

Québec 🔠



Formation professionnelle et technique et formation continue

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5807	Aircraft Mechanical Assembly	,
Year of approval:	2006	
Certification:		Diploma of Vocational Studies
Number of credits:		79
Number of modules:		21
Total duration:		1 185 hours

To be admitted to the *Aircraft Mechanical Assembly* program, students must meet one of the following conditions:

• Persons holding a Secondary School Diploma or its recognized equivalent.

OR

 Persons who are at least 16 years of age on September 30 of the school year in which their training is to begin must meet the following additional requirement: to have earned the Secondary IV credits in language of instruction, second language and mathematics in the programs of study established by the Minister, or to have been granted recognition of equivalent learning.

OR

 Persons who are at least 18 years of age upon entry into the program must have the following functional prerequisites: the successful completion of the general development test, or recognition of equivalent learning.

OR

 Persons having earned Secondary III credits in language of instruction, second language and mathematics in the programs of study established by the Minister must continue their general education courses concurrently with their vocational training in order to obtain the credits they are missing in the following areas: Secondary IV credits in language of instruction, second language and mathematics in the programs of study established by the Minister.

Introduction to the Program

The vocational curriculum, from which this program of study derives, is the responsibility of both the Ministère de l'Éducation, du Loisir et du Sport, which develops programs and their teaching guides, and the educational institutions, which implement the programs and the evaluation process. Programs of study include compulsory objectives and suggestions for competency-related knowledge, skills and attitudes.

Programs of study provide teachers with a frame of reference for planning teaching activities. They define the scope of teaching strategies by identifying the broad educational orientations to be favoured and the objectives to be attained. By successfully completing a program, students acquire not only the entry-level competencies required by the workplace in order to practise a trade or occupation, but also learning that provides them with a certain degree of versatility.

The duration of the program is 1 185 hours, which includes 705 hours spent on the specific competencies required to practise the trade and 480 hours on general, work-related competencies. The program of study is divided into 21 modules, which vary in length from 15 to 120 hours. The total hours allocated to the program include time devoted to evaluation for certification purposes and to remedial work.

Title of Module	Code	Module	Hours	Credits
The Tanda and the Tasiain process	000011	4	4.5	
The Trade and the Training Process	869011	1	15	1
Evolution of the Aerospace Industry	869022	2	30	2
Applied Mathematics	869302	3	30	2
Precision Instruments	869312	4	30	2
Materials Maintenance and Protection	869323	5	45	3
Reading Drawings and Manuals	869334	6	60	4
Work Procedures and Computers	869064	7	60	4
Occupational Health and Safety and Materials Handling	869083	8	45	3
Machining, Assembly and Installation	869906	9	90	6
Static and Dynamic Balancing	869914	10	60	4
Hydraulic and Pneumatic Systems	869923	11	45	3
Power Plant	869934	12	60	4
Cold Section of an Engine	869948	13	120	8
Hot Section of an Engine	869956	14	90	6
Gearboxes, Shafts and Bearings	869965	15	75	5
Primary Engine Systems	869975	16	75	5
Secondary Engine Systems	869984	17	60	4
Job Search Techniques	869201	18	15	1
Flight Control Systems	869504	19	60	4
Landing Gear	869514	20	60	4
Practicum in the Workplace	869524	21	60	4

Glossary

Program

A vocational training program is a coherent set of competencies to be acquired. It is formulated in terms of objectives and divided up into modules for administrative purposes. It describes the learning expected of students in accordance with a given performance level. Published as an official pedagogical document, the program leads to the recognition of training qualifying students to practise a trade or occupation.

A vocational training program includes compulsory objectives and content. Although the educational institutions are responsible for learning and evaluation activities, the program presents suggestions for competency-related knowledge, skills, attitudes and perceptions that must be enriched or adapted according to the needs of students, and information regarding the certification of studies.¹

Program Goals

Program goals consist of the expected outcome at the end of training as well as a general description of a given trade or occupation. They also include the four general goals of vocational training.

Educational Aims

Educational aims are broad orientations to be favoured during training in order to help students acquire intellectual or motor skills, work habits or attitudes. Educational aims usually address important aspects of personal and vocational development that have not been explicitly included in the program goals or competencies. They help guide educational institutions in implementing the program.

Competency

A competency is the ability to act successfully and evolve in order to adequately perform work-related tasks or activities, based on an organized body of knowledge and skills from a variety of fields, perceptions, attitudes, etc.

Objectives

Objectives refer to the operational aspect of a competency to be acquired. They are expressed in terms of specific requirements and serve as the practical basis for teaching, learning and evaluation. Objectives are either behavioural or situational.

Objectives also provide indicators for learning, related knowledge, skills, attitudes and perceptions, and associated guidelines. These indicators are grouped according to elements of the competency (in the case of behavioural objectives), and according to phases of the learning context (in the case of situational objectives).

1. Behavioural Objective

A behavioural objective is a relatively closed objective that describes the actions and results expected of the student. Behavioural objectives consist of the following components:

- The *statement of the competency,* which is the result of the job analysis, the general goals of the program and other determinants.
- •
- The *elements of the competency,* which correspond to essential details that are necessary in order to understand the competency and are expressed in terms of specific behaviours. They refer to the major steps involved in performing a task or the main components of the competency.

^{1.} Specifications regarding certification complement the program of study, but are presented in another document.

- The *achievement context,* which corresponds to the situation in which the competency is exercised at entry-level on the job market. The achievement context does not specify the context for learning or evaluation.
- The *performance criteria*, which define the requirements by which to judge the attainment of the competency. They may refer to each element of the competency, to several elements or to the competency as a whole. Those associated with a specific element correspond to the requirements for performing a task or activity; those associated with several elements indicate the expected level of performance or the overall quality of a product or service.

Evaluation is based on expected results.

2. Situational Objective

A situational objective is a relatively open-ended objective that outlines the major phases of a learning situation in which a student is placed. It allows for output and results to vary from one student to another. Situational objectives consist of the following components:

- The *statement of the competency,* which is the result of the job analysis, the general goals of the program and other determinants.
- The *elements of the competency,* which outline the essential aspects of the competency and ensure a better understanding of the expected outcome.
- The *learning context,* which provides a broad outline of the learning situation designed to help the students develop the required competency. It is normally divided into three phases of learning: information, participation and synthesis.
- The *instructional guidelines,* which provide guidelines and means to ensure that learning takes place and that the context in which it occurs is always the same. These guidelines may include general principles or specific procedures.
- The *participation criteria*, which describe requirements the students must fulfill when participating in the learning activities. 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.

Evaluation is based on the student's participation in the activities suggested in the learning context.

Competency-Related Knowledge, Skills, Attitudes and Perceptions

Competency-related knowledge, skills, attitudes and perceptions define the essential and important learning that the student must acquire in order to apply and continue to develop the competency. They correspond to activities in the job market and are accompanied by guidelines that provide information on the field of application, the level of complexity or content related to training. The knowledge, skills, attitudes and perceptions and the related guidelines are not prescriptive.

Module

A module is a component of a program of study comprising a prescriptive objective and suggestions for competency-related knowledge, skills, attitudes and perceptions.

Credit

A credit is 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 obtain a diploma or attestation.



Part I

Program Goals

Educational Aims

Program Competencies and Grid of Competencies

Harmonization

Program Goals

The *Aircraft Mechanical Assembly* program prepares students to practise the trade of aircraft mechanical assembler.

Aircraft mechanical assemblers generally work on hydraulic, mechanical and hydromechanical systems in the following sectors: manufacturing, air transportation and subcontracting.

Aircraft mechanical assemblers install, assemble and disassemble mechanical components, subsystems and systems, referring to work procedures, in order to adjust, replace, repair or overhaul them. To perform these tasks, they take measurements; do calculations; assemble, modify and check parts; and inspect components, subsystems and systems. They work only indoors, usually on an assembly line or at a bench. Since their work requires a high degree of precision, they must have manual dexterity, agility and good visual and auditory acuity.

For the moment, aircraft mechanical assemblers do not require a licence. At first, apprentices work with more experienced colleagues and, depending on company policy, must usually undergo a 90-day trial period. Subsequent steps vary, depending on the experience and skills required by the company.

