11

MECHANICAL MANUFACTURING

AIRCRAFT MECHANICAL ASSEMBLY

PROGRAM OF STUDY

5699

VOCATIONAL and TECHNICAL EDUCATION

Québec

AIRCRAFT MECHANICAL ASSEMBLY

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The *Aircraft Mechanical Assembly* program leads to the Diploma of Vocational Studies (DVS) and prepares the student to practise the occupation of

AIRCRAFT MECHANICAL ASSEMBLER

Secteur de la formation professionnelle et technique

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TABLE OF CONTENTS

INTRODUCTION

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

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

The program of study lists the competencies that are the minimum requirements for a **Diploma of Vocational Studies (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 *Aircraft Mechanical Assembly* program leads to the Diploma of Vocational Studies. To be admitted to the program, students must meet one of the following conditions:

- For students holding a Secondary School Diploma or a recognized equivalent, no additional conditions are required.

OR

- For students who are at least 16 years of age on September 30 of the school year in which they begin the program, the following condition applies: they must have obtained Secondary IV credits in language of instruction, second language and mathematics, or the recognized equivalents.

OR

- For students who are at least 18 years of age, successful completion of the General Development Test is prescribed as a functional prerequisite.

OR

- For students having obtained Secondary III credits in language of instruction, second language and mathematics in programs established by the Minister, general education is required in conjunction with vocational education in order to obtain the following credits, if applicable: Secondary IV language of instruction, second language and mathematics in programs established by the Minister.

The duration of the program is 1035 hours, which includes 420 hours spent on the specific competencies required to practise the trade and 615 hours on general competencies.

The program of study is divided into 20 modules which vary in length from 15 to 90 hours (multiples of 15). The time allocated to the program is to be used not only for teaching but also for evaluation and remedial work.

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

In keeping with this broad approach, two accompanying documents will be provided: 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 socioaffective behaviours, cognitive skills or psychosensori-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: **20**
Duration in hours: **1035**
Credits: **69**

Aircraft Mechanical Assembly
Code: 5699

CODE	TITLE OF THE MODULE	HOURS	CREDITS*
869 011	1. The Trade and the Training Process	15	1
869 022	2. Evolution of the Aerospace Industry	30	2
869 302	3. Applied Mathematics	30	2
869 312	4. Precision Instruments	30	2
869 323	5. Materials Maintenance and Protection	45	3
869 334	6. Reading Drawings and Manuals	60	4
869 064	7. Work Procedures and Computers	60	4
869 083	8. Occupational Health and Safety and Materials Handling	45	3
869 365	9. Machining, Riveting and Deriveting	75	5
869 374	10. Mechanical Assembly	60	4
869 382	11. Pipes, Tubes and Hoses	30	2
869 415	12. Static and Dynamic Balancing	75	5
869 424	13. Hydraulics and Pneumatics	60	4
869 445	14. Gearbox	75	5
869 456	15. Engines and Accessories	90	6
869 474	16. Hydraulic and Pneumatic Systems	60	4
869 201	17. Job Search Techniques	15	1
869 504	18. Flight Control Systems	60	4
869 514	19. Landing Gear	60	4
869 524	20. Practicum in the Workplace	60	4

* 15 hours = 1 credit

This program leads to a Diploma of Vocational Studies (DVS) in *Aircraft Mechanical Assembly*.

2 PROGRAM TRAINING GOALS

The training goals of the *Aircraft Mechanical Assembly* program are based on the general goals of vocational education and take into account the specific nature of the occupation. These goals are:

To develop effectiveness in the practice of an occupation.

- To teach students to perform aircraft mechanical assembly tasks and activities correctly, at an acceptable level of competence for entry into the job market.

- To prepare students to progress satisfactorily on the job by fostering:
  - the skills required to interpret task-related standards and work methods;
  - a concern for effective communication with superiors and colleagues;
  - attentiveness and precision in the performance of various tasks;
  - order, neatness and speed in carrying out different activities;
  - a concern for total quality.

To ensure integration into the job market.

- To help students learn about the job market in general and in aircraft mechanical assembly in particular.

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

- To foster independence, a sense of responsibility and a desire to succeed.

- To help students understand the principles underlying the different tasks performed by aircraft mechanical assemblers.

- To help students develop the habit of inspecting and correcting their work.

- To help students develop work methods and a sense of discipline.

To ensure job mobility.

- To help students develop positive attitudes toward technological change and new situations.

- To help students learn how to learn.

- To help students prepare for a creative job search.

3 COMPETENCIES

The competencies to be developed in the *Aircraft Mechanical Assembly* 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. Shaded symbols indicate that these relationships have been taken into account in the formulation of objectives intended to develop specific competencies related to the trade 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 **AIRCRAFT MECHANICAL ASSEMBLY** SPECIFIC COMPETENCIES (directly related to the practice of the specific trade)		FIRST-LEVEL OPERATIONAL OBJECTIVES	DURATION (IN HOURS)	WORK PROCESS (major steps)					GENERAL COMPETENCIES (related to technology, subjects, personal development, etc.)															TOTALS	
				Examine the instructions, drawings, work procedures and standards	Plan the work and set up the work station	Do the work	Inspect the work	Tidy up	Gain an overview of the evolution of the aerospace industry	Apply mathematical concepts	Take measurements using precision instruments	Maintain and protect materials used in aircraft structures and systems	Read and interpret drawings, diagrams and manuals, and produce sketches	Use various work procedures and apply concepts of computer science	Apply occupational health and safety rules and materials handling techniques	Perform manual machining, riveting and deriveting tasks	Perform mechanical assembly tasks	Install pipes, tubes and hoses	Balance rotors	Apply principles and techniques in hydraulics and pneumatics	Use job search techniques	Use written English	NUMBER OF OBJECTIVES	DURATION (IN HOURS)
MODULES	MODULES								2	3	4	5	6	7	8	9	10	11	12	13	17	*		
	FIRST-LEVEL OPERATIONAL OBJECTIVES								S	B	B	B	B	B	B	B	B	B	B	B	S		13	
	DURATION (IN HOURS)								30	30	30	45	60	60	45	75	60	30	75	60	15			615
1	Determine their suitability for the trade and the training process	S	15						❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍		
14	Assemble, install and troubleshoot transmissions	B	75	▲	▲	▲	▲	▲	❍	●	●	●	●	●	●	❍	❍	❍						
15	Assemble, install and refurbish engines and their accessories	B	90	▲	▲	▲	▲	▲	❍	❍	●	●	●	●	●	●	●	●	❍					
16	Assemble, install and troubleshoot hydraulic and pneumatic systems	B	60	▲	▲	▲	▲	▲	❍	❍	●	●	●	●	●	●	●	●	❍	❍				
18	Assemble, install and troubleshoot flight control systems	B	60	▲	▲	▲	▲	▲	❍	❍	●	●	●	●	●	●	●	●	❍	●				
19	Assemble, install and refurbish landing gear	B	60	▲	▲	▲	▲	▲	❍	❍	●	●	●	●	●	●	●	●	●	❍				
20	Enter the work force	S	60	△	△	▲	▲	▲	❍	❍	❍	●	●	●	●	●	●	❍	❍	❍				
NUMBER OF OBJECTIVES		7																					20	
DURATION (IN HOURS)			420																					1035

S: Situational objective
B: Behavioural objective

△ Correlation between a step and a specific competency
▲ Correlation to be taught and evaluated

❍ Correlation between a general and a specific competency
● Correlation to be taught and evaluated

4 GENERAL OBJECTIVES

The general objectives of the *Aircraft Mechanical Assembly* 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.
- Gain an overview of the evolution of the aerospace industry.
- Use job search techniques.
- Enter the work force.

