

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 Website
Caron, Stéphane	C-182	4687	stephane.caron@cegepmontpetit.ca

OFFICE HOURS FOR STUDENTS

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Morning					
Afternoon					

Coordinator(s)	Office	☎ Extension	✉ Email or Website
Charrette, Dany	B-125	4661	dany.charrette@cegepmontpetit.ca
Guimont, Louis	B-125	4703	louis.guimont@cegepmontpetit.ca

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. The *Internship 1 helicopter* course 280-5C3-EM is a pre requisite for this course and is also a co-requisite with *Internship on Airplane Maintenance*, 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.

Transports 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 (280.03) and Avionics (280.04) 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 ».

COMPETENCIES OF THE EXIT PROFILE (STUDENT SKILL PROFILES)

Carry on aircraft maintenance.

MINISTRY OBJECTIVE(S) AND COMPETENCIES

026F Perform activities related to helicopter maintenance.

TERMINAL OBJECTIVE OF THE COURSE (FINAL COURSE OBJECTIVE)

By the end of this course, students will be able to:

- gather necessary information.
- Plan all the work.
- proceed with the maintenance activities.
- Store Equipment and Clean Up the Workplace.

TEACHING AND LEARNING STRATEGIES

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 Evaluate 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

<u>Week</u>			<u>Activities</u>	
1	Introduction/Maintenance manual research		FORMATIVE	
2	Tail rotor driveshaft damper inspection		300 CAL	1
3	Troubleshooting		IN CLASS	2
4	Electrical failure research exercise	R44 MIX	500 GNY	3
5	Swashplate removal/installation		206B JPL	4
6	Landing gear configuration change		206B UXA	5
7	Engine control rigging		350 IAQ	6
8	Acceptance check		R44 MIX	7
9	Main rotor head removal/installation		350 IAQ	8
10	Free wheeling unit		206B JPL	9
11	Servo actuators		206B JPL	10
12	Weight and balance	IN CLASS/206B UXA		
13	Vibration analysis		FORMATIVE	
14	On ground and in flight vibration analysis		FORMATIVE	
15	Blade manipulation and inspection		FORMATIVE	

SYNTHESIS OF SUMMATIVE EVALUATION METHODS

Activity Evaluation Description	Learning context and method of evaluation	Learning Objective(s)	Evaluation Criterias	Due Date (assignment or exam)	Weighting (%)
Participation to 10 of the listed activities.	Work will be performed in teams of 2, while evaluation will be individually.	All	See Appendix	Between Weeks 2 and 15	10% per activity for a total of 100%

TOTAL : 100%

REQUIRED MATERIAL

Course notes

MEDIAGRAPHY

SCHAFER, 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 manual and item parts catalogue manual.

Vidéo : Helicopter vibration.

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

Homework required by the teacher must be handed in at the established date, place and time. The penalties associated with delays are established according to departmental rules (PIEA, article 5.2.5.2).

In case of delay the penalties are:

- See section « Règles des départements » at the following website link:

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

(4) Presentation of Written Work

The student must meet the "Written Work Standard Presentation" adopted by the CEGEP. Non-compliance with these standards may delay the acceptance of work or affect the rating granted. These standards are available in **Flash Links, Bibliothèques** under "**Méthodologie**" of the CEGEP Documentation Centers at: www.cegepmontpetit.ca/normes.

The **departmental penalties** for non-compliance with Written Work Standard Presentation (PIEA, article 5.3.2) are:

- See section « Règles des départements » at the following link:

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

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.

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 in the École nationale d'aérotechnique of Édouard-Montpetit CEGEP must be aware of and comply with the contents of institutional policies and regulations. In particular, the *Politique institutionnelle de la langue française (PILF)*, the *Politique pour un milieu d'études et de travail exempt de harcèlement et de violence (PPMÉTEHV)*, the *conditions of admission and academic progress*, the *procedure dealing with student complaints within educational relations*.

The complete version of these policies and regulations is available on the CEGEP website at the following address: <http://www.cegepmontpetit.ca/ena/a-propos-de-l-ecole/reglements-et-politiques>. In case of discrepancy between the version appearing elsewhere and the complete version, the complete version will be applied and will be considered the official version for legal purposes.

Appendix

Task evaluation (Competencies)				
	Excellent	Good	Acceptable	Inadequate
Retrieving information	3 All information was found easily within the first 15 minutes of the course.	2 All information was found within the first 15 minutes of the course.	1 With assistance, the information was found within the first 15 minutes of the course.	0 Couldn't find the information or found after the first 15 minutes of the course.
Following the procedure	3 All steps followed adequately.	2 Most steps followed.	1 Some steps were missed or mixed.	0 The procedure wasn't followed and compromised the integrity of the aircraft.
Task achievement	3 The task was done on time and hardware secured iaw standards.	2 Task done on time but hardware wasn't secured properly.	1 Task done on time but hardware wasn't secured	0 Task not completed.
Tools and equipments	3 Tools and equipment were used adequately.	2 During the task, improper tools were used.	1 During the task, some tools or equipments were used inadequately.	0 The task was stopped due to inadequate use of tools and equipment.
Safety	3 The task was achieved safely.	2 The task was done but some NOTES, WARNING and CAUTIONS were missed.	1 The task was done and most NOTES, WARNINGS and CAUTIONS were missed.	0 The task was stopped due to possibilities of injuries. <i>(not wearing safety glasses)</i> .
Individual involvement	3 The student was involved in all facets of the task	2 The student was involved in some facets of the task.	1 Most of the tasks were carried out by his colleagues.	0 Absent or useless to his team.
Clean up	2 Area and aircraft cleaned. Equipment put away.	1 Area and aircraft not cleaned or equipment wasn't put away		0 Area and aircraft not cleaned and equipment wasn't put away
Total	/20			/10