

Vocational Education Program

5765

Business Equipment Technical Service

Training Sector

9

Electrotechnology

Reach for
your **Dreams**

Québec 

vocational Education Program

5765

Business Equipment Technical Service

Training Sector

9

Electrotechnology

Formation professionnelle et technique
et formation continue

Direction générale des programmes
et du développement

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INTRODUCTION

The *Business Equipment Technical Service* 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 and 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, 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 *Business Equipment Technical Service* program leads to a Diploma of Vocational Studies (DVS). To be admitted to 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, the SPR 06 test in the language of instruction and MTH-4065-2, or their equivalents, are prescribed as functional prerequisites.

OR

- For students having 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, if applicable: 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 795 hours spent on the specific competencies required to practise the trade and 1005 hours on general competencies. The program of study is divided into 21 modules, which vary in length from 15 to 150 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.

This document contains two parts. Part I is of general interest and provides an overview of the training plan. It is broken down into six chapters: the first is a synoptic table of basic information about the modules; the second defines the program training goals; the third, the competencies to be developed; the fourth, general objectives; the fifth, the operational objectives and the sixth addresses harmonization. Part II is designed primarily for those directly involved in implementing the program. It contains a description of the operational objectives of each module.

GLOSSARY

Program Training Goals

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

Competency

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

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.

Operational Objectives

Statements of the educational aims of a program in practical terms. They serve as the basis for teaching, learning and evaluation.

Module

A component part of a program of study comprising a first-level operational objective and, in certain cases, its accompanying second-level operational objectives.

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.

Part I

1 SYNOPTIC TABLE

Number of modules: 21
Duration in hours: 1800
Credits: 120

Business Equipment Technical Service
Code: 5765
Certification: DVS

CODE	TITLE OF MODULE	HOURS	CREDITS*
780 501	1 The Trade and the Training Process	15	1
780 519	2 Diagnosing a Malfunction in Electrical Circuits	150	10
780 523	3 Researching Information	45	3
780 535	4 Repairing and Adjusting Parts	75	5
780 543	5 Communicating in the Second Language	45	3
780 555	6 Diagnosing a Malfunction of Mechanical Origin	75	5
780 563	7 Establishing Communication Links	45	3
780 579	8 Diagnosing a Malfunction in Analogue Circuits	150	10
780 587	9 Servicing Operating Systems	105	7
780 599	10 Diagnosing a Malfunction in Digital Circuits	150	10
780 603	11 After-Sales Service on Multifunction Equipment	45	3
780 613	12 Professional Relationships	45	3
780 627	13 After-Sales Service on Microcomputers	105	7
780 639	14 After-Sales Service on Photocopiers	150	10
780 644	15 Interpretation of a Network Structure	60	4
780 656	16 After-Sales Service on Photocopier Peripherals	90	6
780 663	17 Administrative Tasks	45	3
780 676	18 After-Sales Service on Microcomputer Peripherals	90	6
780 689	19 After-Sales Service on Sales Registration Equipment	150	10
780 694	20 Remote Technical Support	60	4
780 707	21 Practicum in the Workplace	105	7

* 15 hours = 1 credit

2 PROGRAM TRAINING GOALS

The training goals of the *Business Equipment Technical Service* 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 correctly and at an acceptable level of competence for entry into the job market.
- To prepare students to progress satisfactorily on the job by fostering:
 - cognitive skills
 - technical and technological skills
 - communication skills
 - problem-solving skills
 - decision-making skills
 - a sense of professional ethics
 - concern for occupational health and safety
 - etc.

To ensure integration into the work force

- To familiarize students with:
 - the job market in general and the trade they have chosen in particular
 - their rights and responsibilities as workers

To foster the development of occupational knowledge

- To help students:
 - develop autonomy and the desire to learn
 - acquire effective work methods
 - understand the principles underlying the techniques and the technology used in the trade
 - develop self-expression, initiative and an analytical mind
 - acquire the attitudes required to successfully practise the trade, a sense of responsibility and concern for excellence

To ensure job mobility

- To help students develop:
 - positive attitudes toward change
 - the ability to manage their career successfully

3 COMPETENCIES

The competencies to be developed in the *Business Equipment Technical Service* 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 work-related activities. 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 (Δ) indicates a correlation between a specific competency and a step in the work process. The symbol ($\odot$) 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.

GRID OF LEARNING FOCUSES

GRID OF LEARNING FOCUSES				WORK PROCESS (major steps)						GENERAL COMPETENCIES (related to technology, subjects, personal development, etc.)												
		FIRST-LEVEL OPERATIONAL OBJECTIVES	DURATION (IN HOURS)	Receive a service request	Plan the work	Carry out the work	Clean and tidy up	Communicate with customers	Write up a report	Determine their suitability for the trade and the training process	Diagnose a malfunction in electrical circuits	Research technical information	Repair and adjust parts	Communication in the second language	Diagnose a malfunction of mechanical origin	Establish communication links	Diagnose a malfunction in analogue circuits	Service operating systems	Diagnose a malfunction in digital circuits	Establish professional relationships	Interpret a customer's network structure	Perform administrative tasks
MODULES	MODULES									1	2	3	4	5	6	7	8	9	10	12	15	17
	FIRST-LEVEL OPERATIONAL OBJECTIVES									S	B	B	B	S	B	B	B	B	B	S	B	B
	DURATION (IN HOURS)									15	150	45	75	45	75	45	150	105	150	45	60	45
11	Provide after-sales service on multifunction	B	45	▲	▲	▲	▲	▲	▲	○	●	●	●	●	●	●	●		●	○	○	○
13	Provide after-sales service on microcomputers	B	105	▲	▲	▲	▲	▲	▲	○	●	●	●	●	●	●	●	●	●	●	○	○
14	Provide after-sales service on photocopiers	B	150	▲	▲	▲	▲	▲	▲	○	●	●	●	●	●	●	●		●	●	○	○
16	Provide after-sales service on photocopier peripherals	B	90	▲	▲	▲	▲	▲	▲	○	●	●	●	●	●	●	●		●	●		○
18	Provide after-sales service on microcomputer peripherals	B	90	▲	▲	▲	▲	▲	▲	○	●	●	●	●	●	●	●		●	●	○	●
19	Provide after-sales service on sales registration equipment	B	150	▲	▲	▲	▲	▲	▲	○	●	●	●	●	●	●	●	●	●	●	●	●
20	Provide remote technical support	B	60	▲	▲	▲	▲	▲	▲	○	●	●	●	●	●	●	●	●	●	●	●	●
21	Enter the work force	S	105	▲	▲	▲	▲	▲	▲	●	●	●	●	●	●	●	●	●	●	●	●	●
NUMBER OF OBJECTIVES		8																				
DURATION (IN HOURS)			795																			

S: Situational objective
B: Behavioural objective

△ 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 *Business Equipment Technical Service* program are presented below, along with the major statement of each corresponding first-level operational objective.

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

- Determine their suitability for the trade and the training process.
- Enter the work force.

To develop in the students the competencies required to diagnose malfunctions

- Diagnose a malfunction in electrical circuits.
- Diagnose a malfunction of mechanical origin.
- Diagnose a malfunction in analogue circuits.
- Diagnose a malfunction in digital circuits.

To develop in the students the competencies required to use computing and networking technology

- Service operating systems.
- Interpret a customer's network structure.

To develop in the students the competencies required to communicate in the workplace

- Communicate in the second language.
- Establish professional relationships.

To develop in the students the competencies required to apply the techniques needed to practise the trade

- Research technical information.
- Repair and adjust parts.
- Establish communication links.
- Perform administrative tasks.

To develop in the students the competencies required to perform tasks related to business equipment technical service

- Provide after-sales service on multifunction equipment.
- Provide after-sales service on microcomputers.
- Provide after-sales service on photocopiers.
- Provide after-sales service on photocopier peripherals.
- Provide after-sales service on microcomputer peripherals.
- Provide after-sales service on sales registration equipment.
- Provide remote technical support.

5 FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES

5.1 DEFINITION

A first-level operational objective is defined for each competency to be developed in accordance with its description in Chapter 3. 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.

First-level operational objectives are the main compulsory teaching/learning targets and they are specifically evaluated for certification. There are two kinds 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 student's participation in the activities of the learning context.

Second-level operational objectives are intermediate teaching/learning targets deemed prerequisite for attaining first-level objectives. They are grouped according to the specifications (see 5.2.1) or the phases (see 5.2.2) of the first-level objective.

The division of operational objectives into first- and second-level objectives is based on a clear distinction between the levels of learning:

- learning involving prerequisite knowledge
- learning involving competencies

Second-level operational objectives indicate prerequisite knowledge. They prepare the students to learn what is necessary to attain the first-level operational objectives, which collectively lead to the development of a competency. The objectives should always be adapted to meet the particular needs of the individual students or groups of students.

First-level operational objectives cover the learning that the students need to develop a competency:

- The specifications or the phases of the objective determine or guide specific learning, thereby allowing the competency to be developed step by step.
- The objective as a whole (i.e. the six components and in particular the last phase of a situational objective—see 5.2) determines or guides the overall learning and the integration and synthesis of this learning, allowing the competency to be developed fully.

To attain the objectives, the following learning activities may be prepared:

- specific learning activities for second-level objectives
- specific learning activities for the specifications or phases of first-level objectives
- general learning activities for first-level objectives

5.2 HOW TO READ FIRST-LEVEL OPERATIONAL OBJECTIVES

5.2.1 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 the students can and must do during the evaluation designed to verify whether or not they 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, *if applicable*. It indicates cases where the objective applies to one or more tasks, occupations or fields, and so on.

5.2.2 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** suggest 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 fulfill, 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, *if applicable*. It indicates cases where the objective applies to one or more tasks, occupations or fields, and so on.

