

COURSE OUTLINE

COURSE: Internship on Helicopter Maintenance
PROGRAM: 280.C0 Aircraft Maintenance Technology
DISCIPLINE: 280 Aeronautics
WEIGHTING: Theory: 0 Practical Work: 4 Personal Study: 1

| Instructor(s) | Office | ☎ extension | ✉ email or web site |
|----------------|--------|-------------|--|
| Serge Rancourt | C-182 | 4664 | serge.rancout@cegepmontpetit.ca |

AVAILABILITIES

| | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY |
|-----------|--------|---------|-----------|----------|--------|
| Morning | | | | | |
| Afternoon | | | | | |

| Coordinator(s) | Office | ☎ extension | ✉ email or web site |
|----------------|--------|-------------|--|
| Dany Charette | B-125 | 4661 | dany.charette@cegepmontpetit.ca |
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CONTEXT OF THIS COURSE IN THE PROGRAM

This course is offered during the sixth session of the program and it is one of the two capstone courses for the comprehensive assessment at the end of the program. This course is a co-requisite with *Internship on Airplane Maintenance*, 280-6A4-EM.

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

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

The course is a co-requisite with the course 280-6A4-EM.

Students must keep this course outline for the duration of their studies as it will be useful for the comprehensive assessment at the end of the program.

Transport Canada: This course outline meets the requirements of Training Organisation Certification Manual (MCF) of Transport Canada. The Department applies Transport Canada standard which allows a maximum absence of 5% for the course (theory and laboratory). The department compiles absences of all students enrolled in Aircraft Maintenance (280.C0) and Avionics (280.D0) according to Transport Canada requirements. The application of Transport Canada policies regarding absences is available on the college website and in the student agenda under the heading « Privilèges accordés par Transports Canada ».

MINISTRY OBJECTIVE(S) AND COMPETENCIES)

026F Perform activities related to helicopter maintenance.

MINISTRY OBJECTIVE(S) AND COMPETENCIES

Work is performed in teams of two; a rotation of exercises is scheduled with an adequate availability of the models and aircraft. At the beginning of the session, each student will receive his or her activity schedule within the list of planned activities for the course. Each week, students must perform their internship while assuring proper operation and safety procedures.

COURSE PLAN

026F Perform activities related to helicopter maintenance.

1) Gather Necessary Information

| Learning Objective | Content |
|---|---------|
| 1.1 Accurately identify manufacturer's specifications that relate to the helicopter maintenance to be performed. | All |
| 1.2 Summarize the specific facts in the history and documentation of the helicopter that is to receive maintenance. | 2 to 14 |

2) Plan Work

| Learning Objective | Content |
|---|---------|
| 2.1 Use <ul style="list-style-type: none"> • the history (logbook) of the helicopter to be maintained • technical documentation to establish in detail the relevance and type of intervention to be performed | 2 to 14 |
| 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 to 14 |
| 2.4 Respect the limits of the intervention and responsibilities as an aviation maintenance engineer (AME). | 2 to 14 |

3) Proceed with the Maintenance Activities

| Learning Objective | Content |
|---|-----------|
| 3.1 Monitor and maintain the standards and specifications. | All |
| 3.2 Apply health and safety rules. | All |
| 3.3 Turn on helicopter systems. | 4, 12, 14 |
| 3.4 Use equipment and tools appropriately. | All |
| 3.5 Apply maintenance procedures. | All |
| 3.6 Evaluate the service condition of components and systems. | 2 à 14 |
| 3.7 Check condition and operation of components and systems. | 2 à 14 |

4) Perform Activities Related to Weight and Balance

| Learning Objective | Content |
|---|---------|
| 4.1 Gather 026C knowledge, element #5 of the course "System Maintenance" to perform and calculate weight and balance. | 12 |
| 4.2 Identify the steps to carry out the work. | 12 |
| 4.3 Identify the necessary equipment to carry out the operations. | 12 |
| 4.4 Respect the limits of intervention and responsibilities as a maintenance engineer (AME). | 12 |

5) Perform Activities Related to Changes in Outdated Components and Correct Defects.

| Learning Objective | Content |
|--|---|
| 5.1 Monitor and maintain standards and specifications. | 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 |
| 5.2 Apply health and safety rules. | 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 |
| 5.3 Turn on helicopter systems. | 4, 5, 12, 14 |
| 5.4 Use equipment and tools appropriately. | 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 |
| 5.5 Apply maintenance procedures. | 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 |
| 5.6 Évalue service condition of components and systems. | 2 to 14 |
| 5.7 Check condition and operation of components and systems. | 2 to 14 |

6) Perform Activities Related to Parking and Tying Down a Helicopter.

