16 METALLURGICAL TECHNOLOGY

SHEET METAL WORK

PROGRAM OF STUDY
5733

VOCATIONAL and TECHNICAL EDUCATION

Québec

SHEET METAL WORK

PROGRAM OF STUDY
5733

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Ministère de l'Éducation, 2000 – 00-0754

ISBN : 2-550-36645-X

Legal Deposit — Bibliothèque nationale du Québec, 2000

METALLURGICAL TECHNOLOGY

SHEET METAL WORK

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The *Sheet Metal Work* program leads to the
Diploma of Vocational Studies (DVS)
and prepares the student to practise the trade of

SHEET METAL WORKER

Direction générale de la formation professionnelle et technique

ACKNOWLEDGMENTS

The ministère de l'Éducation wishes to thank the following people for their invaluable assistance in the development of this program:

Representatives from the Manufacturing Industry

Michel Bergeron
Racan Spiro-Vibro Inc., Laval

Wilfrid Boudreau
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Marcel Girouard
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Volcano Inc., Saint-Hyacinthe

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Réal Vadnais
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Representatives from Education

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Jean-Paul Ellyson
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Representatives from the Construction Industry: Le sous-comité professionnel des ferblantiers (CCQ)
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INTRODUCTION

The *Sheet Metal Work* program is based on the orientations for secondary school vocational education that calls for the participation of experts from the workplace and the field of education.

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

The program of study lists the competencies that are the minimum requirements for a Diploma of Vocational Studies (DVS) 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 duration of the program is 1800 hours, which includes 690 hours spent on the specific competencies required to practise the trade and 1110 hours on general competencies. The program of study is divided into 32 modules, which vary in length from 15 to 120 hours (multiples of 15). The time allocated to the program is to be used not only for teaching but also for evaluation and remedial work.

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

In keeping with this broad approach, three accompanying documents will be provided: a teaching guide, an evaluation guide, and a planning guide.

GLOSSARY

Program Training Goals

Statements that describe the educational aims of a program. These goals are the general goals of vocational education adapted to a specific trade or occupation.

Competency

A set of socio-affective behaviours, cognitive skills or psycho-sensori-motor skills that enable a person to correctly perform a role, function, activity or task.

General Objectives

Instructional objectives that provide an orientation for leading the students to attain one or more related 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 of a Program

A component part of a program of study comprising a first-level operational objective and the related 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: 32
Duration in hours: 1800
Credits: 120

Sheet Metal Work
CODE: 5733

CODE	TITLE OF THE MODULE		HOURS	CREDITS*
803 011	1.	The Trade and the Training Process	15	1
803 386	2.	Producing Sketches, Diagrams and Drawings	90	6
803 593	3.	Concepts of Trigonometry	45	3
803 603	4.	Designing Rectangular Parts	45	3
803 642	5.	Occupational Health and Safety	30	2
803 393	6.	Measuring Instruments and Tools	45	3
803 794	7.	Machine Tools for Cutting and Forming	60	4
803 807	8.	Numerically Controlled Machine Tools for Cutting and Forming	105	7
803 464	9.	Mechanical Assembly Techniques	60	4
803 624	10.	Making Rectangular Parts	60	4
803 635	11.	Making Rectangular Fittings	75	5
803 084	12.	Concepts Related to the Properties of Metals	60	4
803 645	13.	Interpreting Manufacturing Drawings	75	5
803 656	14.	Designing Cylindrical Objects	90	6
803 664	15.	Thermal Cutting Processes	60	4
803 812	16.	Surface Finishing	30	2
803 674	17.	Making Cylindrical Parts	60	4
803 688	18.	Thermal Assembly Techniques	120	8
803 692	19.	Using Development Software	30	2
803 705	20.	Making Cylindrical Fittings	75	5
755 002	21.	Health and Safety on Construction Sites	30	2
803 715	22.	Interpreting Installation Drawings	75	5
803 722	23.	Scaffolding	30	2
803 482	24.	Hoisting and Handling Techniques	30	2
803 732	25.	Anchoring and Suspension Techniques	30	2
803 744	26.	Installing Metal Siding	60	4
803 754	27.	Installing Metallic Roofing	60	4
803 764	28.	Principles of Ventilation	60	4
803 776	29.	Installing Air Distribution and Exhaust Systems	90	6
803 362	30.	Job Search Techniques	30	2
755 001	31.	Organizations in the Construction Industry	15	1
803 784	32.	Entering the Work Force	60	4

* 15 hours = 1 credit

This program leads to a Diploma of Vocational Studies (DVS) in Sheet Metal Work.

2. PROGRAM TRAINING GOALS

The training goals of the *Sheet Metal Work* 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 sheet metal work tasks and activities correctly, at an acceptable level of competence for entry into the job market.

- To prepare students to perform satisfactorily on the job by fostering:
  - intellectual skills and techniques conducive to making wise choices in carrying out tasks;
  - a constant concern for occupational health and safety;
  - a concern for excellence and accuracy, especially with respect to design and assembly;
  - a concern for neatness.

To ensure integration into the job market.

- To help students integrate harmoniously into the job market by fostering:
  - a knowledge of their rights and responsibilities as workers;
  - a knowledge of the job market in general and with sheet metal work in particular.

To foster personal development and the acquisition of trade-related knowledge.

- To foster independence and a sense of responsibility.

- To help students develop a concern for excellence.

- To help students understand and apply the principles underlying the following processes: cutting, drilling, forming, assembly and installation.

- To help students develop a good work method.

To ensure job mobility.

- To help students acquire the competencies required to work in shops and on construction sites.

- To help students develop a positive attitude toward technological change.

- To help students develop the skills required to learn and obtain information.

- To help students prepare for a creative job search.

3. COMPETENCIES

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

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

The grid of learning focuses shows the relationship between the general competencies on the horizontal axis and the specific competencies on the vertical axis. The symbol (△) indicates a correlation between a specific competency and a step in the work process. The symbol (○) indicates a correlation between a general and a specific competency.

The symbols (▲) and (●) indicate that these relationships have been taken into account in the formulation of objectives intended to develop specific competencies related to the trade or occupation.

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 of the grid shows the competencies directly related to the practice of a specific trade or occupation. These competencies are arranged in a relatively fixed order; therefore, the modules should be taught, insofar as possible, in the order represented on the grid. 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

IN

SHEET METAL WORK

	SPECIFIC COMPETENCIES (directly related to the practice of the specific occupation)	FIRST-LEVEL OPERATIONAL OBJECTIVES	DURATION (IN HOURS)	WORK PROCESS (major steps): Interpret instructions	Plan the work	Handle materials and equipment	Do the work	Inspect the work	Tidy up the work area	GENERAL COMPETENCIES (related to technology, subjects, personal development, etc.): Produce sketches, diagrams and drawings	Apply concepts of trigonometry	Apply occupational health and safety rules	Use measuring instruments and tools	Use machine tools for cutting and forming	Use numerically controlled machine tools for cutting and forming	Use mechanical assembly techniques	Apply concepts related to the properties of metals	Interpret manufacturing drawings	Apply thermal cutting processes	Finish surfaces	Use thermal assembly techniques	Use development software	Apply concepts of health and safety on construction sites	Interpret installation drawings	Set up scaffolding	Use hoisting and handling techniques	Use anchoring and suspension techniques	Apply principles of ventilation	Use job search techniques	Become aware of the organizations in the construction industry	TOTALS: NUMBER OF OBJECTIVES	TOTALS: DURATION (IN HOURS)
MODULES	MODULES									2	3	5	6	7	8	9	12	13	15	16	18	19	21	22	23	24	25	28	30	31		
	FIRST-LEVEL OCCUPATIONAL OBJECTIVES									B	B	B	B	B	B	B	B	B	B	B	B	B	S	B	B	B	B	B	B	S	21	
	DURATION									90	45	30	45	60	105	60	60	75	60	30	120	30	30	75	30	30	30	60	30	15		1110
1	Determine their suitability for the trade and the training process	S	15	△	△	△	△	△	△	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
4	Design rectangular parts	B	45	▲	△		▲	▲	△	●	●		○			○		○														
10	Make rectangular parts	B	60	▲	▲	△	▲	▲	△	●	○	●	○	●	●	●	○	○	○	○	○											
11	Make rectangular fittings	B	75	▲	▲	△	▲	▲	△	●	○	●	●	●	●	●	○	○	○	○	○											
14	Design cylindrical objects	B	90	▲	△		▲	▲	△	●	○		●			○		○				○										
17	Make cylindrical parts	B	60	▲	▲	▲	▲	▲	△	○	○	●	○	●	●	●	○	●	●	●	○	○		○		○	○					
20	make cylindrical fittings	B	75	▲	▲	▲	▲	▲	△	●	○	●	●	●	●	●	●	●	●	●	●	○		○		○	○					
26	Install metal siding	B	60	▲	▲	▲	▲	△	△	○		●	●	○	○	○	○			●			●	●	○	○	●					
27	Install metallic roofing	B	60	△	△	▲	▲	△	△			●	●	○	○	○	○			●			●	●	○	○	●					
29	Install air distribution and exhaust systems	B	90	▲	▲	▲	▲	▲	△			●	●	○	○	○	○			○	●		●	●	●	●	●	●				
32	Enter the work force	S	60	△	△	△	△	△	△	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		○	○		
NUMBER OF OBJECTIVES		11																													32	
DURATION (IN HOURS)			690																													1800

S: Situational objectives

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

BLOCKS

1
2
3

4. GENERAL OBJECTIVES

The general objectives of the *Sheet Metal Work* 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.
- Apply occupational health and safety rules.
- Use job search techniques.
- Apply concepts of health and safety on construction sites.
- Become aware of the organizations in the construction industry.
- Enter the work force.