6 HARMONIZATION

The harmonization of vocational and technical education programs is a ministry orientation that consists in establishing the similarities and the continuity between secondary- and college-level programs of study. It also helps establish links between programs of study at the same level of education.

Whether there is harmonization between or within levels of education, within a same training sector or between different ones, its purpose is to recognize competencies that students have already acquired and to help them progress in their training.

Harmonization is an integral part of program development and revision and, whatever the process applied, is always based on the existence of links between the competencies of various programs.

The *Business Equipment Technical Service* program (5765) harmonizes with programs leading to a diploma in vocational studies in:

- electronic equipment
- telecommunications equipment
- electricity
- security systems
- automated systems electromechanics
- household equipment
- computing support

* program offered in French only

This program also harmonizes with one leading to a college diploma in electronics technology (DEC in *Technologie de l'électronique*, specialization in *Ordinateurs et réseaux*).

The table of equivalents will be published separately.

Part II

MODULE 1: THE TRADE AND THE TRAINING PROCESS

Code: 780 501

Duration: 15 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE 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

During this module, the students will:

- Become familiar with the nature of the trade.
- Understand the training process.
- Confirm their choice of program and career.

LEARNING CONTEXT

PHASE 1: Information on the Trade

- Learning about the job market in the field of business equipment technical service: types of businesses and job prospects.
- Learning about the nature and requirements of the job: tasks, working conditions, etc.
- Presenting the information gathered and discussing as a group their views on the trade.

PHASE 2: Participation in the Training Process

- Discussing the skills, attitudes, aptitudes and knowledge required to practise the trade.
- Becoming familiar with the training process.
- Relating the training program with the trade of business equipment technician.
- Sharing their initial views on the trade.
- Agreeing to observe the professional ethics of the trade.

**FIRST-LEVEL OPERATIONAL OBJECTIVE
SITUATIONAL OBJECTIVE (cont.)**

PHASE 3: Evaluation and Confirmation of Career Choice

- Producing a report in which they must:
 - state how their preferences, aptitudes and interests relate to the trade
 - evaluate their choice of program and career by comparing the aspects and requirements of the trade with their preferences, aptitudes and interests

INSTRUCTIONAL GUIDELINES

The teacher should:

- Create a climate that favours the students' personal development and entry into the work force.
- Encourage all students to engage in discussions and express their opinions.
- Motivate students to participate in the proposed activities.
- Help students gain an accurate perception of the trade.
- Provide students with the means to assess their career choice honestly and objectively.
- Organize visits to businesses representative of the main workplaces in the field.
- Provide the students with pertinent reference materials: information on the trade, programs of study, etc.
- Organize meetings with specialists in the field.

PARTICIPATION CRITERIA

- PHASE 1:**
- Gather information on most of the topics to be covered.
 - Express their views on the trade during a group discussion, relating these views to the information they have gathered.

- PHASE 2:**
- Give their opinions on some of the requirements they will have to meet in order to practise the trade.
 - Carefully review the documentation provided.
 - Listen attentively to the explanations given.
 - Express their views on the training program during a group discussion.
 - Agree to observe the professional ethics of the trade.

- PHASE 3:**
- Produce a brief report in which they:
 - sum up their preferences, interests and aptitudes and knowledge as well as their personal qualities
 - explain their choice of program and career by clearly relating these preferences, interests and aptitudes to the practice of the trade
 - explain why they choose to continue or abandon the training program

SECOND-LEVEL OPERATIONAL OBJECTIVES

IN ORDER TO ACHIEVE THE FIRST-LEVEL OBJECTIVE, THE STUDENTS SHOULD HAVE PREVIOUSLY ATTAINED SECOND-LEVEL OBJECTIVES, SUCH AS:

Before undertaking the activities of each of the phases:

1. Be receptive to information about the trade and the training program.
2. Be willing to share their views on the trade with other members of the group.

Before undertaking the activities of Phase 1 (Information on the Trade):

3. Locate information.
4. Determine how to record and present information.
5. Apply the main rules governing group discussions.

Before undertaking the activities of Phase 2 (Participation in the Training Process):

6. Distinguish among the skills, aptitudes, attitudes and knowledge required to practise the trade.

Before undertaking the activities of Phase 3 (Evaluation and Confirmation of Career Choice):

7. Know their preferences, aptitudes and interests.
8. Describe the main elements of a report.

MODULE 2: DIAGNOSING A MALFUNCTION IN ELECTRICAL CIRCUITS

Code: 780 519

Duration: 150 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must **diagnose a malfunction in electrical circuits** in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
 - electrical circuit schema
 - plans
 - technical manuals in English or French
- Using:
 - tools and measuring instruments
- Working with a piece of business equipment with an electrical malfunction

GENERAL PERFORMANCE CRITERIA

- Observance of occupational health and safety regulations
- Compliance with instructions
- Proper use of problem-solving methods
- Accurate diagnosis
- Clean, orderly work area

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR

A. Become familiar with the nature of the electrical malfunction.

B. Prepare the intervention.

SPECIFIC PERFORMANCE CRITERIA

- Gathering of all the information
- Relevance of the information gathered
- Clear questions

- Appropriate choice of:
 - reference manuals
 - tools
 - instruments

**FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE (cont.)**

**SPECIFICATIONS OF THE
EXPECTED BEHAVIOUR**

SPECIFIC PERFORMANCE CRITERIA

- | | |
|--|--|
| C. Dismantle the equipment or a section of it. | <ul style="list-style-type: none"> — Observance of the dismantling sequence — Maintenance of the equipment in good condition — Proper use of tools |
| D. Interpret the charts and diagrams of electrical circuits. | <ul style="list-style-type: none"> — Accurate interpretation of the charts and diagrams of electrical circuits including: <ul style="list-style-type: none"> – subcircuits – symbols – terminology – conventions |
| E. Verify the electrical circuits. | <ul style="list-style-type: none"> — Proper use of measuring instruments — Accurate interpretation of measurements such as voltage, current, resistance and frequency — Accurate verification of the value of the components |
| F. Process the information. | <ul style="list-style-type: none"> — Proper application of regulations relating to electrical circuits — Accurate calculations — Accurate comparison of the results with a model that is working |
| G. Formulate hypotheses. | <ul style="list-style-type: none"> — Justification of the hypotheses explaining the cause or causes of the malfunction |
| H. Identify the cause or causes of the malfunction. | <ul style="list-style-type: none"> — Accurate detection of the faulty component or components — Exact location of the faulty component or components |
| I. Reassemble the equipment. | <ul style="list-style-type: none"> — Observance of the reassembly sequence |

SECOND-LEVEL OPERATIONAL OBJECTIVES

IN ORDER TO ACHIEVE THE FIRST-LEVEL OBJECTIVE, THE STUDENTS SHOULD HAVE PREVIOUSLY ATTAINED SECOND-LEVEL OBJECTIVES, SUCH AS:

Before learning to become familiar with the nature of the electrical malfunction (A):

1. Be familiar with problem-solving methods.
2. Be familiar with the principles of electricity.
3. Be familiar with the principles of electromagnetism.
4. Distinguish the characteristics of direct current circuits from those of alternating current circuits.
5. Be familiar with the characteristics of circuit components such as resistors, coils, capacitors, solenoids, transformers and magnetic clutches.
6. Demonstrate good observation skills.

Before learning to prepare the intervention (B):

7. Show concern for not making the malfunction worse.
8. Demonstrate good organizational skills.

Before learning to dismantle the equipment or a section of it (C):

9. Acquire manual dexterity.

Before learning to verify the electrical circuits (E):

10. Use measuring instruments.
11. Verify the condition of components.

Before learning to process the information (F):

12. Establish the links between schemas and circuits.
13. Perform calculations.
14. Pay attention to detail.
15. Demonstrate patience.
16. Use a scientific calculator.

Before learning to identify the cause or causes of the malfunction (H):

17. Have self-confidence.

MODULE 3: RESEARCHING INFORMATION

Code: 780 523

Duration: 45 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must **research technical information** in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
 - a technical information need related to business equipment
 - trade journals or technical manuals in English or French
- Using:
 - a microcomputer
 - the Internet

GENERAL PERFORMANCE CRITERIA

- Optimal use of information sources
- Observance of laws and regulations related to acquiring information
- Relevance of the selected information
- Efficient research

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR

A. Specify the purpose of the research.

B. Select sources of information.

SPECIFIC PERFORMANCE CRITERIA

— Correct identification of the purpose of the research

— Consideration of all sources of information

— Relevant and recent sources

**FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE (cont.)**

**SPECIFICATIONS OF THE
EXPECTED BEHAVIOUR**

SPECIFIC PERFORMANCE CRITERIA

C. Consult sources of information.

- Appropriate use of the microcomputer and the Internet in terms of:
 - efficient research on Web sites
 - pertinent participation in discussion groups
 - appropriate choice of news groups
 - correct registration on distribution lists
- Identification of main ideas
- Neat, well-organized notes
- Accurate interpretation of the information gathered
- Verification of the information

D. Consult resource persons.

- Appropriate choice of resource persons according to their credibility and knowledge of the topic
- Relevant questions
- Clear communication

E. Process the information.

- Correct compiling of information
- Efficient filing of information
- Clear comparison of information

F. Record the information.

- Logical organization of information recorded
- Correct saving of information recorded
- Appropriate use of terminology in English or French
- Legible text

SECOND-LEVEL OPERATIONAL OBJECTIVES

IN ORDER TO ACHIEVE THE FIRST-LEVEL OBJECTIVE, THE STUDENTS SHOULD HAVE PREVIOUSLY ATTAINED SECOND-LEVEL OBJECTIVES, SUCH AS:

Before learning to select sources of information (B):

1. List the available sources of information.
2. Be aware of the potential of sources of information.

Before learning to consult sources of information (C):

3. Distinguish main ideas from secondary ones.
4. Use a microcomputer connected to a network.
5. Be familiar with the organizational structure of documentation.
6. Use search tools.
7. Surf the Internet.