To develop in the students the competencies required to perform specialized trade-related tasks.

- Assemble, install and troubleshoot gearbox.
- Assemble, install and refurbish engines and their accessories.
- Assemble, install and troubleshoot flight control systems.
- Assemble, install and refurbish landing gear.

To develop in the students the competencies required to apply basic aircraft mechanical assembly techniques.

- Apply mathematical concepts.
- Take measurements using precision instruments.
- Maintain and protect materials used in aircraft structures and systems.
- Read and interpret drawings, diagrams and manuals, and produce sketches.
- Use various work procedures and apply concepts of computer science.
- Apply occupational health and safety rules and materials handling techniques.
- Perform manual machining, riveting and deriveting tasks.
- Perform mechanical assembly tasks.
- Install pipes, tubes and hoses.
- Balance rotors.
- Apply principles and techniques in hydraulics and pneumatics.

To develop in the students the competencies required to perform complementary tasks.

- Assemble, install and troubleshoot hydraulic and pneumatic systems.

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: 869 011 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.
- Recognize the tasks involved in trades related to aircraft mechanical assembly.
- Understand the training process.
- Confirm their career choice.

LEARNING CONTEXT

PHASE 1: Information on the Trade

A. Learning about the job market in aircraft mechanical assembly.
B. Learning about the nature and requirements of the job through field trips, interviews, written material, etc.
C. Comparing the tasks of the trade with those of related trades, in particular aircraft electrical and structural assembly.
D. Presenting the information gathered and discussing their views on the trade.

PHASE 2: Information on and Participation in the Training Program

E. Discussing the skills, aptitudes and knowledge required to practise the trade.
F. Learning about the program and about the other two aircraft assembly programs.
G. Discussing the relevance of the program to the work environment of an aircraft mechanical assembler.
H. Discussing their initial reactions to the trade and the training program.

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

PHASE 3: Evaluation and Confirmation of Career Choice

I. Stating their preferences, aptitudes and expectations with respect to the trade.
J. Assessing their career choice by comparing the different aspects and requirements of the trade with their own preferences, aptitudes and expectations.
K. Presenting the result of their assessment in a report.

INSTRUCTIONAL GUIDELINES

The teacher should:

- Create a climate that is conducive to personal growth and to the students' integration into the job market.
- Encourage the students to engage in discussions and to express themselves.
- Motivate the students to take part in the suggested activities.
- Help the students acquire an accurate perception of the trade.
- Provide the students with the means of assessing their career choice honestly and objectively.
- Organize field trips to companies that are representative of the main work environments in the trade.
- Make available all pertinent documentation.
- Organize a meeting with specialists in the trade.
- Provide a report outline.

PARTICIPATION CRITERIA

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

PHASE 2:
- Give their opinions on some of the requirements that they will have to meet in order to practise the trade.
- Express their views on the training program in a group meeting.

PHASE 3:
- Write a report that:
  - sums up their preferences, expectations and aptitudes;
  - explains 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 the activities of Phase 1 (Information on the Trade):

1. Be receptive to information about the trade and the training program.
2. Be willing to share their views on the trade with other members of the group.
3. Find information.
4. Determine how to record and present information.
5. Give the meaning of "entry-level qualifications."
6. Explain the main rules governing group discussion.

Before undertaking the activities of Phase 2 (Information on and Participation in the Training Program):

7. Define the terms "skill," "aptitude," "attitude" and "knowledge."
8. Describe the nature and purpose of a program of study.

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

9. Differentiate among preferences, aptitudes and expectations.
10. Describe the main components of the report confirming their career choice.

MODULE 2: EVOLUTION OF THE AEROSPACE INDUSTRY

Code: 869 022 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
gain an overview of the evolution of the aerospace industry.

Specifications

At the end of this module, the students will:

- Be familiar with the main events in the history of the aerospace industry.
- Be familiar with the role of the aerospace industry in the economies of Québec and Canada, as well as in the global market.
- Understand the impact of technological development and the globalization of markets on productivity and competitiveness in the aerospace industry.
- Be familiar with the quality standards associated with the aerospace industry.
- Be familiar with the new types of work organization in the industry and recognize the resulting new management techniques.

LEARNING CONTEXT

PHASE 1: Information on the Evolution of the Aerospace Industry

A. Learning about the major events in the history of the aerospace industry.
B. Learning about the current aerospace markets and the role of the industry in the Québec, Canadian and world economies.
C. Learning about the development of new aerospace technologies and identifying their impact on other sectors of activity.
D. Learning about the globalization of markets and its impact on competitiveness and productivity in the industry.
E. Learning about military and non-military quality standards and certification systems associated with the aerospace industry.
F. Learning about the new types of work organization and their impact on the work situation and environment in the industry.

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

PHASE 2: Participation in a Process of Reflection

G. Considering the importance of being familiar with the evolution of the aerospace industry and the means used by companies to attain their objectives with respect to quality, productivity and competitiveness in the context of a world economy.
H. Participating in discussions in which they:
   - establish a parallel between the main stages in the evolution of the aerospace industry and the development of new technologies;
   - identify current trends on which to base predictions about the future of the industry;
   - determine that conforming with standards is the only way to attain quality objectives in the industry;
   - associate companies' adoption of new technologies and new types of work organization with the requirements of quality, productivity and competitiveness;
   - demonstrate how the new technologies and management techniques influence workers' tasks, their level of responsibility, their relationships with colleagues and superiors and their need for continuing education.
I. Participating in a suggested activity, for example, attending a conference given by a representative of the aerospace industry or visiting a company.
J. Taking notes.

PHASE 3: Evaluation

K. Synthesizing the information gathered.
L. Identifying the advantages of having this new knowledge about the evolution of the aerospace industry.
M. Presenting their thoughts in a report.

INSTRUCTIONAL GUIDELINES

The teacher should:

- Kindle an interest in the history and evolution of the aerospace industry.
- Create a climate that is conducive to research and reflection.
- Make available all the necessary documentation.
- Encourage the students to engage in discussions and to express themselves.
- Underline the need for workers in the aerospace industry to adopt new ways of thinking.
- Provide a report outline.

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

PARTICIPATION CRITERIA

PHASE 1:
- Gather information on most of the topics to be dealt with.

PHASE 2:
- Participate in the suggested activities.
- Show an interest and express their opinion.

PHASE 3:
- Write a report that:
  - synthesizes the topics dealt with in the learning context;
  - explains the importance of being familiar with the evolution of the aerospace industry.