| Learning Objective | Content |
|---|-----------|
| 6.1 Monitor and maintain standards and procedures. | 6, 12, 14 |
| 6.2 Apply health and safety rules. | 6, 12, 14 |
| 6.3 Use equipment and tools appropriately. | 6, 12, 14 |
| 6.4 Demonstrate control of work processes related to ground handling of a helicopter. | 6, 12, 14 |

7) Store Equipment and Clean Up the Workplace

| Learning Objective | Content |
|--|---------|
| 7.1 Store equipment and clean work area. | All |
| 7.2 Take down and handle equipment safely. | All |

List of Activities

| | | | | |
|----|--|----------------|-----------------|---------------|
| 1 | Introduction | | | |
| 2 | Tail rotor driveshaft damper inspection | | 300 CAL | 10 activities |
| 3 | Troubleshooting | | | |
| 4 | Electrical failure research exercise | R44 MIX | 500 GNY | |
| 5 | Swashplate removal/installation | | 206B JPL | |
| 6 | Landing gear configuration change | | 206B UXA | |
| 7 | Engine control rigging | | 350 IAQ | |
| 8 | Acceptance check | | R44 MIX | |
| 9 | Main rotor head removal/installation | | 350 IAQ | |
| 10 | Freewheeling unit inspection | | 206B JPL | |
| 11 | Hydraulic servo removal/installation | | 206B JPL | |
| 12 | Weight and balance | | 206B UXA | |
| 13 | Vibrations analysis | | | |
| 14 | On ground and in-flight vibrations analysis | | | |
| 15 | Exam | | | |

SYNTHESIS OF SUMMATIVE EVALUATION METHODS

| Description of Evaluation Activity | Context | Learning Objective(s) | Due Date (assignment or exam) | Weighting (%) |
|--|---|-----------------------|-------------------------------|------------------------------------|
| Participation to 8 of the listed activities. | Work will be performed in teams of 2 or 3, while evaluation will be individually. | All | Between Weeks 2 and 11 | 7% per activity for a total of 56% |
| Written Exam | Individually. | All | Week 15 | 16% |
| 9 th activity * | Work will be performed in teams of 2 or 3, while evaluation will be individually. | All | Between Weeks 2 and 11 | 14% |
| 10 th activity * | Work will be performed in teams of 2 or 3, while evaluation will be individually. | All | Between Weeks 2 and 11 | 14% |

TOTAL : 100%

* The lowest and the highest score of the 10 activities are included in the final compilation with a 14% relative weight

REQUIREMENTS TO PASS THE COURSE

(1) Passing Mark

The passing mark for this course is 60%.

(2) Attendance for Summative Evaluations

Attendance at summative evaluation activities is mandatory.

(3) Submitting Assignments

Assignments must be submitted by the date, place and time determined by the instructor. Any assignment submitted after the due date will be penalized 10% per day for each day it is late up to a week. After one week, the assignment will be graded a zero (0).

(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."

CLASS PARTICIPATION EXPECTATIONS

SAFETY MEASURES IN THE HANGARS

1. Smoking is prohibited.
2. Sitting on benches or machines is prohibited.
3. Shoes must be worn at all times (sandals are prohibited).
4. Machines must not be used without authorization from the instructor.
5. Caps or hairnets must be worn for long hair when working with the machinery.
6. Ties must be removed or tucked inside the shirt when working with machinery.
7. Sleeves with wide cuffs or fringe must not be worn when working near machinery.
8. Safety glasses must be worn when working on the machinery.
9. The machinery and benches must be cleaned after use.
10. The workshop must be cleaned after each course.
11. The bending machine may only be used by authorized personnel.
12. No aluminum or non-ferrous material is allowed on the grinders.
13. Suitcases, briefcases and towels are prohibited.
14. No one may circulate in the hangar unless authorized.
15. No visitors are allowed without authorization.

REQUIRED MATERIAL

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

MEDIAGRAPHY

SCHAFFER, J., Basic Helicopter Maintenance, Aviation Maintenance, Basin, WY, 1980, 459 p. Réf. : 629.1346S 296b.

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's parts.

Video : *Vibrations on Helicopters*

INSTITUTIONAL POLICIES AND REGULATIONS

All students enrolled at 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.

OTHER DEPARTMENTAL REGULATIONS

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

<http://ena.cegepmontpetit.ca/>

<http://guideena-en.cegepmontpetit.ca/department-rules/>

NOTE: This Course Outline is a translation of the *Plan de cours* for 280-634-EM: *Stage en maintenance d'hélicoptère*. If there is a discrepancy, then the original French version will be considered the official version for legal purposes.