Before learning to consult resource persons (D):

8. Demonstrate patience.
9. Behave with respect.
10. Communicate clearly.

Before learning to process the information (E):

11. Recognize the various formats of computer files.
12. Install plug-in utility software.
13. Use a software suite.

Before learning to record the information (F):

14. Be familiar with techniques for filing data.

MODULE 4: REPAIRING AND ADJUSTING PARTS

Code: 780 535

Duration: 75 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE BEHAVIOURAL OBJECTIVE
EXPECTED BEHAVIOUR To demonstrate the required competency, the students must repair and adjust parts in accordance with the following conditions, criteria and specifications. CONDITIONS FOR PERFORMANCE EVALUATION ■ Given: - schemas, plans and sketches ■ Using: - manual and electrical tools - measuring instruments ■ Working with: - materials - damaged parts taken from business equipment GENERAL PERFORMANCE CRITERIA ■ Observance of occupational health and safety regulations ■ Appropriate choice of tools ■ Correct use of tools and equipment ■ Observance of manufacturer's specifications to maintain the tools in good condition ■ Clean, orderly work area

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must **repair and adjust parts** in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
 - schemas, plans and sketches
- Using:
 - manual and electrical tools
 - measuring instruments
- Working with:
 - materials
 - damaged parts taken from business equipment

GENERAL PERFORMANCE CRITERIA

- Observance of occupational health and safety regulations
- Appropriate choice of tools
- Correct use of tools and equipment
- Observance of manufacturer's specifications to maintain the tools in good condition
- Clean, orderly work area

**FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE (cont.)**

**SPECIFICATIONS OF THE
EXPECTED BEHAVIOUR**

SPECIFIC PERFORMANCE CRITERIA

A. Machine parts.

- Proper adjustment of the tools
- Accurate duplication on paper of the part to be machined
- Accurate measurements
- Appropriate choice of material
- Correct application of machining techniques
- Observance of specific criteria with respect to dimensions, shapes and surface finishes

B. Assemble parts.

- Accurate determination of the location of the parts
- Correct positioning of the parts
- Proper use of fastening devices
- Correct application of assembly techniques
- Strength of the joints

C. Weld and desolder components.

- Precise location of the components
- Observance of the limits of the components
- Appropriate choice of tools and materials
- Correct application of welding and desoldering techniques
- Quality of the welds

D. Repair the panels, doors or housing of a piece of equipment.

- Accurate assessment of the condition of the panels, doors or housing of a piece of equipment
- Appropriate choice of materials
- Correct application of techniques
- Satisfactory completion of the repair
- Clean condition of the equipment

SECOND-LEVEL OPERATIONAL OBJECTIVES

IN ORDER TO ACHIEVE THE FIRST-LEVEL OBJECTIVE, THE STUDENTS SHOULD HAVE PREVIOUSLY ATTAINED SECOND-LEVEL OBJECTIVES, SUCH AS:

Before undertaking the activities of each of the specifications:

1. Be familiar with the characteristics of the tools.
2. Become aware of the occupational health and safety hazards associated with using various tools.
3. Be familiar with the right of refusal to work.
4. Be familiar with first-aid techniques.

Before learning to machine parts (A):

5. Produce sketches of parts.
6. Understand the components reproduced in plans.
7. Use various tools.
8. Be familiar with the properties and composition of materials.

Before learning to assemble parts (B):

9. Be familiar with the characteristics of assembly products.
10. Understand the properties of fastening devices.
11. Be familiar with adjustment techniques.

Before learning to weld and desolder components (C):

12. Be familiar with the different welding and desoldering techniques.
13. Be familiar with the different materials required for welding.
14. Understand the composition of the stand of the part to be welded.
15. Assess the quality of the weld.

Before learning to repair the panels, doors and housing of a piece of equipment (D):

16. Work conscientiously.
17. Follow instructions.
18. Exercise precision in their work.

MODULE 5: COMMUNICATING IN THE SECOND LANGUAGE

Code: 780 543

Duration: 45 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE 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
communicate in the second language.

SPECIFICATIONS

During this module, the students will:

- Read technical documentation.
- Consult with resource persons.
- Ask for information from suppliers.
- Deal with requests from customers.

LEARNING CONTEXT

PHASE 1: Information on Communicating in the Second Language

- Learning about the basic principles of effective communication.
- Learning about proper telephone etiquette.
- Evaluating their degree of proficiency in the second language.
- Gathering information about the second language in order to:
 - distinguish characteristics of the mother tongue from those of the second language
 - associate English terms with French ones
 - recognize verb tenses
 - recognize the difference in sentence structure between the two languages
 - interpret idiomatic expressions

FIRST-LEVEL OPERATIONAL OBJECTIVE
SITUATIONAL OBJECTIVE (cont.)

PHASE 2: Participation in the Process of Communicating in the Second Language

- Summarizing excerpts from technical manuals, instruction booklets, catalogues, etc.
- Introducing themselves.
- Providing technical information.
- Participating in group discussions.
- Holding a telephone conversation.

PHASE 3: Evaluation of Their Ability to Communicate in the Second Language

- Describing ways of improving their ability to communicate in the second language.
- Evaluating their progress relating to:
 - interpretation of verbal and written messages
 - expression of ideas

INSTRUCTIONAL GUIDELINES

The teacher should:

- Provide technical documentation, dictionaries and reference materials.
- Use role-play techniques and learning situations representative of the workplace.
- Favour work in small groups, ensuring that each student has the opportunity to both participate in and observe learning situations.
- Encourage students to participate in the activities.

PARTICIPATION CRITERIA

- PHASE 1:**
- Gather information on most of the topics to be covered.
 - Agree to evaluate their degree of proficiency in the second language.
 - Perform different tasks allowing them to gain knowledge about terminology, syntax, verbs and idiomatic expressions.
- PHASE 2:**
- Summarize excerpts from manuals using dictionaries and reference materials.
 - Participate in group discussions.
- PHASE 3:**
- Assess their ability to interpret verbal and written messages.
Accept feedback on their communication skills with respect to their use of appropriate terminology and correct sentence structure, their capacity to adapt their flow of speech to the situation, and the clearness of their accent.

SECOND-LEVEL OPERATIONAL OBJECTIVES

IN ORDER TO ACHIEVE THE FIRST-LEVEL OBJECTIVE, THE STUDENTS SHOULD HAVE PREVIOUSLY ATTAINED SECOND-LEVEL OBJECTIVES, SUCH AS:

Before undertaking the activities of each of the phases:

1. Understand the importance of communicating in the second language.
2. Show concern for respecting others.

Before undertaking the activities of Phase 1 (Information on Communicating in the Second Language):

3. Research information.
4. Use a dictionary.

Before undertaking the activities of Phase 2 (Participation in the Process of Communicating in the Second Language):

5. Show concern for respecting the opinions of others.
6. Be lenient in their opinion of themselves and of others.
7. Demonstrate patience.

Before undertaking the activities of Phase 3 (Evaluation of Their Ability to Communicate in the Second Language):

8. Show willingness to receive feedback.
9. Demonstrate intellectual honesty.

MODULE 6: DIAGNOSING A MALFUNCTION OF MECHANICAL ORIGIN

Code: 780 555

Duration: 75 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must **diagnose a malfunction of mechanical origin** in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
 - schemas
 - plans
 - technical manuals in English or French
- Using:
 - tools and measuring instruments
- Working with a piece of business equipment with a mechanical malfunction

GENERAL PERFORMANCE CRITERIA

- Observance of occupational health and safety regulations
- Compliance with instructions
- Proper use of problem-solving methods
- Accurate diagnosis
- Clean, orderly work area

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR

A. Become familiar with the nature of the mechanical malfunction.

B. Prepare the intervention.

SPECIFIC PERFORMANCE CRITERIA

- Gathering of all the information
- Relevance of the information gathered
- Clear questions

- Appropriate choice of:
 - reference manuals
 - tools
 - instruments

**FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE (cont.)**

**SPECIFICATIONS OF THE
EXPECTED BEHAVIOUR**

SPECIFIC PERFORMANCE CRITERIA

- | | |
|---|---|
| C. Dismantle the equipment or a section of it. | <ul style="list-style-type: none"> — Observance of the dismantling sequence — Maintenance of the equipment in good condition — Proper use of tools |
| D. Verify the mechanisms. | <ul style="list-style-type: none"> — Careful examination of the mechanisms — Meticulous visual inspection — Accurate measurements |
| E. Process the information. | <ul style="list-style-type: none"> — Accurate comparison of the results with a model that is working |
| F. Formulate hypotheses. | <ul style="list-style-type: none"> — Justification of the hypotheses explaining the cause or causes of the malfunction |
| G. Identify the cause or causes of the malfunction. | <ul style="list-style-type: none"> — Accurate detection of the faulty part or parts — Exact location of the faulty part or parts |
| H. Reassemble the equipment. | <ul style="list-style-type: none"> — Observance of the reassembly sequence |

SECOND-LEVEL OPERATIONAL OBJECTIVES

IN ORDER TO ACHIEVE THE FIRST-LEVEL OBJECTIVE, THE STUDENTS SHOULD HAVE PREVIOUSLY ATTAINED SECOND-LEVEL OBJECTIVES, SUCH AS:

Before learning to become familiar with the nature of the mechanical malfunction (A):

1. Be familiar with the principles of mechanics.
2. Be familiar with mechanical systems in business equipment.
3. Demonstrate good observation skills.

Before learning to prepare the intervention (B):

4. Show respect for other people's property.
5. Show concern for not making the malfunction worse.
6. Demonstrate good organizational skills.