The program goals of the *Aircraft Mechanical Assembly* program are based on the general goals of vocational training. These goals are as follows:

- To help students develop effectiveness in the practice of a trade or occupation
 - to teach students to perform roles, functions, tasks and activities associated with the trade or occupation upon entry into the job market
 - to prepare students to progress satisfactorily on the job (which implies having the technical and technological knowledge and skills in such areas as communication, problem solving, decision making, ethics, health and safety)
- To help students integrate into the work force
 - to familiarize students with the job market in general and the context surrounding the trade or occupation they have chosen
 - to familiarize students with their rights and responsibilities as workers
- To foster students' personal development and acquisition of occupational knowledge, skills, perceptions and attitudes
 - to help students acquire effective work methods and develop their autonomy and ability to learn
 - to help students understand the principles underlying the techniques and the technology used in the trade or occupation
 - to help students develop creativity, a sense of initiative, an entrepreneurial spirit and the ability to express themselves
 - to help students adopt the attitudes required to successfully practise the trade or occupation, and instill in them a sense of responsibility and a concern for excellence
- To promote job mobility
 - to help students develop positive attitudes toward technological change
 - to help students develop the means to manage their careers by familiarizing them with entrepreneurship

Educational Aims

The aim of the *Aircraft Mechanical Assembly* program is to help students develop attitudes and behaviours that are deemed essential to the practice of the trade:

- To develop the skills necessary to work in a team.
- To develop the skills necessary to use specialized English and French terminology.
- To show constant concern for complying with the standards in effect.

Program Competencies and Grid of Competencies

List of Competencies

- Determine their suitability for the trade and the training process.
- Gain an overview 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 computer science concepts.
- Apply occupational health and safety rules and materials handling techniques.
- · Perform machining, assembly and installation tasks.
- Balance rotors.
- Assemble, install and troubleshoot hydraulic and pneumatic systems.
- Assemble and check the power plant.
- Assemble and check the cold section of an engine.
- Assemble and check the hot section of an engine.
- Assemble and check gearboxes, shafts and bearings.
- Install and check primary engine systems.
- Install and check secondary engine systems.
- Use job search techniques.
- Assemble, install and troubleshoot flight control systems.
- Assemble, install and overhaul landing gear.
- Enter the work force.

Grid of Competencies

The grid of competencies shows the relationship between general competencies, which correspond to work-related activities, and specific competencies, which are required to practise the particular trade, as well as the major steps in the work process.

The general competencies appear on the horizontal axis and the specific competencies, on the vertical axis. The symbol (\triangle) indicates a correlation between a specific competency and a step in the work process. The symbol (\bigcirc) 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 related to specific competencies.

The logic used in constructing the grid influences the course sequence. Generally speaking, this sequence follows a logical progression in terms of the complexity of the learning involved and the development of the students' autonomy. The vertical axis presents the specific competencies in the order in which they should be acquired. The modules 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 COMPETENCIES																			
							GEN	ERAL	COMF	PETEN	ICIES				wo	RK	PRC	DCE	SS
Aircraft Mechanical Assembly	Competency Number	Type of Objective	Duration (in hours)	Determine their suitability for the trade and the training process	Gain an overview of the aerospace industry	Apply mathematical concepts	Take measurements using precision instruments	Maintain and protect materials used in aircraft structures and systems	tead and interpret drawings, diagrams and manuals, and produce ketches	Jse various work procedures and apply computer science concepts	Apply occupational health and safety rules and materials handling echniques	Perform machining, assembly and installation tasks	Balance rotors	Use job search techniques	Read instructions, drawings, work procedures and standards	Plan the work	Do the work	Check the work	Tidy up
Competency Number	-			1	2	3	4	5	6	7	8	9	10	18			_		·
Type of Objective				S	S	В	В	В	В	В	В	В	В	S					
Assemble, install and troubleshoot hydraulic and pneumatic systems	11	в	45	0	30 O	30 O	•	45	•	•	45	90 •	0	0	•	•		•	•
Assemble and check the power plant	12	в	60	0	0	•	•	•	•	•	•	٠	0		•	•	•	•	•
Assemble and check the cold section of an engine	13	в	120	0	0	0	•	•	•	•	•	٠	0		•	•	•		•
Assemble and check the hot section of an engine	14	в	90	0	ο	0	•	•	•	•	•	•	0		•	•	•	•	•
Assemble and check gearboxes, shafts and bearings	15	в	75	ο	ο	•	•	•	•	•	•	•			•	•	•	•	•
Install and check primary engine systems	16	в	75	0	0	o	•	•	•	•	•	•	0		•	•	•	•	•
Install and check secondary engine systems	17	в	60	0	ο	0	•	•	•	•	•	٠	0		•	•	•	•	•
Assemble, install and troubleshoot flight control systems	19	в	60	0	0	0	•	•	•	•	•	•	0			•	•		•
Assemble, install and refurbish landing gear	20	в	60	0	ο	0	•	•	•	•	•	•	•		•	•	•	•	•
Enter the work force	21	s	60	0	0	0	0	0	0	0	0	0	0	0	Δ	Δ	Δ	Δ	Δ

Harmonization

The Ministère de l'Éducation, du Loisir et du Sport harmonizes its vocational and technical programs by establishing similarities and continuity between secondary- and college-level programs within a particular sector or between sectors in order to avoid overlap in program offerings, to recognize prior learning and to optimize the students' progress.

Harmonization establishes consistency between training programs and is especially important in ensuring that the tasks of a trade or occupation are clearly identified and described. Harmonization makes it possible to identify tasks requiring competencies that are common to more than one program. Even if there are no common competencies, training programs are still harmonized.

Harmonization is said to be "inter-level" when it focuses on training programs at different levels, "intralevel" when it focuses on programs within the same educational level, and "inter-sector" when carried out between programs in various sectors.

An important aspect of harmonization is that it allows the common features of competencies to be identified and updated as needed. Common competencies are those that are shared by more than one program; once acquired in one program, they can be recognized as having been acquired in another. Competencies with exactly the same statement and elements are said to be identical. Common competencies that are not identical but have enough similarities to be of equal value are said to be equivalent.

Harmonization of the *Aircraft Mechanical Assembly* program has resulted in identifying competencies that are shared with other programs. Detailed information on the harmonization of this program and its results are presented in the document entitled *Tableaux d'harmonisation, Montage mécanique en aérospatiale.*



Part II

Objectives

The Trade and the Training Process

Module 1 Duration 15 Hours

Situational Objective

Statement of the Competency

Determine their suitability for the trade and the training process.

Elements of the Competency

- Be familiar with the nature of the trade.
- Recognize the tasks involved in trades related to aircraft mechanical assembly.
- Understand the training program.
- Confirm their career choice.

Learning Context

Information Phase

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

Participation Phase

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

Synthesis Phase

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

The Trade and the Training Process

Instructional Guidelines

- 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

Information Phase

- Gather information on most of the topics to be covered.
- Make an effort to express their views on the trade during a group discussion, relating these views to the information they have gathered.

Participation Phase

- 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 during a group discussion.

Synthesis Phase

- Write a report that:
 - sums up their preferences, expectations and attitudes
 - explains how they arrived at their career choice

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following is a list of knowledge, skills, attitudes, perceptions and guidelines related to each phase of the learning context.

Information Phase

•	Situate the competency in the training program.	Purpose of the competency, links with other competencies
•	Be receptive to information about the trade and the training program.	Conditions promoting receptiveness: visual and auditory attention, favourable climate, interest, concentration and well-being
•	Make an effort to share their perception of the trade with their classmates.	Advantages of sharing their point of view and listening to others
•	Explain the main rules governing group discussion.	Basic rules: participation, respect of others' right to speak, observance of the topic and acceptance of diverging points of view
•	Describe the characteristics of work teams in mechanical assembly.	Types of work team organization, rules, roles, duties, limitations

The Trade and the Training Process

Participation Phase

• Identify the difficulties and advantages of becoming involved in the training process.

Synthesis Phase

• Describe the main elements of a report confirming their career choice.

Main advantages and difficulties, means of dealing with difficulties

Definition of terms used, content, rules of presentation and format

Evolution of the Aerospace Industry

Module 2 30 hours Duration

Situational Objective

Statement of the Competency

Gain an overview of the aerospace industry.

Elements of the Competency

- 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 market globalization 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

Information Phase

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

Evolution of the Aerospace Industry

Participation Phase

- 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.
- Participating in discussions in which they:
 - draw parallels 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 continuing education needs
- Participating in a suggested activity, for example, attending a conference given by a representative of the aerospace industry or visiting a company.
- Taking notes.

Synthesis Phase

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

Instructional Guidelines

- 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.

Participation Criteria

Information Phase

• Gather information on most of the topics to be covered.

Participation Phase

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

Synthesis Phase

- 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

Evolution of the Aerospace Industry

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following is a list of knowledge, skills, attitudes, perceptions and guidelines related to each phase of the learning context.

