07 BUILDINGS AND PUBLIC WORKS

RESIDENTIAL AND COMMERCIAL DRAFTING

PROGRAM OF STUDY
5750

VOCATIONAL and TECHNICAL EDUCATION

Québec

RESIDENTIAL AND COMMERCIAL DRAFTING

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RESIDENTIAL AND COMMERCIAL DRAFTING

PROGRAM OF STUDY

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The *Residential and Commercial Drafting* program leads to the Diploma of Vocational Studies and prepares the student to practise the trade of **residential and commercial draftsperson.**

Direction générale de la formation professionnelle et technique

DEVELOPMENT TEAM

Coordination	Jean-Paul Bergeron Coordinator of the Buildings and Public Works Sector Direction générale de la formation professionnelle et technique Ministère de l'Éducation
Design and Development	Sylvie Faber Teacher and Content Specialist CFP de Rochebelle, Sainte-Foy (Québec)
Technical Support	Marie-Dominique Decninck Technical Consultant in Program Development
English Version	Services à la communauté anglophone Direction de la production en langue anglaise

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Vidéotron Télécom, Montréal

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Michel Gagnon
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Maurice Labbé
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Serge Lachance
Hydro-Québec, Québec

Bruno Laforce
Groupe Roche, Sainte-Foy

Stéphane Levesques
B.P.R., Québec

Daniel Rochette
S.D.E.S., Saint-Romuald

Éric Rousseau
Génivar, Québec

Pascal Rousseau
Lemay et ass., Montréal

Representatives from Education

Jacques Auger
CS de l'Énergie

Gilles Blanchette
CS de la Seigneurie-des-Mille-Îles

Robert Bonami
CS Marie-Victorin

Jeanne Breton
CS Marguerite-Bourgeoys

François Céré
CS de la Région-de-Sherbrooke

Pierre Francoglio
CS Marie-Victorin

Daniel Frenette
CS des Découvreurs

Christian Guida
CS de Montréal

Stéphane Lalancette
CS des Affluents

Denis Lebrun
CS de la Région-de-Sherbrooke

Bernard Marois
CS des Draveurs

Éric Monastesse
CS de l'Or-et-des-Bois

Maurice Rodriguez
CS Marguerite-Bourgeoys

Pierre Sauvé
CS de la Seigneurie-des-Mille-Îles

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Pierre Sylvain
Maison Laprise, Montmagny

Lucie Vézina
Régis Coté, Architect, Québec

Evans Zuniga
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INTRODUCTION

The *Residential and Commercial Drafting* program was designed on the basis of a framework for developing vocational education programs that calls for the participation of experts from the workplace and the field of education.

The program of study is developed in terms of competencies, expressed as objectives. These objectives are divided into modules. Various factors were kept in mind in developing the program: training needs, the job situation, purposes, goals, and strategies and means used to attain objectives.

The program of study lists the competencies that are the minimum requirements for a Diploma of Vocational Studies, for students in both the youth and adult sectors. It also provides the basis for organizing courses, planning teaching strategies, and designing instructional and evaluation materials.

The *Residential and Commercial Drafting* program leads to a Diploma of Vocational Studies (DVS). To be admitted into the program, students must meet one of the following conditions:

- For students holding a Secondary School Diploma or a recognized equivalent, no additional conditions are required.
  OR
- For students who are at least 16 years of age on September 30 of the school year in which they begin the program, the following condition applies: they must have obtained Secondary IV credits in language of instruction, second language and mathematics, or the recognized equivalents.
  OR
- For students who are at least 18 years of age, successful completion of the General Development Test, and the SPR-06, SPR-04, SPR-03 and SPR-05 tests in English language of instruction, and 3002-2 Mathematics, or their equivalent, are prescribed as functional prerequisites.
  OR
- For students who have obtained Secondary III credits in language of instruction, second language and mathematics in programs established by the Minister, general education is required in conjunction with vocational education in order to obtain the following credits: Secondary IV language of instruction, second language and mathematics in programs established by the Minister.

The duration of the program is 1800 hours, which includes 1095 hours spent on the specific competencies required to practise the trade or occupation and 705 hours on general competencies. The program of study is divided into 25 modules which vary in length from 15 to 120 hours (multiples of 15). The time allocated to the program is to be used not only for teaching but also for evaluation and remedial work.

The document contains two parts. Part I is of general interest and provides an overview of the training plan. It includes a synoptic table of the basic information about the modules, a description of the program training goals, the competencies to be developed and the general objectives, and an explanation of operational objectives. Part II is designed primarily for those directly involved in implementing the program. It contains a description of the operational objectives of each module.

In keeping with this broad approach, two accompanying documents will be provided: a *Guide d'organisation pédagogique et matérielle* and a set of analysis and planning tables.

GLOSSARY

Competency

A set of integrated skills and knowledge pertaining to various fields, perceptions and attitudes that enable a person to perform correctly a role, function, activity or task.

Credit

A unit used for expressing quantitatively the value of the modules in a program of study. One credit corresponds to 15 hours of training. Students must accumulate a set number of credits to graduate from a program.

General Objectives

Expression of the educational aims of a program in terms of competencies to be developed. The general objectives are broken down into operational objectives.

Module of a Program

A component part of a program of study comprising an operational objective.

Operational Objectives

Statements of the educational aims of a program in practical terms. They serve as the basis for teaching, learning and evaluation. In a competency-based approach, these objectives translate the educational aims into competencies to be acquired, in accordance with the requirements.

Program Training Goals

Educational aims of the program. These goals are the general goals of vocational education adapted to a specific trade or occupation.

Part I

1. SYNOPTIC TABLE

Number of modules: 25
Duration in hours: 1800
Credits: 120

Residential and Commercial Drafting
Program Code: 5750

CODE	TITLE OF THE MODULE	HOURS	CREDITS*
825 011	1. The Trade and the Training Process	15	1
825 262	2. Using a Computer	30	2
825 273	3. Architectural Drawing Components	45	3
825 287	4. Basic Functions of Drafting Software Applications	105	7
825 297	5. Architectural Objects	105	7
825 308	6. Architectural Plans: Single-Family Dwellings	120	8
755 002	7. Health and Safety on Construction Sites	30	2
825 315	8. Advanced Functions of Drawing Software Applications	75	5
825 324	9. Reinforced Concrete Drawings	60	4
825 332	10. Construction Site Data	30	2
825 346	11. Information Related to Plumbing	90	6
825 356	12. Plumbing Plans	90	6
825 362	13. Wall Sections and Detail Drawings	30	2
825 372	14. Estimating Quantities	30	2
825 384	15. Steel Structure Assembly Drawings	60	4
825 398	16. Structural Steel Shop Drawings	120	8
825 408	17. Architectural Plans: Multi-Family Dwellings	120	8
825 413	18. Information Related to Electricity	45	3
825 423	19. Electrical Plans	45	3
825 437	20. Presentation Drawings	105	7
825 211	21. Job Search Techniques	15	1
825 446	22. Information Related to Ventilation	90	6
825 457	23. Ventilation Plans	105	7
825 468	24. Commercial Building Plans	120	8
825 258	25. Entering the Work Force	120	8

* 15 hours = 1 credit

2. PROGRAM TRAINING GOALS

The training goals of the *Residential and Commercial Drafting* program are based on the general goals of vocational education and take into account the specific nature of the trade. These goals are:

To develop effectiveness in the practice of a trade

- To teach students to perform tasks and activities related to residential and commercial drafting correctly, at an acceptable level of competence for entry into the job market.
- To prepare students to perform satisfactorily on the job by fostering:
  - the intellectual skills needed to make sound decisions on the job
  - the development of a professional attitude and sense of responsibility
  - the development of sound research habits and the observance of standards
  - a concern for communicating effectively with customers, colleagues and employers
  - attention to detail and a sense of precision in carrying out various drafting tasks
  - the development of the capacity to plan the work and follow it up
  - a sense of aesthetics

To foster integration into the working world

- To familiarize students with the job market in general and the trade of residential and commercial drafting in particular.
- To familiarize students with their rights and responsibilities as workers.

