

## Course outline

<b>COURSE:</b>	<b>Inspection and Minor Repairs of Aircraft</b>		
<b>PROGRAM:</b>	280.C0 Aircraft Maintenance		
<b>DISCIPLINE:</b>	280 Aeronautics		
<b>WEIGHTING:</b>	Theory: 2	Practical work: 3	Personal study: 2

Instructor(s)	Office	☎ Extension	✉ E-mail or web site
Mora, Joaquin	C-186	4220	<a href="mailto:joaquin.mora@cegepmontpetit.ca">joaquin.mora@cegepmontpetit.ca</a>
Boudreau, Paul	B-124	4329	<a href="mailto:paul.boudreau@cegepmontpetit.ca">paul.boudreau@cegepmontpetit.ca</a>

### OFFICE HOURS

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Morning					
Afternoon					

Coordinator(s)	Office	☎ Extension	✉ Email or Website
Goudreault, Éric	C- 160	4691	<a href="mailto:eric.goudreault@cegepmontpetit.ca">eric.goudreault@cegepmontpetit.ca</a>
Arpin, Stéphanie	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 offered during the second session of the program.

By the end of the course, students will have developed:

- dexterity with tools and equipment;
- research skills using technical manuals;
- familiarity with materials and hardware;
- ability to make minor repairs;
- ability to install and remove solid rivets.

**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 standards, 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 ».

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

Maintain aircraft structures

## **MINISTERIAL OBJECTIVE(S) AND COMPETENCIES**

- 025X** To clean, inspect and protect aircraft materials.  
**025Z** To prepare and assemble sheet metal.

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

Upon completion of this course, the student will be able to maintain aircraft structures to manufacturer standards.

## **TEACHING AND LEARNING STRATEGIES**

### Theory

The theoretical part of the course Inspection and Minor Repairs is organized into four themes:

- minor repairs and riveting.
- use of technical manuals;
- inspection and classification of damage;
- prevention and elimination of corrosion;

Exercises and discussions via Teams will be used as a strategy to allow students to develop the necessary skills to service an aircraft. Research assignments in technical manuals and the use of multimedia tools will reinforce the learning process.

**Course Outline 280-5A5-EM: Maintenance of Aircraft Flight Controls and Control Surfaces**  
Practical work

During the laboratory periods, the instructor will guide students with practical demonstrations of different tools and measuring instruments. Students will acquire manual dexterity and the competence necessary to be aircraft maintenance technicians through a variety of practical exercises that involve evaluating damage, treating corrosion and other observed defects. The different minor repair projects during the session, will be assembled by riveting according to aeronautical standards. All activities will comply with the health and safety procedures applicable to the aeronautical industry.

**LEARNING OBJECTIVES**

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| <ol style="list-style-type: none"> <li>1. Become familiar with objectives and requirements.</li> <li>2. Select the techniques, tools and equipment.</li> <li>3. Shape and assemble sheet metal parts by riveting.</li> <li>4. Verify the quality of the work done.</li> <li>5. Tidy and clean the work area</li> </ol> |
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Calendar WEEK	# OBJECTIVE	CONTENT	MODE OF INSTRUCTION AND LEARNING ACTIVITIES	TECHNOLOGICAL TOOLS AND RESOURCES (URL address)
1 to 3	1, 2, 3, 4.	<b>THEME: Rivets</b> - Types of rivets - Solid rivets - Blind rivets - Special rivets  Rivet selection Layout and spacing of rivets Drilling of sheet metal. Hole preparation for flush head rivets. Assembly of sheet metal parts. Rivet installation tools Rivet installation procedure Rivet inspection Rivet removal procedure	YouTube video presentation with "Fill the blanks" on your study document available on LÉA.  Questions and group discussion period on Teams on the second hour of the scheduled theory course.  <b>(Mandatory for attendance record)</b>	YouTube link posted on LÉA
4		<b>THEME: Technical documentation and aeronautical materials</b>  ATA classification standards. Manufacturer's maintenance manual. - SRM - IPC - WM - MM  AC43-13 and AC 43-4A Work card (Snag Sheet) Logbook  Aluminum, plastics,		
5		<b>THEME: Identification, prevention and elimination of corrosion</b>  - Forms of corrosion - Contributing factors of corrosion		