Before learning to dismantle the equipment or a section of it (C):

7. Understand the use of fastening devices in business equipment.
8. Be familiar with the characteristics of metals.
9. Be familiar with the different kinds of lubricants and understand their role.
10. Choose the tools.
11. Exercise precision in their work.
12. Acquire manual dexterity.

Before learning to verify the mechanisms (D):

13. Use measuring instruments.

Before learning to process the information (E):

14. Establish links between the mechanisms.
15. Calculate force and speed ratios.
16. Pay attention to detail.

Before learning to identify the cause or causes of the malfunction (G):

17. Have self-confidence.

MODULE 7: ESTABLISHING COMMUNICATION LINKS

Code: 780 563

Duration: 45 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must **establish communication links** in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
 - technical documentation written in English or French
- Using:
 - tools and measuring instruments
- Working with two pieces of business equipment, each with an external communication link

GENERAL PERFORMANCE CRITERIA

- Observance of occupational health and safety regulations
- Compliance with standards
- Appropriate choice of verification tools
- Reliability of communication links
- Clean, orderly work area

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR

- A. Interpret the technical documentation, schemas and plans.
- B. Assemble the cables and connectors.

SPECIFIC PERFORMANCE CRITERIA

- Correct interpretation of the documents, schemas and plans
- Appropriate choice of the cables and connectors
- Compliance with the connection schemas
- Strength of the junctions
- Quality of the work

**FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE (cont.)**

**SPECIFICATIONS OF THE
EXPECTED BEHAVIOUR**

SPECIFIC PERFORMANCE CRITERIA

C. Make the connections.

- Verification of the compatibility of the material
- Accurate location of the connection
- Strength of the connection

D. Configure the material.

- Accurate adjustment of the parameters of the communication link

E. Carry out testing.

- Appropriate use of the verification tools
- Accurate interpretation of the results of the test

SECOND-LEVEL OPERATIONAL OBJECTIVES

IN ORDER TO ACHIEVE THE FIRST-LEVEL OBJECTIVE, THE STUDENTS SHOULD HAVE PREVIOUSLY ATTAINED SECOND-LEVEL OBJECTIVES, SUCH AS:

Before learning to interpret the technical documentation, schemas and plans (A):

1. Know how a telephone network works.
2. Describe the characteristics of different digital communications.
3. Establish links between electronics and telecommunications.
4. Establish links between computing and telecommunications.

Before learning to assemble cables and connectors (B):

5. Be familiar with cabling standards.
6. Crimp cables.
7. Perform welding.
8. Make connections by insulation displacement.

Before learning to configure the material (D):

9. Be familiar with communication protocol.

Before learning to carry out testing (E):

10. Be aware of the potential of verification tools.
11. Show concern for the quality of their work.

MODULE 8: DIAGNOSING A MALFUNCTION IN ANALOGUE CIRCUITS

Code: 780 579

Duration: 150 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
diagnose a malfunction in analogue circuits
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
 - analogue circuit schema
 - plans
 - technical manuals in English or French
- Using:
 - tools and measuring instruments
- Working with a piece of business equipment with an analogue electronic malfunction

GENERAL PERFORMANCE CRITERIA

- Observance of occupational health and safety regulations
- Compliance with instructions
- Proper use of problem-solving methods
- Accurate diagnosis
- Clean, orderly work area

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR

A. Become familiar with the nature of the
analogue electronic malfunction.

B. Prepare the intervention.

SPECIFIC PERFORMANCE CRITERIA

- Gathering of all the information
- Relevance of the information gathered
- Clear questions

- Appropriate choice of:
 - reference manuals
 - tools
 - instruments

**FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE (cont.)**

**SPECIFICATIONS OF THE
EXPECTED BEHAVIOUR**

SPECIFIC PERFORMANCE CRITERIA

- | | |
|---|---|
| C. Dismantle the equipment or a section of it. | <ul style="list-style-type: none"> — Observance of the dismantling sequence — Maintenance of the equipment in good condition — Proper use of tools |
| D. Interpret the charts and schemas of analogue circuits. | <ul style="list-style-type: none"> — Accurate interpretation of the charts and schemas of analogue circuits including: <ul style="list-style-type: none"> – subcircuits – symbols – terminology – conventions |
| E. Verify the analogue circuits. | <ul style="list-style-type: none"> — Proper use of measuring instruments — Accurate interpretation of measurements such as voltage, current, resistance and frequency — Accurate verification of the value of the semiconductors |
| F. Process the information. | <ul style="list-style-type: none"> — Proper application of regulations relating to analogue electronics. — Accurate calculations — Accurate comparison of the results with a model that is working |
| G. Formulate hypotheses. | <ul style="list-style-type: none"> — Justification of the hypotheses explaining the cause or causes of the malfunction |
| H. Identify the cause or causes of the malfunction. | <ul style="list-style-type: none"> — Accurate detection of the faulty component or components — Exact location of the faulty component or components |
| I. Reassemble the equipment. | <ul style="list-style-type: none"> — Observance of the reassembly sequence |

SECOND-LEVEL OPERATIONAL OBJECTIVES

IN ORDER TO ACHIEVE THE FIRST-LEVEL OBJECTIVE, THE STUDENTS SHOULD HAVE PREVIOUSLY ATTAINED SECOND-LEVEL OBJECTIVES, SUCH AS:

Before learning to become familiar with the nature of the analogue electronic malfunction (A):

1. Be familiar with the principles and characteristics of the electronic components of analogue circuits such as diodes, transistors, thyristors and integrated circuits.
2. Be familiar with the characteristics of the optoelectronic components of analogue circuits such as electroluminescent diodes, displays, photodiodes and phototransistors.
3. Read a block diagram, a wiring diagram, an electronic schema, a timing diagram and a logic diagram.
4. Demonstrate good observation skills.

Before learning to prepare the intervention (B):

5. Show concern for not making the malfunction worse.
6. Demonstrate good organizational skills.

Before learning to verify the analogue circuits (E):

7. Use measuring instruments.

Before learning to process the information (F):

8. Apply Ohm's law, Kirchhoff's laws for nodes and current, and Thévenin's theorem.
9. Be familiar with the principles and characteristics of linear power supply circuits.
10. Be familiar with the principles and characteristics of switched-mode power supply circuits.
11. Be familiar with the principles and characteristics of amplification circuits.
12. Be familiar with the principles and characteristics of switching circuits.
13. Be familiar with the principles and characteristics of oscillation circuits.
14. Develop autonomy.

SECOND-LEVEL OPERATIONAL OBJECTIVES *(cont.)*

IN ORDER TO ACHIEVE THE FIRST-LEVEL OBJECTIVE, THE STUDENTS SHOULD HAVE PREVIOUSLY ATTAINED SECOND-LEVEL OBJECTIVES, SUCH AS :

Before learning to determine the cause or causes of the malfunction (H):

15. Compare data.
16. Be capable of critical thinking.

MODULE 9: SERVICING OPERATING SYSTEMS

Code: 780 587

Duration: 105 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must **service operating systems** in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
 - technical documentation written in English or French
- Working with:
 - a microcomputer
 - operating systems

GENERAL PERFORMANCE CRITERIA

- Concern for rules of ergonomics
- Correct use of the microcomputer
- Correct use of the utility software
- Optimization of the intervention
- Clean, orderly work area

FIELD OF APPLICATION

- On operating systems using older technology, and on those using recent technology
- On a stand-alone workstation

**FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE (cont.)**

**SPECIFICATIONS OF THE
EXPECTED BEHAVIOUR**

SPECIFIC PERFORMANCE CRITERIA

A. Disk management.

- Appropriate partition of the disk
- Suitable choice of the file system
- Appropriate interventions on the file tree
- Appropriate interventions on the files with respect to:
 - moving
 - saving and restoring
 - copying
 - deleting
 - compressing and decompressing
 - editing
- Correct modification of file attributes

B. Customize the computer environment.

- Correct adaptation of the graphical interface to the user's requirements with respect to:
 - start-up
 - menu
 - shortcut
 - taskbar
 - display style
 - screen saver
 - password, etc.
- Correct adaptation of the graphical interface on a multiuser workstation

C. Run programs and commands in text mode.

- Appropriate choice of commands
- Observance of the syntax
- Accurate location of the command or the program
- Correct interpretation of the result of the run
- Correct use of the potential of commands and programs

D. Install drivers.

- Appropriate choice of the drivers
- Compliance with the installation procedure
- Accurate interpretation of the messages
- Correct verification of the installation

SECOND-LEVEL OPERATIONAL OBJECTIVES

IN ORDER TO ACHIEVE THE FIRST-LEVEL OBJECTIVE, THE STUDENTS SHOULD HAVE PREVIOUSLY ATTAINED SECOND-LEVEL OBJECTIVES, SUCH AS:

Before learning to manage the disk (A):

1. Use a computer.
2. Be familiar with installation and updating procedures.
3. Adopt a safe working posture.
4. Install operating systems.