To foster the development of occupational knowledge

- To foster independence, and instill a sense of responsibility and a desire to succeed.
- To help students acquire sound work methods and a sense of discipline.
- To help students develop a quality-conscious approach in carrying out tasks.
- To help students understand the principles underlying various construction trades.

To ensure job mobility

- To develop a positive attitude toward change and new situations.
- To encourage further learning and research.
- To prepare students for a creative job search.

3. COMPETENCIES

The competencies to be developed in the *Residential and Commercial Drafting* program are shown in the grid of learning focuses on the following page. The grid lists general and specific competencies as well as the major steps in the work process.

General competencies involve activities common to several tasks or situations. They cover, for example, the technological or scientific principles that the students must understand to practise the trade. Specific competencies focus on tasks and activities that are of direct use in the trade. The work process includes the most important steps in carrying out the tasks and activities of the trade.

The grid of learning focuses shows the relationship between the general competencies on the horizontal axis and the specific competencies on the vertical axis. The symbol (❍) indicates a correlation between a general and a specific competency. Shaded symbols indicate that these relationships have been taken into account in the formulation of objectives intended to develop specific competencies related to the trade.

The logic used in constructing the grid influences the course sequence. Generally speaking, this sequence follows a logical progression in terms of the complexity of the learning involved and the development of the students' autonomy. The vertical axis presents the specific competencies in the order in which they should be taught. The modules including the general competencies on the horizontal axis should be taught in relation to those on the vertical axis. This means that some modules are prerequisite to others, while other modules are taught concurrently.

3.1 GRID OF LEARNING FOCUSES

				WORK PROCESS (major steps)					GENERAL COMPETENCIES (technology, personal development, etc.)													TOTALS	
RESIDENTIAL AND COMMERCIAL DRAFTING SPECIFIC COMPETENCIES (directly related to the practice of the specific occupation)		OPERATIONAL OBJECTIVES	DURATION (IN HOURS)	Become familiar with the work to be done	Organize the work to be done	Carry out the task	Revise and correct drawings	Produce final version and file documents	To determine their suitability for the trade and the training process	To use a computer	To draft architectural components	To use the basic functions of drafting software applications	To produce drawings of architectural objects	To apply concepts of health and safety on construction sites	To use the advanced functions of drafting software applications	To research information related to plumbing	To draw wall sections and detail drawings	To estimate quantities of materials & equipment	To research information related to electricity	To use job search techniques	To research information related to ventilation	NUMBER OF OBJECTIVES	DURATION (IN HOURS)
Module	Module								1	2	3	4	5	7	8	11	13	14	18	21	22		
	OPERATIONAL OBJECTIVES	T							S	B	B	B	B	S	B	B	B	B	B	S	B	13	
	DURATION (IN HOURS)		H						15	30	45	105	105	30	75	90	30	30	45	15	90		705
	To produce architectural plans for a single-family dwelling		120	▲	▲	▲	▲	▲	○	●	●	●	●		●		□	○					
9	To produce reinforced concrete drawings	B	60	▲	▲	▲	▲	▲	○	●	●	●	●		●		○	○					
10	To record construction site data	B	30	▲	▲	▲	▲	▲	○	●	●	●	●	●	●		○	○					
12	To produce plumbing plans	B	90	▲	▲	▲	▲	▲	○	●	●	●	●		●	●	○	○					
15	To produce steel structure assembly drawings	B	60	▲	▲	▲	▲	▲	○	●	●	●	●		●		○	○					
16	To produce structural steel shop drawings	B	120	▲	▲	▲	▲	▲	○	●	●	●	●		●		○	○					
17	To produce architectural plans for a multi-family dwelling	B	120	▲	▲	▲	▲	▲	○	●	●	●	●		●		○	○					
19	To produce electrical plans	B	45	▲	▲	▲	▲	▲	○	●	●	●	●		●		○		●				
20	To produce presentation drawings	B	105	▲	▲	▲	▲	▲	○	●	●	●	●		●		○						
23	To produce ventilation plans	B	105	▲	▲	▲	▲	▲	○	●	●	●	●		●			○			●		
24	To produce commercial building plans	B	120	▲	▲	▲	▲	▲	○	●	●	●	●		●		●	○					
25	To enter the work force	S	120	▲	▲	▲	▲	▲	○	●	●	●	●	●	●	●	●	○	●	●	●		
NUMBER OF OBJECTIVES		12																				25	
DURATION (IN HOURS)			1095																				1800

S: Situational objective

B: Behavioural objective

Δ Correlation between a step and a specific competency

▲ Correlation to be taught and evaluated

❍ Correlation between a general and a specific competency

● Correlation to be taught and evaluated

4. GENERAL OBJECTIVES

The general objectives of the *Residential and Commercial Drafting* program are presented below, along with the major statement of each corresponding operational objective.

To develop in the students the competencies required to integrate harmoniously in the school and work environments

- Determine their suitability for the trade and the training process.
- Use job search techniques.
- Enter the work force.

To develop in the students the competencies required to use computer software and hardware related to computer assisted drafting

- Use a computer.
- Use the basic functions of drafting software applications.
- Use the advanced functions of drafting software applications.
- Produce presentation drawings.

To develop in the students the competencies required to produce sketches and use a drafting table

- Draft architectural components.
- Produce drawings of architectural objects.

To develop in the students the competencies required to produce architectural drawings

- Produce architectural plans for a single-family dwelling.
- Produce architectural plans for a multi-family dwelling.
- Draw wall sections and detail drawings.
- Produce commercial building plans.

To develop in the students the competencies required to produce structural drawings

- Produce reinforced concrete drawings.
- Produce steel structure assembly drawings.
- Produce structural steel shop drawings.

To develop in the students the competencies required to produce mechanical construction drawings and electrical plans

- Research information related to plumbing.
- Research information related to electricity.
- Research information related to ventilation.
- Produce plumbing plans.
- Produce electrical plans.
- Produce ventilation plans.

To develop in the students the competencies required to carry out various tasks on construction sites

- Apply concepts of health and safety on construction sites.
- Record construction site data.

To develop in the students the competencies required to estimate quantities

- Estimate quantities of materials and equipment.

5. OPERATIONAL OBJECTIVES

5.1 DEFINITION

An operational objective is defined for each competency to be developed. Competencies are organized into an integrated training program designed to prepare students to practise the trade. This systematic organization of competencies produces better overall results than training by isolated objectives. More specifically, it fosters a smooth progression from one objective to the next, saves teaching time by eliminating needless repetition, and integrates and reinforces learning material.