To develop in the students the competencies required to design parts.

- Produce sketches, diagrams and drawings.
- Apply concepts of trigonometry.
- Design rectangular parts.
- Design cylindrical objects.
- Use development software.

To develop in the students the competencies required to make and assemble parts.

- Use measuring instruments and tools.
- Use machine tools for cutting and forming.
- Use numerically controlled machine tools for cutting and forming.
- Use mechanical assembly techniques.
- Make rectangular parts.
- Make rectangular fittings.
- Apply concepts related to the properties of metals.
- Interpret manufacturing drawings.
- Apply thermal cutting processes.
- Finish surfaces.
- Make cylindrical parts.
- Use thermal assembly techniques.
- Make cylindrical fittings.

To develop in the students the competencies required to install metal components and systems.

- Interpret installation drawings.
- Set up scaffolding.
- Use hoisting and handling techniques.
- Use anchoring and suspension techniques.
- Install metal siding.
- Install metallic roofing.
- Install air distribution and exhaust systems.
- Apply principles of ventilation.

5. FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES

5.1 DEFINITION

A first-level objective is defined for each competency to be developed. Competencies are organized into an integrated training program designed to prepare students to practise the trade or occupation. 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 of operational objectives: behavioural and situational.

- **A behavioural objective** is a relatively closed objective that describes the actions and results expected of the student by the end of a learning step. Evaluation is based on expected results.

- **A situational objective** is a relatively open-ended objective that outlines the major phases of a learning situation. It allows for output and results to vary from one student to another. Evaluation is based on the 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 A) or the phases (see 5.2 B) 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) 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

A. How to Read a Behavioural Objective

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

1. 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.

2. The **conditions for performance evaluation** define what is necessary or permissible to the students during evaluation designed to verify whether or not the students have attained the objective. This means that the conditions for evaluation are the same wherever and whenever the program is taught.

3. 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:

4. The **specifications of the expected behaviour** describe the essential elements of the competency in terms of specific behaviours.

5. 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.

6. The **field of application** defines the limits of the objective, where necessary. It indicates cases where the objective applies to more than one task, occupation or field.

B. How to Read a Situational Objective

Situational objectives consist of six components:

1. The **expected outcome** states a competency as an aim to be pursued throughout the course.

2. The **specifications** outline the essential aspects of the competency and ensure a better understanding of the expected outcome.

3. 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

4. The **instructional guidelines** provide suggested ways and means of teaching the course to ensure that learning takes place and that the same conditions apply wherever and whenever the course is taught. These guidelines may include general principles or specific procedures.

5. The **participation criteria** describe the requirements the students must fulfil, which are usually related to each phase of the learning context. They focus on how the students take part in the activities rather than on the results obtained. Participation criteria are normally provided for each phase of the learning context.

6. **The field of application** defines the limits of the objective, where necessary. It indicates cases where the objective applies to more than one task, occupation or field.

PART II

MODULE 1: THE TRADE AND THE TRAINING PROCESS

CODE: 803 011 **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

At the end of this module, the students will:

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

LEARNING CONTEXT

PHASE 1: **Information on the Trade**

- Learning about the job market in sheet metal work, i.e. potential work environments (types of companies, products), job prospects, wages, advancement and transfer opportunities, hiring criteria.

- Learning about the nature and requirements of the job (i.e. tasks, working conditions, evaluation criteria, workers' rights and responsibilities) by going on field trips, conducting interviews, studying reference material, and so forth.

- Presenting the information collected at a group meeting and discussing personal impressions of the trade (i.e. advantages, drawbacks, requirements).

FIRST-LEVEL OPERATIONAL OBJECTIVE
SITUATIONAL OBJECTIVE

LEARNING CONTEXT

PHASE 2: **Information on the Program and Participation in the Training Process**

- Discussing the skills, aptitudes and knowledge needed to practise the trade.
- Becoming familiar with the training program: the program of study, the training process, evaluation methods, certification of studies.
- Discussing how the training program will prepare them to find employment in sheet metal work.
- Giving their first impressions of the trade and the training process.

PHASE 3: **Evaluation and Confirmation of Career Choice**

- Writing a report in which they:
  - describe their preferences, aptitudes and interests with respect to the trade;
  - assess their career choice by comparing the different facets and demands of the trade with their own aptitudes and interests.

INSTRUCTIONAL GUIDELINES

The teacher should:

- Create an atmosphere conducive to personal growth and professional development.
- Encourage students to engage in discussions and express their opinions.
- Involve students in learning activities.
- Provide students with the means to acquire a clear, objective understanding of the trade.
- Help students assess their career choice honestly and objectively.
- Organize field trips to establishments associated with sheet metal work.
- Make suitable reference material available to the students (e.g. information on the trade and training programs, handbooks).
- Arrange for students to meet with trade specialists.

FIRST-LEVEL OPERATIONAL OBJECTIVE
SITUATIONAL OBJECTIVE

PARTICIPATION CRITERIA

PHASE 1:

- Collect information on most of the topics to be covered.
- Express their views on the trade at a group meeting, interrelating the information they have collected.

PHASE 2:

- Give their opinions on some requirements for practising the trade.
- Examine the reference material provided.
- Listen carefully to explanations.
- Express their views on the training program at a group meeting.
- Express their reactions clearly.

PHASE 3:

- Write a report that:
  - sums up their interests and aptitudes;
  - explains clearly how they arrived at their career choice.

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 any of the activities:

1. Be receptive to information on the trade and the training process.
2. Express an interest in sharing their impressions of the trade with the other members of the group.

Before undertaking the activities of Phase 1:

3. Gather information.
4. Determine a way of recording and presenting information.
5. Distinguish between tasks and operations.
6. Define the expression *competencies required to enter the job market.*
7. Explain the principal rules of group discussion.

Before undertaking the activities of Phase 2:

8. Distinguish the skills from the aptitudes and knowledge required to practise a trade.
9. Describe the nature, function and content of a program of study.

Before undertaking the activities of Phase 3:

10. Distinguish aptitudes from interests.
11. Describe the main elements of a report confirming a career choice.

MODULE 2: PRODUCING SKETCHES, DIAGRAMS AND DRAWINGS

CODE: 803 386 **Duration: 90 hours**

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

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

CONDITIONS FOR PERFORMANCE EVALUATION

- Working alone
- Given a simple drawing and written instructions
- Using:
  - the appropriate instruments and equipment
  - drawing paper
- Without reference materials

GENERAL PERFORMANCE CRITERIA

- Mastery of basic drawing techniques
- Correct interpretation of weld symbols
- Clear, accurate drawings

FIRST-LEVEL OPERATIONAL OBJECTIVE

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Draw geometric figures.	- Accurate figures and dimensions
B. Produce freehand orthographic projections of a profile.	- Observance of proportions - Accurate relationships between views - Accurate lines
C. Draw sectional views of a technical drawing.	- Choice of hatching lines appropriate to the materials represented
D. Dimension a drawing.	- Observance of current standards - Correct location of dimensions
E. Draw the isometric views of a profile.	- Observance of technique - Accurate lines

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 how to draw geometric figures (A):

1. Compare the imperial and metric systems of measurement.
2. Differentiate among the techniques for representing parts.
3. Compare the geometric figures used in drawing.
4. Identify the different techniques for drawing geometric figures according to their dimensions.

Before learning how to produce freehand orthographic projections of a profile (B):

5. Differentiate among the views used in orthographic projection.
6. Associate the sides of an object with the orthographic projections.
7. Develop a sense of proportion.
8. Produce freehand orthographic projections of simple objects.

Before learning how to draw sectional views of a technical drawing (C):

9. Explain the principle of sectional views and the various sectional plans.
10. Recognize the hatching lines used to represent various materials.

Before learning how to dimension a drawing (D):

11. Apply the principle of dimensioning in orthographic projection.
12. Name the types of annotations used in technical drawings.

Before learning how to draw the isometric views of a profile (E):

13. Apply the principle of isometric views.
14. Recognize the scales in a drawing.
15. Draw an isometric view of an object.

