Section II
Curriculum Design and Components

Program Components

The Control Technology Module is the third of five modules to be delivered at the Intermediate level. It is recommended students complete the Control Technology Module after completing the Production Technology Module at the grade 8 level, as each module builds on knowledge and skills obtained in previous modules. The recommended delivery order of modules is: Grade 7 Communications, Grade 8 Production, Grade 8 Control, Grade 9 Energy & Power and Grade 9 Biotechnology Modules.

Outcomes Structure

Curriculum content and student activities are defined with respect to a structure of curriculum outcomes (Figure 1). The essential components of the outcomes structure are:

EGL’s. Essential Graduation Learnings are statements describing the knowledge, skills, and attitudes expected of all students who graduate from high school.

GCO’s. General Curriculum Outcomes are statements that identify what students are expected to know and be able to do upon completion of study in a curriculum area.

KSCO’s. Key Stage Curriculum Outcomes provide additional detail for each of the GCO’s. There are four Key Stages - Key Stage 1 (K-Grade 3), Key Stage 2 (Grades 4-6), Key Stage 3 (Grades 7-9), and Key Stage 4 (Grades 10-12). Key Stage Curriculum Outcomes provide a means to quickly assess progress in a subject area at the end of a level of schooling.
SCO’s. Specific Curriculum Outcomes are statements which describe knowledge, skills, and attitudes, in measurable terms, that students should possess upon completion of a grade level or course (e.g., Grade 8 Control Technology Module).

Figure 1

**Curriculum Guide Structure**

Curriculum Guides are developed for a course of study. This guide contains the SCO’s for the course (Section III) and presents other information related to it. Content is presented in four columns that span across two pages. Each set of two pages has an Organizer stated at the top. An Organizer may be a topic or some other statement which is employed to create a discrete component of the course. The four columns of content include:

I **Specific Curriculum Outcomes.** The set is one or more SCO’s from the course that will be addressed by the organizer. Each SCO also contains a listing of the KSCO’s it directly relates to (the relative KSCO’s are included in brackets). The KSCO would be those for the subject area the course fits.
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II Suggested Teaching and Learning Strategies. Suggested Teaching/Learning Strategies are recommendations for implementing the curriculum. This section could include Organization and Preparation and Sample Student Projects and Activities sections.

III Suggested Assessment and Evaluation Strategies. Suggested Assessment and Evaluation Strategies are recommendations for determining student achievement. Suggestions are provided to assist the teacher with the evaluation and assessment of student activity.

IV Resources. This column provides additional information that may be of help to the teacher in lesson planning. References to teacher and student texts, appendix material, and other resources will be included here.

The appendices in this guide provide additional material and resource support to the teacher. Concepts, strategies, and resources identified in the guide are elaborated upon in the appendices.

Essential Graduation Learnings

Essential Graduation Learnings are documented in the Outcomes section of the Foundation for the Atlantic Canada Technology Education Curriculum (2001) document. The Essential Graduation Learnings for (EGL’s) are:

- **Aesthetic Expression.** Graduates will be able to respond with critical awareness to various forms of the arts and be able to express themselves through the arts.

- **Citizenship.** Graduates will be able to assess social, cultural, economic, and environmental interdependence in a local and global context.

- **Communication.** Graduates will be able to use the listening, viewing, speaking, reading, and writing modes of language(s), and mathematical and scientific concepts and symbols, to think, learn, and communicate effectively.

- **Personal Development.** Graduates will be able to continue to learn and to pursue an active, healthy lifestyle.

- **Problem Solving.** Graduates will be able to use the strategies and processes needed to solve a wide variety of problems, including those requiring language, and mathematical and scientific concepts.
• **Technological Competence.** Graduates will be able to use a variety of technologies, demonstrate an understanding of technological applications, and apply appropriate technologies for solving problems.

• **Spiritual and Moral Development.** Graduates will be able to demonstrate understanding and appreciation for the place of belief systems in shaping the development of moral values and ethical conduct.

Reference to the *Foundation for the Atlantic Canada Technology Education Curriculum (2001)* document is encouraged.