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 (Information on the Evolution of the Aerospace Industry):

1. Be open to new knowledge.
2. Adopt a research method.
3. Recognize the main Québec and Canadian companies that build aircraft.
4. Define the concepts of productivity, competitiveness and total quality.

MODULE 3: APPLIED MATHEMATICS

Code: 869 302 Duration: 30 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

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

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - theoretical problems and data related to shop work
  - data in international and imperial units of measurement
- Using:
  - formulas, charts and tables
  - a calculator
  - course notes

GENERAL PERFORMANCE CRITERIA

- Observance of procedure
- Accurate calculations
- Concern for method and logic
- Proper use of English and French terminology

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE

(First-level objectives appear in bold.)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
1. Show concern for neatness and the logical presentation of solutions.	
2. Do basic mathematical calculations.	
3. Recognize units of measurement in the international and imperial systems.	
A. Convert units of measurement from the international to the imperial system and vice versa.	— Appropriate choice and use of conversion factors — Proper use of units of measurement — Proper use of symbols and abbreviations
4. Do basic trigonometric calculations.	
B. Interpret tables and charts.	— Observance of methods for using tables and charts — Accurate interpretation of information contained in the tables and charts
5. Use a calculator.	
C. Do mathematical calculations using the imperial and international systems of measurement in the following fields: **. mechanics** **. hydraulics** **. pneumatics** **. electricity** **. electronics**	— Proper choice of formulas and units of measurement — Proper transformation of formulas, if applicable — Proper use of formulas
D. Check the calculations.	— Proper choice of verification techniques — Proper use of verification techniques

MODULE 4: PRECISION INSTRUMENTS

Code: 869 312 Duration: 30 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
take measurements using precision instruments
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - drawings, diagrams and work procedures
  - records
- Using:
  - measuring and testing instruments
  - gauges and callipers
  - mechanical parts and assemblies

GENERAL PERFORMANCE CRITERIA

- Observance of procedure
- Accurate measurements
- Observance of tolerances
- Precise, methodical approach
- Proper use of English and French terminology

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE

(First-level objectives appear in bold.)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
1. Identify the measuring and testing instruments used in mechanical assembly.	
A. Select the measuring and testing instruments.	— Choice of appropriate instruments for the required measurements and tests
2. Check the accuracy of the measuring instruments.	
3. Recognize defective instruments.	
B. Calibrate and adjust direct-reading measuring instruments.	— Proper choice of calibration method — Observance of calibration and adjustment techniques — Accurate calibration and adjustment
4. Endeavour to do quality work.	
C. Locate the relevant information in the drawings, diagrams and work procedure.	— Thorough identification of necessary information — Accurate interpretation of: – dimensions – tolerances
D. Measure a variety of parts.	— Proper use of measuring and testing instruments — Accurate readings
E. Compare the dimensions, shape and appearance of the parts with the information in the drawings.	— Accurate verification of conformity of measurements with information — Accurate interpretation of results of comparison

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE
(First-level objectives appear in bold)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
F. Tidy up the work area.	— Proper cleaning and storage of: – instruments – equipment — Neat work station

MODULE 5: MATERIALS MAINTENANCE AND PROTECTION

Code: 869 323 Duration: 45 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
maintain and protect materials used in aircraft structures and systems
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - instructions
  - drawings and work procedures
  - reference documents
  - tables and charts
  - illustrations
- Using:
  - structural parts
  - system components
  - samples of materials
  - tools
  - products
  - individual protection equipment
  - course notes

GENERAL PERFORMANCE CRITERIA

- Ability to relate materials and systems and their components with aircraft structures
- Accurate interpretation of information in tables and charts
- Observance of occupational health and safety rules
- Observance of procedure
- Proper use of English and French terminology
- Maintenance and protection in conformity with the requirements specified in the drawings and work procedures

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE

(First-level objectives appear in bold.)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
A. Describe the main materials used in aircraft structures and system components.	— Distinction of materials according to their characteristics and properties — Accurate interpretation of standardized names — Relevant relationships between aircraft materials, system components and structural elements
1. Describe different stresses brought to bear on aircraft materials, system components and structures.	
2. Describe conditions likely to cause corrosion.	
3 Describe the factors that accelerate corrosion.	
4. Describe the consequences of the corrosion of aircraft materials.	
B. Identify the types of corrosion that can affect aircraft system components and structures.	— Recognition of the types of corrosion — Distinction of the effects of corrosion on: – structures – system components
5. Explain the purpose of lubricating, cleaning and protecting aircraft components and systems.	
6. Differentiate among lubricants.	
7 Differentiate among solvents.	
8. Differentiate among protective products and materials.	

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE
(First-level objectives appear in bold)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
C. Locate the relevant information in the drawings, diagrams and work procedures.	— Thorough identification of necessary information — Accurate interpretation of: – drawings – symbols – abbreviations – information – instructions
D. Plan the work.	— Determination of logical sequence of operations — Appropriate choice of: – tools – equipment – materials – products — Conformity with instructions
E. Lubricate aircraft components and systems.	— Correct oil levels — Use of appropriate products in accordance with the operating conditions of the components and systems — Proper application of products at the appropriate points
F. Clean aircraft components and systems.	— Determination of appropriate type of cleaning procedures for the component or system in question — Observance of manufacturer's recommendations — Clean parts

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE

(First-level objectives appear in bold.)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
G. Apply protective products to aircraft components and systems.	— Observance of manufacturer's recommendations — Observance of methods for applying products — Clean component or system
H. Tidy up the work area.	— Proper cleaning and storage of: – tools – equipment – materials – products — Neat work station

MODULE 6: READING DRAWINGS AND MANUALS

Code: 869 334 Duration: 60 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

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

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - instructions
  - detail and assembly drawings
  - manufacturers' manuals
- Using:
  - materials
  - course notes

GENERAL PERFORMANCE CRITERIA

- Observance of conventions
- Concern for detail and method
- Speed
- Neat, careful work
- Proper use of English and French terminology

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE

(First-level objectives appear in bold.)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
1. Consult technical drawing standards.	
2. List the types of drawings used in mechanical assembly.	
3. Recognize the different types of lines.	
A. Locate and interpret complementary information related to aircraft drawings and diagrams.	— Accurate interpretation of: – information – symbols – abbreviations
4. Recognize the importance of handling drawings with care.	
5. Identify the orientation of the views of an aircraft.	
B. Interpret drawings and diagrams containing: - **projections** - **sections** - **views** - **dimensions** - **symbols**	— Accurate interpretation of: – projections – sections – views – dimensions – symbols
C. Locate and interpret information contained in aircraft drawings and diagrams.	— Accurate location of references — Accurate interpretation of information about: – components and parts – fasteners – machine parts – tolerances – parameters – dimensions — Recognition of datum lines

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE
(First-level objectives appear in bold)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
6. Reproduce lines.	
D. Sketch parts and assemblies.	— Proper choice of views — Proper use of freehand drawing technique — Observance of: – layout of views – proportions — Neat, clear sketch
E. Dimension sketches.	— Proper choice of dimensions and symbols — Observance of layout of dimensions — Accurate dimensioning — Relevant notes
F. Locate and interpret information contained in the manufacturers' manuals.	— Accurate location of information — Accurate interpretation of information about: – components and parts – specifications – tolerances – recommendations