Information Phase

Adopt a research method.	Establishment of the research goal, sources of information, research tools, organization of information
 Recognize the main Québec and Canadian companies that build aircraft. 	Characteristics, location, work organization
• Define the concepts of productivity, competitiveness and total quality.	Inspections, work procedures and manufacturers' instructions concerning the repair and overhaul of engines
Participation Phase	
Outline the phases of engine development.	Evolution of the gas turbine, Brayton cycle, etc.
Synthesis Phase	
 Recognize the importance of constantly upgrading their knowledge. 	Importance of upgrading their work-related knowledge

Code: 869022

Applied Mathematics

Module 3 Duration 30 Hours

Behavioural Objective

Statement of the Competency	Achievement Context					
Apply mathematical concepts.	 Given theoretical problems and data related to shop work in international and imperial units of measurement Using formulas, charts, tables and a calculator 					
Elements of the Competency	Performance Criteria					
 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 					
2. Interpret tables and charts.	 Observance of methods for using tables and charts Accurate interpretation of information contained in the tables and charts 					
 3. Do mathematical calculations in the following fields: mechanics hydraulics pneumatics electricity electronics 	 Proper choice of formulas and units of measurement in the international and imperial systems Proper transformation of formulas, if applicable Proper use of formulas 					
4. Check the calculations.	Proper choice of verification methodsProper use of verification methods					
	For the competency as a whole:					
	Observance of work procedureAccurate calculationsConcern for method and logic					

• Proper use of English and French terminology

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following is a list of knowledge, skills, attitudes, perceptions and guidelines related to each element of the competency.

1. Convert units of measurement from the international to the imperial system and vice versa.

•	Show concern for neatness and the logical presentation of solutions.	Rules of presentation and logic
•	Do basic mathematical calculations.	Basic operations
•	Recognize units of measurement in the international and imperial systems.	Characteristics of systems, conversion of measurements
•	Do basic trigonometric calculations.	Calculations using various trigonometric functions
2. Ir •	nterpret tables and charts. Use a calculator.	Use of main functions
3. D e	o mathematical calculations in the following fiele	elds: mechanics, hydraulics, pneumatics, electricity,
٠	Do calculations related to engines.	Calculation of engine thrust and performance

- 4. Check the calculations.
 - Recognize the rules for recording data. Policies and regulations, trends
Module 4 Duration 30 hours

Behavioural Objective

Statement of the Competency	Achievement Context
Take measurements using precision instruments.	 Given drawings, diagrams, work procedures and records Using measuring and testing instruments, gauges, callipers and mechanical parts and assemblies
Elements of the Competency	Performance Criteria
1. Select the measuring and testing instruments.	 Choice of appropriate instruments for the required measurements and tests
 Calibrate and adjust direct-reading measuring instruments. 	 Proper choice of calibration method Observance of calibration and adjustment techniques Precise calibration and adjustment
 Locate the relevant information in the drawings, diagrams and work procedures. 	 Identification of all the necessary information Accurate interpretation of: dimensions tolerances
4. Measure a variety of differently shaped parts.	Proper use of measuring and testing instrumentsAccurate readings
 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
6. Tidy up the work area.	 Proper cleaning and storage of: instruments equipment Neat work station
	For the competency as a whole:
	 Observance of work procedure Accurate measurements Observance of tolerances Precise, methodical approach Proper use of English and French terminology

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following is a list of knowledge, skills, attitudes, perceptions and guidelines related to each element of the competency.

1. Select the measuring and testing instruments.

 Differentiate between the various measuring and testing instruments used in mechanical assembly. Check the accuracy of the measuring instruments Recognize defective instruments. 	Characteristics and functions of the different instruments Verification procedure Main defects		
2. Calibrate and adjust direct-reading measuring inst	ruments.		
 Describe the methods for calibrating tools and gauges. 	Characteristics of methods		
Use measuring tools and devices.	Prescribed techniques and methods for using specialized devices		
3. Locate the relevant information in the drawings, diagrams and work procedures.			
 Interpret dimensions and tolerances. 	Meaning and scope of information		

- 4. Measure a variety of differently shaped parts.
 - Measure dimensions, radii, diameters and Measurement of rectilinear and curvilinear shapes various segments.
- 5. Compare the dimensions, shape and appearance of the parts with the information in the drawings.

• Do a dimensional check.	Methods for checking dimensions against specifications and inspection criteria
6. Tidy up the work area.	
 Maintain calibrated measuring tools and devices. 	Precautions to be taken when maintaining tools and devices

Materials Maintenance and Protection

Module 5 Duration 45 hours

Behavioural Objective

Statement of the Competency	Achievement Context
Maintain and protect materials used in aircraft structures and systems.	 Given instructions, drawings, work procedures, reference documents, tables, charts and illustrations Using structural parts, system components, samples of materials, tools and products Using individual safety equipment
Elements of the Competency	Performance Criteria
 Describe the main materials used in aircraft system components and structures. 	 Identification of materials according to their characteristics and properties Accurate interpretation of standardized names Relevant connections between aircraft materials, system components and structural elements
 Identify the types of corrosion that can affect aircraft system components and structures. 	 Recognition of the types of corrosion Identification of the effects of corrosion on: structures system components
 Locate the relevant information in the drawings, diagrams and work procedures. 	 Thorough identification of necessary information Accurate interpretation of: drawings symbols abbreviations information instructions
4. Plan the work.	 Logical sequence of operations Appropriate choice of: tools equipment materials products Conformity with instructions
5. Lubricate aircraft components and systems.	 Correct oil levels Products used are appropriate for the operating conditions of the components and systems Proper application of products at the appropriate spots

Materials Maintenance and Protection		Code:	869323
6. Clean aircraft components and systems.	 Determination of appropriate cle for the component or system in o Observance of manufacturer's re Clean parts 	aning propertion	ocedures ndations
7. Apply protective products to aircraft components and systems.	 Observance of manufacturer's re Observance of methods for apple Clean component or system 	ecomme lying prod	ndations ducts
8. Tidy up the work area.	 Proper cleaning and storage of: tools equipment materials products Neat work station 		
	For the competency as a whole	e:	
	 Ability to make connections betw and systems and their compone structures 	veen ma nts and a	terials aircraft

the requirements specified in the drawings and work procedures

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following is a list of knowledge, skills, attitudes, perceptions and guidelines related to each element of the competency.

and charts

rules

1. Describe the main materials used in aircraft system components and structures.

- Describe different stresses brought to bear on Stresses and aerodynamics aircraft materials, structures and system components.
- 2. Identify the types of corrosion that can affect aircraft system components and structures.
 - Describe the conditions likely to cause corrosion.

Corrosion, conditions likely to cause corrosion and causative factors

Accurate interpretation of information in tables

Observance of occupational health and safety

Proper use of English and French terminology
Maintenance and protection in conformity with

Observance of work procedure

- Describe the impact of corrosion on aircraft materials.
- Deterioration of materials, rupture, fatigue, etc.

Materials Maintenance and Protection		Code:	869323
3. Locate the relevant information in the drawings, di	agrams and work procedures.		
 Recognize notes and symbols related to the protection of materials. 	Notes on surface treatments and	finishes	
4. Plan the work.			
 Describe maintenance and protective equipment. 	Maintenance equipment and acce abrasives and protective equipme	essories, t ent	types of
5. Lubricate aircraft components and systems.			
 Describe the functions and characteristics of lubricants and related compounds. 	Classification and functions of lub	oricants	
6. Clean aircraft components and systems.			
Be familiar with cleaning procedures.	Characteristics of various cleanin rules for handling cleaning produc	g proceducts and m	ures and aterials
7. Apply protective coatings to aircraft components and systems.			

• Describe the various protective coatings. Properties and functions of coatings

Aircraft Mechanical Assembly

•	
Statement of the Competency	Achievement Context
Read and interpret drawings, diagrams and manuals, and produce sketches.	 Given instructions, detail and assembly drawings, and manufacturers' manuals Using materials and equipment
Elements of the Competency	Performance Criteria
 Locate and interpret complementary information in aircraft drawings and diagrams. 	 Accurate interpretation of: information symbols abbreviations
 2. Interpret drawings and diagrams containing: projections sections views dimensions symbols 	 Accurate interpretation of: projections sections views dimensions symbols
 Locate and interpret information 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
4. Sketch parts and assemblies.	 Proper choice of views Proper use of freehand drawing technique Observance of: layout of views proportions Neat, clear sketch
5. Dimension sketches.	 Proper choice of dimensions and symbols Observance of layout of dimensions Accurate dimensioning Relevant notes

Reading Drawings and Manuals

Module 6 Duration 60 hours

Behavioural Objective

Module 6 33

Code:

869334

Reading Drawings and Manuals		Code:	869334
 Locate and interpret information in the manufacturers' manuals. 	 Accurate location of informatio Accurate interpretation of infor 	n mation ab	out:

- Accurate interpretation of information about:
 - components and parts
 - specifications
 - tolerances
 - recommendations

For the competency as a whole:

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

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following is a list of knowledge, skills, attitudes, perceptions and guidelines related to each element of the competency.