Operational objectives are the main, compulsory teaching/learning targets and they are specifically evaluated for certification. There are two kinds of operational objectives: behavioural and situational.

- **A behavioural objective** is a relatively closed objective that describes the actions and results expected of the student by the end of a learning step. Evaluation is based on expected results.
- **A situational objective** is a relatively open-ended objective that **outlines** the major phases of a learning situation. It allows for output and results to vary from one student to another. Evaluation is based on the students' participation in the activities of the learning context.

5.2 HOW TO READ OPERATIONAL OBJECTIVES

A. How to Read a Behavioural Objective

Behavioural objectives consist of six components. The first three provide an overview of the objective:

- The **expected behaviour** states a competency in terms of the general behaviour that the students are expected to have acquired by the end of the module.
- The **conditions for performance evaluation** define what is necessary or permissible to the students during evaluation designed to verify whether or not the students have attained the objective. This means that the conditions for evaluation are the same wherever and whenever the program is taught.
- The **general performance criteria** define the requirements by which to judge whether or not the results obtained are generally satisfactory.

The last three components ensure that the objective is understood clearly and unequivocally:

- The **specifications of the expected behaviour** describe the essential elements of the competency in terms of specific behaviours.
- The **specific performance criteria** define the requirements for each of the specifications of behaviour. They ensure a more enlightened decision on the attainment of the objective.
- The **field of application** defines the limits of the objective, *where necessary*. It indicates cases where the objective applies to more than one task, occupation or field.

B. How to Read a Situational Objective

Situational objectives consist of six components:

- The **expected outcome** states a competency as an aim to be pursued throughout the course.
- The **specifications** outline the essential aspects of the competency and ensure a better understanding of the expected outcome.
- The **learning context** provides an outline of the learning situation designed to help the students develop the required competencies. It is normally divided into three phases of learning:
  - information
  - performance, practice or involvement
  - synthesis, integration and self-evaluation
- The **instructional guidelines** provide suggested ways and means of teaching the course to ensure that learning takes place and that the same conditions apply wherever and whenever the course is taught. These guidelines may include general principles or specific procedures.
- The **participation criteria** describe the requirements the students must fulfil, which are usually related to each phase of the learning context. They focus on how the students take part in the activities rather than on the results obtained. Participation criteria are normally provided for each phase of the learning context.
- The **field of application** defines the limits of the objective, *where necessary*. It indicates cases where the objective applies to more than one task, occupation or field.

PART II

MODULE 1: THE TRADE AND THE TRAINING PROCESS

Code: 825 011 Duration: 15 hours

SITUATIONAL OBJECTIVE

EXPECTED OUTCOME

By participating in the required activities of the learning context according to the indicated criteria, the students will be able to
determine their suitability for the trade and the training process.

SPECIFICATIONS

- Be aware of the nature of the trade.
- Understand the training program.
- Confirm their career choice.

LEARNING CONTEXT

PHASE 1: Information on the Trade

- Learning about the job market in residential and commercial drafting: potential work environments (types of establishments), job prospects, salaries, advancement opportunities.
- Learning about the nature and requirements of the job (e.g. tasks, working conditions, evaluation criteria, rights and responsibilities of workers) during visits and interviews and by studying written material.
- Presenting the information gathered and discussing their views on the trade at a group meeting (e.g. advantages, disadvantages, requirements).

PHASE 2: Information on and Participation in the Training Process

- Discussing the skills, aptitudes and knowledge required to practise the trade.
- Learning about the training plan: program of study, training process, evaluation methods, certification of studies.
- Discussing the training plan and how it relates to the work of a draftsperson.
- Discussing their initial reactions to the trade and the training plan.

SITUATIONAL OBJECTIVE

PHASE 3: Evaluation and Confirmation of Career Choice

- Producing a report in which they must:
  - describe their preferences, aptitudes and interests with respect to the trade
  - assess their career choice by comparing the different aspects and requirements of the trade with their own tastes, aptitudes and interests

INSTRUCTIONAL GUIDELINES

- Create a climate that is conducive to personal growth and that helps the students to enter the job market.
- Encourage the students to engage in discussions and to express themselves.
- Motivate the students to take part in the suggested activities.
- Help the students to acquire an accurate perception of the trade.
- Provide the students with the means to assess their career choice honestly and objectively.
- Organize field trips to companies that are representative of the main work environments in residential and commercial drafting.
- Make available all pertinent literature (e.g. information on the trade, training program, guides).
- Organize a meeting with trade specialists.

PARTICIPATION CRITERIA

PHASE 1:
- Gather information on most of the topics to be dealt with.
- Express their views on the trade at a group meeting, interrelating the information they have gathered.

PHASE 2:
- Give their opinions on some of the requirements that they will have to meet in order to practise the trade.
- Study carefully the written material provided.
- Listen closely to explanations.
- Express their views on the training program at a group meeting.

PHASE 3:
- Write a report that:
  - sums up their preferences, interests and aptitudes
  - explains clearly how they arrived at their career choice

MODULE 2: USING A COMPUTER

Code: 825 262 Duration: 30 hours

BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
use a computer
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - a computer with several software applications installed
  - peripherals (e.g. monitor, keyboard, mouse, printer)
  - diskettes
- Following instructions
- Using technical documents

GENERAL PERFORMANCE CRITERIA

- Appropriate use of technical documents
- Appropriate use of materials

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Use an operating system.	— Correct use of the main functions of a graphic environment — Observance of procedures for creating, saving and printing documents — Efficient management of files and folders — Appropriate customizing of the graphic environment, as required — Observance of procedures for terminating a work session

BEHAVIOURAL OBJECTIVE	
SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	**SPECIFIC PERFORMANCE CRITERIA**
B. Use a word processor.	— Observance of procedures for creating, saving and printing documents — Use of appropriate commands for: – editing a text – formatting a text – moving blocks of text – choosing fonts – numbering pages – using the dictionary
C. Use a spreadsheet.	— Observance of procedures for creating, saving and printing documents — Use of appropriate commands for: – creating a worksheet – copying and moving cells – entering and copying data – modifying rows and columns – calculating data
D. Use a browser.	— Choice of appropriate browser functions — Efficient browsing to seek information — Observance of procedures for processing electronic mail — Observance of procedures for importing and printing texts and graphics

MODULE 3: ARCHITECTURAL DRAWING COMPONENTS

Code: 825 273 Duration: 45 hours

BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
draft architectural components
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - a drafting table
  - drafting instruments
- Based on:
  - instructions
  - initial data
- Using technical drafting reference manuals

GENERAL PERFORMANCE CRITERIA

- Observance of drafting techniques
- Observance of tracing techniques
- Observance of lettering techniques

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Produce a sketch.	— Observance of techniques for producing a sketch — Observance of proportions
B. Prepare the layout.	— Proper selection of system of measurement — Selection of suitable scale — Accurate calculation of layout — Well-balanced layout