MODULE 7: WORK PROCEDURES AND COMPUTERS

Code: 869 064 Duration: 60 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
use various work procedures and apply concepts of computer science
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - work procedures
  - drawings or diagrams
- Using:
  - a microcomputer and peripherals
  - software
  - a French-English lexicon
  - course notes

GENERAL PERFORMANCE CRITERIA

- Accurate interpretation of information contained in the documents
- Appropriate use of documentation
- Proper use of English and French terminology
- Proper use of equipment and materials

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE

(First-level objectives appear in bold.)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
1. Understand the role and nature of work procedures.	
2. Distinguish among the departments that support production in a company.	
3. Define the goals of communication.	
4. Recognize the main documents related to work procedures.	
A. Associate work procedures with aircraft assembly tasks.	— Appropriate distinction of procedures according to their: – role – content – use — Proper association of procedures with the job to be done
B. Locate and interpret relevant information contained in the work procedures.	— Proper choice of documents according to the job to be done — Observance of methods of using documents — Accurate interpretation of: – instructions – drawings and diagrams – information – abbreviations
5. Recognize different ways of making technical notes in English.	
C. Note the relevant information in the work procedures.	— Clear, accurate information — Accurate notes — Inclusion of all the necessary information

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE
(First-level objectives appear in bold)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
6. Describe the different types of microcomputers.	
7. Handle the microcomputer and peripherals with care.	
8. Describe the specific characteristics of different types of computers.	
9. Recognize the elements that make up a microcomputer environment.	
10. Identify the input and output connections of a microcomputer.	
D. Connect different peripherals to the microcomputer.	— Observance of procedure — Observance of manufacturer's recommendations
11. List the main operating systems.	
E. Perform operations on a microcomputer using: - **an operating system** - **a software program**	— Observance of methods of: – using commands – finding information – inputting data — Accurate interpretation of codes — Appropriate use of software program

MODULE 8: OCCUPATIONAL HEALTH AND SAFETY AND MATERIALS HANDLING

Code: 869 083 Duration: 45 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

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

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - learning contexts or case studies
  - an emergency response plan
  - manufacturers' manuals
- Using:
  - aircraft components and equipment
  - handling accessories and equipment
  - tools
  - materials
  - tables and charts
  - the relevant documentation
  - course notes

GENERAL PERFORMANCE CRITERIA

- Relevant association of risks of industrial accidents and occupational diseases with preventive measures
- Appropriate use of documentation
- Appropriate use of equipment

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE

(First-level objectives appear in bold.)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
1. Be familiar with the main organizations associated with occupational health and safety.	
2. Understand the importance of raising employers' awareness of occupational health and safety.	
3. Be familiar with possible recourse in matters of occupational health and safety.	
A. Associate laws and regulations respecting occupational health and safety with the situation of an aircraft mechanical assembly plant.	— Relevant association of laws and regulations with the tasks performed — Appropriate explanation of the rights and obligations of employers and employees as stipulated in the legislation
4. Learn about the dangers related to automatic controls.	
5. Recognize various hazardous situations in the workplace.	
B. Associate the main health and safety risks with the tasks performed in an aircraft mechanical assembly plant.	— Proper association with respect to: – equipment – materials – products – procedures – methods – the work environment – the work organization
6. State the advantages of prevention and describe methods of promoting it.	

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE
(First-level objectives appear in bold)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
7. Distinguish among the items on a WHMIS data sheet for products used in aircraft mechanical assembly.	
8. List various methods for the environmentally safe elimination of pollutants.	
C. Explain the preventive measures to be taken in an aircraft mechanical assembly plant.	— Accurate explanation of preventive measures
D. Explain the main measures to be taken in case of emergency.	— Accurate explanation of measures to be taken
9. Define “hoisting” and “handling.”	
10. Define “centre of gravity.”	
E. Determine the centre of gravity and estimate loads.	— Accurate location of centre of gravity — Accurate calculations — Appropriate estimate of loads
11. Define the safety factor.	
12. Recognize signalling methods.	

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE

(First-level objectives appear in bold.)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
F. Handling materials and equipment safely, using slings and lifts.	— Proper use of technique — Materials and equipment solidly fastened — Consideration of the capacity of the accessories — Appropriate protection of accessories or slings — Observance of manufacturer's recommendations — Balanced and stable load in accordance with volume, shape and weight — Observance of health and safety rules

MODULE 9: MACHINING, RIVETING AND DERIVETING

Code: 869 365 Duration: 75 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
perform manual machining, riveting and deriveting tasks
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - instructions
  - drawings, diagrams and work procedures
  - manufacturers' manuals
- Using:
  - metal parts
  - equipment
  - tools
  - measuring and marking-out instruments
  - materials
  - products
  - tables and charts
  - individual protection equipment
  - course notes

GENERAL PERFORMANCE CRITERIA

- Observance of occupational health and safety rules
- Observance of procedure
- Observance of manufacturer's recommendations
- Appropriate use of tools, equipment, instruments and materials
- Accurate measurements
- Accurate calculations
- Speed
- Neat, careful work
- Proper use of English and French terminology
- Machining and riveting in conformity with the requirements specified in the drawings, diagrams and work procedures

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE

(First-level objectives appear in bold.)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
1. Differentiate among the types of rivets used in the aerospace industry.	
A. Locate the relevant information in the drawings, diagrams and work procedures.	— Thorough identification of necessary information — Accurate interpretation of: – drawings and symbols – codification – information – instructions
2. List the advantages of effectively planning and organizing work.	
B. Plan the work.	— Determination of logical sequence of operations — Appropriate choice of: – tools – equipment – instruments – materials – products — Conformity with instructions
3. Become aware of the need for precision.	
C. Perform tasks preliminary to machining and riveting: - **examine the part** - **measure** - **mark out** - **punch**	— Accurate observation of the condition of the parts — Accurate location of centres to be punched — Accurate marking out — Proper use of marking-out and punching techniques
4. Recognize defective tools.	