### General Curriculum Outcomes (GCO’s)

Technology Education curriculum in the Atlantic Provinces is defined in terms of five General Curriculum Outcomes (GCO’s). These define the intent and focus of the Technology Education Program and apply from Kindergarten to Grade 12. They are:

• **GCO 1: Technological Problem Solving.** Students will be expected to design, develop, evaluate, and articulate technological solutions.

• **GCO 2: Technological Systems.** Students will be expected to evaluate and manage technological systems.

• **GCO 3: History and Evolution of Technology.** Students will be expected to demonstrate an understanding of the history and evolution of technology, and of its social and cultural implications.

• **GCO 4: Technology and Careers.** Students will be expected to demonstrate an understanding of current and evolving careers and of the influence of technology on the nature of work.

• **GCO 5: Technological Responsibility.** Students will be expected to demonstrate an understanding of the consequences of their technological choices.
Key Stage Curriculum Outcomes (KSCO’s)

Key Stage Curriculum Outcomes

The Key Stage Curriculum Outcomes for Technology Education are listed in the Outcomes section of the *Foundation for the Atlantic Canada Technology Education Curriculum (2001)* document. Key Stage Curriculum Outcomes (KSCO’s) expand the intent of the GCO’s and summarize what is expected of students during each of the four Key Stages. The Grade 8 Control Technology Module adheres to the KSCO’s at the Key Stage 3 level (Grades 7-9).

Key Stage 3 Curriculum Outcomes listed are organized according to each of the five General Curriculum Outcomes (GCO’s) for the Atlantic Canada Technology Education Curriculum.

By the end of grade 9, students will have achieved the outcomes for entry to grade 6 (Key Stage 1 and Key Stage 2) and will also be expected to:

1.301 articulate problems that may be solved through technological means
   • examine problem situations
   • construct simple design briefs that include the problem statement and conditions affecting the solution

1.302 conduct design studies to identify a technological solution to a problem
   • investigate related solutions
   • document a range of options to solve the problem
   • determine and justify the best option
   • create a plan of action that includes technical sketches

1.303 develop (prototype, fabricate, make) technological solutions to problems
   • identify appropriate tools and resources
   • employ safe practices and resource conservation
• develop the solution with redesign as necessary to ensure the design brief is satisfied
• document all activities and decisions

1.304 critically evaluate technological solutions and report their findings
• use established and their own criteria to evaluate the effectiveness of both their own and others’ technological solutions
• assess solution components and incorporate the required changes during the design activity
• document and report their changes, the rationale for change, and conclusions

1.305 communicate ideas and information about technological solutions through appropriate technical means
• create more sophisticated orthographic and isometric views
• create alternate representations, such as computer animations and physical models

GCO 2

Technological Systems

2.301 operate, monitor, and adjust a representative range of technological systems
2.302 manage a representative range of technological systems
2.303 employ programming logic and control systems to sense, switch, and regulate events and processes
2.304 classify technological systems, using one or more schema, and determine their operational components and parameters (e.g., schema include general make-up, underlying principles and purposes, and sub-systems)
2.305 diagnose and repair malfunctioning systems
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GCO 3
History and Evolution of Technology

3.301 examine the historical evolution of technologies and predict future developments

3.302 investigate ways that science activities depend on technology and that inventions in technology depend on science

3.303 examine technological literacy and capability in modern society and their effects on citizenship and education

3.304 evaluate the effects of rapid change in technological systems on people in their schools and communities

3.305 account for effects of cultural diversity on technological solutions
  - examine the effects of culture on traditional products, and vice versa
  - explore how products are designed differently for different markets
  - apply their understanding of cultural preferences when developing technological solutions

GCO 4
Technology and Careers

4.301 examine the technologies of specific careers and workplaces, including the organizational structures of work environments and the effects of newer technologies

4.302 examine the roles of design and invention in business growth and economic development

4.303 develop strategies to assess their technological literacy/capability and plan for continuous personal growth, using external criteria

GCO 5
Technological Responsibility

5.301 demonstrate an understanding of the nature and purpose of legal and ethical rules and principles

5.302 develop personal rules of conduct that ensure healthy and safe practices

5.303 develop and demonstrate risk-management strategies for a variety of technological activities