

## COURSE OUTLINE

**COURSE:** Internship on Airplane Maintenance

**PROGRAM:** 280.C0 Aircraft Maintenance Technology

**DISCIPLINE:** 280 Aeronautics

**WEIGHTING:** Theory: 0 Practice: 4 Personal study: 1

Teacher(s)	Office	☎ extension	✉ email or web site
Jean-François Ducharme	C-182		<a href="mailto:jf.ducharme@cegepmontpetit.ca">jf.ducharme@cegepmontpetit.ca</a>

### OFFICE HOURS

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Morning					
Afternoon					
Other					

Coordinator(s)	Office	☎ extension	✉ email or web site
Éric Goudreault	C-160	4691	<a href="mailto:eric.goudreault@cegepmontpetit.ca">eric.goudreault@cegepmontpetit.ca</a>
Stéphanie Arpin	C-160	4630	<a href="mailto:stephanie.arpin@cegepmontpetit.ca">stephanie.arpin@cegepmontpetit.ca</a>

## **CONTEXT OF THIS COURSE IN THE PROGRAM**

This course is in the sixth session of the program and is one of the two courses of the program's synthesis test. This course is co-taught with the Helicopter Maintenance Course, 280-634-EM.

By the end of this course, students will have developed the following objectives:

- find the necessary information from the entire technical library that is available in order to carry out maintenance on an aircraft
- demonstrate an understanding of the texts and procedures of the manuals in question
- check the operating parameters of an electrical, mechanical or hydraulic component according to the standards of the manufacturers;
- evaluate a component to determine its aeronautical condition in compliance with the manufacturer's strict standards
- perform maintenance and inspections on electrical, hydraulic or mechanical and structural systems according to a predetermined maintenance schedule recommended by the manufacturer
- analyze the aerodynamic and dynamic behavior of an aircraft and its rotary components according to strict rules of operation and safety

Transport Canada: This course outline meets Transport Canada requirements as outlined in the Training Control Manual (MCF). The Department applies the Transport Canada standard, which sets the tolerated absences for courses at 5% (theory and laboratory). The department compiles the absences of students enrolled in the Aircraft Maintenance Techniques (280.C0) and Avionics Techniques (280.D0) programs as required by Transport Canada. The application of Transport Canada's policy on absentee control is available on the ÉNA website and in the student agenda under the heading "Privileges Granted by Transport Canada".

## **COMPETENCE OF THE EXIT PROFILE (STUDENT SKILL PROFILES)**

Perform aircraft maintenance.

## **MINISTERIAL OBJECTIVE AND COMPETENCIES**

026E Perform activities related to airplane maintenance.

## **TERMINAL OBJECTIVE OF THE COURSE (FINAL COURSE OBJECTIVE)**

Demonstrate a methodology and technique of maintenance work around and on aircraft.

**TEACHING AND LEARNING STRATEGIES**

The work is carried out in teams of two participants. The activities will take place alternately depending on the availability of the aircraft. Each week, students carry out their internship while seeing to the proper operation and safety around them.

**COURSE PLAN**

**026E Perform activities related to airplane maintenance.**

**1) Gathering Necessary Information**

Learning Objective	Activities/Weeks
1.1 Accurately identify the Transport Canada maintenance standards that applies to airplanes.	2, 3, 5, 6, 7, 8, 9, 10, 11
1.2 Accurately identify the manufacturer’s specifications that relate to the airplane maintenance to be performed.	All
1.3 Summarize the specific facts in the history and documentation of the airplane that is to be maintained.	4, 6

**2) Planning Work**

Learning Objective	Activities/Weeks
2.1 Establish in detail the relevance and type of intervention to be performed based on: <ul style="list-style-type: none"> <li>• the history (logbook) of the airplane to be maintained</li> <li>• technical documentation</li> </ul>	4, 5, 6, 8
2.2 Identify the steps to carry out the maintenance work.	All
2.3 Identify the necessary equipment to perform the operation and check availability of the equipment.	2, 3, 5, 6, 7, 8, 9, 10, 11
2.4 Respect the limits of the intervention and responsibilities as an aviation maintenance engineer (AME).	2, 3, 5, 6, 7, 8, 9, 10, 11