	1.	Locate and inter	pret compleme	entary inform	ation in airc	raft drawings	and diagrams.
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•	Recognize the importance of handling drawings with care.	Clean drawings, all information included
•	Identify the orientation of the views of an aircraft.	General and detail views, representation of the different components

- 2. Interpret drawings and diagrams containing projections, sections, views, dimensions, symbols.
 - Characteristics of types of projections • Recognize the types of projections.
- 3. Locate and interpret information in aircraft drawings and diagrams.

	 Identify the types of notes and symbols. 	Symbols and notes for assembly, coatings, finishes, materials, etc.
4.	Sketch parts and assemblies.	
	 Recognize the importance of visualizing proportions. 	Dimensions, width, length and height Ratio between different measurements and angles
5.	Dimension sketches.	
	Apply the principle of dimensioning.Recognize the types of notes on a technical drawing.	Conventional lines used in dimensioning Diameter, hole, radius, slope, angle, bevel, machining symbols, threads, etc.
6	Locate and interpret information in the manufactu	rers' manuals

6. Locate and interpret information in the manufacturers' manuals.

•	Recognize manufacturers' recommended procedures and instructions concerning engine repair and reconditioning.	Organization of information, monitoring of maintenance operations and the distribution of equipment, parts and devices
	engine repair and reconditioning.	equipment, parts and devices

Reading Drawings and Manuals		Code:	869334
 Determine the repair methods for different types of damage, and their limitations. 	Types of damage and repair tech	iniques	

Work Procedures and Computers

Module 7 Duration 60 hours

Statement of the Competency	Achievement Context
Use various work procedures and apply computer science concepts.	 Given work procedures and drawings or diagrams Using a computer, peripherals and software
Elements of the Competency	Performance Criteria
 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
 Locate and interpret relevant information in the work procedures. 	 Proper choice of documents depending on the job to be done Observance of methods for using documents Accurate interpretation of: instructions drawings and diagrams information <lu>abbreviations</lu>
3. Note the relevant information in the work procedures.	Clear, accurate informationAccurate notesInclusion of all the necessary information
4. Connect different peripherals to the computer.	Observance of procedureObservance of manufacturer's recommendations
 5. Perform operations on a computer using: – an operating system – a software program 	 Observance of methods: using commands finding information inputting data Accurate interpretation of codes Appropriate use of software program

Work Procedures and Computers

For the competency as a whole:

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

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following is a list of knowledge, skills, attitudes, perceptions and guidelines related to each element of the competency.

1. Associate work procedures with aircraft assembly tasks.

•	Understand the role and nature of work procedures.	Sequence of operations, precision of operations, quality control, observance of standards
•	Recognize the main documents related to work procedures.	Reference documents for repairs, replacing hardware, installing connectors and locking devices, using handling and cleaning methods, marking parts and applying lubricants, adhesives and sealants

2. Locate and interpret relevant information in the work procedures.

Recognize ways of using reference	Organization of information, specialized English
documents.	and French terminology
	Location of inspection criteria in the documentation

3. Note the relevant information in the work procedures.

Recognize the proper way to take notes.	Information to be recorded, signature, recording of defects observed and work done
4. Connect different peripherals to the computer.Identify the components of a computer system.	Central processing unit, data input and output units

- 5. Perform operations on a computer using an operating system and a software program.
 - Use the functions of an operating system. Startup procedure, file management, starting a software program

Occupational Health and Safety and Materials Handling

Module 8 Duration 45 hours

Statement of the Competency	Achievement Context
Apply occupational health and safety rules and materials handling techniques.	 Given an emergency response plan and manufacturers' manuals Using aircraft components and equipment, handling accessories and equipment, tools, materials, tables, charts and relevant documentation
Elements of the Competency	Performance Criteria
 Associate laws and regulations respecting occupational health and safety with the situation in 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
2. Recognize the main health and safety risks associated with the tasks performed in an aircraft mechanical assembly plant.	 Proper identification of risks related to: equipment materials products processes methods the work environment the organization of work
3. Explain the preventive measures to be taken in an aircraft structural assembly plant.	 Accurate explanation of preventive measures
4. Explain the main measures to be taken in case of emergency.	 Accurate explanation of measures to be taken
5. Determine the centre of gravity of loads and estimate their weight.	Accurate location of centre of gravityAccurate calculationsAccurate estimate of loads
 Handle 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

Occupational Health and Safety and Materials Handling

For the competency as a whole:

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

horizontally and on an inclined plane

• Appropriate use of equipment

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following is a list of knowledge, skills, attitudes, perceptions and guidelines related to each element of the competency.

- 1. Associate laws and regulations respecting occupational health and safety with the situation in an aircraft mechanical assembly plant.
 - Identify the regulatory framework for occupational health and safety.
 Laws, organizations, rights and obligations of workers, possible recourse
- 2. Recognize the main health and safety risks associated with the tasks performed in an aircraft mechanical assembly plant.

Recognize health and safety risks.
 Risks related to equipment, products, the environment, foreign bodies and work postures

3. Explain the preventive measures to be taken in an aircraft structural assembly plant.

٠	Describe the appropriate protective	Protective equipment: hardhat, safety glasses,
	equipment.	boots, mask, etc.
٠	Interpret Workplace Hazardous Materials	Information in data sheets and interpretation of
	Information System (WHMIS) data sheets.	symbols related to products

4. Explain the main measures to be taken in case of emergency.

•	Locate the appropriate measures in the work	Company procedures, evacuation measures,
	procedures.	responsibilities, first aid, etc.

- 5. Determine the centre of gravity of loads and estimate their weight.
 - Apply a method for estimating loads. Determination of safe path, calculation methods
- 6. Handle materials and equipment safely, using slings and lifts.
 - Use lifting and handling techniques. Choice of equipment, accessories, cables and slings, slinging methods, lifting and moving loads

Machining, Assembly and Installation

Module 9 Duration 90 hours

Statement of the Competency	Achievement Context
Perform machining, assembly and installation tasks.	 Given drawings, diagrams, work procedures, inspection criteria, technical documentation and manufacturers' manuals Using aircraft components, parts and equipment, measuring and marking-out instruments, personal protective equipment, assembly equipment, fasteners, products, charts and tables
Elements of the Competency	Performance Criteria
1. Process the necessary information.	 Identification of all the necessary information Accurate interpretation of: symbols and diagrams procedures and criteria Proper use of technical documentation
2. Plan the work.	 Proper sequence of operations Appropriate choice of: tools equipment instruments accessories and hardware
3. Prepare the components, parts and equipment.	 Accurate observations concerning the condition of components, parts and equipment Accurate measurement of dimensions of components and parts Accurate identification of reference marks Proper use of preparation methods and techniques Accurate corrections and adjustments
4. Machine parts.	 Proper use of machining techniques for the job to be done Observance of dimensions No burrs Clean parts
5. Rivet and unrivet metal parts.	Proper use of techniques for the type of rivetObservance of dimensionsSolid rivetingClean parts

Machining, Assembly and Installation	Code: 869906
6. Assemble and disassemble parts.	 Proper choice and use of assembly and disassembly methods Proper use of system for identifying parts Proper use of sealants and lubricants
7. Install pipes, tubes and hoses.	 Observance of installation sequence Proper assembly of circuit elements Proper positioning of parts Observance of fastening methods Use of products at the appropriate spots
8. Inspect the work.	 Thorough verification of conformity of parts and assemblies with specifications Proper testing Accurate detection of anomalies Determination of the necessary corrective measures, if applicable
	For the competency as a whole:
	 Observance of occupational health and safety rules Appropriate use of tools, equipment and instruments Proper use of English and French terminology Conformity with inspection criteria and work

procedures

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following is a list of knowledge, skills, attitudes, perceptions and guidelines related to each element of the competency.

1. Process the necessary information.

•	Locate inspection criteria in the documentation.	Criteria and instructions in manufacturers' manuals and work procedures
2. Pla	an the work.	
•	Use hand and power tools.	Characteristics and functions of tools, directions for use and maintenance
٠	Use measuring and marking-out instruments.	Characteristics and functions of instruments, directions for use, calibration and maintenance
•	Replace hardware.	Characteristics of the different types of hardware and methods for replacing them

Machining, Assembly and Installation

- 3. Prepare the components, parts and equipment.
 - Recognize the importance of dimensional checks in aircraft mechanical assembly.
 - Use marking-out and punching techniques.
 - Do minor repairs.
- 4. Machine parts.
 - Use machining techniques.
- 5. Rivet and unrivet metal parts.
 - Use riveting techniques.
 - Use unriveting techniques.
- 6. Assemble and disassemble parts.
 - Use assembly techniques.
 - Use systems for identifying parts.
- 7. Install pipes, tubes and hoses.
 - Use installation methods.
- 8. Inspect the work.
 - Use test procedures.

Factors that justify checks, methods and responsibilities of workers Use of the different techniques Joining, deburring, surface preparation, touch-ups to coatings, etc.