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
C. Produce the drawing.	— Observance of initial data — Correct application of techniques used to draw circles, ellipses, polygons and joining lines — Observance of drafting conventions — Clean linework — Clean presentation
D. Dimension and annotate the drawing.	— Observance of drafting conventions — Complete and accurate dimensions — Complete and accurate notes — Legible data
E. Complete the titleblock.	— Complete information — Accurate information

MODULE 4: BASIC FUNCTIONS OF DRAFTING SOFTWARE APPLICATIONS

Code: 825 287 Duration: 105 hours

BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
use the basic functions of drafting software applications
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - a computer with several software applications installed
  - peripherals (e.g. monitor, keyboard, mouse, printer)
  - diskettes
- Following instructions
- Using technical documents

GENERAL PERFORMANCE CRITERIA

- Appropriate use of technical documents
- Appropriate use of equipment

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Create a document.	— Observance of procedures for creating and saving a document — Use of proper commands for page layout — Use of proper commands to specify the working unit — Proper customization of toolbars

BEHAVIOURAL OBJECTIVE	
SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	**SPECIFIC PERFORMANCE CRITERIA**
B. Produce the drawing.	— Proper selection of commands for: – basic drafting – basic editing – viewing – selecting primitive elements — Optimal use of the various commands — Observance of proper sequencing techniques
C. Supply the required additional elements.	— Proper selection of commands for: – lettering – dimensioning – hatching – providing information related to the drawing — Optimal use of the various commands — Observance of proper sequencing techniques
D. Use a library of symbols (block).	— Proper use of commands for: – creating blocks – inserting blocks — Proper use of commands for editing a block — Proper use of commands for gathering information on a block — Observance of proper procedures for saving a block in a file
E. Manage layers.	— Proper use of layers — Selection of appropriate parameters — Proper layout of graphic components on the layers
F. Modify the dimension variables.	— Selection of proper dimensional parameters — Conformity of dimensioning styles with technical drawing standards

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
G. Modify printing variables.	— Selection of the proper printing parameters — Proper selection of line thickness — Proper selection of printing area — Selection of suitable scale

MODULE 5: ARCHITECTURAL OBJECTS

Code: 825 297 Duration: 105 hours

BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
produce drawings of architectural objects
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - a drafting table
  - drafting instruments
- Based on:
  - instructions
  - initial data
- Using technical drafting reference manuals

GENERAL PERFORMANCE CRITERIA

- Observance of drafting conventions
- Observance of tracing techniques
- Observance of lettering techniques
- Well-balanced layout
- Appropriate use of international and imperial systems of measurement
- Observance of initial data
- Observance of proportions and shapes of the objects to be represented
- Complete, accurate dimensioning
- Complete, accurate notes
- Accurate drawing
- Clean presentation
- Selection of suitable scale

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Produce an orthographic projection of an architectural object.	— Proper choice of views — Correct width of linework — Accurate tracing of the various projection lines — Observance and application of techniques used to draw different types of views — Accurate representation of hidden lines
B. Produce the drawing of a section.	— Appropriate selection of sections — Accurate representation of section views — Correct symbols for the materials represented — Correct identification of views
C. Produce an auxiliary view of an object with inclined planes.	— Correct width of linework — Projections perpendicular to inclined surfaces — Accurate representation of the auxiliary view
D. Produce an isometric drawing of an object.	— Accurate angles of the drawing — Accurate object representation — Correct application of techniques used to draw curves
E. Produce a perspective drawing of an object.	— Appropriate selection of the view — Accurate determination of the location of vanishing points — Convergence of lines to vanishing points — Appropriate level of detail — Clean, attractive presentation

MODULE 6: ARCHITECTURAL PLANS: SINGLE-FAMILY DWELLINGS

Code: 825 308 Duration: 120 hours

BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
produce architectural plans for a single-family dwelling
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - a drafting table

  or
  - a computer with several software applications installed
  - peripherals
- Based on:
  - instructions
  - a preliminary sketch
  - a survey plan
- Using:
  - the section of the National Building Code relating to residential construction
  - manufacturers' catalogues
  - municipal by-laws
  - technical documents

GENERAL PERFORMANCE CRITERIA

- Appropriate use of computer system and software
- Observance of the National Building Code
- Appropriate use of reference material
- Appropriate use of international and imperial systems of measurement
- Conformity of drawings with the initial data
- Consistency throughout the drawings
- Observance of drafting conventions
- Complete, accurate dimensioning
- Complete, accurate notes
- Accurate drawings
- Customer satisfaction
- Observance of time limit

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Interpret the instructions.	— Accurate interpretation of the initial data — Accurate interpretation of the municipal by-laws
B. Draw, dimension and annotate the: - foundation plan - floor plan - plan of a standard roof.	— Accurate determination of the structure's location — Appropriate dimensions of foundations — Appropriate dimensions of footings
C. Draw, dimension and annotate single flight stairs.	— Observance of standards used to draw stairs — Accurate calculations
D. Draw, dimension and annotate simple elevations.	— Observance of axes — Accurate location of the different components of the façades — Accurate identification of the levels of the components of the façades
E. Draw, dimension and annotate: - longitudinal or transversal sections - standard component wall sections - simple details.	— Observance of axes — Appropriate selection of sections and details — Complete, accurate details
F. Draw, dimension and annotate a layout plan on flat ground.	— Observance of by-laws
G. Have the work approved.	— Observance of approval procedure — Clear presentation of project
H. Print the drawings.	— Well-balanced layout. — Selection of suitable scale

MODULE 7: HEALTH AND SAFETY ON CONSTRUCTION SITES

Code: 755 002 Duration: 30 hours

SITUATIONAL OBJECTIVE

EXPECTED OUTCOME

By participating in the required activities of the learning context according to the indicated criteria, the students will
apply concepts of health and safety on construction sites.

SPECIFICATIONS

- Be familiar with the laws and regulations governing health and safety on construction sites.
- Be familiar with the roles and responsibilities of safety representatives and officers.
- Be aware of the hazards and safety measures related to certain tasks.
- Be aware of the hazards and safety measures related to a construction site in general.
- Be aware of the hazards and safety measures related to the use of certain products.
- Be familiar with the measures to be taken in case of accidents.

LEARNING CONTEXT

PHASE 1: Information

- Becoming familiar with the objectives of this unit and the accompanying guide.

PHASE 2: Learning

- Gathering information on the topic to be covered in this unit.
- Forming and expressing an opinion on the topic.
- Asking questions.
- Listing the main concepts and underlying principles of safe behaviour.
- Assessing their own observance of these principles.

SITUATIONAL OBJECTIVE

PHASE 3: Reinforcement

- Reviewing the main concepts of the unit.
- Answering a questionnaire.
- Correcting the answers and discussing them if necessary.

INSTRUCTIONAL GUIDELINES

- Use a suitable room and proper materials.
- Present the material in a dynamic way.
- Encourage the students to engage in group discussion.
- Use teaching materials appropriately (e.g. tables, transparencies, films, videotapes, information sheets).

PARTICIPATION CRITERIA

- Participate in at least 18 out of 20 units (units 1 and 2 being compulsory).
- Pay attention in class.
- Stick to the topic.
- Ask pertinent questions and give appropriate answers.
- Do the exercises conscientiously.
- Correct the exercises.