**3) Proceeding with the Maintenance Activities**

Learning Objective	Activities/Weeks
3.1 Follow and respect the applicable standards and specifications.	All
3.2 Apply health and safety rules.	All
3.3 Operate airplane systems.	6, 12, 13
3.4 Use equipment and tools appropriately.	All
3.5 Use of appropriate maintenance procedures.	All
3.6 Evaluate the service condition of components and systems.	6, 12, 13
3.7 Check condition and operation of the components and systems.	6, 12, 13

Learning Objective	Activities/Weeks
3.8 Record defects, checks and inspections in writing or using aircraft maintenance software.	All

**4) Performing activities related to weight and balance**

Learning Objectives	Activities/Weeks
4.1 This activity will be perform during 280-6B4-EM	-----

**5) Performing Activities Related to Changing Defective Components**

Learning Objective	Activities/Weeks
5.1 Follow and respect standards and specifications.	All
5.2 Apply health and safety rules.	All
5.3 Operate the airplane systems.	6, 13
5.4 Use equipment and tools appropriately.	All
5.5 Use of appropriate maintenance procedures.	All
5.6 Evaluate the service condition of the components and of the systems.	6, 13,
5.7 Check the condition and operation of the components and the systems.	6, 13,
5.8 Record defects, checks and inspections in writing or using aircraft maintenance software.	All

**6) Performing Activities Related to Parking and Towing an Airplane**

Learning Objective	Activities/Weeks
6.1 Follow and respect standards and procedures.	All
6.2 Apply health and safety rules.	All
6.3 Use equipment and tools appropriately.	All
6.4 Demonstrate control of work processes related to ground handling of an airplane.	2,4,6,7

**7) Storing and Cleaning the Workplace**

Learning Objective	Activities/Weeks
7.1 Store equipment and clean work area.	All
7.2 Handle equipment safely.	All

## List of Activities

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**ACTIVITY PERIODS: Week 1**

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**Learning Objective:** Document anomalies, checks and inspections in writing, use equipment and tools appropriately, apply maintenance procedures, and apply security measures surrounding operations around aircraft.

**Content:** Course outlines, structure of the course, schedule of activities, safety, video presentation (the influence of human factors in maintaining aircraft and « *don't get sucked in* »).

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**ACTIVITY PERIODS: Weeks 2 to 15**

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**Activity 1: Bleed the Brakes**

**Learning Objective:**

- Bleed brakes under pressure
- Check braking capacity
- Complete relevant documentation for the work that was done

**Activity 2: Functional Test of the Flight Spoilers on the Challenger 601**

**Learning Objective:**

- Perform functional test of the flight spoilers according to the manufacturer's manual.

**Activity 3: Servicing of an Accumulator**

**Learning Objectives:**

- Put an accumulator into service as per the manufacturer's recommendations.
- Check the quality of the work.
- Perform a functional test.

**Activity 4: Performance Flight**

**Learning Objectives:**

- Do a "pre-flight" inspection
- Become aware of the influence of the quality of maintenance on the safety and performance of the airplane.
- Apply safety concepts on the ground.
- Check the proper operation of various airplane systems and engine parameters.
- Complete the questionnaire related to performance flight.

**Activity 5: Performing a Compass Swing on an Airplane**

**Learning Objectives:**

- Perform compass compensation following standard techniques.
- Complete documentation relevant to the work that was done.

**Activity 6: Towing an Airplane**

**Learning Objectives:**

- Tow a plane according to the manufacturer's procedures.
- Use proper signals.

**Activity 7:**

**Run-Up on a Turboprop**

**Learning Objectives:**

- Prepare the aircraft and equipment for the run-up.
- Apply the signals and safety rules used during the run-up and taxiing.
- Check various engine parameters according to the manufacturer's data.

**Activity 8:**

**Performing an Electrical snag**

**Learning Objectives:**

- Detect failure
- Locate components
- Analysis wiring diagram
- Resolve failure.

