

SECTION C: PLANNING FOR INSTRUCTION

CTS provides increased opportunity for junior and senior high schools to design courses based on the needs and interests of their students and the circumstances within the school and community. Some strands may be appropriately introduced at the junior high school level. Other strands are more appropriately introduced at the senior high school level or to Grade 9 students. Refer to Sample 1 and 2 in Section C for recommendations regarding the Electro-Technologies strand, or the *Career & Technology Studies Manual for Administrators, Counsellors and Teachers* for a summary of the recommended grade levels for each strand.

PLANNING FOR CTS

Defining Courses

Schools determine which strands and courses will be offered in a particular school, and will combine 1-credit CTS courses into multiple-credit CTS offerings.

Each 1-credit course was designed for approximately 25 hours of instruction. However, this time frame is only a guideline to facilitate planning. The CTS curricula are competency based, and the student may take more or less time to gain the designated competencies within each course.

A multiple-credit CTS offering will usually consist of 1-credit courses primarily from the same strand but, where appropriate, may include courses from other CTS strands. Refer to the *Guide to Education: ECS to Grade 12* (Appendix 1) for more information on course names and course codes.

Course selection and sequencing should consider:

- prerequisite(s)
- supporting course(s) (other CTS courses that may enhance the learning opportunity if offered with the course)
- course parameters
 - instructional qualifications, if specialized

- equipment and facility requirements, if specialized.

The course parameters are defined in Sections D, E and F of this Guide.

Degree of Flexibility

The CTS program, while designed using the modular structure to facilitate flexible timetabling and instructional delivery, does not mandate the degree of flexibility a school or teacher will offer. The teacher and school will determine the degree of flexibility available to the student. Within the instructional plan established by the school, the student may:

- be given the opportunity to progress at a rate that is personally challenging
- have increased opportunity to select courses that develop competencies he or she finds most relevant.

Integrating Basic Competencies

The basic competencies relate to managing learning and resources, problem solving and innovation, communicating effectively, working with others and demonstrating responsibility are developed throughout the CTS program, and within each 1-credit course.

Assessment of student achievement on the basic competencies is integrated throughout the other general outcomes. Refer to Section G (Assessment Tools) of this Guide for the description of student behaviours expected at each of the four developmental stages defined for the basic competencies.

Assessment of basic competencies could include input and reflection involving the student, teacher(s), peers and others. Description of the observed behaviour could be provided through a competency profile for the course. Positive, ongoing interaction between the student and teacher will support motivation for student growth and improvement.

Assessing Student Achievement

Assessing the student's competency is a process of gathering information by way of observations of process, product and student interaction.

Where appropriate, assessment tools have been defined to assist the teacher and student in the assessment. Refer to Section G (Assessment Tools) of this Guide for copies of the various tools (worksheets, checklists, sample questions, etc.).

A suggested emphasis for each general outcome has also been established. The suggested emphasis is a guideline to help teachers determine time allocation and/or the appropriate emphasis for each general outcome and the student grade.

Recognizing Student Achievement

At the high school level, successful demonstration of the exit-level competencies in a course qualifies the student for one credit. Refer to Section A for more detailed information about how curriculum and assessment standards are defined in CTS. Refer to the *Career & Technology Studies Manual for Administrators, Counsellors and Teachers* for more information on how student achievement can be recognized and reported at the school and provincial levels.

Portfolios

When planning for instruction and assessment, consider a portfolio as an excellent tool to provide evidence of a student's effort, progress and achievement. Portfolios will aid students in identifying skills and interest. They also provide the receiving teacher, employer and/or post-secondary institution proof of a student's accomplishments. The make-up and evaluation of the portfolio should be a collaborative agreement between the student and teacher.

Resources

A comprehensive resource base, including print, software and audio-visual, has been identified to support CTS strands. It is intended that these resources form the basis of a resource centre, encouraging teachers and students to access a wide selection of resources and other information sources throughout the learning process. Unless

otherwise noted, these resources are considered to be suitable for both junior and senior high school students.

Refer to Section I (Learning Resource Guide) to obtain directions for accessing up-to-date information about learning resources that have been identified to support the delivery of CTS courses in this strand.