MODULE 8: ADVANCED FUNCTIONS OF DRAFTING SOFTWARE APPLICATIONS

Code: 825 315 Duration: 75 hours

BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
use the advanced functions of drafting software applications
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - a computer with several software applications installed
  - peripherals (e.g. monitor, keyboard, mouse, printer)
  - diskettes
- Following instructions
- Using technical documents

GENERAL PERFORMANCE CRITERIA

- Appropriate use of technical documents
- Appropriate use of materials

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Manage a library of symbols (block).	— Correct insertion of a drawing in the form of a reference folder — Optimal use of commands used to create, modify and export attributes of existing blocks
B. Manage a reference drawing.	— Appropriate use of commands for: – external reference blocks – redefining and fusing – fusing a block sub-entity in a reference file

BEHAVIOURAL OBJECTIVE	
SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	**SPECIFIC PERFORMANCE CRITERIA**
C. Create a layout.	— Mastery of the two environments (model and paper space) — Application of proper work procedures — Mastery of commands for: – dimensioning – inserting hatching – inserting external blocks – managing layers – establishing the scale ratio
D. Customize tools.	— Use of appropriate commands for customizing toolbars and menus

MODULE 9: REINFORCED CONCRETE DRAWINGS

Code: 825 324 Duration: 60 hours

BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
produce reinforced concrete drawings
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - a computer with several software applications installed
  - peripherals
- Based on:
  - instructions
  - architectural plans
  - engineering calculations and notes
- Using:
  - codes
  - manufacturers' catalogues
  - technical documents

GENERAL PERFORMANCE CRITERIA

- Appropriate use of computer system and software
- Observance of applicable standards and codes
- Observance of drafting conventions
- Conformity of drawings with initial data
- Consistency throughout the drawings
- Accurate drawings
- Complete, accurate dimensioning
- Complete, accurate notes
- Observance of time limit

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Plan the work.	— Accurate interpretation of drawings — Accurate interpretation of the calculations and notes provided by the engineering department — Complete list of drawings to be produced — Realistic estimate of time needed to do the work
B. Draw, dimension and annotate: - footings - foundation walls	— Accurate determination of the location of axes — Accurate location of footings and walls — Accurate dimensions of footings and walls — Accurate drawing of the reinforcement
C. Draw, dimension and annotate: - beams - columns	— Observance of axes — Accurate location of beams and columns — Accurate dimensions of beams and columns — Accurate drawing of the reinforcement
D. Draw, dimension and annotate: - floor slabs - roof slabs	— Observance of axes — Accurate drawing of the reinforcement
E. Draw, dimension and annotate the details.	— Appropriate selection of details — Observance of axes — Accurate drawing of the reinforcement
F. Design the reinforcement panels.	— Complete list of data — Accurate data — Correct use of reference materials
G. Write the general notes related to the composition of concrete.	— Complete list of notes — Accurate notes — Correct use of reference materials

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
H. Have the work approved.	— Observance of approval procedure — Clear presentation of project
I. Print the drawings.	— Well-balanced layout — Selection of suitable scale

MODULE 10: CONSTRUCTION SITE DATA

Code: 825 332 Duration: 30 hours

BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
record construction site data
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - a computer with several software applications installed
  - peripherals

  or
  - a drafting table
  - drafting instruments
- Based on:
  - instructions
  - a plan
- Using:
  - measuring instruments
  - drawing materials
  - protective gear

GENERAL PERFORMANCE CRITERIA

- Observance of health and safety rules on the construction site
- Precise, detailed work
- Autonomy and efficiency
- Appropriate use of material and equipment
- Appropriate behaviour on the construction site

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Plan the work.	— Appropriate selection of drawings — Appropriate selection of instruments of measurement, protective gear and drawing materials
B. Produce sketches.	— Observance of proportions — Accurate linework
C. Take measurements, notes and photographs.	— Appropriate use of measuring instruments — Accurate measurements — Appropriate selection of photographs to be taken — Accurate notes — Legible writing
D. List the building equipment.	— Accurate data — Complete list — Accurate entry of data into the computer
E. Carry out the layout.	— Appropriate use of drafting table — Appropriate use of a drafting application — Accurate drawing — Accurate data — Selection of suitable scale for printing data
F. Verify and complete the task.	— Complete, accurate verification of data — Accurate corrections

MODULE 11: INFORMATION RELATED TO PLUMBING

Code: 825 346 Duration: 90 hours

BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
research information related to plumbing
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - a drafting table
  - drafting instruments
- Based on:
  - instructions
  - architectural and structural plans
- Using:
  - the National Plumbing Code
  - manufacturers' catalogues

GENERAL PERFORMANCE CRITERIA

- Observance of standards prescribed by the National Plumbing Code
- Compliance with instructions
- Compliance with architectural and structural plans
- Use of correct terminology

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Select the sources of information.	— Appropriate selection of the technical documentation

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
B. Gather the information.	— Appropriate location of the information — Accurate information — Complete list of the information — Accurate interpretation of the information
C. Process the information.	— Accurate determination of the pipe sizes of a system — Complete list of fixtures and accessories
D. Apply the technical information.	— Schematic diagram of the plumbing system — Complete, accurate list of data — Complete, accurate technical specifications

MODULE 12: PLUMBING PLANS

Code: 825 356 Duration: 90 hours

BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
produce plumbing plans
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - a computer with several software applications installed
  - peripherals
- Based on:
  - instructions
  - architectural and structural plans
  - engineering calculations and notes
  - specifications
- Using:
  - applicable codes
  - manufacturers' catalogues
  - technical documents

GENERAL PERFORMANCE CRITERIA

- Appropriate use of computer system and software
- Observance of standards and applicable codes
- Appropriate use of reference materials
- Appropriate use of international and imperial systems of measurement
- Conformity of drawings with initial data
- Consistency throughout the different plumbing plans
- Customer satisfaction
- Observance of drafting conventions
- Observance of time limit

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Plan the work.	— Accurate interpretation of the initial data — Accurate interpretation of calculations and sketches — Complete list of plans to be produced — Realistic estimate of time needed to do the work
B. Prepare the background drawing.	— Conformity of the background drawing with the architectural and structural plans — Appropriate selection of components of the plan to be retained — Conformity of symbols with the conventions related to background drawings
C. Draw a preliminary plumbing system.	— Accurate drawing — Observance of conventions related to schematic diagrams — Observance of the order of plumbing lines — Complete list of technical specifications related to the piping and plumbing fixtures — Consistency with ventilation, electrical, structural and architectural plans
D. Calculate the dimensions of the systems.	— Use of the appropriate mathematical formulae — Accurate calculations
E. Compile a table listing the necessary materials.	— No errors or omissions concerning: – type of piping elements – models of fixtures and accessories – quantities – dimensions
F. Have the preliminary plans and fixtures approved.	— Observance of approval procedure — Clear presentation of project

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BAHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
G. Produce the working drawings.	— Complete drawings — Accurate layout of the components of the plumbing systems — Appropriate selection of details — Accurate symbols, dimensions and notes
H. Print the drawings.	— Well-balanced layout — Selection of suitable scale

