLO 12C.6.2.3: Analyze the operation of basic servo control.
  - SLO 12C.6.2.4: Analyze the operation of RC discharge time as used as a microprocessor input.
  - SLO 12C.6.2.5: Analyze the operation of 7-segment LED display control.
  - SLO 12C.6.2.6: Analyze the operation of the use of light sensors as microprocessor input.
  - SLO 12C.6.2.7: Analyze the operation of signal generation as microprocessor output.
  - SLO 12C.6.2.8: Analyze the operation of microprocessor/digital interfacing.
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**GLO 6.3:** Demonstrate an understanding of applied **programming** of microprocessors.

SLO 12C.6.3.1: Demonstrate an understanding of basic control and decision structures.

SLO 12C.6.3.2: Demonstrate an understanding of language-specific microprocessor commands.

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**Goal 7:** Demonstrate **soldering skills, fabricating printed circuit boards,** and **selecting and installing** components.

**GLO 7.1:** Demonstrate **soldering skills.**

No applicable SLOs.

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**GLO 7.2:** Demonstrate the procedures for **selecting** and **installing components.**

No applicable SLOs.

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**Goal 8:** Describe and demonstrate the transferable **cross-curricular** knowledge and skills as they apply to electronics technology.

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

SLO 12.C.8.1.1: Demonstrate appropriate documentation by completing a lab report, which includes the following: describing the method, recording and analyzing results, and drawing conclusions.

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**GLO 8.2:** Apply the knowledge and skills from **mathematics.**

No applicable SLOs.

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**Goal 9:** Understand **education, career opportunities, employment conditions,** and **professional organizations** in the electronics industry.

**GLO 9.1:** Understand **education, career opportunities, employment conditions,** and **professional organizations** in the electronics industry.

No applicable SLOs.

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**Goal 10:** Demonstrate awareness of **sustainability** as it pertains to electronics technology.

**GLO 10.1:** Describe the impact of **human sustainability** on the health and well-being of electronics technicians and those who use their products.

SLO 12C.10.1.1: Discuss how large-scale integration has made electronics technology more powerful and accessible for people.

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**GLO 10.2:** Describe the electronic technology's sustainability practices and impact on the **environment**.

No applicable SLOs.

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**Goal 11:** Demonstrate awareness of the **ethical standards and legal issues**.

**GLO 11.1:** Demonstrate awareness of the **ethical standards and legal issues**.

SLO 12C.11.1.1: Discuss the legal requirements found in the Certified Engineering Technologist's Code of Ethics.

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**Goal 12:** Demonstrate **employability skills**.

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

SLO 12C.12.1.1: Demonstrate regular and punctual attendance.

SLO 12C.12.1.2: Demonstrate the ability to communicate respectfully and effectively with teachers, supervisors, co-workers, and students.

SLO 12C.12.1.3: Demonstrate accountability by taking responsibility for one's actions.

SLO 12C.12.1.4: Demonstrate adaptability, initiative, and effort.

SLO 12C.12.1.5: Demonstrate the ability to accept and follow direction and feedback.

SLO 12C.12.1.6: Demonstrate teamwork skills.

SLO 12C.12.1.7: Demonstrate the ability to stay on task and effectively use time in class and work environments.

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

SLO 12B.12.2.1: Discuss the principles of cultural proficiency.

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**GLO 12.3:** Demonstrate **critical thinking skills** in planning, procedures, analysis, and diagnosis.

No applicable SLOs.

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**Goal 13:** Understand the **evolution, technological progression,** and **emerging trends** in electronics technology.

**GLO 13.1:** Describe the **evolution, technological progression,** and **emerging trends** in electronics technology.

SLO 12C.13.1.1: Demonstrate awareness of the evolution, technological progression, and emerging trends in microprocessors.

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