



## Course outline

COURSE : **Internship on Helicopter Maintenance**

PROGRAM : 280.C0 Aircraft Maintenance



DISCIPLINE : 280 Aeronautics

WEIGHTING : Theory : 0 Practice : 4 Personal Study : 1

Teacher(s)	Office	 extension	 e-mail ou website
Stéphane Caron	B-122	4687	<a href="mailto:stephane.caron@cegepmontpetit.ca">stephane.caron@cegepmontpetit.ca</a>

### Office hours

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Morning					
Afternoon					
Other					

Coordinator(s)	Office	 extension	 e-mail
Paul-Anthony Ashby	C-160	4691	<a href="mailto:stephanie.arpin@cegepmontpetit.ca">stephanie.arpin@cegepmontpetit.ca</a>
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## 1 CONTEXT OF THIS COURSE WITHIN 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.

**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) according to Transport Canada requirements. The application of Transport Canada policies regarding absences is available on the [Ma réussite à l'ÉNA](#) website under the heading « Privilèges accordés par Transports Canada ».

## 2 COMPETENCIES OF THE EXIT PROFILE (STUDENT SKILL PROFILES)

- Carry on aircraft maintenance.

## 3 MINISTERIAL OBJECTIVE(S) AND COMPETENCIES

026F Perform activities related to helicopter maintenance.

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

- Carry out a maintenance activity according to applicable airworthiness standards.

## 5 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 prepare them self by going through technical questions related to their activity prior performing their internship while assuring proper operation and safety procedures.

## 6 COURSE PLAN

### LEARNING OBJECTIVES

<b>Demonstrate mastery of the work process related to maintenance activities:</b>	<b>Weeks</b>
<b>1.</b> Use the appropriate documentation for the different activities.	<b>All</b>
<b>2.</b> Plan and carry out the various activities in an efficient and coordinated way, respecting the health and safety rules.	<b>3 to 15</b>
<b>3.</b> Check out unserviceable components and correct any anomalies.	<b>5, 9,10,11 and 12</b>
<b>4.</b> Change a configuration aircraft taking into account the weight and center of the aircraft.	<b>6 and 13</b>
<b>5.</b> Find and apply the appropriate regulations for the different activities.	<b>1 to 15</b>

<u>WEEKS</u>	<u>OBJECTIVE(S)</u>	<u>CONTENT</u>	<u>RESSOURCES</u>	<u>ACTIVITIES WEIGHING</u>
1	1,5	Introduction / maintenance manuals	Through LEA	Formatif
2	1,5	Troubleshooting	206/300/H120/H125	Formatif
3	1,2,5	Tail rotor drive shaft damper	300 CAL	/10
4	1,2,5	Electrical failure research exercise	R44 MIX	/10
5	1,2,3,5	Mast removal/ installation	206L BHT	/10
6	1,2,4,5	Landing gear configuration change	206B UXA	/5
7	1,2,5	Weight and balance	206B UXA	/5
8	1,2,5	Engine control rigging	H125 IAQ	/10
9	1,2,3,5	Acceptance check	R44 MIX	/10
10	1,2,3,5	Main rotor removal / installation	H125 IAQ	/10
11	1,2,3,5	Free wheeling unit	206B JLP	/10
12	1,2,3,5	Servo controls	206B JLP	/10
13	1,2,4,5	Configuration changes	BO-105 CFN	/10
14	1,2,5	Blade manipulation and inspection	206/412/H125	Formatif
15	1,2,5	<i>On ground and in-flight vibration analysis</i>	H120 LSP	Formatif

Please note that the teacher can at any time replace an activity with a free activity of his choice.

## 7 SYNTHESIS OF SUMMATIVE EVALUATION METHODS

Description of Evaluation Activity	Context	Learning objective(s)	Evaluation Criteria <sup>1</sup>	Due Date (approximate date assignment due or exam given)	Weighting (%)
Participation to 11 of the listed activities.	Work will be performed in teams of 2, while evaluation will be individually.	All	See Appendix	Between Weeks 3 and 13 inclusively	11 activities will be evaluated (10% per activity except weight and balance and landing gear configuration at 5% each for a total of 100%)
				<b>TOTAL</b>	<b>100 %</b>

## 8 REQUIRED MATERIAL

– None

## 9 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.

<sup>1</sup> Issus du programme d'études (critères de performance) et adaptés au niveau des étudiants (exigences évolutives) d'une session à l'autre. Les critères d'évaluation doivent être explicites et permettre l'observation des résultats (processus, produits, propos).  
Les critères d'évaluation seront présentés par écrit aux étudiants au moins une semaine avant l'activité d'évaluation sommative (article 5.1j PIEA)

## 10 REQUIREMENTS TO PASS THE COURSE

### 1. Passing Mark

The passing mark for this course is 60% by adding the marks for the theory and practical work for the course.

### 2. Attendance for Summative Evaluations

Students must be present for summative evaluations and must comply with the instructions given by the instructor to carry out the evaluation activity and written in the course outline. Unexcused tardiness for a summative evaluation could result in being excluded from the activity. Any absence from a summative evaluation that is not due to serious reasons (illness, death in the family, etc.) could result in a mark of zero (0) for the activity.