Before learning to customize the computer environment (B):

5. Take the needs of customers into account.
6. Demonstrate patience.

Before learning to install drivers (D):

7. Surf the Internet.

MODULE 10: DIAGNOSING A MALFUNCTION IN DIGITAL CIRCUITS

Code: 780 599

Duration: 150 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must **diagnose a malfunction in digital circuits** in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
 - digital circuit schema
 - plans
 - technical manuals in English or French
- Using:
 - tools and measuring instruments
- Working with a piece of business equipment with a digital electronic malfunction

GENERAL PERFORMANCE CRITERIA

- Observance of occupational health and safety regulations
- Compliance with instructions
- Proper use of problem-solving methods
- Accurate diagnosis
- Clean, orderly work area

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR

A. Become familiar with the nature of the digital electronic malfunction.

B. Prepare the intervention.

SPECIFIC PERFORMANCE CRITERIA

- Gathering of all the information
- Relevance of the information gathered
- Clear questions
- Appropriate choice of:
 - reference manual
 - tools
 - instruments

**FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE (cont.)**

**SPECIFICATIONS OF THE
EXPECTED BEHAVIOUR**

SPECIFIC PERFORMANCE CRITERIA

- | | |
|---|---|
| C. Dismantle the equipment or a section of it. | <ul style="list-style-type: none"> — Observance of the dismantling sequence — Maintenance of the equipment in good condition — Proper use of tools |
| D. Interpret the charts and diagrams of digital circuits. | <ul style="list-style-type: none"> — Accurate interpretation of the charts and diagrams of digital circuits including: <ul style="list-style-type: none"> – subcircuits – symbols – terminology – conventions |
| E. Verify the digital circuits. | <ul style="list-style-type: none"> — Proper use of measuring instruments — Accurate interpretation of measurements such as voltage, current, resistance and frequency — Accurate verification of the value of logic circuits and microprocessors |
| F. Process the information. | <ul style="list-style-type: none"> — Proper application of regulations relating to digital electronics — Accurate calculations — Accurate comparison of the results with a model that is working |
| G. Formulate hypotheses. | <ul style="list-style-type: none"> — Justification of the hypotheses explaining the cause or causes of the malfunction |
| H. Identify the cause or causes of the malfunction. | <ul style="list-style-type: none"> — Accurate detection of the faulty component or components — Exact location of the faulty component or components |
| I. Reassemble the equipment. | <ul style="list-style-type: none"> — Observance of the reassembly sequence |

SECOND-LEVEL OPERATIONAL OBJECTIVES

IN ORDER TO ACHIEVE THE FIRST-LEVEL OBJECTIVE, THE STUDENTS SHOULD HAVE PREVIOUSLY ATTAINED SECOND-LEVEL OBJECTIVES, SUCH AS:

Before learning to become familiar with the nature of the digital electronic malfunction (A):

1. Be familiar with digital components such as logic gates, switches, counters, multiplexes, memories, analogue-to-digital converters, digital-to-analogue converters, microprocessors, interfaces and microcontrollers.
2. Be familiar with the characteristics of the electronic components of digital circuits.
3. Read a block diagram, a wiring diagram, an electronic schema, a timing diagram and a logic diagram.
4. Demonstrate good observation skills.

Before learning to prepare the intervention (B):

5. Show concern for not making the malfunction worse.
6. Demonstrate good organization skills.

Before learning to verify the digital circuits (E):

7. Use measuring instruments.

Before learning to process the information (F):

8. Be familiar with truth tables.
9. Be familiar with state diagrams.
10. Use low-level programming language.
11. Develop autonomy.

Before learning to determine the cause or causes of the malfunction (H):

12. Observe the operating sequences of the program.
13. Compare data.
14. Be capable of critical thinking.

MODULE 11: AFTER-SALES SERVICE ON MULTIFUNCTION EQUIPMENT

Code: 780 603

Duration: 45 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must **provide after-sales service on multifunction equipment** in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
 - a service call
- Using:
 - technical documentation written in English or French
 - tools and measuring instruments
- Working with a piece of multifunction equipment

GENERAL PERFORMANCE CRITERIA

- Observance of occupational health and safety regulations
- Observance of professional ethics
- Customer satisfaction
- Optimal working order of the multifunction equipment
- Appropriate use of tools and instruments
- Effective stress management
- Clean, orderly work area

FIELD OF APPLICATION

- In a workshop or at the customer's place of business

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR

A. Receive a service request.

SPECIFIC PERFORMANCE CRITERIA

— Accurate interpretation of the service request

**FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE (cont.)**

**SPECIFICATIONS OF THE
EXPECTED BEHAVIOUR**

SPECIFIC PERFORMANCE CRITERIA

B. Plan the work.

- Correct prioritization of calls
- Proper work sequence
- Correct estimate of the material required to perform the work

C. Install a piece of multifunction equipment.

- Accurate interpretation of technical manuals
- Appropriate choice of location
- Proper verification of the power supply and the telephone line
- Observance of the activation procedure
- Configuration in accordance with the customer's needs
- Proper testing of reception and transmission, and other testing
- Clear verbal communication when demonstrating the functioning of the equipment

D. Repair a piece of multifunction equipment.

- Gathering of all the information
- Accurate assessment of the condition of the piece of multifunction equipment, and in particular:
 - meticulous inspection of its working order
 - correct determination of the faulty section
- Accuracy of the diagnosis in terms of a:
 - mechanical malfunction
 - electrical malfunction
 - electronic malfunction
- Correct estimate of repair costs
- Effective problem solving
- Accurate verification of the functioning of the piece of equipment

**FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE (cont.)**

**SPECIFICATIONS OF THE
EXPECTED BEHAVIOUR**

SPECIFIC PERFORMANCE CRITERIA

E. Service a piece of multifunction equipment.

- Observance of the manufacturer's specifications
- Appropriate choice of the products required to service the equipment
- Relevant decisions with respect to adjustments
- Correct replacement of the components
- Clean condition of the equipment
- Safe disposal of toxic products

F. Write up a service report.

- Use of appropriate terminology
- Accuracy of the recorded information
- Quality of the written language
- Legibility of the recorded data

SECOND-LEVEL OPERATIONAL OBJECTIVES

IN ORDER TO ACHIEVE THE FIRST-LEVEL OBJECTIVE, THE STUDENTS SHOULD HAVE PREVIOUSLY ATTAINED SECOND-LEVEL OBJECTIVES, SUCH AS:

Before learning to plan the work (B):

1. Demonstrate good organization skills.
2. Develop autonomy.
3. Choose the tools.
4. Show concern for observing occupational health and safety regulations with respect to working on live equipment.

Before learning to install a piece of multifunction equipment (C):

5. Use a piece of multifunction equipment.
6. Know how the multifunction equipment and its sections work.
7. Research information.
8. Use measuring instruments.

Before learning to repair a piece of multifunction equipment (D):

9. Adopt a safe method of working.
10. Recognize the components of the equipment.
11. Diagnose malfunctions of electrical, electronic or mechanical origin.
12. Interpret self-diagnostic codes.
13. Make decisions.
14. Demonstrate perseverance.

Before learning to service a piece of multifunction equipment (E):

15. Be familiar with the characteristics of various cleaning products.
16. Observe the manufacturer's specifications.

Before learning to write up a service report (F):

17. Use a notepad.
18. Be familiar with terminology in English.
19. Compile precise, accurate data.
20. Know how to summarize.

MODULE 12: PROFESSIONAL RELATIONSHIPS

Code: 780 613

Duration: 45 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE 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 **establish professional relationships.**

SPECIFICATIONS

During this module, the students will:

- Understand the importance of harmonious professional relationships in the workplace.
- Observe professional ethics.
- Contact customers.
- Communicate with superiors and colleagues.

LEARNING CONTEXT

PHASE 1: Information on Professional Relationships

- Gathering information on the rules of professional ethics specific to the trade, such as portraying a positive image of the company, showing concern for confidentiality, demonstrating tact, dressing appropriately, having respect for customers, and keeping a clean, orderly toolbox.
- Learning about different types of customers.
- Learning about discussion and negotiation techniques.

**FIRST-LEVEL OPERATIONAL OBJECTIVE
SITUATIONAL OBJECTIVE (cont.)**

PHASE 2: Participation in the Communication Process

- Starting to reflect on the way they interact with others.
- Discussing the importance of effective communication in establishing harmonious professional relationships.
- Identifying methods of reassuring customers.
- Analyzing methods of reducing stress.
- Applying basic communication techniques when introducing themselves, interpreting the needs of customers, providing explanations, consulting resource persons, and negotiating with suppliers; for example, active listening, feedback and empathy.

PHASE 3: Evaluation of Their Behaviour and Attitudes

- Indicating the steps they could take to improve the way they communicate in the workplace.
- Indicating the steps they could take to reduce stress in the workplace.
- Assessing their personal strengths and weaknesses in terms of their ability to:
 - avoid conflicts
 - apply effective communication techniques
 - respect others
 - create a climate of confidence
- Evaluating their ability to observe professional ethics.

INSTRUCTIONAL GUIDELINES

The teacher should:

- Use role-play techniques and learning situations representative of the workplace.
- Favour work in small groups, ensuring that each student has the opportunity to participate in and observe learning situations.
- Encourage the students to participate in the activities.
- Help students to gain a clear understanding of the importance of professional relationships in the trade.
- Provide students with methods of assessing their ability to establish harmonious professional relationships.
- Organize meetings with representatives from the workplace.

PARTICIPATION CRITERIA

- PHASE 1:** ■ Gather information on most of the topics to be covered.

FIRST-LEVEL OPERATIONAL OBJECTIVE
SITUATIONAL OBJECTIVE *(cont.)*

- PHASE 2:**
- Give their opinion during discussions.
 - Participate in activities.
- PHASE 3:**
- Agree to assess their relationships with others.
 - Present steps that could be taken to reduce stress and avoid conflicts in the workplace.
 - Observe professional ethics.

SECOND-LEVEL OPERATIONAL OBJECTIVES

IN ORDER TO ACHIEVE THE FIRST-LEVEL OBJECTIVE, THE STUDENTS SHOULD HAVE PREVIOUSLY ATTAINED SECOND-LEVEL OBJECTIVES, SUCH AS:

Before undertaking the activities of each of the phases:

1. Understand the importance of establishing harmonious professional relationships.

Before undertaking the activities of Phase 1 (Information on Professional Relationships):

2. Distinguish relationships with customers from those with colleagues.

Before undertaking the activities of Phase 2 (Participation in the Communication Process):

3. Apply the principles of effective communication.
4. Be familiar with methods of reducing stress.
5. Show concern for respecting the opinions of others.
6. Demonstrate empathy.