Filing, countersinking, counterboring, sawing, drilling, reaming, tapping, threading and sharpening

Percussion, compression and traction riveting Unriveting on a workbench and in an aircraft

Assembly with threaded fasteners, unthreaded fasteners and machine parts Temporary marking and permanent identification

Installation and adjustment of accessories, controls, indicators, pipes and wiring harnesses

Steps to be followed and recording of results

Static and Dynamic Balancing

Module 10 Duration 60 hours

Behavioural Objective

Statement of the Competency	Achievement Context
Balance rotors.	 Given instructions, drawings, work procedures and manufacturers' manuals Using a rotor, a dynamic balancing machine, tools, measuring instruments, materials and products Using individual and collective safety equipment
Elements of the Competency	Performance Criteria
 Locate the relevant information in the drawings and work procedures. 	 Identification of all the necessary information Accurate interpretation of: drawings and symbols information instructions
2. Plan the work.	 Logical sequence of operations Appropriate choice of: tools equipment instruments materials products Conformity with instructions
3. 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
4. Take readings.	Identification of all the necessary informationAccurate interpretation
 5. Improve the balance of a rotor: static balancing dynamic balancing 	 Observance of how balancing machines operate Conformity with balancing standards Observance of tolerances Accurate interpretation of readings Accurate calculations

869914

Static and Dynamic Balancing		Code:	869914
6. Check the precision of the balancing.	 Proper choice of formulas Proper use of formulas Observance of test method Accurate verifications 		

- 7. Remove the rotor from the machine.
- 8. Tidy up the work area.

- Observance of disassembly technique
- Proper cleaning and storage of:
 - tools
 - equipment
 - instruments
 - materials
 - products
- Neat work station

For the competency as a whole:

- Observance of occupational health and safety rules
- Observance of work 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

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following is a list of knowledge, skills, attitudes, perceptions and guidelines related to each element of the competency.

- 1. Locate the relevant information in the drawings and work procedures.
 - Recognize the principles associated with balancing.
 Purpose of balancing, terms used, causes of imbalance

Static and Dynamic Balancing		Code:	869914
2 Plan the work.Recognize the methods and equipment used in balancing.	Types of imbalance, units of mea corrective methods Methods for determining and defi magnitude and angle of the imba	isurement ining the lance	used,
3. Mount the rotor on the balancing machine.Configure the blades.	Configuration of fan blades		Grinte
4. Take readings.Recognize the data to be collected.	Characteristics and functions of o	lata, inter	pretation
5. Improve the balance of a rotor: static balancing, dUse balancing equipment.	ynamic balancing. Methods for using balancing equ situations	ipment in	different
6. Check the precision of the balancing.Use a verification procedure.	Formulas and test method		
7. Remove the rotor from the machine.Use the disassembly procedure.	Disassembly procedure		
8. Tidy up the work area.Recognize the importance of properly wrapping and storing rotating assembly parts.	Damage resulting from improper storage Rules for maintaining and storing	wrapping I equipme	and nt

Hydraulic and Pneumatic Systems

Module 11 Duration 45 hours

Behavioural Objective

Statement of the Competency	Achievement Context
Assemble, install and troubleshoot hydraulic and pneumatic systems.	 Given instructions, drawings, diagrams, work procedures and manufacturers' manuals Using hydraulic and pneumatic components, hydraulic and pneumatic assembly benches, simulation systems, equipment, tools, measuring instruments, materials and products Using personal protective equipment
Elements of the Competency	Performance Criteria
 Locate the relevant information in the drawings, diagrams and work procedures. 	 Identification of all the necessary information Accurate interpretation of: drawings symbols and abbreviations information instructions Accurate location of components
2. Plan the work.	 Logical sequence of operations Appropriate choice of: tools equipment instruments materials products Conformity with instructions
3. Check the components to be assembled.	 Accurate identification of components Accurate evaluation of: condition of components dimensions of components
 4. Assemble components of: hydraulic systems pneumatic systems 	 Observance of assembly sequence Proper use of techniques for assembling: pneumatic components hydraulic components electropneumatic components electrohydraulic components Leakproof connections Precise, solid assembly

869923

Hydraulic and Pneumatic Systems

5. Install:

- hydraulic systems
- pneumatic systems
- 6. Verify the operation of hydraulic and pneumatic systems.
- 7. Troubleshoot hydraulic and pneumatic systems:
 - remove the defective parts
 - clean the parts
 - inspect the parts
 - apply the necessary corrective measures
- 8. Tidy up the work area.

- Observance of installation sequence
- Proper use of each installation technique
- Leakproof connections
- Solid installation
- Observance of filling levels
- Observance of verification and test methods
- Thorough verification of conformity of systems with requirements
- · Recognition of malfunctions
- Determination of appropriate corrective measures
- Observance of removal sequence
- Proper use of work methods
- Proper protection of parts
- Use of authorized solvents
- Clean components
- Proper use of verification methods
- Accurate identification of defects
- Determination of appropriate corrective measures
- Proper use of the appropriate methods for the job
- Proper reassembly of systems
- Proper cleaning and storage of:
 - tools
 - equipment —
 - instruments _
 - materials
 - products
 - system parts, if applicable
- Neat work station

For the competency as a whole:

- · 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

50

- Observance of tolerances

Hydraulic and Pneumatic Systems

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following is a list of knowledge, skills, attitudes, perceptions and guidelines related to each element of the competency.

1. Locate the relevant information in the drawings, diagrams and work procedures.

•	Interpret hydraulic and pneumatic drawings	Interpretation of symbols, circuit components and
	and diagrams.	logic

- 2. Plan the work.
 - Identify the characteristics and functions of the tools, instruments and equipment. Tools, instruments and equipment commonly used on hydraulic and pneumatic systems
- 3. Check the components to be assembled.
 - Identify the characteristics and functions of the Hydraulic and pneumatic circuit components components.
- 4. Assemble components of hydraulic and pneumatic systems.

•	Assemble circuits.	Assembly of hydraulic and pneumatic circuits,
		assembly sequences

- 5. Install hydraulic and pneumatic systems.
 - Identify the methods for installing systems. Installation procedures and criteria
- 6. Verify the operation of hydraulic and pneumatic systems.

٠	Use verification methods.	Test and verification methods, operating
		parameters, interpretation of results

7. Troubleshoot hydraulic and pneumatic systems: remove the defective parts, clean the parts, inspect the parts, apply the necessary corrective measures.

Recognize the main system malfunctions.	Common defects in hydraulic, pneumatic, electrohydraulic and electropneumatic systems
8. Tidy up the work area.	
_	

Clean the tools, instruments and equipment. Methods for cleaning specialized tools

Module 12 Duration 60 hours

Statement of the Competency	Achievement Context
Assemble and check the power plant.	 Working on different types of aircraft engines Given drawings, diagrams, verification procedures, inspection criteria, technical documentation and manufacturers' manuals Using aircraft power plant components and systems; mechanical, hydraulic, pneumatic and electrical assembly benches; measuring instruments; personal protective equipment and the necessary accessories, tools and equipment
Elements of the Competency	Performance Criteria
1. Process the necessary information.	 Identification of all the necessary information Accurate interpretation of: symbols and abbreviations characteristics and functions of power plant components and systems verification procedures Proper use of technical documentation
2. Plan the work.	 Logical sequence of operations Appropriate choice of: tools equipment instruments materials products Observance of procedures
 Check and prepare the components to be assembled. 	 Accurate identification of components Accurate evaluation of the condition of the components Execution of appropriate corrections
4. Assemble the power plant components.	 Observance of assembly sequence Proper use of methods for assembling the different types of components Precise, solid assembly

Power Plant

- 5. Perform troubleshooting tasks, such as:
 - removing and disassembling power plant parts
 - cleaning the components
 - inspecting the components
 - making the necessary corrections
- 6. Tidy up the work area.

- Observance of removal and disassembly sequence
- Proper use of work methods
- Appropriate protection of components
- Observance of manufacturer's recommendations
- · Components in conformity with requirements
- Proper cleaning and storage of:
 - tools
 - equipment
 - instruments
 - materials
 - engine and accessories
- Neat work station

For the competency as a whole:

- Observance of occupational health and safety rules
- Appropriate use of tools, equipment and instruments
- Proper use of English and French terminology
- Work in conformity with procedures and specifications

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following is a list of knowledge, skills, attitudes, perceptions and guidelines related to each element of the competency.