MODULE 3: CONCEPTS OF TRIGONOMETRY

CODE: 803 593 **Duration: 45 hours**

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
apply concepts of trigonometry
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Working alone
- Given:
  - sketches and drawings
  - information about the job
  - measurements in the imperial and metric systems
- Using a calculator
- Without any other reference materials

GENERAL PERFORMANCE CRITERIA

- Satisfactory use of formulas
- Observance of calculation methods
- Consideration of fractions and decimals

FIRST-LEVEL OPERATIONAL OBJECTIVE

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Perform mathematical operations.	- Accurate calculations - Logical reasoning
B. Solve basic geometry problems.	- Appropriate application of concepts of geometry - Accurate transposition of data
C. Solve trigonometry problems.	- Appropriate choice of trigonometric ratio - Accurate results

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 how to perform mathematical operations (A):

1. Use the imperial and metric systems of measurement.
2. Convert fractions into decimals.
3. Apply the rule of three.

Before learning how to solve basic geometry problems (B):

4. Differentiate among geometric figures.
5. Be familiar with the principles and concepts of geometry used in the trade.
6. Apply the formulas for calculating the perimeter and surface area of geometric figures.
7. Calculate the volume of solids.

Before learning how to solve trigonometry problems (C):

8. Explain the principle of trigonometry.
9. Recognize the value of the angles of a right triangle.
10. Use tables of trigonometric ratios.
11. Use a calculator.

MODULE 4: DESIGNING RECTANGULAR PARTS

CODE: 803 603 **Duration: 45 hours**

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
design rectangular parts
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Working alone
- Given:
  - a drawing
  - sheets of galvanized metal
- Using:
  - layout and measuring instruments
  - cutting and drilling instruments
- Without any other reference materials

GENERAL PERFORMANCE CRITERIA

- Mastery of layout techniques
- Mastery of squaring technique
- Neat work area
- Pattern in conformity with drawing and specifications

FIRST-LEVEL OPERATIONAL OBJECTIVE

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Read the drawing.	- Accurate interpretation of information
B. Lay out the pattern.	- Appropriate choice of instruments - Clear, accurate layout - Accurate measurements
C. Cut out the pattern.	- Correct use of tools - Accurate cutting - Correct positioning of holes
D. Check the quality of the pattern.	- Careful inspection

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 how to read the drawing (A):

1. Interpret the orthographic projections.
2. Recognize the dimensions and annotations.

Before learning how to lay out the pattern (B):

3. Use measuring and layout instruments.
4. Lay out geometric figures.
5. Use drafting instruments.

Before learning how to cut out the pattern (C):

6. List the materials used to make patterns.
7. Use cutting and drilling tools.

Before learning how to check the quality of the pattern (D):

8. Use the techniques for checking angles.
9. Describe the techniques for squaring parts.

MODULE 5: OCCUPATIONAL HEALTH AND SAFETY

CODE: 803 642 **Duration: 30 hours**

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
apply occupational health and safety rules
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Working alone
- Given case studies pertaining to:
  - health and safety in the workshop
  - different assembly procedures
  - the handling of materials, tools and equipment
- Without any other reference materials

GENERAL PERFORMANCE CRITERIA

- Accurate suggestions for case studies
- Accurate understanding of health and safety rules
- Satisfactory integration of health and safety rules into the practise of the trade

FIRST-LEVEL OPERATIONAL OBJECTIVE

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Explain the safety measures related to the handling and use of tools, equipment and materials.	- Accurate knowledge of preventive measures - Complete knowledge of risks
B. Explain the safety measures related to cutting and tacking.	- Accurate knowledge of preventive measures
C. Be familiar with workers' legal rights, obligations and recourse.	- Accurate knowledge of rights, obligations and recourse
D. Adopt behaviour in conformity with occupational health and safety rules.	- Correct application of rules
E. Intervene in the case of an emergency.	- Appropriate choice of action - Speed of action - Observance of limits

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 how to explain the safety measures related to the handling and use of tools, equipment and materials (A):

1. Comment on the dangers inherent in dust.
2. Describe the effects of noise and means of controlling it at the source.
3. Recognize the safety equipment required in a workshop.
4. Interpret the safety signals used in a workshop.
5. Interpret manufacturers' recommendations for tools and equipment.
6. Describe the health and safety rules related to the use and handling of materials.

Before learning how to explain the safety measures related to cutting and tacking (B):

7. State the safety rules related to the use and storage of cylinders of gas.
8. Describe the consequences of electrical radiation.
9. Check the operation of the workshop's ventilation system.

Before learning how to be familiar with workers' legal rights, obligations and recourse (C):

10. Define workers' rights, obligations and recourse, e.g. the right to refuse dangerous work, protective reassignment.
11. Be familiar with the laws and regulations and their relationships to one another.
12. Participate in safety inspections.

Before learning how to adopt behaviour in conformity with occupational health and safety rules (D):

13. Wear safety equipment.
14. Detect toxic fumes.
15. Handle materials and equipment safely.
16. Understand the importance of adopting behaviour in conformity with health and safety rules.

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 how to intervene in the case of an emergency (E):

17. Detect operating problems in equipment.
18. Understand the importance of applying emergency procedures in the workplace.
19. Be familiar with the school's emergency procedures.

MODULE 6: MEASURING INSTRUMENTS AND TOOLS

CODE: 803 393 **Duration: 45 hours**

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
use measuring instruments and tools
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Working alone
- Given:
  - written instructions
  - sheets of metal
- Using:
  - measuring and layout instruments
  - assembly tools
- Without any other reference materials

GENERAL PERFORMANCE CRITERIA

- Observance of health and safety rules
- Mastery of techniques for using tools
- Mastery of techniques for using mechanical straightening instruments
- Neat work area

FIRST-LEVEL OPERATIONAL OBJECTIVE

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Select the instruments and tools.	- Selection appropriate to use
B. Check the operation of the instruments and tools.	- Use of safety devices - Accurate diagnosis
C. Use measuring and drilling techniques.	- Correct handling of tools and instruments
D. Maintain the instruments and tools.	- Appropriate inspection of condition - Accurate diagnosis

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 how to select the instruments and tools (A):

1. Choose the appropriate measuring and layout instruments.
2. Explain the operation of drilling tools.
3. Identify levelling instruments.
4. Compare mechanical straightening equipment.

Before learning how to check the operation of the instruments and tools (B):

5. Lay out geometric figures on a sheet of metal.
6. Use the tools.
7. Fasten assembly parts.
8. Drill holes in the sheets of metal with a portable drill and a magnetic drill.

Before learning how to maintain the instruments and tools (D):

9. List the operations involved in regular maintenance.
10. Detect defects and anomalies in the tools and instruments, as well as their degree of wear.
11. Diagnose the severity of the problem detected.
12. Specify the limits of basic maintenance.
13. Recognize the importance of regular maintenance.

MODULE 7: MACHINE TOOLS FOR CUTTING AND FORMING

CODE: 803 794 **Duration: 60 hours**

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
use machine tools for cutting and forming
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Working alone
- Given:
  - instructions and projects
  - sheets of mild steel up to 6.4 mm thick
- Using various machine tools for cutting and forming

GENERAL PERFORMANCE CRITERIA

- Observance of health and safety rules
- Observance of sequence of operations
- Observance of technique
- Part in conformity with requirements

FIRST-LEVEL OPERATIONAL OBJECTIVE

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Examine the work to be done.	- Accurate interpretation of safety instructions - Accurate interpretation of project
B. Prepare the work.	- Choice of machine tool appropriate to project - Appropriate planning of sequence of operations - Accurate calculations - Accurate adjustment of machine tools
C. Cut and form metal.	- Accurate cutting and forming - Clean cuts and forms - Minimum waste
D. Maintain equipment.	- Appropriate lubrication according to manufacturer's standards - Accurate location of defects and wear marks on machine tools

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 how to become aware of the work to be done (A):

1. Apply the health and safety rules related to the use of machine tools and the technique for adjusting them.
2. Explain the operation of folding pliers and the technique for adjusting them.
3. Explain the operation of squaring shears and the technique for adjusting them.
4. Explain the operation of punches and the technique for adjusting them.
5. Explain the operation of lock formers and the technique for adjusting them.
6. Explain the operation of section bending rolls.
7. Explain the operation of notching presses and the technique for adjusting them.
8. Explain the operation of band saws and bolters and the technique for adjusting them.
9. Explain the operation of universal shears and the technique for adjusting them.
10. Explain the operation of brakes and the technique for adjusting them.
11. Explain the operation of universal shears with curved blades (“TRUMPF”-type) and the technique for adjusting them.
12. Explain the operation of bending machines and the technique for adjusting them.

MODULE 8: NUMERICALLY CONTROLLED MACHINE TOOLS FOR CUTTING AND FORMING

CODE: 803 807 **Duration: 105 hours**

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
use numerically controlled machine tools for cutting and forming
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Working alone
- Given:
  - instructions and projects
  - sheets of mild steel up to 6.4 mm thick
- Using various numerically controlled machine tools for cutting and forming

GENERAL PERFORMANCE CRITERIA

- Observance of health and safety rules
- Observance of sequence of operations
- Observance of technique
- Part in conformity with requirements

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Examine the work to be done.	- Accurate interpretation of safety instructions - Accurate interpretation of project
B. Program a numerically controlled punch using the coded data input technique.	- Observance of data input technique - Parameters in conformity with part to be made
C. Program a numerically controlled punch using a computer-assisted design and drafting program.	- Accurate drawing in conformity with part to be made - Observance of code generating and editing procedures - Appropriate use of the various functions of the software program
D. Cut metal using a numerically controlled punch.	- Clean cuts - Minimum waste - Observance of technique for using punch
E. Program a brake with a 3-axis numerical control.	- Conformity of forms with specifications - Minimum waste - Observance of techniques for using brake

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 how to examine the work to be done (A):

1. Identify the characteristics and functions of numerically controlled punches, as well as the related safety rules.
2. Describe the operation of a 3-axis numerical control on a brake.