Before undertaking the activities of Phase 3 (Evaluation of Their Behaviour and Attitudes):

7. Agree to assess their behaviour and attitudes.

MODULE 13: AFTER-SALES SERVICE ON MICROCOMPUTERS

Code: 780 627

Duration: 105 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must **provide after-sales service on microcomputers** in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
 - a service call
- Using:
 - technical documentation written in English or French
 - tools and measuring instruments
- Working with:
 - a microcomputer, a mouse, a keyboard and a monitor
 - an operating system
 - software

GENERAL PERFORMANCE CRITERIA

- Observance of occupational health and safety regulations
- Observance of professional ethics
- Customer satisfaction
- Optimal working order of the microcomputers
- Appropriate use of tools and instruments
- Effective stress management
- Clean, orderly work area

FIELD OF APPLICATION

- In a workshop or at the customer's place of business
- On a stand-alone computer

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR

A. Receive a service request.

SPECIFIC PERFORMANCE CRITERIA

— Accurate interpretation of the service request

**FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE (cont.)**

**SPECIFICATIONS OF THE
EXPECTED BEHAVIOUR**

SPECIFIC PERFORMANCE CRITERIA

B. Plan the work.

- Correct prioritization of calls
- Proper work sequence
- Correct estimate of the material required to perform the work

C. Prepare a microcomputer.

- Accurate interpretation of technical manuals
- Appropriate choice of location
- Correct installation of the components of the microcomputer, such as:
 - memory
 - motherboard
 - sound card
 - microprocessor
 - hard disk
 - floppy disk drive
 - etc.
- Correct installation of the operating systems
- Correct installation of the drivers
- Correct configuration of the microcomputer

D. Install a microcomputer.

- Proper verification of the power supply and the telephone line
- Observance of the service procedure
- Correct connection of the peripherals such as the mouse, the keyboard and the monitor
- Proper testing
- Correct installation of the software
- Clear verbal communication when demonstrating the functioning of the microcomputer

**FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE (cont.)**

**SPECIFICATIONS OF THE
EXPECTED BEHAVIOUR**

SPECIFIC PERFORMANCE CRITERIA

E. Repair a microcomputer.

- Gathering of all the information
- Accurate assessment of the condition of the microcomputer, and in particular:
 - meticulous inspection of its working condition
 - correct determination of the faulty section
- Accuracy of the diagnosis in terms of a:
 - hardware malfunction
 - software malfunction
- Correct estimate of repair costs
- Correct saving of the data
- Effective problem solving
- Correct reconfiguration of the microcomputer
- Accurate verification of the functioning of the microcomputer

F. Service a microcomputer.

- Appropriate use of utility programs required for hard disk management
- Proper cleaning of the microcomputer

G. Update a microcomputer.

- Correct replacement of the hardware components of the microcomputer
- Correct replacement of the BIOS of the microcomputer
- Correct replacement of the software components of the microcomputer

H. Write up a service report.

- Use of appropriate terminology
- Accuracy of the recorded information
- Quality of the written language
- Legibility of the recorded data

SECOND-LEVEL OPERATIONAL OBJECTIVES

IN ORDER TO ACHIEVE THE FIRST-LEVEL OBJECTIVE, THE STUDENTS SHOULD HAVE PREVIOUSLY ATTAINED SECOND-LEVEL OBJECTIVES, SUCH AS:

Before learning to plan the work (B):

1. Demonstrate good organizational skills.
2. Develop autonomy.
3. Choose the tools.
4. Choose the utility software.
5. Show concern for observing occupational health and safety regulations with respect to working on live equipment.

Before learning to prepare a microcomputer (C):

6. Be familiar with the components of a microcomputer.
7. Be familiar with microcomputer architectures.
8. Be familiar with the different speeds of data processing and data transfer.
9. Be familiar with the elements of compatibility and incompatibility.

Before learning to install a microcomputer (D):

10. Use a microcomputer.
11. Know how microcomputers work.
12. Be familiar with the different connectors and other communication components.
13. Research information.
14. Use measuring instruments.
15. Be familiar with operating systems using recent technology.
16. Work methodically.
17. Apply the principles of effective communication.
18. Be familiar with safety regulations related to wearing an antistatic wriststrap.

Before learning to repair a microcomputer (E):

19. Diagnose a malfunction of electrical, electronic, mechanical or computing origin.
20. Make decisions.
21. Demonstrate perseverance.

Before learning to service a microcomputer (F):

22. Observe the manufacturer's specifications.

MODULE 14: AFTER-SALES SERVICE ON PHOTOCOPIERS

Code: 780 639

Duration: 150 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must **provide after-sales service on photocopiers** in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
 - a service call
- Using:
 - technical documentation written in English or French
 - tools and measuring instruments
- Working with a photocopier

GENERAL PERFORMANCE CRITERIA

- Observance of occupational health and safety regulations
- Observance of professional ethics
- Customer satisfaction
- Optimal working order of the photocopiers
- Appropriate use of tools and instruments
- Effective stress management
- Clean, orderly work area

FIELD OF APPLICATION

- In a workshop or at the customer's place of business
- On an analogue or digital photocopier
- On a monochrome or colour photocopier

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR

A. Receive a service request.

SPECIFIC PERFORMANCE CRITERIA

— Accurate interpretation of the service request

**FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE (cont.)**

**SPECIFICATIONS OF THE
EXPECTED BEHAVIOUR**

SPECIFIC PERFORMANCE CRITERIA

B. Plan the work.

- Correct prioritization of calls
- Proper work sequence
- Correct estimate of the material required to perform the work

C. Install a photocopier.

- Accurate interpretation of technical manuals
- Proper verification of the power supply
- Observance of the activation procedure
- Configuration in accordance with the customer's needs
- Proper testing
- Clear verbal communication when demonstrating the functioning of the photocopier

SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE (cont.)

**SPECIFICATIONS OF THE
EXPECTED BEHAVIOUR**

SPECIFIC PERFORMANCE CRITERIA

D. Repair a photocopier.

- Gathering of all the information, and in particular:
 - proper verification of the counter and the service book
 - relevant questions to the user
- Accurate assessment of the condition of the equipment, and in particular:
 - meticulous inspection of its working order
 - proper verification of the quality of the copies
 - correct determination of the faulty section
- Accuracy of the diagnosis in terms of a:
 - mechanical malfunction
 - electrical malfunction
 - electronic malfunction
 - optical malfunction
 - colour-related malfunction
- Correct estimate of repair costs
- Problem solving
- Accurate verification of the functioning of the photocopier

E. Service a photocopier.

- Precise adjustment of:
 - the quality of the image
 - the colours
- Correct lubrication of the parts
- Neatness during the replacement of ink and toner containers
- Meticulous cleaning of the photocopier and its sections
- Safe disposal of toxic products

**FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE (cont.)**

**SPECIFICATIONS OF THE
EXPECTED BEHAVIOUR**

SPECIFIC PERFORMANCE CRITERIA

F. Recondition a photocopier.

- Observance of dismantling and reassembly techniques
- Correct replacement of the parts
- Proper repair of the housing or panels

G. Write up a service report.

- Use of appropriate terminology
- Accuracy of the recorded information
- Quality of the written language
- Legibility of the recorded data

SECOND-LEVEL OPERATIONAL OBJECTIVES

IN ORDER TO ACHIEVE THE FIRST-LEVEL OBJECTIVE, THE STUDENTS SHOULD HAVE PREVIOUSLY ATTAINED SECOND-LEVEL OBJECTIVES, SUCH AS:

Before learning to plan the work (B):

1. Demonstrate good organizational skills.
2. Develop autonomy.
3. Choose the tools.
4. Show concern for observing occupational health and safety regulations with respect to working on live equipment.

Before learning to install a photocopier (C):

5. Use a photocopier.
6. Know how photocopiers work.
7. Distinguish among the different sections and components of a photocopier.
8. Research information.
9. Use tools and measuring instruments.
10. Work methodically.
11. Interpret data sheets on the Workplace Hazardous Material Information System (WHMIS).
12. Transport heavy equipment properly.
13. Adopt a safe working posture.
14. Understand the risks related to the reflection of a laser beam.
15. Apply the principles of effective communication.

Before learning to repair a photocopier (D):

16. Be familiar with the principles of colour composition.
17. Diagnose a malfunction of electrical, electronic, mechanical, optical or colour-related origin.
18. Weld components.
19. Repair parts.
20. Make decisions.
21. Detect signs of wear.
22. Demonstrate perseverance.

Before learning to service a photocopier (E):

23. Observe the manufacturer's specifications.

MODULE 15: INTERPRETATION OF A NETWORK STRUCTURE

Code: 780 644

Duration: 60 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must **interpret a customer's network structure** in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
 - technical documentation written in English or French
- Using:
 - network plans and schemas
- Working on an established network

GENERAL PERFORMANCE CRITERIA

- Correct interpretation of data gathered

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR

A. Communicate with the network administrator.

B. Read the documents.

C. Inspect the equipment.

D. Compile the information.

SPECIFIC PERFORMANCE CRITERIA

- Relevant questions
- Accurate recording of the main ideas
- Active listening
- Courtesy
- Accurate interpretation of the network schemas and plans
- Accurate interpretation of the functioning of the network hardware
- Meticulous inspection of the network environment
- Accuracy of the information recorded
- Accuracy of the information gathered
- Correct reproduction of the network structure

SECOND-LEVEL OPERATIONAL OBJECTIVES

IN ORDER TO ACHIEVE THE FIRST-LEVEL OBJECTIVE, THE STUDENTS SHOULD HAVE PREVIOUSLY ATTAINED SECOND-LEVEL OBJECTIVES, SUCH AS:

Before learning to read the documents (B):

1. Be familiar with the different network architectures.
2. Be familiar with the different network topologies.
3. Distinguish among different network hardware.
4. Be familiar with reference models.
5. Distinguish among the characteristics of transmission media.
6. Be familiar with communications protocols.