MODULE 13: WALL SECTIONS AND DETAIL DRAWINGS

Code: 825 362 Duration: 30 hours

BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
draw wall sections and detail drawings
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - a computer with several software applications installed
  - peripherals
- Based on:
  - instructions
  - architectural and structural plans
  - sketches
  - data related to the components of different walls
- Using:
  - the National Building Code
  - the *Act respecting the conservation of energy in buildings*
  - manufacturers' catalogues
  - technical manuals

GENERAL PERFORMANCE CRITERIA

- Appropriate use of computer system and software
- Observance of the National Building Code
- Appropriate use of reference materials
- Conformity of drawings with initial data
- Accurate drawings
- Observance of drafting conventions
- Observance of time limit

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Plan the work.	— Accurate interpretation of the plans and other data — Appropriate selection of the placement of the section or detail
B. Locate the placement of the various materials that enter into the composition of a wall or detail.	— Observance of the proper sequence for placing the different materials — Accurate calculation of the placement of the different materials — Observance of the principles relating to: – insulation – condensation – heat loss – thermal bridge – ventilation
C. Draw the components of the wall or detail.	— Observance of architectural data — Observance of the structure of the building — Observance of the axis lines — Accurate placement of the different materials — Observance of drafting conventions used to represent the materials in section-form or in detail — Correct use of international and imperial systems of measurement
D. Dimension and annotate the drawings.	— Accuracy of data related to the thermal resistance — Correct use of international and imperial systems of measurement — Complete, accurate dimensions — Complete, accurate notes

MODULE 14: ESTIMATING QUANTITIES

Code: 825 372 Duration: 30 hours

BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
estimate quantities of materials and equipment
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - computer with a spreadsheet installed
  - peripherals
- Based on:
  - instructions
  - a plan and specifications
- Using:
  - a calculator
  - reference materials
  - manufacturers' catalogues
  - technical manuals

GENERAL PERFORMANCE CRITERIA

- Appropriate use of computer system and spreadsheet
- Appropriate use of reference materials
- Legible document

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Become familiar with the plan and specifications.	— Accurate interpretation of the plan — Accurate interpretation of the specifications

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
B. Compile a table listing the categories of materials, equipment and accessories.	— Observance of appropriate classification procedure for the specifications — Accurate table data — Complete list of materials, equipment and accessories — Correct terminology
C. Do the calculations.	— Observance of the correct method used to do the calculations — Appropriate selection of mathematical formulae — Accurate calculation of the quantities required — Accurate conversion of metric units into imperial units and vice versa

MODULE 15: STEEL STRUCTURE ASSEMBLY DRAWINGS

Code: 825 384 Duration: 60 hours

BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
produce steel structure assembly drawings
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - a computer with several software applications installed
  - peripherals
- Based on:
  - instructions
  - architectural plans
  - engineering calculations and notes
- Using:
  - codes
  - manufacturers' catalogues
  - technical manuals

GENERAL PERFORMANCE CRITERIA

- Appropriate use of computer system and software
- Appropriate use of reference materials
- Observance of applicable standards and codes
- Observance of drafting conventions
- Conformity of plans with initial data
- Consistency throughout the drawings
- Complete, accurate dimensions
- Complete, accurate notes
- Accurate drawings
- Observance of time limit

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Plan the work.	— Accurate interpretation of the plans — Accurate interpretation of calculations and notes provided by the engineering department — Complete list of plans to be produced — Realistic estimate of time needed to do the work
B. Draw, dimension and annotate the layout drawings.	— Accurate representation of the structural components — Accurate determination of the location of the axes — Accurate location and orientation of the columns
C. Draw, dimension and annotate the floor and roof plans.	— Accurate representation of the structural components — Accurate determination of the location of the axes — Accurate location and orientation of the columns, beams and joists
D. Draw, dimension and annotate the elevations.	— Accurate representation of the structural components — Accurate determination of the location of the axes — Accurate location and orientation of the columns, beams, joists, bracings and plates
E. Draw, dimension and annotate the sections and details.	— Appropriate selection of the location of sections and details
F. Have the work approved.	— Observance of approval procedure — Clear presentation of project
G. Print the drawings.	— Well-balanced layout — Selection of suitable scale

MODULE 16: STRUCTURAL STEEL SHOP DRAWINGS

Code: 825 398 Duration: 120 hours

BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
produce structural steel shop drawings
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - a computer with several software applications installed
  - peripherals
- Based on:
  - instructions
  - steel structure assembly drawings
- Using:
  - reference materials
  - manufacturers' catalogues
  - technical documents

GENERAL PERFORMANCE CRITERIA

- Appropriate use of computer system and software
- Appropriate use of reference materials
- Observance of drafting conventions
- Conformity of drawings with initial data
- Consistency throughout the drawings
- Accurate drawings
- Complete, accurate dimensions
- Complete, accurate notes
- Observance of time limit

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Plan the work.	— Accurate interpretation of the steel structure assembly drawings — Accurate interpretation of calculations and notes provided by the engineering department — Complete list of plans to be produced — Realistic estimate of time needed to do the work
B. Draw, dimension and annotate the bracings.	— Accurate calculation of the lengths of the bracings
C. Draw, dimension and annotate the beams and columns.	— Accurate calculation of the lengths of the beams and columns — Accurate dimensions of the structural components — Accurate location of the joists and copes — Accurate dimensions of the gains — Appropriate use of welding symbols
D. Draw, dimension and annotate the fasteners.	— Accurate dimensions of the fasteners
E. Draw, dimension and annotate the rough opening frames on the roof, walls and floor.	— Accurate dimensions of the openings
F. Compile a table listing: - quantities and dimensions pertaining to steel shapes - quantities and dimensions pertaining to steel bolts	— Complete data — Accurate data
G. Have the work approved.	— Observance of approval procedure — Clear presentation of project
H. Print the drawings.	— Well-balanced layout — Selection of suitable scale

MODULE 17: ARCHITECTURAL PLANS: MULTI-FAMILY DWELLINGS

Code: 825 408 Duration: 120 hours

BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
produce architectural plans for a multi-family dwelling
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - a computer with several software applications installed
  - peripherals
- Based on:
  - instructions
  - a preliminary sketch
  - an architectural application
  - engineering calculations
  - a survey plan
- Using:
  - the section related to residential construction in the National Building Code
  - manufacturers' catalogues
  - municipal by-laws
  - technical documents

GENERAL PERFORMANCE CRITERIA

- Appropriate use of computer system and software
- Observance of the National Building Code
- Appropriate use of reference materials
- Appropriate use of international and imperial systems of measurement
- Conformity of drawings with initial data
- Consistency throughout the drawings
- Observance of drafting conventions
- Accurate drawings
- Complete, accurate dimensions
- Complete, accurate notes
- Customer satisfaction
- Observance of time limit

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Plan the work.	— Accurate interpretation of the initial data — Accurate interpretation of municipal by-laws — Complete list of plans to be produced — Realistic estimate of time needed to do the work
B. Draw the structure.	— Accurate interpretation of engineering calculations — Observance of axes — Appropriate dimensions of the structural components — Accurate identification of the structure
C. Draw, dimension and annotate: - foundation plans; - floor plans for different landings - roof plans, including a cathedral ceiling, dormers, etc. - layout plans on uneven ground	— Observance of axes — Accurate calculation of the levels — Observance of municipal by-laws
D. Draw, dimension and annotate a stair with several flights.	— Observance of standards used to produce drawings of stairs — Accurate calculations — Accurate technical specifications
E. Draw, dimension and annotate elevations with balconies, bay windows, etc.	— Observance of axes — Accurate identification of the levels of the components of the façades — Accurate location of the different components of the façades
F. Draw, dimension and annotate: - longitudinal or transversal sections - wall sections, including party walls - complex details	— Observance of axes — Appropriate selection of sections and details — Complete, accurate details