Students are responsible for meeting with the instructor before an evaluation activity is held or immediately upon returning to ENA to explain the reason for an absence. Proper documentation, such as a medical certificate, a death certificate, legal papers, etc., must be shown if the reason for absence is serious and recognized as such by the instructor(s), arrangements will be made between the instructor(s) and the student to make up the activity.

### 3. Submitting Assignments

All assignments must be submitted by the date, hour and location designated by the instructor(s). Late assignments will be penalized 10% per day that they are late and will receive a mark of zero (0) after 6 days.

### 4. Presentation of Written Work

The instructor(s) will provide students with information and guidelines regarding the presentation of written work. When the presentation of an assignment is unacceptable, the work will be penalized as a late assignment until an acceptable version is submitted. In this case, the penalties for late work will be applied (Late assignments will be penalized 10% per day that they are late and will receive a mark of zero (0) after 6 days).

Students must follow the standards adopted by the Cégep for written work (« *Normes de présentation matérielle des travaux écrits* »). These can be found at : <http://rmsh.cegepmontpetit.ca/normes-de-presentation-materielle-des-travaux-ecrits-du-cegep/>.

## 11 METHODS OF COURSE PARTICIPATION

### SECURITY MEASURES IN THE HANGARS

1. Access to the hangar is forbidden to students without ÉNA's recommended clothings. (Polo and pants highly recommended).
2. Prohibition of sitting on workbenches or aircraft.
3. Safety shoes are mandatory at all times. (Sandals prohibited)
4. Safety glasses mandatory for working on aircraft.
5. Clean aircraft and workbenches after use.
6. Clean the location of your aircraft after each lesson.
7. Cell "PROHIBITED" in the hangar.
8. Movement in the hangar prohibited to unauthorized persons.
9. No visitors without permission.
10. Strictly forbidden to use the overhead crane.

## 12 OTHER DEPARTMENTAL REGULATIONS

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

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

<https://mareussite.cegepmontpetit.ca/ena/mon-parcours/mon-programme/regles-departementales>

### **13 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* (PIEA), la *Politique institutionnelle de la langue française* (PILF), la *Politique pour un milieu d'études et de travail exempt de harcèlement et de violence* (PPMÉTEHV), les *Conditions d'admission et cheminement scolaire*, la *Procédure concernant le traitement des plaintes étudiantes dans le cadre des relations pédagogiques*.

The full text of these policies and regulations is accessible on the Cégep web site at the following address: <http://www.cegepmontpetit.ca/ena/a-propos-de-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.

### **14 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".

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.

## 15 ANNEX A

<b>Competencies Clarification</b>						
<b><u>Retrieving information</u></b> Proper technical manual. Precision. Time. With or without assistance	<b><u>Following procedures</u></b> Precise application. Using proper software. Chronology. Understanding and correct interpretation. Compliance with standards and specifications.	<b><u>Task achievement</u></b> Rigorous judgment of work priorities and judicious choice of operations to be executed. Precise execution. Troubleshooting. Work quality	<b><u>Tools and equipments</u></b> Proper equipment planning and work area. Proper tools used	<b><u>Safety</u></b> Safety glasses -1 Safety shoes -1 Workdress -1 Task accomplishment -4	<b><u>Individual involvement</u></b> Helpfull for his teammate. Involve in technical research and all technical task steps. Involve in the set up and clean up.	<b><u>Clean up</u></b> Work area. Aircraft. Toolbox. POL stowed properly

<b>Task evaluation (Competencies)</b>				
	<b>Excellent</b>	<b>Good</b>	<b>Acceptable</b>	<b>Inadequate</b>
<b>Retrieving information</b>	<b>3</b> All information was found easily within the first 15 minutes of the course.	<b>2</b> All information was found within the first 15 minutes of the course.	<b>1</b> With assistance, the information was found within the first 15 minutes of the course.	<b>0</b> Couldn't find the information or found after the first 15 minutes of the course.
<b>Following the procedure</b>	<b>3</b> All steps followed adequately.	<b>2</b> Most steps followed.	<b>1</b> Some steps were missed or mixed.	<b>50% of total.</b> A major mistake was done and the integrity of the aircraft was compromised.
<b>Task achievement</b>	<b>3</b> The task was done on time and hardware secured iaw standards.	<b>2</b> Task done on time but hardware wasn't secured properly.	<b>1</b> Task done on time but hardware wasn't secured	<b>0</b> Task not completed.
<b>Tools and equipments</b>	<b>3</b> Tools and equipment were used adequately.	<b>2</b> During the task, improper tools were used.	<b>1</b> During the task, some tools or equipments were used inadequately.	<b>50 % of total.</b> The task was stopped due to inadequate use of tools and equipment. Serious possible injury.
<b>Safety</b>	<b>3</b> The task was achieved safely.	<b>2</b> The task was done but some NOTES, WARNING and CAUTIONS were missed.	<b>1</b> The task was done and most NOTES, WARNINGS and CAUTIONS were missed.	<b>0</b> The task was stopped due to possibilities of injuries. ( <i>not wearing safety glasses</i> ).
<b>Individual involvement</b>	<b>3</b> The student was involved in all facets of the task.	<b>2</b> The student was involved in some facets of the task.	<b>1</b> Most of the tasks were carried out by his colleagues.	<b>0</b> Absent or useless to his team.
<b>Clean up</b>	<b>2</b> Area and aircraft cleaned. Equipment put away.		<b>1</b> Area and aircraft not cleaned or equipment wasn't put away	<b>0</b> Area and aircraft not cleaned and equipment wasn't put away
<b>Total</b>	/20		/10	

