



9053

MICROPROCESSOR
APPLICATIONS (12D)

40S/40E/40M

An Electronics Technology Course

9053: MICROPROCESSOR APPLICATIONS (12D) 40S/40E/40M

Course Description

This course builds on the skills and theory learned in Microprocessors. It focuses on higher-level functions such as analog to digital and digital to analog conversion, pulse-width modulation, frequency sampling, etc.

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

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

- SLO 12D.1.1.1: Create and maintain a safe work environment.
 - SLO 12D.1.1.2: Demonstrate awareness of the rights and responsibilities of employees, employers, and supervisors under the Workplace Health and Safety Act (Manitoba).
 - SLO 12D.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 12D.1.1.4: Describe and utilize personal protective equipment (PPE) and follow prescribed procedures.
 - SLO 12D.1.1.5: Demonstrate an awareness of electrical safety.
 - SLO 12D.1.1.6: Demonstrate an awareness of fire safety.
 - SLO 12D.1.1.7: Recognize and control hazards.
 - SLO 12D.1.1.8: Identify the safety requirements as they apply to WHMIS for products used in an electronics technology facility.
 - SLO 12D.1.1.9: Demonstrate an understanding of how Ohm's law relates to electrical safety.
 - SLO 12D.1.1.10: Demonstrate awareness of emergency procedures related to electrical shock.
 - SLO 12D.1.1.11: Demonstrate awareness of shop safety procedures.
 - SLO 12D.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 12D.2.1.1: Identify and select appropriate tools and materials.

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

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

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

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

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

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

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

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

No applicable SLOs.

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

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

Goal 4: Demonstrate the utilization and maintenance of equipment.

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

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

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

No applicable SLOs.

Goal 5: Demonstrate schematic reading.

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

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

GLO 5.2: Demonstrate rendering.

SLO 12D.5.2.1: Render flowcharts.

GLO 5.3: Demonstrate breadboarding.

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

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

GLO 6.1: Demonstrate an understanding of electrical theory.

SLO 12D.6.1.1: Demonstrate an understanding of analog and digital comparators.

SLO 12D.6.1.2: Demonstrate an understanding of parallel and serial communication circuits.

SLO 12D.6.1.3: Demonstrate an understanding of analog to digital conversion.

SLO 12D.6.1.4: Demonstrate an understanding of digital to analog conversion.

SLO 12D.6.1.5: Demonstrate an understanding of pulse width modulation.

SLO 12D.6.1.6: Demonstrate an understanding of frequency analysis.

GLO 6.2: Demonstrate the procedures for **analyzing electrical circuits**.

SLO 12D.6.2.1: Analyze the operation of analog and digital comparators.

SLO 12D.6.2.2: Analyze the operation of parallel and serial communication circuits.

SLO 12D.6.2.3: Analyze the operation of analog to digital convertors.

SLO 12D.6.2.4: Analyze the operation of digital to analog convertors.

SLO 12D.6.2.5: Analyze the operation of circuits using pulse width modulation.

SLO 12D.6.2.6: Analyze the operation of frequency analyzers.

SLO 12D.6.2.7: Apply pulse width modulation to digital to analog conversion.

SLO 12D.6.2.8: Apply RC time constants to light spectrum analysis.

GLO 6.3: Demonstrate an understanding of applied **programming of microprocessors**.

SLO 12D.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.

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

GLO 7.1: Demonstrate **soldering skills**.

No applicable SLOs.

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

No applicable SLOs.

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.

No applicable SLOs.

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

No applicable SLOs.

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.

SLO 12D.9.1.1: Discuss the process for finding employment in the electronics industry.

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.

No applicable SLOs.

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

No applicable SLOs.

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

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

No applicable SLOs.

Goal 12: Demonstrate employability skills.**GLO 12.1: Demonstrate fundamental employability skills.**

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

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

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

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

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

SLO 12D.12.1.6: Demonstrate teamwork skills.

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

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

No applicable SLOs.

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

No applicable SLOs.

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.**

No applicable SLOs.
