



9049

SEMICONDUCTOR POWER
DEVICES (11C)

30S/30E/30M

An Electronics Technology Course

9049: SEMICONDUCTOR POWER DEVICES (11C) 30S/30E/30M

Course Description

This course builds on the semiconductor theory learned in Semiconductor Technology and Signal Devices. It focuses on power devices, such as thyristors, power transistors, and MOSFETs, as well as their applications.

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

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

- SLO 11C.1.1.1: Create and maintain a safe work environment.
 - SLO 11C.1.1.2: Describe and utilize personal protective equipment (PPE) and follow prescribed procedures.
 - SLO 11C.1.1.3: Demonstrate an awareness of electrical safety.
 - SLO 11C.1.1.4: Demonstrate an awareness of fire safety.
 - SLO 11C.1.1.5: Recognize and control hazards.
 - SLO 11C.1.1.6: Demonstrate an understanding of how Ohm's law relates to electrical safety.
 - SLO 11C.1.1.7: Demonstrate awareness of emergency procedures related to electrical shock.
 - SLO 11C.1.1.8: Demonstrate awareness of shop safety procedures.
 - SLO 11C.1.1.9: Demonstrate awareness of accident reporting procedures.
 - SLO 11C.1.1.10: Demonstrate awareness of the rights and responsibilities of employees, employers, and supervisors under the Workplace Health and Safety Act (Manitoba).
 - SLO 11C.1.1.11: 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 11C.1.1.12: Identify the safety requirements as they apply to WHMIS for products used in an electronics technology facility.
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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 11C.2.1.1: Identify and select appropriate tools and materials.

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

SLO 11C.2.2.1: Demonstrate the appropriate utilization of tools and materials.

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

SLO 11C.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 11C.3.1.1: Identify and select appropriate semiconductor power devices.

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

SLO 11C.3.2.1: Determine values of components.

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

SLO 11C.3.3.1: Demonstrate the appropriate utilization of semiconductor power devices.

Goal 4: Demonstrate the utilization and maintenance of equipment.

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

SLO 11C.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 11C.5.1.1: Read, understand, and interpret schematic diagrams related to semiconductor power devices.

GLO 5.2: Demonstrate rendering.

SLO 11C.5.2.1: Render schematic diagrams.

GLO 5.3: Demonstrate breadboarding.

SLO 11C.5.3.1: Demonstrate the appropriate use of solderless breadboards.

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

GLO 6.1: Demonstrate an understanding of electrical theory.

SLO 11C.6.1.1: Demonstrate an understanding of how thyristors work (i.e., SCR, triac, diac).

SLO 11C.6.1.2: Demonstrate an understanding of a PUT device as used in power circuits.

GLO 6.2: Demonstrate the procedures for analyzing electrical circuits.

SLO 11C.6.2.1: Analyze thyristor circuits.

SLO 11C.6.2.2: Analyze PUT controlled circuits.

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

GLO 7.1: Demonstrate **soldering skills.**

SLO 11C.7.1.1: Demonstrate appropriate soldering skills.

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

SLO 11C.7.2.1: Appropriately select and install components.

GLO 7.3: Demonstrate the procedures for **fabricating printed circuit boards.**

SLO 11C.7.3.1: Fabricate circuit boards.

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 11C.8.1.1: Read, interpret, and communicate information related to electronics technology.

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

No applicable SLOs.

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

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.

No applicable SLOs.

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 11C.12.1.1: Demonstrate regular and punctual attendance.

SLO 11C.12.1.2: Demonstrate the ability to communicate respectfully and effectively with teachers, supervisors, co-workers, and students.

SLO 11C.12.1.3: Demonstrate accountability by taking responsibility for one's actions.

SLO 11C.12.1.4: Demonstrate adaptability, initiative, and effort.

SLO 11C.12.1.5: Demonstrate the ability to accept and follow direction and feedback.

SLO 11C.12.1.6: Demonstrate teamwork skills.

SLO 11C.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.