**Activity 9:**

**Changing the Piper Aztec Carburetor**

**Learning Objectives:**

- Remove the old carburetor.
- Follow-up documentation
- Reinstall new carburetor
- Adjust the throttle.

**Activities 10 to 12:**

**Maintenance Internship on an Available Airplane**

**Learning Objectives:**

- Conduct maintenance work (inspect, locate, modify).
- Troubleshoot (mechanical, hydraulic and electrical problems)
- Complete relevant documentation for the work that was done.

**Activity 14:**

**Practical Exam**

**Learning Objectives:**

Students must apply a rigging procedure or a servicing procedure of an aircraft component.

**Activity 15:**

**Theory Exam**

**Learning Objectives:**

- Review of practical exam.
- Theory exam on Activities 1 to 9.

**Note: Free activities could replace any other planned activities.**

**SUMMATIVE AND FORMATIVE EVALUATION**

Description of Evaluation Activity	Context of realization and evaluation mode	Learning Objective(s)	Evaluation criteria	Due Date (approximate date assignment due or exam given)	Weighting (%)
<b>Synthesis evaluation of the program</b>					
Activities 1 to 13 in rotation depending of the aircraft availability. (In accordance with the evaluation criteria presented by the instructor.)	Work in team but individual evaluation.	all	See Table 1	Week 2 to week 4 - formative evaluations. 8th week - Assessment report with the student. Week 5 to week 15 - summative evaluations.	40%
Practical Exam. Plan and perform a maintenance task on an aircraft according to a methodology and a working technique adapted to the aeronautical standard.	Individual, between 50 to 90 minutes depending of the activity.	all	See Table 1	14 <sup>th</sup> week	30%
<ol style="list-style-type: none"> <li>1. Find the pertinent information concerning the maintenance task and organize the intervention in accordance with the standards of airworthiness.</li> <li>2. Verify the parameters of different systems operation.</li> <li>3. Evaluate aeronautical components.</li> <li>4. Rectify discrepancies.</li> <li>5. Inspect and return to service the aircraft in accordance with the manufacturer recommendations.</li> <li>6. Record maintenance activities in the appropriate technical records.</li> </ol>					

**70%**

Table 1 Evaluation criteria
<ol style="list-style-type: none"> <li>A) Accurate identification of information and maintenance procedures within a prescribed time.</li> <li>B) Verification and consistent interpretation of operating parameters on different systems.</li> <li>C) Precise evaluation of the condition of the component according to standards.</li> <li>D) Accurate execution of procedures for rectification of anomalies.</li> <li>E) Systematic identification of all anomalies and commissioning according to standards.</li> <li>F) Careful and accurate documentation of work in aircraft maintenance record sets.</li> </ol>

**SUMMATIVE AND FORMATIVE EVALUATION (cont's)**

Description of Evaluation Activity	Context of realization and evaluation mode	Learning Objective(s)	Evaluation criteria	Due Date (approximate date assignment due or exam given)	Weighting (%)
Technical records. Writing technical snags and rectifications	- Individual, according to a simulation - With the help of sample supply by the teacher.	Record inspections and interventions in airplane work sheets	- Writing procedure according to the model provided. - Exact description of the technical problem. - Full and exact description of the rectification. - Respect of the presentation standards of the model provided.	Three samples picked by the teacher during the session will be evaluate	10%
Review of week 14 practical exam.  Inspection, research and a written exam on all concepts acquired during the internship.	- Individual - The exam will include a practical and written part.	See activities 1 to 14	-Precise founding and exact description of the anomalies. -Use the right reference to trace a standard. -Pertinence and accuracy of the answer according to the course standard. -Fullness of the answer according to the course standard.	15th week	20%

**30%**

**TOTAL: 100%**

**REQUIRED MATERIAL**

Course notes, (the number will be provided by the teacher during the first course)

**MEDIAGRAPHY**

Acceptable Methods, Techniques and Practices : V. 1 : Aircraft Inspection and Repair, AC43.13-1A, V.2 : Aircraft Alterations AC 43.13-2A, 2 volumes, Federal Aviation Administration, Department of Transportation, Us Government Printing Office, Washington DC, 1977.