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE
(First-level objectives appear in bold)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
D. Perform machining tasks such as: - **filing** - **milling** - **counterboring** - **cutting** - **drilling** - **reaming** - **tapping** - **threading** - **sharpening**	— Proper use of the appropriate techniques — Observance of dimensions — No burrs — Clean parts
E Assemble the parts to be riveted.	— Accurate positioning of parts to be assembled — Appropriate positioning of temporary fasteners — Precise assembly
F. Rivet metal parts using: - **percussion riveting** - **compression riveting** - **traction riveting**	— Proper use of the appropriate techniques for the type of rivet used — Observance of dimensions — Solid riveting — Clean parts
G. Derivet parts: - **on a workbench** - **in an aircraft**	— Proper use of the appropriate techniques for the type of rivet used — Conformity of hole sizes with requirements — No burrs — Clean parts

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE

(First-level objectives appear in bold.)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
H. Inspect the work.	— Accurate inspection of conformity of machined, riveted and deriveted parts with requirements — Detection of anomalies — Observance of tolerances
I. Tidy up the work area.	— Proper cleaning and storage of: – tools – equipment – instruments – materials – products — Neat work station

MODULE 10: MECHANICAL ASSEMBLY

Code: 869 374 Duration: 60 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

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

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - instructions
  - drawings and work procedures
  - manufacturers' manuals
- Using:
  - aircraft components, parts and equipment
  - threaded and unthreaded fasteners and machine parts
  - tools
  - equipment
  - measuring instruments
  - materials
  - products
  - individual protection equipment
  - course notes

GENERAL PERFORMANCE CRITERIA

- Observance of occupational health and safety rules
- Observance of procedure
- Observance of manufacturer's recommendations
- Appropriate use of tools, equipment, instruments and materials
- Accurate measurements
- Observance of tolerances
- Speed
- Neat, careful work
- Proper use of English and French terminology
- Assembly in conformity with the requirements specified in the drawings and work procedures

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE

(First-level objectives appear in bold.)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
1. Describe the different types of fasteners.	
2. Describe the different machine parts.	
A. Locate the relevant information in the drawings and work procedures.	— Thorough identification of necessary information — Accurate interpretation of: – drawings and symbols – information – instructions – standards
B. Select the necessary tools, equipment, instruments, materials and products.	— Conformity with instructions — Appropriate choice of tools, equipment, instruments, materials and products
C. Do assemblies using threaded fasteners.	— Proper use of techniques for assembling with threaded fasteners — Observance of tightening and locking techniques — Application of sealers at the appropriate points
D. Do assemblies using unthreaded fasteners.	— Proper use of techniques for assembling with unthreaded fasteners — Observance of cotter pinning techniques — Proper use of fasteners — Observance of tightening and locking techniques

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE
(First-level objectives appear in bold)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
E. Do assemblies using machine parts.	— Proper use of assembly techniques: – bonding – shrink fitting — Observance of temperatures — Conformity of adjustments with requirements — Lubrication at the appropriate points
F. Disassemble an assembly.	— Observance of disassembly sequence — Proper use of disassembly techniques
G. Inspect the assembly.	— Observance of test methods — Determination of appropriate corrective measures, if applicable — Thorough inspection of conformity of assembly with requirements
H. Tidy up the work area.	— Proper cleaning and storage of: – tools – equipment – instruments – materials – products — Neat work station

MODULE 11: PIPES, TUBES AND HOSES

Code: 869 382 Duration: 30 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
install pipes, tubes and hoses
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - instructions
  - drawings, diagrams and work procedures
  - manufacturers' manuals
- Using:
  - assembly and test benches
  - equipment
  - tools
  - measuring instruments
  - materials
  - products
  - individual protection equipment

GENERAL PERFORMANCE CRITERIA

- Observance of occupational health and safety rules
- Observance of standards and tolerances
- Appropriate use of tools, equipment, instruments and materials
- Speed
- Neat, careful work
- Proper use of English and French terminology
- Inclusion of all information in work procedures
- Installation in conformity with the requirements specified in the drawings and work procedures

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE

(First-level objectives appear in bold.)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
1. Recognize the parts of a system or circuit and describe their functions.	
A. Locate the relevant information in the drawings, diagrams and work procedures.	— Thorough identification of necessary information — Accurate interpretation of: – drawings and symbols – information – instructions
B. Plan the work.	— Determination of sequence of operations — Appropriate choice of: – tools – equipment – instruments – materials – products — Conformity with instructions
C. Inspect the materials and prepare them for assembly.	— Proper use of techniques — Accurate measurements — Conformity of materials with requirements
D. Assemble the parts of a circuit.	— Observance of sequence of operations — Proper use of assembly technique — Application of products at the appropriate points

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE

(First-level objectives appear in bold)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
E. Install the parts of a system on an aircraft.	— Observance of installation sequence — Proper positioning of parts — Observance of fastening techniques — Application of sealers at the appropriate points
2. Become aware of the need for absolute leakproofing.	
F. Do tests.	— Observance of test methods — Detection of anomalies — Thorough inspection of conformity of system or circuit with information
G. Tidy up the work area.	— Proper cleaning and storage of: – tools – equipment – instruments – materials – products — Neat work station

MODULE 12: STATIC AND DYNAMIC BALANCING

Code: 869 415 Duration: 75 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

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

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - instructions
  - drawings and work procedures
  - manufacturers' manuals
- Using:
  - a rotor
  - a dynamic balancing machine
  - tools
  - measuring instruments
  - materials
  - products
  - individual and collective protection equipment

GENERAL PERFORMANCE CRITERIA

- Observance of occupational health and safety rules
- Observance of procedure
- Appropriate use of tools, equipment, instruments and materials
- Speed
- Concern for precision
- Proper use of English and French terminology
- Inclusion of all information in work procedures
- Balancing in conformity with the requirements specified in the drawings and work procedures

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE

(First-level objectives appear in bold.)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
1. Define terms associated with balancing.	
2. Explain the physical principles associated with balancing.	
3. Recognize the possible causes and effects of unbalance.	
4. Recognize the units of measurement used in balancing.	
5. Differentiate among the machines used for balancing.	
6. Recognize the main components of a centrifugal balancing machine.	
A. Locate the relevant information in the drawings and work procedures.	— Thorough identification of necessary information — Accurate interpretation of: – drawings and symbols – information – instructions
B. Plan the work.	— Determination of logical sequence of operations — Appropriate choice of: – tools – equipment – instruments – materials – products — Conformity with instructions

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE
(First-level objectives appear in bold)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
C. Mount the rotor on the balancing machine.	— Proper installation of: – balancing machine – part to be balanced — Proper positioning of reference mark — Conformity of balancing with requirements: – rpm – direction of rotation
D. Take readings.	— Thorough identification of necessary information — Accurate interpretation
E. Improve the balance of a rotor: – **static balancing** – **dynamic balancing**	— Consideration of operation of balancing machines — Conformity with balancing standards — Observance of tolerances — Accurate interpretation of readings — Accurate calculations
F. Check the accuracy of the balancing.	— Proper choice of formulas — Proper use of formulas — Observance of test method — Accurate verifications
G. Remove the rotor from the machine.	— Observance of disassembly technique
7. Recognize the importance of properly wrapping and storing rotating assemblies and parts.	

