
Specific Curriculum Outcomes

Overview

The Specific Curriculum Outcomes (SCOs) for the Power and Energy 3201 Curriculum Guide are derived from Stage 4 (Grade 10-12) of the Key Stage Curriculum Outcomes (KSCOs) outlined in the Atlantic Canada Foundation document for Technology Education (2001). The SCOs are organized into six units:

- Unit 1: Safety
- Unit 2: Power Overview
- Unit 3: Experiencing Small Engines Modularly
- Unit 4: Introduction to Alternative Energy
- Unit 5: Experiencing Alternative Energy Modularly

It is recommended that unit 1 be covered before any other units. Unit 2 and 3 are intended to be taught together and unit 4 and 5 are intended to be taught together. This can be done in a number of ways either by using modules or by “flipping” the class after half the course is completed.

Unit 2 and 3 contain the research and hands-on work involved in small engine tear down and troubleshooting. Working in groups of two, on modular-based projects, students are required to tear down and reassemble a small engine. They are expected to use the knowledge gained in a series of troubleshooting tasks. Evaluation of the outcome is based on the ability to identify all the working pieces, reassemble the engine and successfully troubleshoot a minor problem.

Unit 4 and 5 are the theory and practice of working with alternative energy units. From wind energy to solar to fuel cell technology, students will learn the processes involved and some of the theory behind these innovative energy solutions.

Each unit consists of several topics that address the General Curriculum Outcomes (GCOs) detailed in the Atlantic Canada Foundation document for Technology Education (2001). Units are sequenced to introduce theory before hands-on practice.

Overview cont.

The five units that comprise Power and Energy include the following key topics for a total of 110 hours instructional time:

Unit 1: Safety (10 hours)

- Topic 1: General Fabrication Room Safety (6 hours)
- Topic 2: Occupational Health and Safety (4 hours)

Unit 2: Introduction to Engines (4 hours)

- Topic 1: Introduction to Engines (4 hours)

Unit 3: Experiencing Small Engines Modularly (46 hours)

- Topic 1: Small Engine Overview (4 hours)
- Topic 2: Ignition Systems (7 hours)
- Topic 3: Fuel System (7 hours)
- Topic 4: Valve Train/Timing System (7 hours)
- Topic 5: Compression System (7 hours)
- Topic 6: Lubrication/Cooling System (7 hours)
- Topic 7: Mechanical System (7 hours)

Unit 4: Alternative Energy (10 hours)

- Topic 1: Types of Energy (3 hours)
- Topic 2: Sources of Energy (3 hours)
- Topic 3: Power and Energy Overview (4 hours)

Unit 5: Experiencing Alternative Energy Modularly (40 hours)

- Topic 1: Hydrogen Fuel Cell Technology (8 hours)
- Topic 2: Wind Turbines Technology (8 hours)
- Topic 3: Solar Cell Technology (8 Hours)
- Topic 4: Heat Pump Technology (8 hours)
- Topic 5: Service Panel Wiring for Off-the-grid Technologies (8 hours)

Note that the times allocated to each topic are recommendations only.

The 4-column Layout

The 4-column layout in the curriculum guide spans across two pages and presents the necessary information to the teacher to deliver a particular course topic to the student. The 4-column layout consists of:

I Specific Curriculum Outcomes.

The first column will contain one or more SCOs from the course that will be addressed by the organizer. Each SCO also contains a listing of the KSCOs to which it directly relates (the relative KSCOs are included in brackets). The KSCO would be those for the subject area the course fits.

II Suggested Teaching and Learning Strategies.

Suggested Teaching and Learning Strategies are recommendations for implementing the curriculum. This section could include Teacher Preparation and Sample Student Activities sections.

III Suggested Assessment 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 and other resources are included here. The teacher is encouraged to expand and elaborate upon the information presented in columns II, III and IV.