



9051  
ADVANCED DIGITAL  
SYSTEMS (12B)

40S/40E/40M

An Electronics Technology Course



# 9051: ADVANCED DIGITAL SYSTEMS (12B)

## 40S/40E/40M

### Course Description

This course builds on the skills and theory learned in Digital Devices and Basic Logic. It focuses on higher-level functions such as multiplexers, decoders, counters, displays, etc.

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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 12B.1.1.1: Create and maintain a safe work environment.
  - SLO 12B.1.1.2: Demonstrate awareness of the rights and responsibilities of employees, employers, and supervisors under the Workplace Health and Safety Act (Manitoba).
  - SLO 12B.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 12B.1.1.4: Describe and utilize personal protective equipment (PPE) and follow prescribed procedures.
  - SLO 12B.1.1.5: Demonstrate an awareness of electrical safety.
  - SLO 12B.1.1.6: Demonstrate an awareness of fire safety.
  - SLO 12B.1.1.7: Recognize and control hazards.
  - SLO 12B.1.1.8: Identify the safety requirements as they apply to WHMIS for products used in an electronics technology facility.
  - SLO 12B.1.1.9: Demonstrate an understanding of how Ohm's law relates to electrical safety.
  - SLO 12B.1.1.10: Demonstrate awareness of emergency procedures related to electrical shock.
  - SLO 12B.1.1.11: Demonstrate awareness of shop safety procedures.
  - SLO 12B.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 12B.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 12B.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 12B.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 12B.3.1.1: Identify and select appropriate components related to digital systems.

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

SLO 12B.3.2.1: Determine values of components.

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

SLO 12B.3.3.1: Demonstrate the appropriate utilization of components related to digital systems.

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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 12B.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.**

SLO 12B.4.2.1: Demonstrate the appropriate utilization and maintenance of diagnostic equipment related to digital systems.

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**Goal 5: Demonstrate schematic reading.**

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

SLO 12B.5.1.1: Read, understand, and interpret digital logic diagrams.

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**GLO 5.2: Demonstrate rendering.**

SLO 12B.5.2.1: Render digital logic diagrams.

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**GLO 5.3: Demonstrate breadboarding.**

SLO 12B.5.3.1: Demonstrate the appropriate use of solderless breadboards to construct digital circuits.

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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 12B.6.1.1: Demonstrate an understanding of counters and shift registers.

SLO 12B.6.1.2: Demonstrate an understanding of encoders and decoders.

SLO 12B.6.1.3: Demonstrate an understanding of multiplexers and demultiplexers.

SLO 12B.6.1.4: Demonstrate an understanding of displays (i.e., 7-segment display).

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

SLO 12B.6.2.1: Analyze the operation of counters and shift registers constructed from flip-flops.

SLO 12B.6.2.2: Analyze the operation of encoders and decoders.

SLO 12B.6.2.3: Analyze the operation of multiplexers and demultiplexers.

SLO 12B.6.2.4: Analyze the operation of displays (i.e., 7-segment display).

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

No applicable SLOs.

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

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

SLO 12B.7.1.1: Demonstrate appropriate soldering skills.

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

SLO 12B.7.2.1: Appropriately select and install components.

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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.

No applicable SLOs.

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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.

SLO 12B.9.1.1: Demonstrate awareness of the professional organizations in the electronics industry.

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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.

No applicable SLOs.

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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 12B.11.1.1: Discuss the legal issues pertaining to current issues in electronics technology (e.g., cell phone contracts, cablevision or Internet packages, pirating music or videos).

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

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

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

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

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

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

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

SLO 12B.12.1.6: Demonstrate teamwork skills.

SLO 12B.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 need to interact positively with people of different cultures in society and in the workplace.

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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.

No applicable SLOs.

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