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE

(First-level objectives appear in bold.)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
H. Tidy up the work area.	— Proper cleaning and storage of: – tools – equipment – instruments – materials – products — Neat work station

MODULE 13: HYDRAULICS AND PNEUMATICS

Code: 869 424 Duration: 60 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
apply principles and techniques in hydraulics and pneumatics
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - instructions
  - drawings and diagrams
  - manufacturers' manuals
- Using:
  - hydraulic and pneumatic components
  - hydraulic and pneumatic assembly benches or aircraft equipment
  - tools
  - measuring instruments
  - materials
  - products
  - tables or charts
  - individual protection equipment

GENERAL PERFORMANCE CRITERIA

- Observance of occupational health and safety rules
- Observance of procedure
- Observance of manufacturer's recommendations
- Conformity with drawings and diagrams
- Appropriate use of tools, equipment, instruments and materials
- Speed
- Neat, careful work
- Proper use of English and French terminology

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE
(First-level objectives appear in bold.)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
1. Recognize the role of hydraulics and pneumatics.	
2. Distinguish among the fluids used in hydraulics and pneumatics.	
3. Explain the principles of physics as they apply to hydraulics and pneumatics.	
A. Explain the operation of hydraulic, electrohydraulic, pneumatic and electropneumatic components.	— Distinction among components based on: – their characteristics – their uses — Accurate explanation of operating principles
4. Differentiate between a series circuit and a parallel circuit.	
B. Interpret hydraulic and pneumatic drawings and diagrams.	— Accurate interpretation of symbols. — Recognition of type of circuit — Proper explanation of the logical operation of circuits
C. Select the necessary tools, components and materials.	— Proper choice of components and materials for the type of circuit to be assembled — Choice of appropriate tools
5. Understand the need to use safety devices on circuits.	
D. Assemble hydraulic and pneumatic circuits.	— Conformity of assembly with drawings, diagrams and instructions

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE
(First-level objectives appear in bold)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
E. Inspect the hydraulic and pneumatic circuits.	— Observance of inspection techniques — Accurate interpretation of readings — Determination of appropriate corrective measures — Observance of operating parameters
F. Tidy up the work area.	— Proper cleaning and storage of: – tools – equipment – instruments – materials – products — Neat work station

MODULE 14: GEARBOX

Code: 869 445 Duration: 75 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
assemble, install and troubleshoot gearbox
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - instructions
  - drawings, diagrams and work procedures
  - manufacturers' manuals
- Using:
  - a gearbox and components
  - an assembly bench
  - a hydraulic bench
  - equipment
  - tools
  - measuring instruments
  - materials
  - products
  - individual protection equipment
  - course notes

GENERAL PERFORMANCE CRITERIA

- Observance of occupational health and safety rules
- Appropriate use of tools, equipment, instruments and materials
- Accurate measurements
- Accurate calculations
- Neat, careful work
- Observance of time limit
- Proper use of English and French terminology
- Inclusion of all information in work procedures
- Assembly and installation in conformity with the requirements specified in the drawings, diagrams and work procedures

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE

(First-level objectives appear in bold.)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
1. Situate a gearbox in a drive train.	
2. Differentiate among the types of gearbox used in aircraft.	
3. Differentiate among the components and systems used in gear boxes.	
A. Locate the relevant information in the drawings, diagrams and work procedures.	— Thorough identification of necessary information — Accurate interpretation of: – drawings – symbols and abbreviations – information – instructions
B. Plan the work.	— Determination of logical sequence of operations — Appropriate choice of: – tools – equipment – instruments – materials – products — Conformity with instructions — Careful handling of components — Accurate assessment of condition of components — Proper adjustments
4. Recognize gearbox defects that can be detected visually or by touch.	

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE
(First-level objectives appear in bold)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
C. Inspect the components and prepare them for assembly.	— Accurate identification of components — Accurate assessment of condition of components — Proper adjustments
D. Assemble gearbox components.	— Observance of assembly sequence — Proper use of assembly techniques: – mechanical – electrical – hydraulic — Observance of fastening techniques — Proper lubrication of machine parts — Precise, solid assembly
E. Install the gearbox.	— Determination of appropriate technique for the type of gearbox — Observance of installation sequence — Proper use of installation technique — Precise, leakproof connections — Solid installation
5. Associate gearbox problems with their causes.	
F. Inspect the gearbox.	— Observance of inspection techniques and test methods — Thorough inspection of conformity of gearbox with requirements — Recognition of operating problems — Determination of appropriate corrective measures — Observance of tolerances

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE

(First-level objectives appear in bold.)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
G. Troubleshoot a gearbox:	
- remove and disassemble the gearbox	— Observance of removal and disassembly sequence — Proper use of techniques — Proper protection of components
- clean the components	— Use of authorized solvents — Clean components
- inspect the components	— Proper use of inspection techniques — Accurate identification of defects — Determination of corrective measures
- apply the necessary corrective measures	— Proper use of the appropriate techniques — Conformity of components with requirements — Observance of manufacturer's recommendations — Proper reassembly of the gearbox
H. Tidy up the work area.	— Proper cleaning and storage of: – tools – equipment – instruments – materials – products – gearbox, if applicable — Neat work station

MODULE 15 : ENGINES AND ACCESSORIES

Code: 869 456 Duration: 90 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
assemble, install and refurbish engines and their accessories
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - instructions
  - drawings, diagrams and work procedures
  - manufacturers' manuals
- Using:
  - turbine or piston engine components
  - mechanical, hydraulic, pneumatic and electrical assembly benches
  - accessories
  - equipment
  - tools
  - measuring instruments
  - materials
  - products
  - individual protection equipment
  - course notes

GENERAL PERFORMANCE CRITERIA

- Observance of occupational health and safety rules
- Proper use of tools, equipment and materials
- Observance of measurements
- Accurate calculations
- Neat, careful work
- Observance of time limit
- Proper use of English and French terminology
- Inclusion of all information in work procedures
- Assembly and installation in conformity with the requirements specified in the drawings, diagrams and work procedures

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE

(First-level objectives appear in bold.)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
1. Distinguish among the types of engines used in the aerospace industry. 2. Explain the functions and operating principles of the different aircraft engines. 3. Distinguish among the main engine components and integrated systems.	
A. Locate the relevant information in the drawings, diagrams and work procedures.	— Thorough identification of necessary information — Accurate interpretation of: – drawings – symbols and abbreviations – information – instructions
B. Plan the work.	— Determination of logical sequence of operations — Appropriate choice of: – tools – equipment – instruments – materials – products — Conformity with instructions
4. Recognize aircraft engine defects that can be detected visually or by touch.	
C. Inspect the components and prepare them for assembly.	— Accurate identification of components — Accurate assessment of condition of components — Proper adjustments

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE
(First-level objectives appear in bold)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
D. Balance the rotors.	— Observance of balancing sequence and technique — Accurate balancing
E. Assemble aircraft engine components.	— Observance of assembly sequence — Proper use of assembly techniques: – mechanical – electrical – hydraulic – pneumatic — Observance of fastening techniques — Proper lubrication of machine parts — Precise, solid assembly
5. Distinguish among the accessories used on aircraft engines.	
F. Install engine accessories.	— Observance of installation sequence — Accurate positioning of accessories — Proper use of installation techniques — Observance of fastening techniques — Precise, leakproof connections — Solid installation
G. Install the engine on an aircraft.	— Determination of appropriate installation technique for type of engine — Observance of installation sequence — Use of proper installation technique — Precise, leakproof connections — Solid installation — Lubrication at the appropriate points