1. Process the necessary information.

•	Identify the types of engines used in aircraft. Differentiate between the various parts of an aircraft power plant.	Piston and turbine engines Functions and operating principles Jet propulsion, Brayton cycle, thrust formula, components and systems, engine performance and efficiency
2. P	lan the work.	
•	Identify the steps involved in disassembling and reassembling components.	Disassembly and removal of engines Assembly of modules and subassemblies
3. C	heck and prepare the components to be assemb	led.
•	Differentiate between various non-destructive test methods.	Characteristics of methods, fluid penetrant, magnetic-particle inspection, eddy current, x-ray inspection
•	Do a visual inspection.	Types of defect, dimensions and location of defect, recording of defects

Power Plant		Code:	869934
4. Assemble the power plant components.			
Use assembly procedures.	Assembly of modules, subassem to make the main assemblies	blies and	sections
Check the assembly.	Determination of condition of eng conformity with standards, identifi recording of anomalies	ine, verific cation and	cation of d
5. Perform troubleshooting tasks, such as removin components, inspecting the components, making	g and disassembling power plant the necessary corrections.	parts, clea	aning the

 Associate power plant malfunctions with their causes. 	Main problems and causes
Use verification methods.	Verification and test methods, removal procedures
6. Tidy up the work area.Use the appropriate maintenance procedure.	Maintenance of power plant components

Cold Section of an Engine

Module 13 Duration 120 hours

Statement of the Competency	Achievement Context
Assemble and check the cold section of an engine.	 Given drawings, diagrams, verification procedures, technical documentation and manufacturers' manuals Using components of the cold section of an engine; mechanical, hydraulic, pneumatic and electrical assembly benches; measuring instruments; personal protective equipment and the necessary accessories, tools and equipment
Elements of the Competency	Performance Criteria
1. Process the necessary information.	 Identification of all the necessary information Accurate interpretation of: symbols and diagrams characteristics and functions of cold section components verification procedures Proper use of technical documentation
2. Plan the work.	 Logical sequence of operations Appropriate choice of: tools equipment instruments materials products Observance of procedures
 Check and prepare the components to be assembled. 	 Accurate identification of components Accurate evaluation of the condition of the components Execution of appropriate corrections
4. Assemble the cold section components.	 Observance of assembly sequence Proper use of methods for assembling the different types of components Precise, solid assembly
5. Install the cold section components.	 Observance of installation method and sequence Precise, leakproof connections Solid installation

6. Verify the operation of the cold section components.

- 7. Perform troubleshooting operations such as:
 - removing and disassembling the cold section
 - cleaning the components
 - inspecting the components
 - making the necessary corrections
- 8. Tidy up the work area.

Cold Section of an Engine

Observance of verification and test methods

869948

Code:

- Thorough verification of conformity of components with requirements
- Recognition of malfunctions
- Observance of tolerances
- Observance of removal and disassembly sequence
- Proper use of work methods
- Appropriate protection of components
- Observance of manufacturer's recommendations
- · Components in conformity with requirements
- Proper cleaning and storage of:
 - tools
 - equipment
 - instruments
 - materials
 - products
 - components
- Neat work station

For the competency as a whole:

- Observance of occupational health and safety rules
- Appropriate use of tools, equipment and instruments
- Proper use of English and French terminology
- Work in conformity with procedures and specifications

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following is a list of knowledge, skills, attitudes, perceptions and guidelines related to each element of the competency.

1. Process the necessary information.

- Situate the cold section with respect to the power plant.
- Identify the characteristics and functions of cold section components and systems.

2. Plan the work.

- Identify the steps involved in disassembling and reassembling components.
- Location and characteristics
- Inlet systems and ducts, characteristics of compressors, sections of the diffuser

Cold section modules, subassemblies and parts

3. Check and prepare the components to be assemb	oled.
Do a visual inspection.	Use of magnification devices, recording of
Sort parts.	Determination of condition of parts, method of arranging parts, acceptance and rejection of parts, command procedures and use of parts
4. Assemble the cold section components.	
Use assembly procedures.	Assembly of modules and subassemblies to make the cold section
Check the assembly.	Determination of condition of parts, verification of conformity with standards, identification and recording of anomalies
5. Install the cold section components.	
 Identify the methods of installing components. 	Installation procedures and criteria
6. Verify the operation of the cold section componen	ts.
 Associate cold section component malfunctions with their causes. 	Main problems and causes

- 7. Perform troubleshooting operations such as removing and disassembling the cold section, cleaning the components, inspecting the components, making the necessary corrections.
 - Use verification methods.
 Verification and test methods, removal procedures
- 8. Tidy up the work area.

Cold Section of an Engine

• Use the appropriate maintenance procedure. Maintenance of cold section components

Hot Section of an Engine

Module 14 Duration 90 hours

Statement of the Competency	Achievement Context
Assemble and check the hot section of an engine.	 Given drawings, diagrams, verification procedures, technical documentation and manufacturers' manuals Using components of the hot section of an engine; mechanical, hydraulic, pneumatic and electrical assembly benches; measuring instruments; personal protective equipment and the necessary accessories, tools and equipment
Elements of the Competency	Performance Criteria
1. Process the necessary information.	 Identification of all the necessary information Accurate interpretation of: symbols and abbreviations characteristics and functions of the hot section components verification procedures Proper use of technical documentation
2. Plan the work.	 Logical sequence of operations Appropriate choice of: tools equipment instruments materials products Observance of procedures
 Check and prepare the components to be assembled. 	 Accurate identification of components Accurate evaluation of the condition of the components Execution of appropriate corrections
4. Assemble the hot section components.	 Observance of assembly sequence Proper use of methods for assembling the different types of components Precise, solid assembly
5. Install the hot section components.	 Observance of installation method and sequence Precise, leakproof connections Solid installation

Hot Section of an Engine

- 6. Verify the operation of the hot section components.
- 7. Perform troubleshooting operations such as:
 - removing and disassembling the hot section
 - cleaning the components
 - inspecting the components
 - making the necessary corrections
- 8. Tidy up the work area.

- Observance of verification and test methods
- Thorough verification of conformity of components with requirements
- Recognition of malfunctions
- Observance of tolerances
- Observance of removal and disassembly sequence
- Proper use of work methods
- Appropriate protection of components
- Observance of manufacturer's recommendations
- · Components in conformity with requirements
- Proper cleaning and storage of:
 - tools
 - equipment
 - instruments
 - materials
 - products
 - components
- Neat work station

For the competency as a whole:

- Observance of occupational health and safety rules
- Appropriate use of tools, equipment and instruments
- Proper use of English and French terminology
- Work in conformity with procedures and specifications

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following is a list of knowledge, skills, attitudes, perceptions and guidelines related to each element of the competency.

1. Process the necessary information.

- Situate the hot section with respect to the power plant.
 Identify the characteristics and functions of hot section components and systems.
 Location and characteristics
 Combustion sections, turbines, exhaust section Thrust vector characteristics
 Plan the work.
 Identify the steps involved in disassembling
 Hot section modules, subassemblies and parts
 - Identify the steps involved in disassembling and reassembling components.
 Hot section modules, subassemblies and parts
Hot Section of an Engine

- 3. Check and prepare the components to be assembled.
 - Analyze the results of the non-destructive Limits, tolerances and evaluation of defects testing.
- 4. Assemble the hot section components.
 - Use assembly procedures.
 - Check the assembly.

Assembly of modules and subassemblies to make the hot section Determination of condition of parts, verification of conformity with standards, identification and recording of anomalies

- 5. Install the hot section components.
 - Identify the methods of installing components. Installation procedures and criteria
- 6. Verify the operation of the hot section components.
 - Associate hot section component malfunctions Main problems and causes with their causes.
- 7. Perform troubleshooting operations such as removing and disassembling the hot section, cleaning the components, inspecting the components, making the necessary corrections.
 - Use verification methods.
 Verification and test methods, removal procedures
- 8. Tidy up the work area.
 - Use the appropriate maintenance procedure. Maintenance of hot section components

Aircraft Mechanical Assembly	

Statement of the Competency	Achievement Context
Assemble and check gearboxes, shafts and bearings.	 Given drawings, diagrams, verification procedures, technical documentation and manufacturers' manuals Using gearboxes, shafts and bearings; mechanical, hydraulic, pneumatic and electrical assembly benches; measuring instruments; personal protective equipment and the necessary accessories, tools and equipment
Elements of the Competency	Performance Criteria
1. Process the necessary information.	 Identification of all the necessary information Accurate interpretation of: symbols and abbreviations characteristics and functions of gearboxes, shafts and bearings verification procedures Proper use of technical documentation
2. Plan the work.	 Logical sequence of operations Appropriate choice of: tools equipment instruments materials products Observance of procedures
 Check and prepare the components and systems to be assembled. 	 Accurate identification of components Accurate evaluation of the condition of the components Execution of appropriate corrections
4. Assemble the components and systems.	 Observance of assembly sequence Proper use of methods for assembling the different types of components and systems Precise, solid assembly
5. Install the transmission device.	Observance of installation method and sequencePrecise, leakproof connectionsSolid installation

Gearboxes, Shafts and Bearings

Module 15 Duration 75 hours

Behavioural Objective

Chserval

7. Perform troubleshooting operations such as:

6. Verify the operation of the transmission device.

- removing and disassembling the transmission dovice
- transmission device

Gearboxes, Shafts and Bearings

- cleaning the components
- inspecting the components
- making the necessary corrections
- 8. Tidy up the work area.