Before learning how to program a numerically controlled punch using the coded data input technique (B):

3. Explain the coded data input technique for a numerically controlled punch.

Before learning how to program a numerically controlled punch using a computer-assisted design and drafting program (C):

4. Identify the components of a computer environment.
5. Use various functions of DOS.
6. Explain the procedure for using a computer-assisted design and drafting program to program a numerically controlled punch.

MODULE 9: MECHANICAL ASSEMBLY TECHNIQUES

CODE: 803 464 **Duration: 60 hours**

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
use mechanical assembly techniques
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Working alone
- Given:
  - written instructions
  - a drawing
  - sheets of galvanized steel
- Using:
  - hand tools and machine tools
  - bolts and rivets

GENERAL PERFORMANCE CRITERIA

- Observance of health and safety rules
- Conformity with drawing instructions and specifications
- Satisfactory use of machine tools
- Mastery of techniques
- Assemblies in conformity with drawing

FIRST-LEVEL OPERATIONAL OBJECTIVE

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Interpret the drawing.	- Correct interpretation of drawing
B. Select the tools and materials.	- Complete list of materials required - Correct choice of tools
C. Scribe the metal.	- Accurate calculation of required dimensions - Accurate positioning of lines
D. Form the fasteners.	- Solid fasteners - Correct adjustment of machine tools
E. Install bolts and rivets.	- Position of bolts and rivets in conformity with instructions - Identical rivet head shapes
F. Evaluate the quality of the assembly.	- Accurate assessment

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 how to interpret the drawing (A):

1. Identify the types of mechanical assemblies.

Before learning how to select the tools and materials(B):

2. Differentiate between forming tools and assembly tools.

Before learning how to scribe the metal (C):

3. Explain the technique for scribing metal for each type of joint.

Before learning how to form the fasteners (D):

4. Choose a type of fastener appropriate to a given application.
5. Make various types of fasteners.

Before learning how to install bolts and rivets (E):

6. Explain the choice of rivets and their arrangement.
7. Use rivets.
8. Remove a rivet.
9. Differentiate among the different types of threaded fasteners.
10. Recognize fastening accessories.

Before learning how to evaluate the quality of the assembly (F):

11. Use inspection instruments.

MODULE 10: MAKING RECTANGULAR PARTS

CODE: 803 624 **Duration: 60 hours**

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
make rectangular parts
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Working alone
- Given:
  - a drawing
  - sheets of galvanized steel
- Using:
  - tools and machine tools for cutting and forming
  - fasteners

GENERAL PERFORMANCE CRITERIA

- Observance of health and safety rules
- Accurate layout
- Mastery of assembly techniques
- Parts in conformity with specifications

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Interpret the drawing.	- Accurate interpretation of specifications
B. Plan the work.	- Logical sequence of operations - Correct choice of tools
C. Scribe the metal.	- Accurate lines
D. Cut the metal.	- Accurate cuts
E. Form the metal.	- Correct adjustment of machine tools - Correct use of machine tools
F. Assemble the metal.	- Observance of drawing specifications and dimensions - Observance of tolerances
G. Evaluate the quality of the assembly.	- Good judgment

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 how to interpret the drawing (A):

1. Recognize the types of fasteners.

Before learning how to plan the work (B):

2. Calculate the material required to make the part.
3. Determine the sequence of operations.

Before learning how to scribe the metal (C):

4. Explain the technique for laying out seams.

Before learning how to cut the metal (D):

5. Explain the operation of rocking shears.
6. Adjust the parameters of hydraulic squaring shears.
7. Apply safety rules when cutting.

Before learning how to form the metal (E):

8. Apply safety rules when bending metal.

Before learning how to assemble the metal (F):

9. Square the parts.
10. Install the fasteners.

Before learning how to evaluate the quality of the assembly (G):

11. Use inspection instruments.

MODULE 11: MAKING RECTANGULAR FITTINGS

CODE: 803 635 **Duration: 75 hours**

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
make rectangular fittings
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Working alone
- Given:
  - a drawing
  - sheets of galvanized steel
- Using:
  - tools and machine tools for cutting and forming
  - fasteners
- Without any other reference materials

GENERAL PERFORMANCE CRITERIA

- Observance of health and safety rules
- Accurate interpretation of information in drawing
- Observance of work method
- Observance of tolerances
- Parts in conformity with drawing specifications

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Interpret the drawing.	- Accurate interpretation of specifications
B. Prepare the parts.	- Accurate measurements - Appropriate layout of parts - Accurate cutting dimensions
C. Form the parts.	- Correct use of machine tools - Correct adjustment of machine tools
D. Position the parts.	- Correct positioning of parts
E. Assemble the parts.	- Observance of drawing dimensions and specifications - Use of appropriate assembly techniques
F. Evaluate the quality of the work.	- Good judgment

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 how to interpret the drawing (A):

1. Recognize the types of mechanical assembly joints.
2. Calculate the material required to make the fasteners.

Before learning how to prepare the parts (B):

3. Use measuring and layout instruments.
4. Follow the layout procedure.

Before learning how to form the parts (C):

5. Select dies according to the thickness and angles of the parts.
6. Adjust the pressure of the brake according to the thickness of the part.

Before learning how to position the parts (D):

7. Explain the operation of holding devices.
8. Use squaring instruments.

Before learning how to assemble the parts (E):

9. Recognize assembly techniques using different types of rivets.
10. Explain the order in which joints are rivetted.

Before learning how to evaluate the quality of the work (F):

11. Explain the techniques for verifying angles.
12. Check the squareness of the parts.

MODULE 12: CONCEPTS RELATED TO THE PROPERTIES OF METALS

CODE: 803 084 **Duration: 60 hours**

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
apply concepts related to the properties of metals
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Working alone
- Given:
  - written instructions
  - simulations and case studies
- Without any other reference materials

GENERAL PERFORMANCE CRITERIA

- Observance of health and safety rules
- Accurate understanding of the principal phenomena
- Proper choice of techniques

FIRST-LEVEL OPERATIONAL OBJECTIVE

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Determine the filler metal required to tack metals.	- Accurate determination of the metallurgical composition of the parts - Correct choice of filler metal
B. Evaluate the expansion and contraction of metals.	- Accurate understanding of the expansion and contraction of metals
C. Choose a technique for reducing metal distortion.	- Accurate identification of area to be treated - Proper choice of technique
D. Select assembly and welding techniques for composite materials.	- Proper choice of techniques in accordance with the work to be done - Proper choice of tools, products and materials - Proper choice of techniques in accordance with the job to be done - Proper choice of tools, products and materials

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 how to determine the filler metal required to tack metals (A):

1. Differentiate between ferrous and nonferrous metals.
2. Use the classification of steel according to alloying element.
3. Describe the industrial applications of the different types of steel.
4. Describe the composition of carbon steels.
5. Become aware of the risks related to the use of inappropriate filler metal.

Before learning how to evaluate the expansion and contraction of metals (B):

6. Observe the expansion and contraction of metals.
7. Comment on the consequences of expansion and contraction according to the conductivity and ductility of metals.
8. Find means of attenuating the effects of expansion and contraction.

Before learning how to choose a technique for reducing distortion (C):

9. Detect distortions and fractures in metals.
10. Identify experimental data on welding-related expansion and contraction.

Before learning how to select assembly and welding techniques for composite materials (D):

11. Classify the composite materials used in the manufacture of industrial parts.
12. Describe the composition of a laminate.
13. Describe the characteristics of the different techniques used to assemble plastic, fibreglass and polyvinyl chloride (PVC) parts.
14. Describe the characteristics and functions of the tools and products used in each technique.
15. Explain the health and safety rules related to the assembly of plastic and fibreglass parts.

MODULE 13: INTERPRETING MANUFACTURING DRAWINGS

CODE: 803 645 **Duration: 75 hours**

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

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

CONDITIONS FOR PERFORMANCE EVALUATION

- Working alone
- Given a general drawing
- Using drafting instruments
- Without any other reference materials

GENERAL PERFORMANCE CRITERIA

- Accurate understanding of drawings
- Mastery of drafting technique
- Use of correct terminology
- Concern for detail

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Recognize weld symbols.	- Correct association of symbols with techniques used - Correct determination of dimensions
B. Draw detail views.	- Accurate views in conformity with drawings - Accurate dimensioning - Relevant annotations - Correct use of symbols
C. Make a list of materials.	- Complete list of materials required - Accurate calculation of quantities and dimensions
D. Determine the order of assembly.	- Logical sequence - Optimum number of manipulations - Minimum waste

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 how to recognize weld symbols (A):

1. Differentiate among weld symbols.
2. Recognize the types of joints and their dimensions.

Before learning how to draw detail views (B):

3. Modify the scale of the drawing to the detail view.
4. Lay out the work to be done on the parts.
5. Lay out a part or component.