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE
(First-level objectives appear in bold.)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
6. Link engine problems to their causes.	
H. Overhaul an engine and its accessories: - **remove and disassemble the engine and its accessories**	— Observance of removal and disassembly sequences — Proper use of overhaul techniques — Proper protection of components — Observance of manufacturer's recommendations
- **clean the components and accessories** - inspect the components	— Use of authorized solvents — Clean components — Accurate identification of defects
- **apply the necessary corrective measures**	— Determination of appropriate corrective measures — Proper use of the appropriate techniques — Conformity of components with requirements — Observance of manufacturer's recommendations — Proper reassembly of engine and accessories
I. Inspect the aircraft engine.	— Observance of inspection techniques and test methods — Thorough inspection of conformity of engine and accessories with requirements — Recognition of operating problems — Observance of tolerances
J. Tidy up the work area.	— Proper cleaning and storage of: – tools – equipment – instruments – materials – products – engine and accessories, if applicable — Neat work station

MODULE 16: HYDRAULIC AND PNEUMATIC SYSTEMS

Code: 869 474 Duration: 60 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must **assemble, install and troubleshoot hydraulic and pneumatic systems** in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - instructions
  - drawings, diagrams and work procedures
  - manufacturers' manuals
- Using:
  - hydraulic and pneumatic components
  - hydraulic and pneumatic assembly benches
  - real or simulated systems
  - equipment
  - tools
  - measuring instruments
  - materials
  - products
  - individual protection equipment
  - course notes

GENERAL PERFORMANCE CRITERIA

- Observance of occupational health and safety rules
- Appropriate use of tools, equipment, instruments and materials
- Accurate measurements
- Neat, careful work
- Observance of time limit
- Proper use of English and French terminology
- Inclusion of all information in work procedures
- Assembly and installation in conformity with the requirements specified in the drawings, diagrams and work procedures

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE

(First-level objectives appear in bold.)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
1. Recognize hydraulic and electrohydraulic system circuits. 2. Recognize pneumatic and electropneumatic system circuits. 3. Define the terms associated with hydraulic, electrohydraulic, pneumatic and electropneumatic systems.	
A. Locate the relevant information in the drawings, diagrams and work procedures.	— Thorough identification of necessary information — Accurate interpretation of: – drawings – symbols and abbreviations – information – instructions — Accurate identification of components
B. Plan the work.	— Determination of logical sequence of operations — Appropriate choice of: – tools – equipment – instruments – materials – products — Conformity with instructions
4. Recognize hydraulic, electrohydraulic, pneumatic and electropneumatic system defects that can be detected visually or by touch. 5. Understand the need for assemblies to conform to standards and requirements.	

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE
(First-level objectives appear in bold)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**

C. Inspect the components to be assembled.	— Accurate identification of components
	— Accurate assessment of:
	  - the condition of the components
	  - their dimensions

D. Assemble the hydraulic and pneumatic system components.	— Observance of assembly sequence
	— Proper use of assembly techniques:
	  - pneumatic
	  - hydraulic
	  - electropneumatic
	  - electrohydraulic
	— Leakproof connections
	— Precise, solid assembly

E. Install hydraulic and pneumatic systems.	— Observance of installation sequence — Proper use of the appropriate techniques — Leakproof connections — Solid installation — Observance of filling levels
6. Associate hydraulic, electrohydraulic, pneumatic and electropneumatic system problems with their causes.	
F. Inspect the hydraulic and pneumatic systems.	— Observance of inspection techniques and test methods — Thorough inspection of conformity of systems with requirements — Recognition of operating problems — Determination of appropriate corrective measures — Observance of tolerances

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE

(First-level objectives appear in bold.)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
G. Troubleshoot hydraulic and pneumatic systems: **- remove the defective parts** **- clean the parts** **- inspect the parts** **- apply the necessary corrective measures**	— Observance of removal sequence — Proper use of techniques — Proper protection of parts — Use of authorized solvents — Clean components — Proper use of inspection techniques — Accurate identification of defects — Determination of appropriate corrective measures — Proper use of the repair techniques — Proper reassembly of systems
H. Tidy up the work area.	— Proper cleaning and storage of: – tools – equipment – instruments – materials – products – system parts, if applicable — Neat work station

MODULE 17: JOB SEARCH TECHNIQUES

Code: 869 201 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
use job search techniques.

Specifications

During this module, the students will:

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

LEARNING CONTEXT

PHASE 1: Preparing the Job Search

A. Becoming familiar with various sources of information that can be used before and while preparing documents for the job search.
B. Writing a résumé and a cover letter.
C. Participating in a simulated job interview.

PHASE 2: Preparing and Following a Job Search Plan

D. Determining the types of establishments that correspond to their expectations and values.
E. Planning the steps involved in the job search plan.
F. Carrying out the steps of the job search plan.
G. Keeping a log of the various steps of the job search and the procedure followed.

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

PHASE 3: Evaluating Job Search Techniques

H. Presenting the results of the techniques used at a group meeting, referring to their log.

INSTRUCTIONAL GUIDELINES

The teacher should:

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

PARTICIPATION CRITERIA

PHASE 1:
- Write a résumé and cover letter containing information on their work experience, training and qualifications, as well as personal information, in accordance with the rules of presentation.
- Participate in activities.

PHASE 2:
- List three types of establishments that could meet their expectations.
- Submit a log containing information on each of the steps in their job search plan, as well as a description of the job search itself.

PHASE 3:
- Give a brief presentation on the relevance of the reference materials used in their job search and the effectiveness of their approach.

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 (Preparing the Job Search):

1. Identify various types of selection interviews.

Before undertaking the activities of Phase 2 (Preparing and Following a Job Search Plan):

2. Describe job search techniques.
3. Explain the extent to which characteristics of the job market can influence their job search.
4. Indicate the attitudes and behaviour that make it easier to approach prospective employers.

MODULE 18: FLIGHT CONTROL SYSTEMS

Code: 869 504 Duration: 60 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
assemble, install and troubleshoot flight control systems
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - instructions
  - drawings, diagrams and work procedures
  - manufacturers' manuals
- Using:
  - a flight control system and components
  - an assembly bench
  - a simulated system
  - equipment
  - tools
  - measuring instruments
  - materials
  - products
  - individual and collective protection equipment

GENERAL PERFORMANCE CRITERIA

- Observance of occupational health and safety rules
- Appropriate use of tools, equipment, instruments and materials
- Accurate measurements
- Accurate calculations
- Neat, careful work
- Observance of time limit
- Proper use of English and French terminology
- Inclusion of all information in work procedures
- Assembly and installation in conformity with the requirements specified in the drawings, diagrams and work procedures

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE

(First-level objectives appear in bold.)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
1. Differentiate among the components and systems associated with flight control	
A. Locate the relevant information in the drawings, diagrams and work procedures.	— Thorough identification of necessary information — Accurate interpretation of: – drawings – symbols and abbreviations – information – instructions
B. Plan the work.	— Determination of logical sequence of operations — Proper choice of: – tools – equipment – materials – products — Conformity with instructions
2. Recognize flight control component defects that can be detected visually or by touch.	
C. Inspect the components and prepare them for assembly.	— Accurate identification of components — Accurate assessment of condition of components — Proper adjustments
3. Understand the need for assemblies to conform to standards and requirements.	