- Observance of verification and test methods
- Thorough verification of conformity of transmission device with requirements
- Recognition of malfunctions
- Observance of tolerances
- Observance of removal and disassembly sequence
- Proper use of work methods
- Appropriate protection of components
- Observance of manufacturer's recommendations
- Components in conformity with requirements
- Proper cleaning and storage of:
 - tools
 - equipment
 - instruments
 - materials
 - products
 - components
- Neat work station

For the competency as a whole:

- Observance of occupational health and safety rules
- Appropriate use of tools, equipment and instruments
- Proper use of English and French terminology
- Work in conformity with procedures and specifications

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following is a list of knowledge, skills, attitudes, perceptions and guidelines related to each element of the competency.

1. Process the necessary information.

•	Situate the transmission devices with respect to a drive-train.	Location and characteristics
•	Differentiate between the various transmission devices used in aircraft.	Rotary transmission system, torque and speed changes, etc.
•	Differentiate between the various transmission unit components and systems.	Gears, gear trains, gearboxes, bearings (rolling and sliding), shafts
2. P	lan the work.	
•	Identify the steps involved in disassembling and reassembling the components.	Transmission device and gearbox modules, subassemblies and parts

Gearboxes, Shafts and Bearings		Code:	869965
3. Check and prepare the components and systems	3. Check and prepare the components and systems to be assembled.		
Recognize transmission device defects.Sort parts.	Visual and tactile inspection Sorting of parts for repair, remach modification	nining or	
4. Assemble the components and systems.			
Use assembly procedures.	Assembly of gearboxes, gear trai bearings	ns, shafts	and
5. Install the transmission device.			
 Identify the methods for installing transmission devices. 	Installation procedures and criter	а	
6. Verify the operation of the transmission device.			
Associate transmission device malfunctions with their causes.	Main problems and causes		
Perform troubleshooting operations such as rer cleaning the components, inspecting the components	noving and disassembling the tra ents, making the necessary correct	ansmissio ions.	n device,
Use verification methods.	Verification and test methods, rer	noval pro	cedures

- 8. Tidy up the work area.
 - Use the appropriate maintenance procedure. Maintenance of gearboxes, shafts and bearings

Primary Engine Systems

Module 16 Duration 75 Hours

Behavioural Objective

Statement of the Competency	Achievement Context
Install and check primary engine systems.	 Given drawings, diagrams, verification procedures, technical documentation and manufacturers' manuals Using primary system components; mechanical, hydraulic, pneumatic and electrical assembly benches; measuring instruments; personal protective equipment and the necessary accessories, tools and equipment
Elements of the Competency	Performance Criteria
1. Process the necessary information.	 Identification of all the necessary information Accurate interpretation of: symbols and abbreviations characteristics and functions of primary system components verification procedures Proper use of technical documentation
2. Plan the work.	 Logical sequence of operations Appropriate choice of: tools equipment instruments materials products Observance of procedures
 Check and prepare the components to be assembled. 	 Accurate identification of components Accurate evaluation of the condition of the components Execution of appropriate corrections
4. Install primary system components.	Observance of installation method and sequencePrecise, leakproof connectionsSolid installation
5. Verify the operation of primary systems.	 Observance of verification and test methods Thorough verification of conformity of device with requirements Recognition of malfunctions Observance of tolerances

Primary Engine Systems

- Perform troubleshooting operations on primary systems, such as removing and disassembling the components, cleaning the components, inspecting the components, making the necessary adjustments.
- 7. Tidy up the work area.

- Observance of removal and disassembly sequence
- Proper use of work methods
- Appropriate protection of components
- Observance of manufacturer's recommendations
- · Components in conformity with requirements
- Proper cleaning and storage of:
 - tools
 - equipment
 - instruments
 - products
 - components
- Neat work station

For the competency as a whole:

- Observance of occupational health and safety rules
- Appropriate use of tools, equipment and instruments
- Proper use of English and French terminology
- Work in conformity with procedures and specifications

installation of equipped engines

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following is a list of knowledge, skills, attitudes, perceptions and guidelines related to each element of the competency.

1. Process the necessary information. • Describe the primary engine systems. Location in the power plant; lubrication, fuel and air systems 2. Plan the work. Primary system components and parts Identify the steps involved in disassembling and reassembling components. 3. Check and prepare the components to be assembled. • Do the necessary inspections. Determination of condition of engine oil, inspection of oil filters and magnetic sensors Sorting of parts, possibility of using parts, ordering Replace parts. and recording procedures 4. Install primary system components. Installation and adjustment of external components, Use installation procedures.

Primary Engine Systems

- 5. Verify the operation of primary systems.
 - Associate primary system malfunctions with their causes.

Main problems and causes

- 6. Perform troubleshooting operations on primary systems, such as removing and disassembling the components, cleaning the components, inspecting the components, making the necessary adjustments.
 - Drain the oil system.
 - Use verification methods.

Draining procedure Verification of conformity of engine with prescribed standards

- 7. Tidy up the work area.
 - Use the appropriate maintenance and storage procedure. Maintenance of primary system components Storage of fuel system

Behavioural Objective

17

Duration

60 hours

Module

Secondary Engine Systems

Statement of the Competency	Achievement Context
Install and check secondary engine systems.	 Given drawings, diagrams, verification procedures, technical documentation and manufacturers' manuals Using secondary system components; mechanical, hydraulic, pneumatic and electrical assembly benches; measuring instruments; personal protective equipment and the necessary accessories, tools and equipment
Elements of the Competency	Performance Criteria
1. Process the necessary information.	 Identification of all the necessary information Accurate interpretation of: symbols and abbreviations characteristics and functions of secondary system components verification procedures Proper use of technical documentation
2. Plan the work.	 Logical sequence of operations Appropriate choice of: tools equipment instruments materials products Observance of procedures
 Check and prepare the components to be assembled. 	 Accurate identification of components Accurate evaluation of the condition of the components Execution of appropriate corrections
4. Install secondary system components.	Observance of installation method and sequencePrecise, leakproof connectionsSolid installation
5. Verify the operation of secondary systems.	 Observance of verification and test methods Thorough verification of conformity of device with requirements Recognition of malfunctions Observance of tolerances

Secondary Engine Systems

the necessary adjustments.

7. Tidy up the work area.

6. Perform troubleshooting operations on

secondary systems, such as removing and

disassembling the components, cleaning the

components, inspecting the components, making

The following is a list of knowledge, skills, attitudes, perceptions and guidelines related to each element of the competency.

· Describe the secondary engine systems. 2. Plan the work.

1. Process the necessary information.

- Identify the steps involved in disassembling
- 3. Check and prepare the components to be assembled.
 - · Replace parts.
- 4. Install secondary system components.
 - Use installation procedures.
- 5. Verify the operation of secondary systems.
 - Associate secondary system malfunctions with Main problems and causes their causes.

- Observance of removal and disassembly sequence
- Proper use of work methods
- Appropriate protection of components
- Observance of manufacturer's recommendations
- Components in conformity with requirements
- Proper cleaning and storage of:
 - tools
 - equipment
 - instruments
 - products
 - components
- Neat work station

For the competency as a whole:

- Observance of occupational health and safety • rules
- Appropriate use of tools, equipment and instruments
- Proper use of English and French terminology
- Work in conformity with procedures and specifications

Location in the power plant; ignition, anti-icing, startup, propeller control and engine drain systems

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

Secondary system components and parts and reassembling components. Sorting and possibility of using parts, ordering and recording procedures Installation and adjustment of external components, installation of equipped engines

Secondary Engine Systems

- 6. Perform troubleshooting operations on secondary systems, such as removing and disassembling the components, cleaning the components, inspecting the components, making the necessary adjustments.
 - Use verification methods.

Verification of conformity of engine with prescribed standards

- 7. Tidy up the work area.
 - Use the appropriate maintenance and storage Maintenance of secondary system components procedure.

Job Search Techniques

Module 18 Duration 15 hours

Situational Objective

Statement of the Competency

Use job search techniques.

Elements of the Competency

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

Learning Context

Information Phase

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

Participation Phase

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

Synthesis Phase

Presenting the results of the techniques used during a group discussion, referring to their log.

Instructional Guidelines

- Provide students with the material resources and examples that will help them with their work.
- Teach the students how to use reference materials.
- Put the students in touch with resource people who can help them with their job search.
- Allot enough time and provide the necessary means for the students to carry 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.

Job Search Techniques

Participation Criteria

Information Phase

- 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.