Before learning how to make a list of materials (C):

6. Locate identical parts.
7. Calculate the dimensions of the parts.
8. Number the parts listed on the drawing.
9. Observe the conventions for describing materials.
10. Fill out an internal voucher.

Before learning how to determine the order of assembly (D):

11. Recognize the components of a subassembly.
12. Analyze assembly constraints.
13. Determine the sequence for cutting materials.

MODULE 14: DESIGNING CYLINDRICAL OBJECTS

CODE: 803 656 **Duration: 90 hours**

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
design cylindrical objects
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Working alone
- Given:
  - a drawing of a conical part
  - sheets of cardboard
- Using:
  - drafting instruments
  - a scientific calculator
- Without any other reference materials

GENERAL PERFORMANCE CRITERIA

- Observance of work method
- Mastery of development techniques
- Neat and careful work
- Concern for detail
- Pattern in conformity with drawing

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Interpret the drawing.	- Accurate interpretation of information
B. Develop the pattern using the following techniques: • parallel line • radial line • triangulation	- Clear, accurate layout - Accurate measurements
C. Cut out the pattern.	- Correct use of tools - Accurate cutting
D. Evaluate the quality of the pattern.	- Careful inspection - Good judgment

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 how to interpret the drawing (A):

1. Determine the development technique appropriate to the part to be developed.
2. Apply pattern development calculation techniques.

Before learning how to develop the pattern (B):

3. Draw orthographic projections.
4. Recognize intersecting lines.
5. Divide a circle into equal parts.
6. Describe the techniques for laying out construction lines.
7. Apply the techniques for calculating the dimensions of generating lines.

Before learning how to cut out the pattern (C):

8. List the materials used to make patterns.
9. Use cutting and drilling tools.

Before learning how to evaluate the quality of the pattern (D):

10. Use the techniques for checking angles.
11. Describe the techniques for squaring parts.

MODULE 15: THERMAL CUTTING PROCESSES

CODE: 803 664 **Duration: 60 hours**

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
apply thermal cutting processes
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Working alone
- Given:
  - a drawing
  - sheets of stainless steel
- Using:
  - measuring and layout instruments
  - a plasma-arc cutting machine
- Without any other reference materials

GENERAL PERFORMANCE CRITERIA

- Observance of health and safety rules
- Observance of work method
- Concern for economy
- Part in conformity with drawing

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Prepare the metal for cutting.	- Appropriate cleaning, layout and positioning
B. Set up the oxyacetylene and plasma-arc cutting machines.	- Correct setup of machines - Correct adjustment of parameters
C. Cut the metal.	- Observance of techniques - Clean cuts
D. Clean the cuts.	- Good choice of tools and equipment - Correct use of tools and equipment - Clean cuts
E. Assess the quality of the cuts.	- Good judgment

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 how to prepare the metal for cutting (A):

1. Identify metals.
2. Use cleaning products and processes.
3. Describe cutting techniques.
4. Become aware of the importance of the positioning of the metal.

Before learning how to set up the oxyacetylene and plasma-arc cutting machines (B):

5. Describe the basic principle of oxyacetylene cutting.
6. Explain the operation of cutting torches.
7. Select the cutting tip according to the thickness of the metal.
8. Describe the principle of plasma-arc cutting.
9. Choose the accessories for each process.
10. Explain the adjustments for each process.

Before learning how to cut the metal (C):

11. Make straight-line, curvilinear and circular cuts.
12. Make bevelled cuts.
13. Show a constant concern for successful cuts.
14. Describe the dangers inherent in each process.

Before learning how to assess the quality of the cuts (D):

15. Recognize the qualities and defects of cuts.

MODULE 16: SURFACE FINISHING

CODE: 803 812 **Duration: 30 hours**

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
finish surfaces
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Working alone
- Given:
  - specifications and quality standards
  - different types of metal
- Using finishing tools, accessories and products

GENERAL PERFORMANCE CRITERIA

- Observance of health and safety rules
- Appropriate use of finishing tools, accessories and products
- Surface finishes in conformity with specifications and quality standards

FIRST-LEVEL OPERATIONAL OBJECTIVE

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Examine the work to be done.	- Accurate identification of type of metal to be finished - Accurate understanding of finishing to be done - Accurate identification of specifications and quality standards
B. Prepare the work.	- Accurate determination of sequence of finishing operations according to desired result - Accurate choice of finishing tools, accessories and products - Appropriate preparation of parts and materials
C. Rough down a weld bead.	- Appropriate technique
D. Sand various metals.	- Appropriate technique
E. Polish various metals.	- Appropriate finishing technique
F. Evaluate the quality of the work.	- Accurate verification of conformity of work with specifications and quality standards

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 how to examine the work to be done (A):

1. Identify the types of metal finishes.
2. Identify the degree of finishing required.
3. Identify means of ensuring quality control in metal finishing.

Before learning how to prepare the work (B):

4. Identify the characteristics and functions of metal finishing tools and accessories, as well as the directions for their use.
5. Use metal finishing tools and accessories.

MODULE 17: MAKING CYLINDRICAL PARTS

CODE: 803 674 **Duration: 60 hours**

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
make cylindrical parts
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Working alone
- Given:
  - a manufacturing drawing
  - sheets of aluminum
- Using:
  - tools and machine tools for cutting and forming
  - a GTA welding machine
  - no. 4043 filler rods

GENERAL PERFORMANCE CRITERIA

- Observance of health and safety rules
- Mastery of technique for preparing metal
- Accurate work
- Concern for economy
- Neat work areas
- Correct handling of parts
- Parts in conformity with drawing specifications

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Interpret the manufacturing drawing.	- Accurate interpretation of specifications
B. Plan the work.	- Logical sequence of operations - Complete list of materials, tools and equipment required
C. Lay out the parts.	- Accurate layout
D. Cut out the parts.	- Accurate cuts
E. Form the parts.	- Correct adjustment of machine tools - Correct use of machine tools
F. Assemble and tack the parts.	- Mastery of assembly techniques - Observance of dimensions - Mastery of tacking techniques
G. Evaluate the quality of the work.	- Good judgment - Careful inspection of quality of finish

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 how to interpret the manufacturing drawing (A):

1. Calculate the dimensions of the sheets of metal used to make the cylindrical parts.

Before learning how to plan the work (B):

2. Group the components of the cylindrical part into subassemblies.
3. Establish a sequence for assembling the subassemblies.

Before learning how to cut out the parts (D):

4. Adjust the blade angles of squaring shears.

Before learning how to form the parts (E):

5. Identify the different bending points of parts.
6. Use techniques for bending parts.
7. Apply the health and safety rules related to bending metal.

Before learning how to assemble and tack the parts (F):

8. Make autogenous and heterogenous stringer beads and tack welds using the oxyacetylene process in a horizontal position.
9. Adjust the parameters of the GTA welding machine.
10. Explain the techniques for tacking aluminum parts.
11. Use tacking techniques to reduce distortion.

Before learning how to evaluate the quality of the work (G):

12. Use techniques for verifying the straightness of cylindrical parts.

MODULE 18: THERMAL ASSEMBLY TECHNIQUES

CODE: 803 688 **Duration: 120 hours**

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
use thermal assembly techniques
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Working alone
- Given:
  - written instructions
  - sheets of mild steel, stainless steel and aluminum
- Using SMAW, GTAW and GMAW welding machines
- Without any other reference materials

GENERAL PERFORMANCE CRITERIA

- Observance of health and safety rules
- Observance of work process
- Tack welds in conformity with requirements

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Set up the GTAW, SMAW and GMAW welding machines.	- Correct choice of accessories - Correct setup of machines - Accurate selection of gases - Accurate selection of filler metal
B. Tack sheets of mild steel and stainless steel using the GTAW process in a horizontal position for: • 1.6 X 150-mm lap joint assemblies • 1.6 X 150-mm t-joint assemblies • 1.6 X 150-mm corner joint assemblies • 1.6 X 150-mm butt joint assemblies	- Accurate positioning and alignment of sheets according to the type of joint - Appropriate adjustment of parameters - Tacking in conformity with requirements at the appropriate spots - Observance of techniques
C. Tack sheets of mild steel using the SMAW process in a horizontal position for: • 6.4 X 200-mm lap joint assemblies • 6.4 X 200-mm t-joint assemblies • 6.4 X 200-mm corner joint assemblies • 6.4 X 200-mm butt joint assemblies	- Accurate positioning and alignment of sheets according to the type of joint - Appropriate adjustment of parameters - Tacking in conformity with requirements at the appropriate spots - Observance of techniques
D. Tack sheets of mild steel, stainless steel and aluminum using the GMAW process in a horizontal position for: • 3.2 X 200-mm lap joint assemblies • 3.2 X 200-mm t-joint assemblies • 3.2 X 200-mm corner joint assemblies • 3.2 X 200-mm butt joint assemblies	- Accurate positioning and alignment of sheets according to the type of joint - Appropriate adjustment of parameters - Tacking in conformity with requirements at the appropriate spots - Observance of techniques

FIRST-LEVEL OPERATIONAL OBJECTIVE

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
E. Visually evaluate the quality of the tack welds.	- Accurate assessment of uniformity of tack welds and quality of fusion of filler metal and base metal
F. Apply health and safety rules.	- Use of safety clothing and accessories - Safe handling of tools and 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 learning how to set up the GTAW, SMAW and GMAW welding machines (A):

1. Differentiate among OAW, GTAW, SMAW, GMAW and RSW processes and soldering.
2. Identify the types of accessories and their use.
3. Select gases according to the processes used and the metals to be welded.