Before learning to inspect the equipment (C):

7. Demonstrate a good sense of observation.
8. Demonstrate intellectual curiosity.

Before learning to compile information (D):

9. Be capable of critical thinking and of synthesis.

MODULE 16: AFTER-SALES SERVICE ON PHOTOCOPIER PERIPHERALS

Code: 780 656

Duration: 90 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must **provide after-sales service on photocopier peripherals** in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
 - a service call
- Using:
 - technical documentation written in English or French
 - tools and measuring instruments
- Working on photocopier peripherals such as sorters, staplers, slot machines and chip card readers

GENERAL PERFORMANCE CRITERIA

- Observance of occupational health and safety regulations
- Observance of professional ethics
- Customer satisfaction
- Optimal working order of the photocopier peripherals
- Appropriate use of tools and instruments
- Effective stress management
- Clean, orderly work area

FIELD OF APPLICATION

- In a workshop or at the customer's place of business

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR

A. Receive a service request.

SPECIFIC PERFORMANCE CRITERIA

— Accurate interpretation of the service request

**FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE (cont.)**

**SPECIFICATIONS OF THE
EXPECTED BEHAVIOUR**

SPECIFIC PERFORMANCE CRITERIA

B. Plan the work.

- Correct prioritization of calls
- Proper work sequence
- Correct estimate of the material required to perform the work

C. Install the photocopier peripherals.

- Accurate interpretation of technical manuals
- Proper verification of the power supply, telephone line and network transmission media
- Assembly according to the manufacturer's specifications
- Observance of the activation procedure
- Configuration of the photocopier and the peripherals in accordance with the customer's needs
- Proper testing
- Clear verbal communication when demonstrating the functioning of the photocopier peripherals

**FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE (cont.)**

**SPECIFICATIONS OF THE
EXPECTED BEHAVIOUR**

SPECIFIC PERFORMANCE CRITERIA

D. Repair the photocopier peripherals.

- Gathering of all the information, and in particular:
 - proper verification of the counter and the service book
 - relevant questions to the user
- Accurate assessment of the condition of the photocopier peripherals, and in particular:
 - meticulous inspection of their working order
 - correct determination of the faulty section
- Accuracy of the diagnosis in terms of a:
 - mechanical malfunction
 - electrical malfunction
 - electronic malfunction
 - optical malfunction
- Correct estimate of repair costs
- Problem solving
- Accurate verification of the functioning of the photocopier peripherals

E. Service the photocopier peripherals.

- Correct lubrication of the parts
- Appropriate replacement of the parts
- Meticulous cleaning of the photocopier peripherals

F. Write up a service report.

- Use of appropriate terminology
- Accuracy of the recorded information
- Quality of the written language
- Legibility of the recorded data

SECOND-LEVEL OPERATIONAL OBJECTIVES

IN ORDER TO ACHIEVE THE FIRST-LEVEL OBJECTIVE, THE STUDENTS SHOULD HAVE PREVIOUSLY ATTAINED SECOND-LEVEL OBJECTIVES, SUCH AS:

Before learning to plan the work (B):

1. Demonstrate good organizational skills.
2. Develop autonomy.
3. Choose the tools.
4. Show concern for occupational health and safety regulations.

Before learning to install the photocopier peripherals (C):

5. Use the photocopier peripherals.
6. Know how photocopier peripherals work.
7. Distinguish among the components of photocopier peripherals.
8. Distinguish among the different network transmission media.
9. Research information.
10. Use tools and measuring instruments.
11. Work methodically.
12. Adopt a safe working posture.
13. Apply the principles of effective communication.

Before learning to repair the photocopier peripherals (D):

14. Diagnose a malfunction of electrical, electronic, mechanical or computer origin.
15. Make decisions.
16. Detect signs of wear.
17. Demonstrate perseverance.

Before learning to service the photocopier peripherals (E):

18. Observe the manufacturer's specifications.

MODULE 17: ADMINISTRATIVE TASKS

Code: 780 663

Duration: 45 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must **perform administrative tasks** in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Using:
 - technical documentation written in English or French
 - a microcomputer
 - a software suite

GENERAL PERFORMANCE CRITERIA

- Observance of professional ethics
- Quality of the written English or written French

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR

A. Keep an up-to-date inventory.

B. Keep an up-to-date list of customers.

SPECIFIC PERFORMANCE CRITERIA

- Appropriate use of a database
- Meticulous management of the inventory of parts and tools
- Accurate ordering of parts
- Proper verification of the parts received
- Correct classification of the parts
- Appropriate use of the software
- Logical classification of customer information

**FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE (cont.)**

**SPECIFICATIONS OF THE
EXPECTED BEHAVIOUR**

SPECIFIC PERFORMANCE CRITERIA

C. Keep an up-to-date agenda.

- Correct use of an electronic agenda.
- Thorough compiling of the information entered into the handwritten or electronic agenda
- Clear, precise recording of the data
- Efficient time management

D. Prepare time sheets and expense accounts.

- Correct use of spreadsheet and word-processing software.
- Accurate recording of the data

E. Prepare invoices.

- Accurate recording of the data
- Accurate calculation of taxes

SECOND-LEVEL OPERATIONAL OBJECTIVES

IN ORDER TO ACHIEVE THE FIRST-LEVEL OBJECTIVE, THE STUDENTS SHOULD HAVE PREVIOUSLY ATTAINED SECOND-LEVEL OBJECTIVES, SUCH AS:

Before learning to keep an up-to-date inventory (A):

1. Be familiar with database software.
2. Be familiar with methods for placing orders.
3. Communicate with suppliers in the mother tongue or the second language.
4. Search for information in technical manuals.
5. Demonstrate a good sense of observation.
6. Use a microcomputer.

Before learning to keep an up-to-date list of customers (B):

7. Demonstrate good organizational skills.

Before learning to keep an up-to-date agenda (C):

8. Work methodically.
9. Develop autonomy.

MODULE 18: AFTER-SALES SERVICE ON MICROCOMPUTER PERIPHERALS

Code: 780 676

Duration: 90 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must **provide after-sales service on microcomputer peripherals** in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
 - a service call
- Using:
 - technical documentation written in English or French
 - tools and measuring instruments
- Working with microcomputer peripherals such as a monitor, a scanner and a printer

GENERAL PERFORMANCE CRITERIA

- Observance of occupational health and safety regulations
- Observance of professional ethics
- Customer satisfaction
- Optimal working order of the microcomputer peripherals
- Appropriate use of tools and instruments
- Effective stress management
- Clean, orderly work area

FIELD OF APPLICATION

- In a workshop or at the customer's place of business

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR

A. Receive a service request.

SPECIFIC PERFORMANCE CRITERIA

— Accurate interpretation of the service request

**FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE (cont.)**

**SPECIFICATIONS OF THE
EXPECTED BEHAVIOUR**

SPECIFIC PERFORMANCE CRITERIA

B. Plan the work.

- Correct prioritization of calls
- Proper work sequence
- Correct estimate of the material required to perform the work

C. Install the microcomputer peripherals.

- Accurate interpretation of technical manuals
- Proper verification of the power supply and telephone line
- Observance of the activation procedure, and in particular:
 - correct connection of the external peripherals
 - correct installation of the drivers
 - correct configuration of the microcomputer
- Proper testing
- Clear verbal communication when demonstrating the functioning of the microcomputer peripherals

**FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE (cont.)**

**SPECIFICATIONS OF THE
EXPECTED BEHAVIOUR**

SPECIFIC PERFORMANCE CRITERIA

D. Repair the microcomputer peripherals.

- Gathering of all the information, and in particular:
 - relevant questions to the user
- Accurate assessment of the condition of the microcomputer peripherals, and in particular:
 - meticulous inspection of their working order
 - correct determination of the faulty section
- Accuracy of the diagnosis in terms of a:
 - hardware malfunction
 - software malfunction
- Correct estimate of repair costs
- Correct saving of the data
- Effective problem solving
- Correct reconfiguration of the microcomputer
- Accurate verification of the functioning of the microcomputer peripherals

E. Service the microcomputer peripherals.

- Accurate adjustment of the parts
- Correct lubrication of the parts
- Meticulous cleaning of the microcomputer peripherals

F. Write up a service report.

- Use of appropriate terminology
- Accuracy of the recorded information
- Quality of the written language
- Legibility of the recorded data

SECOND-LEVEL OPERATIONAL OBJECTIVES

IN ORDER TO ACHIEVE THE FIRST-LEVEL OBJECTIVE, THE STUDENTS SHOULD HAVE PREVIOUSLY ATTAINED SECOND-LEVEL OBJECTIVES, SUCH AS:

Before learning to plan the work (B):

1. Demonstrate good organizational skills.
2. Develop autonomy.
3. Choose the tools.
4. Show concern for observing occupational health and safety regulations.

Before learning to install the microcomputer peripherals (C):

5. Use microcomputer peripherals.
6. Know how microcomputer peripherals work.
7. Distinguish among the different components of microcomputer peripherals.
8. Be familiar with the elements of compatibility and incompatibility.
9. Research information.
10. Use tools and measuring instruments.
11. Work methodically.
12. Adopt a safe method of working.
13. Apply the principles of effective communication.

Before learning to repair the microcomputer peripherals (D):

14. Diagnose a malfunction of electrical, electronic, mechanical or computing origin.
15. Make decisions.
16. Detect signs of wear.
17. Demonstrate perseverance.