FIRST-AND SECOND-LEVEL OPERATIONAL OBJECTIVES

BEHAVIOURAL OBJECTIVE	
(First-level objectives appear in bold)	
IN ORDER TO ACHIEVE THE FIRST-LEVEL OBJECTIVE, THE STUDENTS SHOULD HAVE PREVIOUSLY ATTAINES SECOND-LEVEL OBJECTIVES.	
D. Assemble flight control system components on a bench.	— Observance of assembly sequence — Proper use of assembly techniques: – mechanical – hydraulic – electrohydraulic — Observance of fastening techniques — Proper lubrication of parts — Precise, solid assembly
E. Install flight control system components.	— Observance of installation sequence — Use of proper installation technique — Precise, leakproof connections: – mechanical – hydraulic – electrohydraulic — Solid installation — Lubrication at the appropriate points — Observance of filling levels
4. Associate flight control problems with their causes.	
F. Inspect flight control systems.	— Observance of inspection techniques and test methods — Thorough inspection of conformity of flight control system with requirements — Recognition of operating problems — Determination of appropriate corrective measures — Observance of tolerances

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE

(First-level objectives appear in bold.)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
G. Troubleshoot a flight control system: **- remove and disassemble the flight control system** **- clean the components** **- inspect the components** **- apply the necessary corrective measures**	— Observance of removal and disassembly sequences — Proper use of techniques — Proper protection of components — Use of recommended solvents — Clean components — Proper use of inspection techniques — Accurate identification of defects — Determination of appropriate corrective measures — Proper use of the corrective techniques — Conformity of components with requirements — Observance of manufacturer's recommendations — Proper reassembly of flight control system
H. Tidy up the work area.	— Proper cleaning and storage of: – tools – equipment – instruments – materials – products – flight control system components, if applicable — Neat work station

MODULE 19: LANDING GEAR

Code: 869 514 Duration: 60 hours

FIRST-LEVEL OPERATIONAL OBJECTIVE
BEHAVIOURAL OBJECTIVE

EXPECTED BEHAVIOUR

To demonstrate the required competency, the students must
assemble, install and refurbish landing gear
in accordance with the following conditions, criteria and specifications.

CONDITIONS FOR PERFORMANCE EVALUATION

- Given:
  - instructions
  - drawings, diagrams and work procedures
  - manufacturers' manuals
- Using:
  - components and landing gear
  - simulated systems
  - equipment
  - tools
  - measuring instruments
  - materials
  - products
  - individual protection equipment

GENERAL PERFORMANCE CRITERIA

- Observance of occupational health and safety rules
- Appropriate use of tools, equipment, instruments and materials
- Accurate measurements
- Neat, careful work
- Observance of time limit
- Proper use of English and French terminology
- Inclusion of all information in work procedures
- Assembly and installation in conformity with the requirements specified in the drawings, diagrams and work procedures

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE
(First-level objectives appear in bold.)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
1. Recognize the particular characteristics of nose and main landing gear.	
2. Differentiate among landing gear components: . mechanical . hydraulic . electrohydraulic	
A. Locate the relevant information in the drawings, diagrams and work procedures.	— Thorough identification of necessary information — Accurate interpretation of: – drawings – symbols and abbreviations – information – instructions
B. Plan the work.	— Determination of logical sequence of operations — Appropriate choice of: – tools – equipment – instruments – materials – products — Conformity with instructions
3. List landing gear component defects that can be detected visually or by touch.	
4. Understand the need for assemblies to conform to standards and requirements.	

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE
(First-level objectives appear in bold)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
C. Inspect the components and prepare them for assembly.	— Accurate identification of components — Accurate assessment of condition of components — Proper adjustments
D. Assemble landing gear: **- mechanical components** **- hydraulic components** **- electrohydraulic components**	— Observance of assembly sequence — Proper use of assembly techniques — Observance of fastening techniques — Precise, solid assembly
E. Install landing gear.	— Observance of installation sequence — Use of proper installation technique — Accurate adjustments — Observance of fastening techniques
F. Prepare landing gear for operation.	— Proper use of techniques for: – filling the shock strut – bleeding the brakes – inflating the tires — Observance of techniques for applying lubricants — Accurate adjustments
5. Associate landing gear problems with their causes.	

FIRST- AND SECOND-LEVEL OPERATIONAL OBJECTIVES
BEHAVIOURAL OBJECTIVE
(First-level objectives appear in bold.)

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

Specifications of the expected behaviour and second-level objectives	**Specific performance criteria**
G. Refurbish landing gear: - **disassemble the landing gear** - **clean the components** - **inspect the components** - **apply the necessary corrective measures**	— Observance of disassembly sequence — Proper use of disassembly techniques — Use of authorized solvents — Clean components — Proper application of inspection techniques — Accurate identification of defects — Determination of appropriate corrective measures — Proper use of the repair techniques — Conformity of components with requirements and standards
H. Inspect landing gear operation.	— Observance of inspection techniques and test methods — Accurate detection of operating problems — Determination of appropriate corrective measures — Observance of tolerances
I. Tidy up the work area.	— Proper cleaning and storage of: – tools – equipment – instruments – materials – products — Neat work station

MODULE 20: PRACTICUM IN THE WORKPLACE

Code: 869 524 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:

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

LEARNING CONTEXT

PHASE 1: Preparing for the Practicum

A. Becoming familiar with information about the practicum and the related terms and conditions.
B. Looking for information on possible practicum positions.

PHASE 2: Observing and Practising the Trade in the Workplace

C. Observing the work environment.
D. Observing mechanical assemblers at work.
E. Performing or helping perform various trade-related tasks.
F. Producing a brief report describing their observations of the work environment and of the tasks performed in the establishment.

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

PHASE 3: Comparing Initial Perceptions with the Actual Work Environment

G. Identifying aspects of the trade that are similar to and that differ from their training.
H. Comparing their perception of the trade before and after the practicum.
I. Determining how their experiences will affect their career choice.
J. Commenting on their experience in each practicum position.

INSTRUCTIONAL GUIDELINES

The teacher should:

- Provide the students with the necessary sources of information.
- Suggest two or three practicum positions for each student.
- Maintain close ties between the school and the establishment.
- Make sure that the establishments provide the students with conditions favourable to the performance of practicum-related activities.
- Make sure that the trainees are supervised by a responsible employee of the company.
- Ensure regular support and supervision of the students.
- Intervene if difficulties or problems arise.
- Encourage the students to engage in discussions and to express themselves.

PARTICIPATION CRITERIA

PHASE 1:
- Consult sources of information at their disposal.

PHASE 2:
- Respect the establishment's work schedules, policies concerning the activities they are authorized to carry out as trainees, professional ethics and occupational health and safety rules.
- Produce a report containing their observations on at least five aspects of the work environment and the tasks carried out during the practicum.

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

SECOND-LEVEL OPERATIONAL OBJECTIVES

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

Before undertaking the activities of Phase 2 (Observing and Practising the Trade in the Workplace):

1. Describe the points to record during a practicum.
2. Describe the behaviour to adopt in the workplace.

Before undertaking the activities of Phase 3 (Comparing Initial Perceptions with the Actual Work Environment):

3. List their aptitudes, preferences and expectations.

Éducation

Québec

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