Before learning how to tack sheets of mild steel and stainless steel using the GTAW process in a horizontal position for:

- **1.6 X 150-mm lap joint assemblies**
- **1.6 X 150-mm t-joint assemblies**
- **1.6 X 150-mm corner joint assemblies**
- **1.6 X 150-mm butt joint assemblies (B):**

4. Form various types of assemblies.
5. Become aware of the importance of tacking.
6. Adjust the welding parameters.
7. Detect a lack of shielding gas.
8. Select the filler rods according to the metal to be welded.
9. Describe the points to be checked during welding.

Before learning how to tack sheets of mild steel using the SMAW process in a horizontal position for:

- **6.4 X 200-mm lap joint assemblies**
- **6.4 X 200-mm t-joint assemblies**
- **6.4 X 200-mm corner joint assemblies**
- **6.4 X 200-mm butt joint assemblies (C):**

10. Adjust the welding parameters.
11. Select the electrodes.
12. Describe the points to be checked during welding.

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 how to tack sheets of mild steel, stainless steel and aluminum using the GMAW process in a horizontal position for:

- **3.2 X 200-mm lap joint assemblies**
- **3.2 X 200-mm t-joint assemblies**
- **3.2 X 200-mm corner joint assemblies**
- **3.2 X 200-mm butt joint assemblies (D):**

13. Adjust the welding parameters.
14. Select the correct filler metal according to the base metal.
15. Describe the points to be checked during welding.

Before learning how to visually evaluate the quality of the tack welds (E):

16. Recognize the qualities of a good tack weld.
17. Determine the causes of defects and the necessary corrective measures.

MODULE 19: USING DEVELOPMENT SOFTWARE

CODE: 803 692 **Duration: 30 hours**

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

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

CONDITIONS FOR PERFORMANCE EVALUATION

- Working alone
- Given a drawing
- Using:
  - a microcomputer
  - a dot-matrix printer
  - development software

GENERAL PERFORMANCE CRITERIA

- Observance of method for using equipment
- Mastery of method for using the software program
- Correct use of commands

FIRST-LEVEL OPERATIONAL OBJECTIVE

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Load and operate a development program.	- Accurate operations
B. Make development drawings.	- Correct choice of commands - Accurate information - Optimum use of software
C. Print the drawing.	- Observance of printing procedure

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 how to load and operate a development program (A):

1. Establish communication with a disk drive.
2. Use the operating system's internal and external commands.
3. Use the program's main commands.

Before learning how to make development drawings (B):

4. Determine the dimensions of segments.
5. Recognize the geometric elements.

Before learning how to print the drawing (C):

6. Describe the operating principles of a dot-matrix printer.
7. Close files.

MODULE 20: MAKING CYLINDRICAL FITTINGS

CODE: 803 705 **Duration: 75 hours**

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
make cylindrical fittings
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Working alone
- Given:
  - a manufacturing drawing
  - sheets of stainless steel
- Using:
  - tools and machine tools for cutting and forming
  - a GTA welding machine
  - no. 308 filler rods
- Without any other reference materials

GENERAL PERFORMANCE CRITERIA

- Observance of health and safety rules
- Accurate interpretation of information in drawing
- Mastery of development techniques
- Appropriate use of tools and equipment
- Parts in conformity with specifications

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Read the manufacturing drawing.	- Accurate interpretation of specifications
B. Plan the work.	- Logical sequence of operations - Complete list of materials, tools and equipment
C. Develop the pattern.	- Clear, accurate layout - Accurate measurements
D. Lay out the pattern on the parts.	- Accurate layout
E. Cut out the parts.	- Accurate cuts
F. Form the fittings.	- Correct adjustment of machine tools - Correct use of machine tools
G. Assemble and tack the fittings.	- Mastery of assembly techniques - Mastery of tacking techniques - Observance of dimensions
H. Assess the conformity of the assembly.	- Good judgment - Careful inspection of quality of finish

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 how to plan the work (B):

1. Determine the logical order of production steps.
2. Calculate the material required to make a cylindrical fitting.

Before learning how to develop the pattern (C):

3. Identify the main materials used to make patterns.

Before learning how to lay out the pattern on the parts (D):

4. Explain the main layout techniques.

Before learning how to cut out the parts (E):

5. Explain the operation of hydraulic shears.

Before learning how to form the fittings (F):

6. Select the appropriate machinery.
7. Use bending machine tools.

Before learning how to assemble and tack the fittings (G):

8. Adjust the welding machine parameters.
9. Describe the points to be checked when tacking.

Before learning how to assess the conformity of the assembly (H):

10. Describe the main manufacturing defects of cylindrical fittings.

MODULE 21: HEALTH AND SAFETY ON CONSTRUCTION SITES

CODE: 755 002 **Duration: 30 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
apply concepts of health and safety on construction sites

SPECIFICATIONS

At the end of this module, the students will:

- Be familiar with the laws and regulations governing health and safety on construction sites.
- Be familiar with the roles and responsibilities of health and safety officers.
- Be familiar with the risks inherent in certain tasks and the applicable preventive measures.
- Be familiar with the general risks inherent in construction sites and the applicable preventive measures.
- Be familiar with the risks inherent in the use of certain products and the applicable preventive measures.
- Be familiar with measures to be taken in case of an accident.

LEARNING CONTEXT

PHASE 1: **Information**

- Learning about the objective of the unit.

FIRST-LEVEL OPERATIONAL OBJECTIVE
SITUATIONAL OBJECTIVE

LEARNING CONTEXT

PHASE 2: **Learning**

- Gathering information on the topic.
- Assessing and expressing their opinion on the topic.
- Asking questions.
- Identifying the main concepts and underlying principles of safe behaviour.
- Assessing their adherence to these principles.

PHASE 3: **Reinforcement**

- Reviewing the important concepts of the unit.
- Answering a series of questions.
- Correcting their answers and discussing them if necessary.

INSTRUCTIONAL GUIDELINES

The teacher should:

- Provide a room and appropriate materials.
- Present the content in a dynamic manner.
- Promote group discussion.
- Use a variety of teaching materials (e.g. tables, transparencies, films, videos, information sheets).

FIRST-LEVEL OPERATIONAL OBJECTIVE
SITUATIONAL OBJECTIVE

PARTICIPATION CRITERIA

PHASE 1:

- Participate in at least 18 of the 20 units. Units 1 and 2 are compulsory.

PHASE 2:

- Listen attentively.
- Discuss the topics.
- Ask questions and give relevant answers.

PHASE 3:

- Answer the series of questions.
- Correct their answers.

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:

1. Be receptive to information on health and safety.
2. Express an interest in sharing their knowledge with the rest of the group.

Before undertaking the activities of Phase 2:

3. Find information.
4. Determine a way of presenting information.
5. Apply the principal rules of group discussion.

Before undertaking the activities of Phase 3:

6. Describe the technique for answering a series of questions.

MODULE 22: INTERPRETING INSTALLATION DRAWINGS

CODE: 803 715 **Duration: 75 hours**

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

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

CONDITIONS FOR PERFORMANCE EVALUATION

- Working alone
- Given:
  - the installation drawing for a ventilation or distribution system
  - codes
  - manufacturers' catalogues and data sheets
- Using drafting instruments

GENERAL PERFORMANCE CRITERIA

- Observance of standards set out in the codes
- Observance of drawing standards and conventions
- Correct arrangement of system components
- Neat, accurate work
- Detail views in conformity with installation drawing

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Recognize the components of the systems.	- Accurate list of components
B. Check whether the drawings conform to codes.	- Accurate understanding of codes - Good judgment
C. Draw the detail views of the connections.	- Appropriate arrangement of details on drawing - Drawing in conformity with scale indicated
D. Make a list of material to be installed.	- Accurate number of pieces of equipment and accessories - Correct assessment of the quantity of material

FIELD OF APPLICATION

Installation drawings for air distribution, exhaust and processing systems

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 how to recognize the components of the systems (A):

1. Identify the pieces of equipment and accessories in a system.
2. Associate the components of the systems with their symbols.

Before learning how to check whether the drawings conform to codes (B):

3. Become familiar with the reference manuals.
4. Respect the codes governing ventilation or air distribution systems.

Before learning how to draw the detail views of the connections (C):

5. Describe the techniques for assembling parts.
6. Determine the location of the components.

Before learning how to make a list of material to be installed (D):

7. Locate identical parts.
8. Calculate the dimensions of the parts.
9. Number the parts on the drawing.
10. Respect the conventions for describing parts.