Participation Phase

- Make a list 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 approach used.

Synthesis Phase

• Give a brief presentation on their job search, discussing the relevance of the reference materials used and the effectiveness of their approach.

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following is a list of knowledge, skills, attitudes, perceptions and guidelines related to each phase of the learning context.

Information Phase

Establish a plan of action.	Determination of work activities corresponding to their interests, job search plan
Participation Phase	
Record data in a log.	Data to be recorded, recording methods
Synthesis Phase	
• Describe the characteristics of the presentation to be produced.	Content, rules of presentation and format

Flight Control Systems

Module 19 Duration 60 hours

Behavioural Objective

Statement of the Competency	Achievement Context
Assemble, install and troubleshoot flight control systems.	 Given instructions, drawings, diagrams, work procedures and manufacturers' manuals Using a flight control system and components, an assembly bench, a simulation bench, equipment, tools, measuring instruments, materials and products Using individual and collective safety equipment
Elements of the Competency	Performance Criteria
 Locate the relevant information in the drawings, diagrams and work procedures. 	 Identification of all the necessary information Accurate interpretation of: drawings symbols and abbreviations information instructions
2. Plan the work.	 Logical sequence of operations Appropriate choice of: tools equipment materials products Observance of instructions
 Check and prepare the components to be assembled. 	 Accurate identification of components Accurate evaluation of the condition of the components Executino of appropriate corrections
 Using a bench, assemble flight control system components. 	 Observance of assembly sequence Proper use of methods for assembling: mechanical components hydraulic components electrohydraulic components Observance of fastening techniques Proper lubrication of parts Precise, solid assembly

Flight Control Systems		Code:	869504
5. Install flight control system components.	 Observance of installation seq Proper use of installation techr Precise leakproof connections 	uence nique	

7. Perform troubleshooting operations on a flight control system, such as:

6. Verify the operation of flight control systems.

- removing and disassembling the flight control system
- cleaning the components
- inspecting the components
- making the necessary corrections

- leakprool connection
 - mechanical components
 - hydraulic components
 - electrohydraulic components
- Solid installation
- Lubrication at the appropriate spots
- Observance of filling levels
- · Observance of verification and test methods
- Thorough verification of conformity of flight control system with requirements
- Recognition of malfunctions
- Determination of appropriate corrective measures
- Observance of tolerances
- Observance of removal and disassembly sequence
- Proper use of work methods
- Appropriate protection of components
- Use of recommended solvents
- Clean components
- Proper use of verification methods
- Accurate identification of defects
- Determination of appropriate corrective measures
- Proper use of techniques and methods for the job to be done
- · Components in conformity with requirements
- Observance of manufacturer's recommendations
- Proper reassembly of flight control system
- Proper cleaning and storage of:
 - tools
 - equipment
 - instruments
 - materials
 - products
 - flight control system components, if applicable
- Neat work station

8. Tidy up the work area.

Flight Control Systems

- 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

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following is a list of knowledge, skills, attitudes, perceptions and guidelines related to each element of the competency.

1. Locate the relevant information in the drawings, diagrams and work procedures.

•	Differentiate between the various flight control	Mechanical, hydraulic and electrohydraulic
	components and systems.	components and systems such as prop control

- 2. Plan the work.
 - Determine the methods to be used. Methods for disassembling and reassembling systems
- 3. Check and prepare the components to be assembled.
 - Recognize flight control component defects. Visual and tactile inspection
- 4. Using a bench, assemble flight control system components.

 Use an assembly bench. 	Method of using bench to assemble flight control system components
5. Install flight control system components.	
Use installation techniques.	Installation of accessories, controls, indicators, tubing and wiring harnesses
6. Verify the operation of flight control systems.	
 Associate flight control system malfunctions 	Main problems and causes

with their causes.

Flight Control Systems

- 7. Perform troubleshooting operations on a flight control system, such as removing and disassembling the flight control system, cleaning the components, inspecting the components, making the necessary corrections.
 - Use verification methods.

Verification and test methods, removal procedures

- 8. Tidy up the work area.
 - Use the appropriate maintenance procedure. Maintenance of flight control system components

Landing Gear

Module 20 Duration 60 hours

Behavioural Objective

Statement of the Competency	Achievement Context
Assemble, install and overhaul landing gear.	 Given instructions, drawings, diagrams, work procedures and manufacturers' manuals Using components and landing gear, simulation benches, equipment, tools, measuring instruments, materials and products Using personal protective equipment
Elements of the Competency	Performance Criteria
 Locate the relevant information in the drawings, diagrams and work procedures. 	 Identification of all the necessary information Accurate interpretation of: drawings symbols and abbreviations information instructions
2. Plan the work.	 Logical sequence of operations Appropriate choice of: tools equipment instruments materials products Observance of instructions
 Check and prepare the components to be assembled. 	 Accurate identification of components Accurate evaluation of the condition of the components Execution of Appropriate corrections
 4. Assemble landing gear: mechanical components hydraulic components electrohydraulic components 	 Observance of assembly sequence Proper use of methods for assembling components Observance of fastening techniques Precise, solid assembly
5. Install landing gear.	 Observance of installation sequence Proper use of installation method Accurate adjustments Observance of fastening techniques

Landing Gear		Code:	869514
6. Prepare landing gear for operation.	 Proper use of techniques for: filling the shock strut bleeding the brakes 		

- 7. Overhaul landing gear:
 - disassemble the landing gear
 - clean the components
 - inspect the components
 - apply the necessary corrective measures

- 8. Verify the operation of landing gear.
- 9. Tidy up the work area.

- inflating the tires
- Observance of techniques for applying lubricants
- Precise adjustments
- Observance of disassembly sequence
- Proper use of disassembly techniques
- Use of authorized solvents
- Clean components
- Proper use of verification methods
- Accurate identification of defects
- Determination of appropriate corrective measures
- Proper use of techniques and methods for the job to be done
- Components in conformity with requirements and standards
- Observance of verification and test methods
- Accurate detection of malfunctions
- Determination of appropriate corrective measures
- Observance of tolerances
- Proper cleaning and storage of:
 - tools
 - equipment
 - instruments
 - materials
 - products
- Neat work station

For the competency as a whole:

- 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

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following is a list of knowledge, skills, attitudes, perceptions and guidelines related to each element of the competency.

1. Locate the relevant information in the drawings, diagrams and work procedures.

٠	Recognize the particular characteristics of landing gear.	Characteristics, functions, nose gear and main gear			
•	Differentiate between the various landing gear components.	Mechanical, hydraulic and electrohydraulic components			
2. Pla	an the work.				
•	Determine the methods to be used.	Methods for disassembling and reassembling landing gear			
3. Cł	. Check and prepare the components to be assembled.				
•	Recognize landing gear component defects.	Visual and tactile inspection			
4. Assemble landing gear: mechanical components, hydraulic components, electrohydraulic compone					
•	Realize the need to ensure that assemblies are in conformity with standards and requirements.	Consequences of nonconformity			
5. Ins	stall landing gear.				
•	Follow the installation procedure.	Installation sequence, adjustments, installation and fastening techniques			
6. Pr	epare landing gear for operation.				
٠	Use landing gear preparation techniques.	Operations involved, lubrication techniques			
7. Ov ap	verhaul landing gear: disassemble the landing gear, clean the components, inspect the components pply the necessary corrective measures.				
•	Explain the responsibilities and activities involved in overhauling landing gear.	Assemblers' activities, responsibilities and limitations			
8. Ve	erify the operation of landing gear.				
•	Associate landing gear malfunctions with their causes.	Main problems and causes			
9. Tio	dy up the work area.				
•	Use the appropriate maintenance procedure.	Maintenance of landing gear components			

Practicum in the Workplace

Situational Objective

Statement of the Competency

Enter the work force.

Elements of the Competency

- 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 and trade practices, and their aptitudes, preferences, expectations and training.

Learning Context

Information Phase

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

Participation Phase

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

Synthesis Phase

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

Instructional Guidelines

- Provide the students with the necessary sources of information.
- Suggest two or three practicum positions for each student.
- Develop and 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 express themselves.

Information Phase

• Consult the sources of information at their disposal.

Participation Phase

- Comply with the establishment's instructions regarding the tasks carried out by trainees, work schedules, 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.

Synthesis Phase

• Discuss their experiences in the workplace with their classmates.

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following is a list of knowledge, skills, attitudes, perceptions and guidelines related to each phase of the learning context.

Information Phase

٠	Identify sources of information.	Characteristics of the various sources		
Participation Phase				
•	Describe the information to be recorded during a practicum.	Tasks, requirements, difficulties, context		
•	Describe the behaviour to adopt in the workplace.	Respect for others, compliance with instructions, etc.		
Synthesis Phase				
•	Describe the characteristics of a practicum report.	Content, rules of presentation and format		





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