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
G. Compile tables listing: - doors and windows - finishes	— Complete data — Accurate technical specifications
H. Have the work approved.	— Observance of approval procedure — Clear presentation of project
I. Print the drawings.	— Well-balanced layout — Selection of suitable scale

MODULE 18: INFORMATION RELATED TO ELECTRICITY

Code: 825 413 Duration: 45 hours

BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
research information related to electricity
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - a drafting table
  - drafting instruments
- Based on:
  - instructions
  - architectural and structural plans
- Using:
  - the Québec Electrical Code
  - the *Act respecting the conservation of energy in buildings*
  - manufacturers' catalogues

GENERAL PERFORMANCE CRITERIA

- Observance of standards prescribed by the Québec Electrical Code
- Observance of the *Act respecting the conservation of energy in buildings*
- Observance of instructions
- Compliance with architectural and structural plans
- Use of correct terminology

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Select the sources of information.	— Appropriate selection of the technical documentation

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
B. Gather the information.	— Correct location of the information — Accurate information — Complete list of the necessary information — Accurate interpretation of the information
C. Process the information.	— Accurate thermal calculations — Appropriate selection of heating units — Accurate calculations related to electrical loads — Accurate calculations related to electrical circuits — Appropriate selection of size of conductors
D. Apply the technical information.	— Approximate sketch of the electrical circuit — Approximate sketch of the branch circuits — Complete, accurate data — Complete, accurate characteristics of the electrical equipment pertaining to capacity, voltage and size

MODULE 19: ELECTRICAL PLANS

Code: 825 423 Duration: 45 hours

BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
produce electrical plans
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - a computer with several software applications installed
  - peripherals
- Based on:
  - instructions
  - architectural and structural plans
  - engineering calculations and notes
  - specifications
- Using:
  - the Québec Electrical Code and the National Building Code
  - manufacturers' catalogues
  - technical documents

GENERAL PERFORMANCE CRITERIA

- Appropriate use of computer system and software
- Observance of standards and applicable codes
- Appropriate use of reference materials
- Appropriate use of international and imperial systems of measurement
- Conformity of drawings with initial data
- Consistency throughout the different electrical drawings
- Consistency of the electrical drawings with the architectural, structural and mechanical plans
- Customer satisfaction
- Observance of drafting conventions
- Observance of time limit

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Plan the work.	— Accurate interpretation of the initial data — Accurate interpretation of the calculations and notes provided by the engineering department — Complete list of plans to be produced — Realistic estimate of time needed to do the work
B. Prepare the background drawing.	— Conformity of background drawing with architectural and structural plans — Appropriate selection of the components of the plan to be retained — Conformity of symbols with the conventions related to background drawings
C. Produce a plan of: - lighting - outlets - services	— Clear drawings — Accurate drawings — Complete drawings — Accurate symbols and legends
D. Draw: - the details - a mast - a service entrance diagram	— Appropriate selection of details — Accurate layout of the components of the electrical system
E. Compile a table listing the necessary materials.	— Complete list of materials — Accurate numbering — Accurate transcription of the technical description of the materials
F. Have the work approved.	— Observance of approval procedure — Clear presentation of project
G. Print the drawings.	— Well-balanced layout — Selection of suitable scale

MODULE 20: PRESENTATION DRAWINGS

Code: 825 437 Duration: 105 hours

BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
produce presentation drawings
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - a computer with several software applications installed
  - peripherals
  - the necessary drawing materials used to add colour
- Based on:
  - instructions
  - a preliminary drawing or a construction drawing
  - photographs
- Using:
  - reference materials (manuals, architectural illustrations, etc.)
  - technical documents

GENERAL PERFORMANCE CRITERIA

- Appropriate use of computer system and software
- Attractive presentation
- Compliance of the presentation drawings with the plans
- Observance of time limit

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Plan the work.	— Accurate interpretation of the initial data — Appropriate selection of views — Appropriate selection of work mediums — Realistic estimate of time needed to do the work

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
B. Produce a perspective background drawing.	— Proper use of 3D drafting commands — Proper use of 3D drafting editing commands — Proper use of 3D drafting info commands — Correct proportions of all elements in the drawing
C. Draw the architectural details.	— Accurate details — Attractive details — Correct proportions
D. Incorporate the surroundings (people, cars, trees, etc.).	— Originality of scenery — Correct proportions — Pleasing presentation
E. Represent the lighting of the building and its surroundings.	— Proper use of lighting commands — Appropriate selection of light sources — Appropriate selection of light intensity — Appropriate location of the lighting
F. Print the drawing.	— Well-balanced layout — Appropriate modification of printing variables — Appropriate selection of perspective
G. Add colour procedure.	— Proper technique used to colour by hand or computer — Observance of materials and textures — Appropriate ambiance for the drawing — Attractive drawing

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
H. Carry out the assembly of the drawing.	— Correct proportion between title and drawing — Proper use of illustration materials — Attractive presentation — Clean presentation

MODULE 21: JOB SEARCH TECHNIQUES

Code: 825 211 Duration: 15 hours

SITUATIONAL OBJECTIVE

EXPECTED OUTCOME

By participating in the required activities of the learning context according to the indicated criteria, the students will be able to
use job search techniques.

SPECIFICATIONS

- Consult various sources of information.
- Prepare documents for a job search.
- Plan a job search.
- Contact prospective employers.

LEARNING CONTEXT

PHASE 1: Preparing Documents for the Job Search

- Becoming familiar with various sources of information that can be used before and while preparing documents for the job search.
- Writing a résumé and a cover letter.
- Assembling a portfolio of the drawings prepared during the training program.

PHASE 2: Preparing and Following a Job Search Plan

- Determining the types of establishments that correspond to their interests and values.
- Planning the steps involved in the job search plan.
- Keeping a journal on the various steps of the job search and the procedure followed.

PHASE 3: Evaluating Job Search Techniques

- Assessing their work and their job search based on their journal and presenting the results of this assessment at a group meeting.

SITUATIONAL OBJECTIVE

INSTRUCTIONAL GUIDELINES

- Provide the students with the material resources and examples that will help them with their work.
- Explain to the students how to use reference materials.
- Put the students in touch with resource persons who can help them with their job search.
- Allot enough time and provide the necessary means for the students to try out their search plan.
- Follow up the steps taken by the students.
- Encourage discussion and cooperation among the students.

PARTICIPATION CRITERIA

PHASE 1:

- Consult sources of information at their disposal when necessary.
- Write a résumé and cover letter containing information on their work experience, their training, qualifications, personal data and activities, in accordance with presentation rules.
- Assemble a portfolio of drawings that are representative of their qualifications.

PHASE 2:

- List three types of establishments that could meet their requirements.
- Submit a journal containing information on each of the steps in their job search plan.

PHASE 3:

- Give a brief presentation on the relevance of the reference material used in their job search and the effectiveness of their approach.

