

Program Design and Components

Program Components

Power and Energy 3211 is one of two Level III technology education courses that introduce students to a wide variety of technologies and problem-solving strategies that reflect industry practice. This course does not have a pre-requisite although knowledge and skills gained in the Energy and Power Technology Module in the intermediate grades will be of use to the student. This course is the final one in the skilled trades are for the *Futures in Skilled Trades and Technology Program*.

Outcomes Structures

The course curriculum is structured to address outcomes as suggested in the Atlantic Canada Foundation Document for Technology Education (2001). These include Essential Graduation Learnings (EGLs), General Curriculum Outcomes (GCOs), Key Stage Curriculum Outcomes (KSCOs) and Specific Curriculum Outcomes (SCOs).

EGLs are statements describing the knowledge, skills, and attitudes expected of all students who graduate from high school.

GCOs are statements that identify what students are expected to know and be able to do upon completion of study in a curriculum area.

KSCOs provide additional detail for each of the GCOs and provide a means to quickly assess progress in a subject area at the end of a level of schooling. SCOs identify what students are expected to know and be able to do at a particular grade level.

The EGLs specified in the Atlantic Canada Foundation document on Technology Education include:

Essential Graduation Learnings

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

General Curriculum Outcomes

The GCOs for technology education as defined in the Atlantic Canada Foundation document on Technology Education include:

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

The KSCO's for Power and Energy 3201 are based on the five previously noted GCO's and indicate what is expected of students at the end of Level III. By the end of Level III, students will be expected to:

GCO 1: Technological Problem Solving

[1.401] articulate problems that may be solved through technological means

- assess diverse needs and opportunities
- construct detailed design briefs that include design criteria and a work schedule

[1.402] conduct design studies to identify a technological solution to a problem

- investigate related solutions
- document a range of options to solve this problem
- determine and justify the best option
- determine resource requirements and availability
- develop detailed action plans, including technical drawings and sequences of action

**Key Stage
Curriculum
Outcomes (cont'd)**

**GCO 1: Technological
Problem Solving**

[1.403] develop (prototype, fabricate, make) technological solutions to problems

- match resources and technical processes for specific tasks
- construct and test models and prototypes as needed
- construct the solution with adherence to the design criteria
- document activities, decisions, and milestones

[1.404] critically evaluate technological solutions and report their findings

- develop detailed evaluations of both their own and others' technological solutions, with reference to independently developed criteria
- employ a continuous assessment methodology with the purpose of continuous improvement of the design
- document and report their changes, the rationale for change, and conclusions

[1.405] communicate ideas and information about technological solutions through appropriate technical means

- accurately present technical information by using a representative sample of analog and digital tools, including, for example, two- and three-dimensional computer-assisted drafting and modeling tools
- create accurately scaled models and prototypes

**GCO 2: Technological
Systems**

[2.401] operate, monitor, and adjust technological systems of increasing complexity

[2.402] manage technological systems of increasing complexity

[2.403] modify programming logic and control systems to optimize the behaviour of systems

[2.404] deconstruct complex technological systems into their simpler systems and components

[2.405] troubleshoot and maintain systems

GCO 3: History and Evolution of Technology

- [3.401] evaluate technological systems in the context of convergence where one system has multiple functions, or divergence where multiple systems have the same function
- [3.402] evaluate the symbiotic roles of technology and science in modern society
- [3.403] analyse the symbiotic relationship between technology and education, including factors that influence standards for technological literacy and capability, and ways that the community responds
- [3.404] critically evaluate the effects of accelerating rates of technological change on self and society
- [3.405] account for effects of cultural diversity on technological solutions
 - critically examine the effects of cultural diversity on market forces and technological products, and vice versa
 - incorporate knowledge of cultural diversity into development of technological solutions

GCO 4: Technology and Careers

- [4.401] assess and evaluate employability profiles for a variety of workplaces and careers and determine the level of technological literacy and capability they would need to achieve for job entry
- [4.402] employ design and invention as tools to create entrepreneurial activity
- [4.403] envision their short and longer-term future and develop a plan for acquiring the technological literacy/capability required to achieve their vision

GCO 5: Technological Responsibility

- [5.401] demonstrate responsible leadership in employing legal and ethical rules and principles
- [5.402] demonstrate responsible leadership in employing health and safety rules and standards
- [5.403] demonstrate responsible leadership in taking proper measures to manage current and future technological risk