**Course Outline 280-5A5-EM: Maintenance of Aircraft Flight Controls and Control Surfaces**

6*		Exam 1	<p>In attendance, during common exam week after week 5.</p> <p><b>NOTE: There will be no class on week 6 of calendar. Classes will resume on week 7</b></p>	N/A
7 and 8	1, 2, 3, 4.	<p><b>THEME: Forms of Corrosion</b></p> <ul style="list-style-type: none"> <li>- Surface corrosion</li> <li>- Pitting</li> <li>- Galvanic corrosion</li> <li>- Intergranular corrosion</li> <li>- Exfoliation</li> <li>- Concentration cell</li> <li>- Filiform corrosion</li> <li>- Microbial corrosion</li> </ul> <p><b>THEME: Propitious areas for corrosion</b></p> <ul style="list-style-type: none"> <li>- Engines</li> <li>- Fuselage</li> <li>- Structure</li> </ul> <p><b>THEME: Corrosion specific to helicopters</b></p> <p><b>THEME: Protection against corrosion</b></p>	<p>YouTube video presentation with "Fill the blanks" on your study document available on LÉA.</p> <p>Questions and group discussion period on Teams on the second hour of the scheduled theory course.</p> <p><b>(Mandatory for attendance record)</b></p>	YouTube link posted on LÉA
9		<ul style="list-style-type: none"> <li>- Material selection</li> <li>- Shape of parts and assemblies</li> <li>- Metallic coatings</li> <li>- Organic coatings</li> <li>- Chemical protection</li> </ul>		
10		<p><b>THEME: Inspection and clarification of damage</b></p>		
11 and 12		<p><b>THEME: Damage repair</b></p> <ul style="list-style-type: none"> <li>- Typical vs Specific repair</li> </ul> <p><b>THEME: Inspection methods</b></p> <ul style="list-style-type: none"> <li>- Visual</li> <li>- Sound inspection</li> <li>- LPI</li> <li>- Ultrasonic</li> <li>- Thermography</li> <li>- Eddy current</li> <li>- X ray</li> <li>- MPI</li> </ul>		
13		<p><b>THEME: Structure design</b></p> <ul style="list-style-type: none"> <li>- Fail Safe</li> <li>- Damage tolerance</li> <li>- Safe Life</li> </ul>		
14		Exam 2	<p>In attendance, during common exam week after week 13.</p>	N/A

**COURSE PLAN – LABORATORY**

**025X** To clean, inspect and protect aircraft materials.

**025Z** To prepare and assemble sheet metal.

Week 1	<ul style="list-style-type: none"> <li>• Course Outline</li> <li>• Hangar photos activity</li> </ul>
Week 2-3-4	<ul style="list-style-type: none"> <li>• Riveting practice                             <ul style="list-style-type: none"> <li>- Tracing (layout)</li> <li>- Riveting</li> <li>- Rivet removal</li> <li>- Dimpling</li> <li>- Countersinking</li> <li>- Sealant application</li> </ul> </li> </ul>
<b>Week 5</b>	<b>Exam 1</b>
Week 6	<ul style="list-style-type: none"> <li>• Visual inspection of the interior structure (by opening of the access Panels and using flashlight, mirror, boroscope, camera, etc.)</li> <li>• Locating damages on the Challenger 601</li> <li>• Classification (identification) of damage on trim tab CL415</li> </ul>
Week 7	<ul style="list-style-type: none"> <li>• Locating and classifying damages on the Q400 fuselage</li> <li>• Minor repairs (dent, crack, scratch)</li> </ul>
Week 8	<ul style="list-style-type: none"> <li>• Removal of corrosion                             <ul style="list-style-type: none"> <li>- Identification and localization of corrosion</li> <li>- Technical research</li> <li>- Corrosion removal (manual and mechanical)</li> </ul> </li> </ul>
Week 9	<ul style="list-style-type: none"> <li>• Visual inspection by drone</li> <li>• Chemical removal of corrosion</li> </ul>
<b>Week 10</b>	<b>Exam 2</b>
Week 11	<ul style="list-style-type: none"> <li>• Parts cleaning</li> <li>• Using "Micromesh"</li> </ul>
Week 12	<ul style="list-style-type: none"> <li>• NDT demo (LPI, MPI, Thermography)</li> </ul>
Week 13	<ul style="list-style-type: none"> <li>• Airplane washing                             <ul style="list-style-type: none"> <li>- Dry cleaning</li> <li>- Wet cleaning</li> </ul> </li> </ul>
<b>Week 14-15</b>	<b>Final exam</b>

**SYNTHESIS OF SUMMATIVE EVALUATIONS**

**Theory**

Description of evaluation activity	Context	Learning objective(s)	Evaluation criteria	Due date	Weighting (%)
<b>Exam 1</b> Written exam	Individual In attendance (Multiple choice and short answer)	Competence 025Z	Selection of correct answer (multiple choice questions) Relevance of the explanations (short answer questions)	In attendance, during common exam week after week 5 (Date to be advised)	15%
<b>Exam 2</b> Written exam	Individual In attendance (Multiple choice and short answer)	Competence 025X	Selection of correct answer (multiple choice questions) Relevance of the explanations (short answer questions)	In attendance, during common exam week after week 13 (Date to be advised)	25%

**Sub-total: 40%**

**Laboratory**

Description of evaluation activity	Context	Learning objective(s)	Evaluation criteria	Due date	Weighting (%)
<b>Exam 1</b> Riveting	Individual Practical exam In attendance	Competence 025Z	Meeting of standards Precision of operations	Week 5	15%
<b>Exam 2</b> Classification of Damage and Minor Repairs Q400	Individual Practical exam In attendance	Competence 025X	Meeting of standards Quality of work	Week 10	15%
<b>Exam 3 (Final)</b> Comprehensive examination Minor inspection and repair.	Individual Practical exam In attendance With technical documentation	Competence 025X	Proper consultation of manuals Proper choice of tools Meeting of standards Precision of operations	Week 15	30%

**Sub-total: 60%**

**TOTAL: 100%**

**REQUIRED MATERIAL**

In the lab, safety glasses, safety boots/shoes and overalls (or approved ÉNA work clothes) are mandatory.