Maintenance manuals and manufacturer parts.



## REQUIREMENTS TO PASS THE COURSE

### (1) Passing Mark

The passing mark for this course is 60% (PIEA, article 5.1m).

### (2) Attendance for Summative Evaluations

Attendance at summative evaluation activities is mandatory (PIEA, article 5.2.5.1).

### (3) Submitting Assignments

The work required by the teacher must be given to the date, place and time fixed. The penalties resulting from the delays are established according to the departmental rules (PIEA, article 5.2.5.2).

In case of delay the penalties are: - See "Departmental Rules" section at

<http://guideena.cegepmontpetit.ca/regles-des-departements/>

### (4) Presentation of Written Work

Students must follow the standards adopted by the Cégep for written work (*Normes de présentation matérielle des travaux écrits*). These can be found in the documentation centre on the Cégep web site <http://ena.cegepmontpetit.ca/liens-eclair> under the heading **Liens éclair**, **Bibliothèques**, « Aide ».

### (5) Quality of English

A teacher may refuse or delay acceptance of any submitted work if the level of English is considered unacceptable. If the work is refused, it will receive a mark of "0." If the teacher delays acceptance, the work is subject to the same penalties listed under "Submitting Assignments."

## METHODS OF COURSE PARTICIPATION

### SAFETY MEASURES IN THE HANGARS

1. Students participating in any training, maintenance or manufacturing activity either in the hangars or workshops, shall at all times wear safety boots or shoes, ÉNA overall and safety glasses.
2. Smoking is prohibited in school, hangars and on the ramp giving access to the airport.
3. Sitting on workbenches, machineries or equipments will not be tolerated.
4. Do not use any machineries or equipments without having first the permission of the instructor.
5. Long hair will have to be secured before working with machineries.
6. Workbenches, machineries and work places shall be clean after being used or prior leaving courses.
8. Circulation in any hangars of unauthorized persons is prohibited.
9. No visitors without permission.
10. Watches, rings and chains must be removed prior starting course.

## OTHER DEPARTMENTAL REGULATIONS

Students are encouraged to consult the website for the specific regulations for this course:

<http://guideena.cegepmontpetit.ca/regles-des-departements/>

## **INSTITUTIONAL POLICIES AND REGULATIONS**

All students enrolled to the National Institute of Aeronautics, of the Cégep Édouard-Montpetit must become familiar with and comply with the institutional policies and regulations. In particular, these policies address learning evaluations, maintaining admission status, French language policies, maintaining a violence-free and harassment-free environment, and procedures regarding student complaints. The French titles for the policies are: *Politique institutionnelle d'évaluation des apprentissages, les conditions d'admission et cheminement scolaire, la Politique relative à l'usage, à la qualité et à la valorisation de la langue française, la Politique pour un milieu d'études et de travail exempt de harcèlement et de violence, les procédures et règles concernant le traitement des plaintes étudiantes.*

The full text of these policies and regulations is accessible on the Cégep web site at the following address: <http://ena.cegepmontpetit.ca/l-ecole/reglements-et-politiques>. If there is a disparity between shortened versions of the text and the full text, the full text will be applied and will be considered the official version for legal purposes.

## **STUDENT ACCESSIBILITY CENTER - FOR STUDENTS WITH DISABILITIES**

Students having received a professional diagnosis of impairment (motor skills, neurological, organic, sensory, learning difficulties, mental health, autism spectrum disorder or other) or suffering from a temporary medical condition may request special accommodations.

Students seeking these accommodations must forward their diagnosis to the CSA by either MIO to « Service, CSA-ENA » or email to « [servicesadaptesena@cegepmontpetit.ca](mailto:servicesadaptesena@cegepmontpetit.ca) ».

Students already registered with the CSA must communicate with their teachers at the beginning of the semester to discuss those accommodations they have been awarded by the CSA.

## **ANNEX**

None