Sample Student Learning Guides

In addition to the resources, Sample Student Learning Guides are available (refer to Section J of this Guide). These samples, designed for individual student or small group use, provide an instructional plan for selected courses and include the following components:

- Why take this course?
- What are the entry-level competencies?
- What are the exit-level competencies?
- What resources may be accessed?
- What assignments/activities must be completed?
- What are the timelines?
- How will the final mark be calculated?

Sample Student Learning Guides have been developed for the following courses in Electro-Technologies:

- ELT1010 Electro-assembly 1
- ELT1130 Robotics 1.

PLANNING FOR ELECTRO-TECHNOLOGIES

Safety

In Career and Technology Studies, health and safety are given a high priority. Teachers of Electro-Technologies program should make every effort to provide a safe environment for students. Facilitators should have knowledge of safety hazards in the program and how best to minimize accidents.

In Electro-Technologies, when student-fabricated projects involve circuitry with live (110 volts or higher) voltages, instruction must be supervised by persons with a journeyman or equivalent status. These projects must be connected, when tested, to live voltages through a ground fault interrupter (GFI) circuit breaker.

Projects may also be designed and constructed for Class 1 voltages (less than 30 volts) or simulated through the use of interactive software packages. When these delivery strategies are used, journeyman status would not be required. For specific safety concerns, refer to the course parameters and specific outcomes relating to safety.

Related Legislation

The Electro-Technologies strand delivers many of the competencies that exist in the following Alberta compulsory trade areas: Appliance Serviceman, Electrician, Electronic Technician; and some of the competencies in the following optional trade areas: Communication Electrician, Electrical Rewind Mechanic and Instrument Mechanic.

The *Alberta Apprenticeship and Industry Training Act* provides detailed explanations regarding the delivery of apprenticeship programs in Alberta. The Act specifically addresses who can or cannot work in compulsory and optional trade areas. The Act states: *A person shall not work in a compulsory or optional trade area unless that person:*

- a. *holds a trade certificate*
- b. *is an apprentice in the specified trade*
- c. *is authorized under Section 23 to work or perform one or more tasks in the trade*
- d. *is a student in a student work training program in that trade.* (Note: CTS related.)

In addition, optional certificated trades, if a person is employed by another person, that individual may work in or perform one or more tasks, activities or functions if the employer is satisfied that the person possesses the skill and knowledge in the trade as would be expected from one who would be in possession of a trade certificate.

It should be noted that the Act spells out that the ratio of journeyman to apprentices is a minimum of one apprentice to each journeyman employed. This ruling applies to Registered Apprentice students during off-campus learnings.

Instructional Qualifications

Responsibility for instructional planning and delivery of courses in Electro-Technologies will be assumed by Alberta certified teachers having expertise in classroom and electricity/electronics laboratory experience. See specific courses for detailed information regarding instructional qualifications. Note that portions of courses requiring special instructional qualifications can also be delivered through off-campus learnings. Or, projects may be accomplished using Class 1 voltages (less than 30), at which time no journeyman instructional qualifications would be required.

Selecting Courses

The scope and sequence chart in Section B provides an overview of the Electro-Technologies courses, indicating prerequisites and theme areas. Brief descriptions of each of the courses follow the scope and sequence chart in Section B.

The Electro-Technologies curriculum allows teachers the flexibility to design programs based on the needs and interests of their students and other mitigating factors within the school and/or community.

Electro-Technologies courses may be offered as multiple-credit CTS offerings; i.e., they may be grouped with other courses in this strand or from other strands into 3-, 4-, 5- or 6-credit CTS offerings.

The following groupings are samples of possible multiple-credit offerings.

Sample 1

Junior High Program

Courses
ELT1010 Electro-assembly 1 ELT1030 Conversion & Distribution MEC1010 Modes & Mechanisms
Rationale/Learnings
Students understand and appreciate electrical/electronic systems and will be motivated toward further learnings. This program complements the junior high science program. It also links with other CTS strands such as Design Studies, Construction Technologies and Fabrication Studies.

Sample 2

Senior High Program

Courses
ELT1010 Electro-assembly 1 ELT1050 Electronic Power Supply 1 ELT1060 Digital Technology 1
Rationale/Learnings
The successful completion of these courses will provide students with introductory skills and knowledge in fabrication and service, power systems and computer logic systems. This program complements the high school science program units “Understanding Technology – Electricity,” “Energy and Change,” “Electromagnetic Energy” and “Electric Forces and Fields.” This program also complements mathematics and language arts programs as well as other CTS strands.