**MEDIAGRAPHY**

**CORROSION CONTROL FOR AIRCRAFT**, AC 43-4A, Department of Transportation. Federal Aviation Administration. Washington D.C., U.S. Government Printing Office, 1991, 224 pages.

**AIRCRAFT STRUCTURAL TECHNICIAN**, Dale Hurst, AVOTEK, T-AST-1, Harrisburg VA. 2001,272 pages, chapitres 5 et 9.

## *Course Outline 280-5A5-EM: Maintenance of Aircraft Flight Controls and Control Surfaces*

**A & P TECHNICIAN AIRFRAME TEXTBOOK**, Jeppesen, JS312692, Englewood, Colorado, 2003, 876 pages, chapitres 2, 3, 6 et 8.

**A & P TECHNICIAN GENERAL TEXTBOOK**, Jeppesen, JS312690, Englewood, Colorado, 2003, 568 pages, chapitres 11 et 12.

**A & P TECHNICIAN GENERAL TEXTBOOK** and **A & P TECHNICIAN AIRFRAME TEXTBOOK** are recommended for the Inspection and minor repairs (280-2B5).

### **REQUIREMENTS TO PASS THE COURSE**

#### **(1) Passing Mark**

The passing mark for this course is 60%.

#### **(2) Attendance for Summative Evaluations**

Students must be present for summative evaluations.

#### **(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 one week.

#### **(4) Presentation of Written Work**

Students must follow the standards adopted by the College for written work (« *Normes de présentation matérielle des travaux écrits* »). These can be found in the documentation center on the College web site <http://www.cegepmontpetit.ca/biblio> under the heading « **Aide** ».

### **METHODS OF COURSE PARTICIPATION**

#### **SAFETY REGULATIONS FOR WORKSHOP PERSONNEL**

1. Running is prohibited.
2. Loose clothing and hair must be pulled back, tightened or tucked in when using rotational equipment (e.g. ties, sleeves, long hair).
3. Hand tools and workshop equipment are to be used only after a demonstration.
4. No work may be done in the workshop without the supervision of an instructor.
5. Small metal parts to be drilled (manually or with a drill press) must be held in place with clamps.
6. All dangerous products must be used in an appropriate and well ventilated room (paint room).
7. Sitting on the workbenches or machines is prohibited.
8. Visual and auditory instructions in case of a fire must be followed by everyone.
9. Any accident must be reported to authorized staff; the guard must be notified if first aid is not sufficient.

#### **SAFETY REGULATIONS FOR WORKSHOP EQUIPMENT**

1. Clean the workshop after each course (tables, workbenches, floor, etc.).
2. Clean workshop equipment after each use (drill press, sandblaster, grinder, etc.).
3. No aluminum material or non-ferrous material may be used on the grinders.
4. Respect directives regarding materials when using the band saw.
5. Return all workshop equipment to its appropriate place after use.

### ***Course Outline 280-5A5-EM: Maintenance of Aircraft Flight Controls and Control Surfaces***

6. Report any defective or damaged equipment or tools.
7. Correctly maintain the classification of rivets or bolts.

#### **FOR ONLINE CLASSES:**

By attending online classes through videoconference technology, the student understands that his image and voice may be captured on video in the context of his courses and agrees to this. Videos are only visible during live classes and by the teacher and other participants exclusively.

For pedagogical reasons, some courses may be recorded. It is the teacher's responsibility to clearly inform students beforehand when their images and voices are to be captured on video. Any student opposed to his image and/or voice being recorded may turn off his camera and microphone but will be required to participate in writing through means established by the teacher. Otherwise, students who activate their cameras or their microphones are deemed to have agreed to their images and voices being taped. These recordings of courses will be available for the express and sole use of those students registered in the courses for the duration of the semester. It is strictly forbidden to broadcast these recordings in any public manner or to use them other than for pedagogical purposes.

No student may record an online course without prior consent from the teacher. Students whose personal information (voices and images) is captured on video may exercise such remedies as provided by the right to access records and the right of rectification per the Act respecting access to documents held by public bodies and the protection of personal information through the Cegep's Secretary General's Office.

#### **OTHER DEPARTMENTAL REGULATIONS**

Students are encouraged to consult the website for specific regulations related to this course:  
<http://ena.cegepmontpetit.ca/>  
<http://ena.cegepmontpetit.ca/etudiants-actuels/programmes-d-etudes/departements-d-enseignement#a2>

#### **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 particulières concernant le maintien de l'admission d'un étudiant, la Politique de 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 College web site at the following address: <http://www.cegepmontpetit.ca/campus-de-longueuil/le-college/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 « [servicesadaptesen@cegepmontpetit.ca](mailto:servicesadaptesen@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.