MODULE 23: SCAFFOLDING

CODE: 803 722 **Duration: 30 hours**

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
set up scaffolding
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Working alone, with the help of a classmate following instructions
- Given written instructions
- Working on scaffolding at least two metres high and five metres long

GENERAL PERFORMANCE CRITERIA

- Observance of health and safety rules
- Use of appropriate terminology
- Positioning of scaffolding in accordance with instructions
- Level, stable and safe scaffolding

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Choose the scaffolding.	- Correct choice of scaffolding
B. Install the supports.	- Satisfactory preparation of ground - Appropriate choice of locking devices - Accurate levels
C. Assemble the scaffolding components.	- Appropriate work method - Correct alignment and levelling
D. Install the equipment and safety accessories.	- Observance of safety code - Solid anchors - Appropriate access
E. Check the installation.	- Correct inspection of main points
F. Disassemble the scaffolding.	- Observance of disassembly sequence - Appropriate storage of parts

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 how to choose the scaffolding (A):

1. Be familiar with the types of scaffolding.
2. Identify the main scaffolding spans.
3. Identify the use of each type of scaffolding.

Before learning how to install the supports (B):

4. Identify the types of scaffolding supports according to use.
5. Recognize the components used to support and stabilize scaffolding.

Before learning how to assemble the scaffolding components (C):

6. Explain the techniques for assembling the various scaffolding components.
7. Explain the construction standards for scaffolding.
8. Plan the assembly operations.

Before learning how to install the equipment and safety accessories (D):

9. Be familiar with the safety measures related to overhead jobs.
10. Be familiar with the safety equipment and accessories adapted to various types of scaffolding.

Before learning how to check the installation (E):

11. Be familiar with the points to inspect.

Before learning how to disassemble the scaffolding (F):

12. List the precautions to take when disassembling scaffolding.

MODULE 24: HOISTING AND HANDLING TECHNIQUES

CODE: 803 482 **Duration: 30 hours**

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
use hoisting and handling techniques
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Working alone, with the help of a classmate following instructions
- Given:
  - handling drawings
  - large objects
- Using hoists and slings

GENERAL PERFORMANCE CRITERIA

- Observance of occupational health and safety rules
- Appropriate use of tools and equipment
- Observance of work method
- Movements in conformity with drawings and specifications
- Observance of signalling code in effect
- Observance of established standards

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Plan the movements.	- Correct interpretation of drawings and specifications - Satisfactory choice of equipment - Accurate assessment of loads - Accurate identification of centres of gravity - Minimum number of movements
B. Rig the equipment.	- Correct installation of slings and chains
C. Use crane operator signals.	- Accurate signals
D. Hoist and move objects on a horizontal plane.	- Observance of technique - Smooth movement
E. Inspect the equipment.	- Observance of storage techniques

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 how to plan the movements (A):

1. Read and interpret the handling drawings.
2. Define handling and rigging.
3. Calculate volumes and masses.
4. Identify the centre of gravity.
5. Recognize hoisting equipment.

Before learning how to rig the equipment (B):

6. Define safety in terms of handling and rigging.
7. Tie knots.
8. Install cable clips on steel cables.

Before learning how to use crane operator signals (C):

9. Use hand signals.

Before learning how to hoist and move objects on a horizontal plane (D):

10. Adopt safe work methods.
11. Identify techniques for moving objects on a horizontal plane and on an inclined plane.

Before learning how to inspect the equipment (E):

12. Describe the process by which cables deteriorate.

MODULE 25: ANCHORING AND SUSPENSION TECHNIQUES

CODE: 803 732 **Duration: 30 hours**

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
use anchoring and suspension techniques
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Working alone
- Given:
  - installation drawings and specifications
  - a wall
- Using:
  - hand and electric tools
  - anchors, pins, racks and supports
- Without scaffolding

GENERAL PERFORMANCE CRITERIA

- Observance of health and safety rules
- Observance of drawing specifications
- Solid anchors and supports

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Interpret the drawings.	- Accurate interpretation
B. Select the equipment and material required.	- Correct choice of anchors - Correct choice of equipment
C. Drill the holes.	- Position of holes in conformity with drawings
D. Install the anchors.	- Mastery of anchoring techniques
E. Install the supports.	- Adequate length of pins - Adequate length of supports
F. Check the quality of the work.	- Good judgment

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 how to select the equipment and material required (B):

1. Describe the types of anchors and their use.
2. Explain the techniques for installing anchors.
3. Lay out the position of the anchors on the wall.

Before learning how to drill the holes (C):

4. Select the type of bit according to the composition of the walls.
5. Use drilling tools.

Before learning how to install the anchors (D):

6. Assess the support capacity of an anchor.

Before learning how to install the supports (E):

7. Determine the length of the retaining pins.
8. Describe the types of supports and the conditions for their use.

Before learning how to check the quality of the work (F):

9. Check the level of the supports.

MODULE 26: INSTALLING METAL SIDING

CODE: 803 744 **Duration: 60 hours**

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
install metal siding
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Working alone
- Given:
  - written instructions
  - siding drawings
- Using:
  - metallic materials
  - tools and machine tools

GENERAL PERFORMANCE CRITERIA

- Observance of health and safety rules
- Correct choice of techniques for installing joists
- Appropriate use of tools and equipment
- Observance of work method
- Installation in conformity with drawing

FIRST-LEVEL OPERATIONAL OBJECTIVE

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Interpret the drawing.	- Accurate identification of type of siding
B. Plan the work.	- Accurate calculation of quantities of material
C. Install the interior flashing.	- Neat, accurate forming of flashing - Solid flashing
D. Install the backing.	- Solid anchors - Level installation
E. Install the insulation.	- Observance of installation methods - Uniform installation
F. Install the exterior siding.	- Solid anchors - Level installation
G. Apply the sealants.	- Observance of standards and techniques
H. Install the exterior flashing.	- Observance of assembly techniques

FIELD OF APPLICATION

Siding made of metal and similar materials

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 how to interpret the drawing (A):

1. Differentiate among the types of siding.
2. Calculate the materials required for the installation.

Before learning how to plan the work (B):

3. Determine the logical sequence of operations for installing siding.
4. Select the necessary tools and instruments.
5. Differentiate among the types of flashing.

Before learning how to install the interior flashing (C):

6. Explain the installation methods.
7. Identify the types of flashing.

Before learning how to install the backing (D):

8. Differentiate among the techniques for installing backing.
9. Explain the installation techniques.

Before learning how to install the insulation (E):

10. Identify the types of insulation.
11. Be familiar with the types of fasteners.

Before learning how to install the exterior siding (F):

12. Determine the sequence in which to install the sheets.

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 how to apply the sealants (G):

13. Select the type of sealant according to the materials used.

Before learning how to install the exterior flashing (H):

14. Identify the types of flashing.

MODULE 27: INSTALLING METALLIC ROOFING

CODE: 803 754 **Duration: 60 hours**

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
install metallic roofing
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Working alone
- Given:
  - a roofing drawing
  - a roof (jig)
- Using:
  - the necessary tools, equipment and materials
  - sheathing
  - metallic roofing

GENERAL PERFORMANCE CRITERIA

- Observance of safety rules
- Logical sequence of operations
- Efficient, safe use of tools and equipment
- Installation in conformity with drawing

FIRST-LEVEL OPERATIONAL OBJECTIVE

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Calculate the quantity of materials needed.	- Accurate calculations
B. Install the sheathing.	- Appropriate choice of materials - Correct choice of starting point - Appropriate choice of waterproof membrane
C. Install flashing and roofing.	- Correct choice of order of installation - Appropriate choice of roofing - Spaces around conduits sealed - Appropriate choice of roofing for ridges
D. Install gutters.	- Correct installation sequence - Leak-tight corners - Correct positioning
E. Apply safety rules.	- Appropriate use of personal safety equipment - Safe handling of materials

FIELD OF APPLICATION

Roofing made of metal and other similar materials

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 how to calculate the quantity of materials needed (A):

1. Identify the types of roofs.
2. Explain the calculation techniques according to the type of roofing.

Before learning how to install the sheathing (B):

3. Identify the types of sheathing and the techniques for their installation.
4. Explain the techniques for starting and finishing overhang.

Before learning how to install flashing and roofing (C):

5. Identify the types of roofing and the techniques for their installation.
6. Explain the principle of sealing around conduits.
7. Choose the scaffolding in accordance with the type of roofing and the slope of the roof.
8. Differentiate among the types of roofing according to their use.
9. Compare the techniques for anchoring roofing materials.
10. Explain the techniques for installing roofing flashing.
11. Handle materials.

Before learning how to install gutters (D):

12. Identify the types of gutters.
13. Determine the proper anchor.

Before learning how to apply safety rules (E):

14. Adopt work methods to ensure safety on construction sites.

MODULE 28: PRINCIPLES OF VENTILATION

CODE: 803 764 **Duration: 60 hours**

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
apply principles of ventilation
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Working alone
- Given:
  - learning situations
  - the necessary codes
  - manufacturers' catalogues

GENERAL PERFORMANCE CRITERIA

- Use of appropriate terminology
- Airflow in conformity with instructions

FIRST-LEVEL OPERATIONAL OBJECTIVE

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Recognize the types of systems.	- Accurate identification of components - Correct understanding of role of components - Correct interpretation of ventilation symbols
B. Check the operation of the system.	- Correct use of measuring instruments
C. Calibrate a ventilation system.	- Satisfactory adjustment of flow - Mastery of technique for balancing a system

FIELD OF APPLICATION

Ventilation, air conditioning and air processing systems

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 how to recognize the types of systems (A):

1. Identify ventilation symbols.
2. Explain the role and operation of the equipment and accessories in a system.
3. Become aware of the importance of the positioning of the equipment in a system.