## Annex B

<b>Competencies Clarification</b>						
<b><u>Retrieving information</u></b> Proper technical manual. Precision. Time. With or without assistance	<b><u>Following procedures</u></b> Precise application. Using proper software. Chronology. Understanding and correct interpretation. Compliance with standards and specifications.	<b><u>Task achievement</u></b> Rigorous judgment of work priorities and judicious choice of operations to be executed. Precise execution. Troubleshooting. Work quality	<b><u>Tools and equipments</u></b> Proper equipment planning and work area. Proper tools used	<b><u>Safety</u></b> Safety glasses -1 Safety shoes -1 Workdress -1 Task accomplishment -4	<b><u>Individual involvement</u></b> Helpfull for his teammate. Involve in technical research and all technical task steps. Involve in the set up and clean up.	<b><u>Clean up</u></b> Work area. Aircraft. Toolbox. POL stowed properly



<b>Team :</b>	<b>Internship 280-6B4</b>					<b>Group :</b>	<b>Marks</b>
<b>Tail rotor drive shaft damper 300CAL</b>						Comments:	/10
<u>Information</u>	<u>Procedure</u>	<u>Task Achievement</u>	<u>tools/equip.</u>	<u>Indi. Involve.</u>	<u>Clean up</u>		/10
/1	/3	/3	/1	/1	/1		
<b>Electrical failure and research exercise</b>						Comments:	/10
<u>Information</u>	<u>Procedure</u>	<u>Task Achievement</u>	<u>tools/equip.</u>	<u>Indi. Involve.</u>	<u>Clean up</u>		/10
/1	/3	/3	/1	/1	/1		
<b>Mast removal /installation 206L BHT</b>						Comments:	/10
<u>Information</u>	<u>Procedure</u>	<u>Task Achievement</u>	<u>tools/equip.</u>	<u>Indi. Involve.</u>	<u>Clean up</u>		/10
/1	/3	/3	/1	/1	/1		
<b>Landing gear configuration change 206B UXA</b>						Comments:	/5
<u>Information</u>	<u>Procedure</u>	<u>Task Achievement</u>	<u>tools/equip.</u>	<u>Indi. Involve.</u>	<u>Clean up</u>		/5
/1	/3	/3	/1	/1	/1		
<b>Weight and balance 206B UXA</b>						Comments:	/5
<u>Information</u>	<u>Procedure</u>	<u>Task Achievement</u>	<u>tools/equip.</u>	<u>Indi. Involve.</u>	<u>Clean up</u>		/5
/1	/3	/3	/1	/1	/1		
<b>Engine control rigging H125 IAQ</b>						Comments:	/10
<u>Information</u>	<u>Procedure</u>	<u>Task Achievement</u>	<u>tools/equip.</u>	<u>Indi. Involve.</u>	<u>Clean up</u>		/10
/1	/3	/3	/1	/1	/1		
<b>Acceptance check R44 MIX</b>						Comments:	/10
<u>Information</u>	<u>Procedure</u>	<u>Task Achievement</u>	<u>tools/equip.</u>	<u>Indi. Involve.</u>	<u>Clean up</u>		/10
/1	/3	/3	/1	/1	/1		
<b>Main rotor removal / installation H125 IAQ</b>						Comments:	/10
<u>Information</u>	<u>Procedure</u>	<u>Task Achievement</u>	<u>tools/equip.</u>	<u>Indi. Involve.</u>	<u>Clean up</u>		/10
/1	/3	/3	/1	/1	/1		
<b>Free wheeling unit 206B JPL</b>						Comments:	/10
<u>Information</u>	<u>Procedure</u>	<u>Task Achievement</u>	<u>tools/equip.</u>	<u>Indi. Involve.</u>	<u>Clean up</u>		/10
/1	/3	/3	/1	/1	/1		
<b>Servo control 206B JPL</b>						Comments:	/10
<u>Information</u>	<u>Procedure</u>	<u>Task Achievement</u>	<u>tools/equip.</u>	<u>Indi. Involve.</u>	<u>Clean up</u>		/10
/1	/3	/3	/1	/1	/1		
<b>Conficuration change BO-105 CFN</b>						Comments:	/10
<u>Information</u>	<u>Procedure</u>	<u>Task Achievement</u>	<u>tools/equip.</u>	<u>Indi. Involve.</u>	<u>Clean up</u>		/10
/1	/3	/3	/1	/1	/1		