MODULE 22: INFORMATION RELATED TO VENTILATION

Code: 825 446 Duration: 90 hours

BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
research information related to ventilation
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - a drafting table
  - drafting instruments
  - an air duct calculator
- Based on:
  - instructions
  - architectural and structural plans
- Using:
  - relevant reference materials
  - manufacturers' catalogues

GENERAL PERFORMANCE CRITERIA

- Observance of current standards
- Observance of instructions
- Compliance with architectural and structural plans
- Use of correct terminology

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Select the sources of information.	— Appropriate selection of the technical documentation

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
B. Gather the information.	— Correct location of the information — Accurate information — Complete list of information — Accurate interpretation of the information
C. Process the information.	— Accurate calculations of heat loss — Accurate calculations of air change rate — Appropriate selection of ducts, equipment and accessories — Complete list of equipment and accessories
D. Apply the technical information.	— Approximate sketch of the ventilation system — Complete, accurate data — Complete, accurate technical specifications

MODULE 23: VENTILATION PLANS

Code: 825 457 Duration: 105 hours

BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
produce ventilation plans
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - a computer with several software applications installed
  - peripherals
  - an air duct calculator
- Based on:
  - instructions
  - architectural and structural plans
  - engineering calculations and notes
  - specifications
- Using:
  - relevant codes
  - manufacturers' catalogues
  - technical documents

GENERAL PERFORMANCE CRITERIA

- Appropriate use of computer system and software
- Observance of standards and applicable codes
- Appropriate use of reference materials
- Appropriate use of international and imperial systems of measurement
- Consistency of drawings with initial data
- Consistency throughout the different ventilation plans
- Customer satisfaction
- Observance of drafting conventions
- Observance of time limit

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Plan the work.	— Accurate interpretation of the initial data — Accurate interpretation of calculations and sketches — Complete list of plans to be produced — Realistic estimate of time needed to do the work
B. Prepare the background drawing.	— Conformity of background drawing with architectural and structural plans — Appropriate selection of components of the plan to be retained — Conformity of symbols with the conventions related to background drawings
C. Produce a preliminary ventilation system plan.	— Accurate drawing — Observance of conventions related to schematic diagrams — Observance of correct procedure related to couplings — Complete list of specifications related to ventilation systems and equipment — Consistency with plumbing, electrical, structural and architectural plans
D. Calculate the dimensions of the systems.	— Use of the appropriate mathematical formulae — Accurate calculations
E. Compile a table listing the necessary material.	— No errors or omissions concerning: – ventilation system – type of equipment and accessories – quantities – dimensions
F. Have the preliminary drawings and equipment approved.	— Observance of approval procedure — Clear presentation of project

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
G. Produce the working drawings.	— Complete drawings — Accurate layout of the components of the ventilation system — Appropriate selection of details — Correct symbols, dimensions and notes
H. Print the drawings.	— Well-balanced layout — Selection of suitable scale

MODULE 24: COMMERCIAL BUILDING PLANS

Code: 825 468 Duration: 120 hours

BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
produce commercial building plans
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - a computer with several software applications installed
  - peripherals
- Based on:
  - instructions
  - a preliminary sketch produced by an architect
  - an architectural program
  - data provided by the engineering department
- Using:
  - the National Building Code
  - manufacturers' catalogues
  - technical documents

GENERAL PERFORMANCE CRITERIA

- Appropriate use of computer system and software
- Observance of the National Building Code
- Appropriate use of reference materials
- Appropriate use of international and imperial systems of measurement
- Conformity of plans with initial data
- Consistency throughout the drawings
- Complete, accurate dimensions
- Complete, accurate notes
- Accurate drawings
- Observance of drafting conventions
- Observance of time limit

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Plan the work.	— Correct interpretation of preliminary drawings — Accurate interpretation of initial data — Complete list of plans to be produced — Realistic estimate of time needed to do the work
B. Draw the structure.	— Accurate interpretation of the structural plan — Appropriate selection of the structure required for the architectural drawings — Observance of axes — Observance of dimensions and orientation of the structure
C. Draw, dimension and annotate: - floor plans - roof plans - reflected ceiling plans - site plans - layout plans	— Observance of dimensions related to the rooms and traffic areas — Accurate location of walls and partitions — Observance of data provided by the architect
D. Draw, dimension and annotate the elevations.	— Accurate location of the axes — Accurate location of the levels — Accurate location the components of the façades
E. Draw, dimension and annotate the stairs.	— Observance of data provided by the architect — Observance of standards related to stairs — Appropriate selection of views and details

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
F. Draw, dimension and annotate the sections and details.	— Appropriate selection of longitudinal and transversal sections — Appropriate selection of wall sections — Appropriate selection of details — Observance of axes — Proper layout of wall components — Observance of drafting conventions related to the representation of materials — Complete, accurate details
G. Have the work approved.	— Observance of approval procedure — Clear presentation of project
H. Print the drawings.	— Well-balanced layout — Selection of suitable scale

MODULE 25: ENTERING THE WORK FORCE

Code: 825 258 Duration: 120 hours

SITUATIONAL OBJECTIVE

EXPECTED OUTCOME

By participating in the required activities of the learning context according to the indicated criteria, the students will be able to
enter the work force.

SPECIFICATIONS

- Look for a practicum position.
- Become familiar with the workplace.
- Become aware of how their practicum will affect their perception of the work environment, trade practices, aptitudes, preferences, interests and training.

LEARNING CONTEXT

PHASE 1: Looking for a Practicum Position

- Becoming familiar with information and terms and conditions of the practicum.
- Setting personal criteria for selecting potential host companies.
- Identifying companies that are likely to host trainees.
- Applying for a practicum position.

PHASE 2: Observing and Practising the Trade in the Workplace

- Observing the work environment: the socio-economic environment (sectors), the structure of the establishment, equipment, technological advances, working conditions, interpersonal relations and so forth.
- Participating in and carrying out various tasks.
- Producing a brief report describing their observations of the work environment and of tasks carried out in the establishment.

SITUATIONAL OBJECTIVE

PHASE 3: Comparing Initial Perceptions with Their Experiences in the Workplace

- Identifying aspects of the trade that are similar to and that differ from their training.
- Discussing the accuracy of their perception of the trade before and after the practicum (e.g. the workplace, trade practices).
- Discussing how their experiences will affect their careers (e.g. aptitudes, preferences and interests).

INSTRUCTIONAL GUIDELINES

- Provide the students with the means to help them select an appropriate practicum position.
- Maintain close ties between the school and the establishment.
- Make it possible for students to observe and carry out tasks.
- Ensure regular support and supervision of the students.
- Intervene if difficulties or problems arise.
- Encourage the students to participate in discussions to express their opinions, particularly when they are looking for a practicum position or comparing their initial perceptions with their experiences in the workplace.

PARTICIPATION CRITERIA

PHASE 1:
- List, in order of priority, three potential host companies that meet their selection criteria.
- Meet with a company representative to apply for a position as a trainee.

PHASE 2:
- Observe the establishment's work schedules and policies concerning the activities they are authorized to carry out as trainees.

PHASE 3:
- Discuss with their colleagues their experiences in the workplace.

Éducation

Québec

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