Before learning how to check the operation of the system (B):

4. Use measuring instruments.

Before learning how to calibrate a ventilation system (C):

5. Identify the factors involved in the loss of pressure.
6. Use manuals and catalogues.
7. Use adjustment instruments.

MODULE 29: INSTALLING AIR DISTRIBUTION AND EXHAUST SYSTEMS

CODE: 803 776 **Duration: 90 hours**

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
install air distribution and exhaust systems
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Working in pairs
- Given:
  - written instructions
  - the installation drawing for a system including:
    - an installed and connected fan in operating condition
    - an assembled and installed cabinet
    - 7.5 m of conduit
  - manufacturers' installation drawings
- Using:
  - the necessary scaffolding components
  - the necessary materials and accessories
  - hoisting equipment
  - cutting and assembling tools and equipment

GENERAL PERFORMANCE CRITERIA

- Observance of health and safety rules
- Observance of commonly accepted installation standards
- Mastery of assembly techniques
- Functional installation in conformity with drawing specifications

FIRST-LEVEL OPERATIONAL OBJECTIVE

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Interpret the installation drawing.	- Accurate interpretation of drawing
B. Plan the work.	- Logical sequence of operations - Correct choice of type of scaffolding - Correct choice of materials
C. Assemble the system components on the ground.	- Solid assembly
D. Set up scaffolding.	- Correct installation of safety equipment - Use of safety equipment
E. Install the supports.	- Solid anchors - Positioning in conformity with drawing - Mastery of anchoring and suspension techniques
F. Handle the materials and equipment.	- Correct use of handling and hoisting equipment
G. Install the conduits.	- Logical installation sequence - Mastery of cutting and assembly techniques - Leak-tight joints - Satisfactory adjustment of scrim
H. Install and adjust the accessories.	- Positioning in conformity with drawing - Observance of manufacturer's installation standards

FIRST-LEVEL OPERATIONAL OBJECTIVE

BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR

I. Balance the system.

SPECIFIC PERFORMANCE CRITERIA

- Observance of start-up procedure
- Volume of air distributed in conformity with specifications

FIELD OF APPLICATION

Air distribution, exhaust and processing systems in residential, commercial, institutional and industrial buildings

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 how to interpret the installation drawing (A):

1. Recognize the components of air distribution, exhaust and air conditioning systems.
2. Determine the actual location of the system components appearing in the drawing.

Before learning how to plan the work (B):

3. Explain commonly applied principles of architecture.

Before learning how to assemble the system components on the ground (C):

4. Install angle irons.
5. Make joints.
6. Apply thermal cutting and assembly procedures.
7. Check that conduits are leakproof.

Before learning how to install the conduits (G):

8. Differentiate between the components of the air distribution, exhaust and conditioning system cabinets.
9. Describe the optimum conditions for installing a fan.
10. Connect the conduits to the cabinet and the fan.

Before learning how to balance the system (I):

11. Use instruments to measure the volume of air in a room.

MODULE 30: JOB SEARCH TECHNIQUES

CODE: 803 362 **Duration: 30 hours**

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
use job search techniques
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - information
  - simulations
  - reference materials on résumés and letters of application

GENERAL PERFORMANCE CRITERIA

- Observance of commonly accepted standards
- Quality of communication
- Validity of résumé and letter of application

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

SPECIFICATIONS OF THE EXPECTED BEHAVIOUR	SPECIFIC PERFORMANCE CRITERIA
A. Write a résumé.	- Relevant information - Accurate, consistent style - Correct spelling - Correct presentation
B. Write a letter of application.	- Observance of conventions
C. Prepare for and undergo a preselection interview.	- Adequate knowledge of company - Courtesy - Attentiveness - Relevant answers - Clarity

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 how to write a résumé (A):

1. Define the role of the résumé, taking into account the advantages of using it.
2. Indicate the qualities of a well-written résumé.
3. Describe the parts of a résumé, indicating the appropriate information.

Before learning how to write a letter of application (B):

4. Define the role of the letter of application.
5. Indicate the qualities of a well-written letter of application.
6. Describe the parts of a letter of application, indicating its characteristics and the appropriate information.

Before learning how to prepare for and undergo a preselection interview (C):

7. Understand the importance of preparing for an interview.
8. Identify the different types of interviews and their purpose.
9. Research a company: its size, products, orientations, organization, etc.
10. Analyze the selection criteria for the position.
11. Show interest and adopt courteous behaviour during the interview.

MODULE 31: ORGANIZATIONS IN THE CONSTRUCTION INDUSTRY

CODE: 755 001 **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
become aware of the organizations in the construction industry.

SPECIFICATIONS

During this module, the students will:

- Identify the main roles and responsibilities of employer and employee associations and organizations.
- Describe the laws and regulations governing labour relations in the construction industry.

LEARNING CONTEXT

PHASE 1: **Information**

- Learning about the objective of the unit.

PHASE 2: **Learning**

- Receiving information on the topic.

- Expressing their opinion on the topic and asking questions.

FIRST-LEVEL OPERATIONAL OBJECTIVE
SITUATIONAL OBJECTIVE

LEARNING CONTEXT

PHASE 3: **Reinforcement**

- Reviewing the important concepts of the unit.
- Working alone to answer a series of questions.
- Correcting their answers in the group.

INSTRUCTIONAL GUIDELINES

The teacher should:

- Provide the appropriate materials.
- Present the content in a dynamic manner.
- Promote group discussion.
- Use charts and illustrations.

PARTICIPATION CRITERIA

PHASE 1:

- Participate in 7 of the 9 units.

PHASE 2:

- Listen attentively.
- Discuss the topics.
- Ask questions and give relevant answers.

PHASE 3:

- Answer the series of questions.
- Correct their answers.

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:

1. Be receptive to information on the organizations in the construction industry.
2. Express an interest in sharing their knowledge with the rest of the group.

Before undertaking the activities of Phase 2:

3. Explain the principal rules of group discussion.

Before undertaking the activities of Phase 3:

4. Describe the technique for answering a series of questions.

MODULE 32: ENTERING THE WORK FORCE

CODE: 803 784 **Duration: 60 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:

- Find a practicum position.
- Become familiar with the workplace.
- Adjust their perceptions of the work context, trade-related practices and their aptitudes, interests and training.
- Prepare to function in the workplace.

LEARNING CONTEXT

PHASE 1: **Preparing for the Practicum**

- Learning about the practicum procedures.

- Setting criteria for selecting companies.

- Listing companies likely to hire trainees.

- Searching for a practicum position.

FIRST-LEVEL OPERATIONAL OBJECTIVE
SITUATIONAL OBJECTIVE

LEARNING CONTEXT

PHASE 2: **Observation and Performance of Activities in the Workplace**

- Observing the work context, e.g. socioeconomic sector (products, market), trade associations, organization of the company, equipment, technological development, working conditions, interpersonal relationships, health and safety.

- Observing, performing or participating in various trade-related tasks.

- Writing a brief report on their observations of the work context and the tasks performed in the workplace.

PHASE 3: **Comparison of Their Perceptions Before and After the Practicum**

- Identifying aspects of the trade that differ from the training received.

- Discussing the accuracy of their perception of the trade before and after the practicum, e.g. workplace, trade-related practices.

- Discussing the consequences of their experience on their choice of a future job, e.g. aptitudes, interests.

INSTRUCTIONAL GUIDELINES

The teacher should:

- Provide students with means of choosing a practicum wisely.
- Maintain close cooperation between the school and the company.
- Make it possible for students to observe and perform trade-related tasks.
- Make sure the students are supervised at all times by a representative of the company.
- Provide students with support and supervision as needed.
- Intervene in the case of problems or difficulties.
- Encourage students to express themselves, especially when choosing a practicum position and when comparing their perceptions before and after the practicum.

FIRST-LEVEL OPERATIONAL OBJECTIVE
SITUATIONAL OBJECTIVE

PARTICIPATION CRITERIA

PHASE 1:

- List, in order of priority, three possible practicum positions that meet their predetermined selection criteria.
- Meet with a representative of the company in order to obtain a practicum position.

PHASE 2:

- Observe the company's rules with respect to activities trainees are allowed to perform, work schedules and other working conditions.
- Write a report containing information on at least five of the topics to be observed and describing the tasks performed or observed.

PHASE 3:

- Referring to their report, sharing their experience in the workplace with the rest of the group.

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:

1. Describe the steps involved in planning a practicum search.
2. List the attitudes required to find a practicum position.

Before undertaking the activities of Phase 2:

3. Describe the items to be noted during the practicum.
4. Describe the behaviour to adopt in the workplace.

Before undertaking the activities of Phase 3:

5. List their aptitudes and interests.
6. Describe the requirements of the workplace.

Éducation

Québec

17-1614-01A