Courses could also be grouped according to themes, thereby accommodating special interest. Many courses may be offered in combination with service and fabrication courses to accommodate individual construction projects, or with Career Transitions project courses where more challenging projects are selected requiring additional skills and time.

Organizing for Learning

Once courses have been selected and the instructional period defined, teachers will plan how students will learn. This will involve:

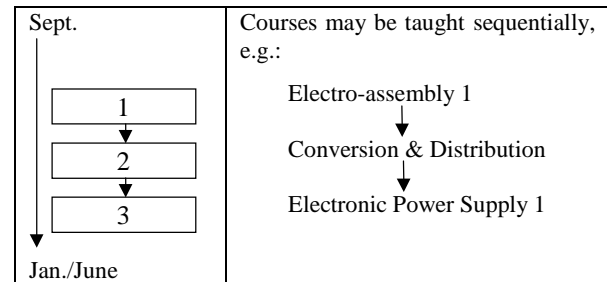
- reviewing general outcomes and specific outcomes for each course selected

- assessing the competencies that students bring to the course and determine if a course challenge is warranted, or allow students to waive some of the activities/projects if competencies have already been acquired
- directing the students to proceed to another course if all competencies are met
- determining the level of flexibility students will have in selecting and progressing through courses
- determining the resources, including student learning guides required
- determining how basic competencies will be integrated into the program
- determining instructional strategies to be used (see *CTS Manual for Administrators, Counsellors and Teachers*)
- determining how student achievement will be assessed including tools and emphasis (refer to section G of this Guide).

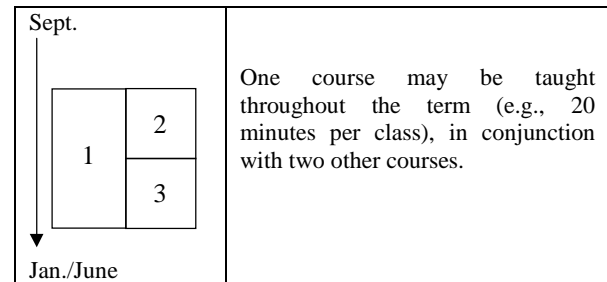
Before selecting courses, teachers should check the course parameters outlined in each course (see Sections D, E and F of this Guide).

Individual 1-credit courses can be delivered sequentially, concurrently or combined.

Scenario A

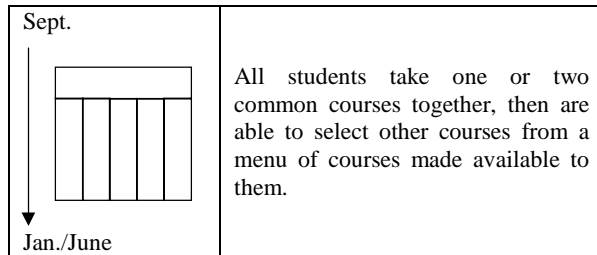


Scenario B



Teachers can also allow students to progress at a rate that is personally challenging; e.g.:

Scenario C



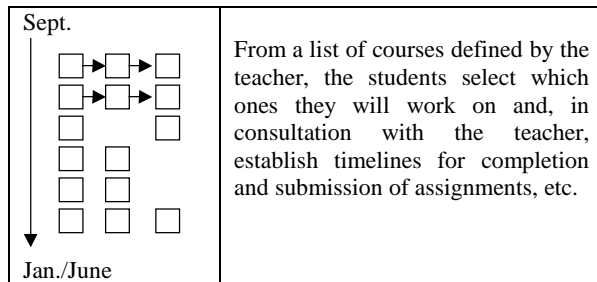
Transition from High School to the Workplace and/or Related Post-secondary Programs

To assist students in making smooth transitions, consideration should be given to the development of a portfolio.

Refer to Section H of this Guide for potential transitions that students may make into:

- the workplace
- related apprenticeship programs
- related post-secondary programs or other avenues for further learnings.

Scenario D



Identifying Linkages

Programs in Electro-Technologies may be designed by:

- combining courses from one or more strands (e.g., Mechanics, Design Studies, Construction Technologies, Career Transitions)
- combining courses with science programs.

Section H of this Guide describes linkages with CTS strands and with core and other complementary programs.

Project and practicum courses are **not** designed to be offered as distinct courses and should **not** be used to extend Work Experience 15, 25 and 35 courses.