Before learning to service the microcomputer peripherals (E):

18. Observe the manufacturer's specifications.

MODULE 19: AFTER-SALES SERVICE ON SALES REGISTRATION EQUIPMENT

Code: 780 689

Duration: 150 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must **provide after-sales service on sales registration equipment** in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
 - a service call
- Using:
 - technical documentation written in English or French
 - tools and measuring instruments
- Working with a piece of sales registration equipment

GENERAL PERFORMANCE CRITERIA

- Observance of occupational health and safety regulations
- Observance of professional ethics
- Customer satisfaction
- Optimal working order of the sales registration equipment
- Appropriate use of tools and instruments
- Effective stress management
- Clean, orderly work area

FIELD OF APPLICATION

- In a workshop or at the customer's place of business
- On a piece of sales registration equipment linked to a network

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR

A. Receive a service request.

SPECIFIC PERFORMANCE CRITERIA

— Accurate interpretation of the service request

**FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE (cont.)**

**SPECIFICATIONS OF THE
EXPECTED BEHAVIOUR**

SPECIFIC PERFORMANCE CRITERIA

B. Plan the work.

- Correct prioritization of calls
- Proper work sequence
- Correct estimate of the material required to perform the work

C. Prepare the equipment in the workshop.

- Accurate interpretation of technical manuals
- Assembly in accordance with the manufacturer's specifications
- Correct connection of the cables and connectors
- Correct installation of the software
- Effective configuration of the equipment

D. Install the sales registration equipment.

- Proper verification of the power supply, telephone line and network transmission media
- Observance of the activation procedure
- Proper testing
- Clear explanations with respect to:
 - change of price, time, date, etc.
 - production of reports
 - configuration of new codes

**FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE (cont.)**

**SPECIFICATIONS OF THE
EXPECTED BEHAVIOUR**

SPECIFIC PERFORMANCE CRITERIA

- | | |
|--|--|
| E. Repair the sales registration equipment. | <ul style="list-style-type: none"> — Gathering of all the information, and in particular: <ul style="list-style-type: none"> – relevant questions to the network administrator or the user — Accurate assessment of the condition of the sales registration equipment, and in particular: <ul style="list-style-type: none"> – meticulous inspection of its working order – correct determination of the faulty section — Accuracy of the diagnosis in terms of a: <ul style="list-style-type: none"> – mechanical malfunction – electrical malfunction – electronic malfunction – computing malfunction — Correct estimate of repair costs — Effective problem solving — Correct reconfiguration of the equipment, if necessary — Accurate verification of the functioning of the sales registration equipment |
| F. Service the sales registration equipment. | <ul style="list-style-type: none"> — Accurate adjustment of the parts — Correct lubrication of the parts — Meticulous cleaning of the sales registration equipment |
| G. Recondition the sales registration equipment. | <ul style="list-style-type: none"> — Observance of dismantling and reassembly techniques — Correct replacement of the parts — Proper updating of the software |
| H. Write up a service report. | <ul style="list-style-type: none"> — Use of appropriate terminology — Accuracy of the recorded information — Quality of the written language — Legibility of the recorded data |

SECOND-LEVEL OPERATIONAL OBJECTIVES

IN ORDER TO ACHIEVE THE FIRST-LEVEL OBJECTIVE, THE STUDENTS SHOULD HAVE PREVIOUSLY ATTAINED SECOND-LEVEL OBJECTIVES, SUCH AS:

Before learning to plan the work (B):

1. Demonstrate good organization skills.
2. Develop autonomy.
3. Choose the tools.
4. Show concern for observing occupational health and safety regulations with respect to working on live equipment.

Before learning to install the sales registration equipment (D):

5. Use sales registration equipment.
6. Know how sales registration equipment works, such as the cash register, optical scanner, printer and electronic scales.
7. Distinguish among the different components of sales registration equipment.
8. Research information.
9. Be familiar with the different connectors and other linkage components.
10. Use tools and measuring instruments.
11. Be familiar with operating systems using recent technology.
12. Work methodically.
13. Use the material required to transport equipment safely.
14. Apply the principles of effective communication.

Before learning to repair the sales registration equipment (E):

15. Diagnose a malfunction of electrical, electronic, mechanical or computing origin.
16. Make decisions.
17. Detect signs of wear.
18. Demonstrate perseverance.

Before learning to service the sales registration equipment (F):

19. Observe the manufacturer's specifications.

MODULE 20: REMOTE TECHNICAL SUPPORT

Code: 780 694

Duration: 60 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must **provide remote technical support** in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
 - a service call
- Using:
 - technical documentation written in English or French
 - a microcomputer
 - software for remote troubleshooting
 - a telephone
- Working with a piece of business equipment

GENERAL PERFORMANCE CRITERIA

- Observance of professional ethics
- Observance of the principles of effective communication
- Customer satisfaction
- Optimal working order of the equipment
- Appropriate use of software
- Effective stress management

FIELD OF APPLICATION

- In a workshop

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR

A. Receive a service request.

SPECIFIC PERFORMANCE CRITERIA

— Accurate interpretation of the service request

**FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE (cont.)**

**SPECIFICATIONS OF THE
EXPECTED BEHAVIOUR**

SPECIFIC PERFORMANCE CRITERIA

- | | |
|---|--|
| B. Communicate with the customer. | <ul style="list-style-type: none"> — Active listening — Relevant questions — Correct visualization of the malfunction |
| C. Install the remote troubleshooting software, if necessary. | <ul style="list-style-type: none"> — Appropriate choice of software — Observance of the installation procedure |
| D. Solve the problem. | <ul style="list-style-type: none"> — Gathering of all the information — Thorough analysis of the malfunction — Accuracy of the diagnosis — Correct application of the solution |
| E. Communicate with the customer. | <ul style="list-style-type: none"> — Clear, precise instructions — Verification of the customer's understanding |

SECOND-LEVEL OPERATIONAL OBJECTIVES

IN ORDER TO ACHIEVE THE FIRST-LEVEL OBJECTIVE, THE STUDENTS SHOULD HAVE PREVIOUSLY ATTAINED SECOND-LEVEL OBJECTIVES, SUCH AS:

Before learning to communicate with the customer (B):

1. Be familiar with the principles of effective communication.
2. Observe proper telephone etiquette.
3. Show concern for respecting others.
4. Visualize a problem.
5. Demonstrate empathy.

Before learning to install remote troubleshooting software, if necessary (C):

6. Be familiar with the potential and the limitations of software programs.
7. Establish the communication.

Before learning to solve the problem (D):

8. Identify a malfunction of electrical, electronic, mechanical or computing origin.
9. Make decisions.
10. Demonstrate perseverance.
11. Demonstrate patience.
12. Work methodically.

MODULE 21: PRACTICUM IN THE WORKPLACE

Code: 780 707

Duration: 105 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE 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

During this module, the students will:

- Become familiar with certain working conditions related to business equipment technical service.
- Carry out various trade-related activities.
- Observe company policies.
- Observe professional ethics.

LEARNING CONTEXT

PHASE 1: Preparation for the practicum in the Workplace

- Learning about the terms and conditions of the practicum.
- Preparing a list of companies likely to accept trainees.
- Learning about the policies of the company.
- Writing a résumé and a cover letter.
- Communicating with company personnel in charge of practicum.

PHASE 2: Integration Into the Workplace

- Observing the work context: socioeconomic environment in terms of the product and the market, professional associations, organizational structure, equipment, changing technology, working conditions, professional relationships, health and safety, etc.
- Performing or participating in various occupational tasks.
- Taking note of their observations in an practicum log.

FIRST-LEVEL OPERATIONAL OBJECTIVE
SITUATIONAL OBJECTIVE (cont.)

PHASE 3: Evaluation

- Producing a brief report of their observations, the tasks carried out, and the resemblances and differences between the classroom and the workplace.
- Discussing the accuracy of their perception of the trade.
- Participating in the evaluation of their practicum with the teaching personnel and the person responsible in the company.
- Participating in the evaluation of the practicum with other trainees.

INSTRUCTIONAL GUIDELINES

The teacher should:

- Provide the students with the means to choose an appropriate practicum position.
- Maintain close ties between the school and the company.
- Promote the observation and performance of a variety of trade-related tasks.
- Make sure that a qualified employee of the company supervises the trainees.
- Ensure regular support and supervision of the students.
- Intervene if difficulties or problems arise.
- Encourage the students to engage in discussions and to express their opinions, especially when choosing their practicum position, and then when comparing their perceptions before and after their experience in the workplace.

PARTICIPATION CRITERIA

- PHASE 1:**
- Prepare a list of companies.
 - Learn about the policies of the company.
 - Meet with a representative of the company with a view to obtaining a practicum position.
- PHASE 2:**
- Follow the company's instructions with respect to activities, work schedules, etc.
 - Gather information about the workplace.
- PHASE 3:**
- Produce a brief report.
 - Share with other students their experiences in the workplace.

SECOND-LEVEL OPERATIONAL OBJECTIVES

IN ORDER TO ACHIEVE THE FIRST-LEVEL OBJECTIVE, THE STUDENTS SHOULD HAVE PREVIOUSLY ATTAINED SECOND-LEVEL OBJECTIVES, SUCH AS:

Before undertaking the activities of Phase 1 (Preparation for the Practicum in the Workplace):

1. Describe the steps involved in planning to find a practicum position.
2. List the attitudes required when actively searching for a practicum position.
3. Show interest in doing a practicum.

Before undertaking the activities of Phase 2 (Integration Into the Workplace):

4. Describe the instructions to be followed during a practicum.
5. Describe behaviours to be adopted in the workplace.
6. Understand the importance of observing company policies.
7. Show concern for observing occupational and safety regulations.
8. Show concern for adopting positive attitudes.

Before undertaking the activities of Phase 3 (Evaluation):

9. List their aptitudes, interests and preferences related to the trade.
10. Describe the requirements of the workplace.
11. Show willingness to receive feedback.

