

Course outline

COURSE : **Shaping, Assembly and Installation Techniques**

PROGRAM : 280.C0 Aircraft Maintenance

DISCIPLINE : 280 Aeronautics

WEIGHTING : Theory : 2 Practice : 3 Personal Study : 1

Teacher(s)	Office	☎ extension	✉ e-mail ou website
Paul Boudreau	B-124	4329	paul.boudreau@ena.ca

Office hours

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Morning					
Afternoon					
Other					

Coordinator(s)	Office	☎ extension	✉ e-mail
Goudreault, Éric	C-160		eric.goudreault@ena.ca
Arpin, Stéphanie	C-160		stephanie.arpin@ena.ca

1 CONTEXT OF THIS COURSE WITHIN THE PROGRAM

This course is given during the first semester of the program.

By the end of this course, the student will have developed:

- dexterity with tools
- research skills using technical manuals
- familiarity with materials and hardware;
- the capacity to fabricate different parts that will be assembled using appropriate tools and hardware.

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 SKILLS PROFILES)

To master the aeronautic maintenance work techniques.

3 MINISTERIAL OBJECTIVE(S) AND COMPETENCIES

025Q To use shaping, assembly and installation techniques.

4 TERMINAL OBJECTIVE OF THE COURSE (FINAL COURSE OBJECTIVE)

- To shape aluminum with precision.
- Repairing a fluid line in order to install a hydraulic component on an aircraft.

5 TEACHING AND LEARNING STRATEGIES

- Lecture with or without audio-visual support
- Demonstration in lab class
- Hands-on work
- Functional test

6 COURSE PLAN

LEARNING OBJECTIVES

1. Know the goals and needs.
2. Choose the appropriate techniques, tools and equipment.
3. Shaping and assembling aeronautical components
4. Fabricate and install piping
5. Check the quality of the work
6. Tidy up and clean the workplace

Theory

WEEK	LEARNING OBJECTIVE	CONTENT	PERSONAL STUDIES ACTIVITIES
1	2	<ul style="list-style-type: none"> – Identify and describe measuring tools – Describe Imperial Unit System 	<ul style="list-style-type: none"> – Lecture in class – Exercise on vernier
2	2	<ul style="list-style-type: none"> – Identify and describe manual and workshop tools – Identify and describe drilling tools 	<ul style="list-style-type: none"> – Lecture in class
3	6	<ul style="list-style-type: none"> – Identify and describe risks associated with air tools – Describe the WHMIS system 	<ul style="list-style-type: none"> – Lecture in class
4	1,2,3,5	<ul style="list-style-type: none"> – Describe cutting tools. – Threads repair methods 	<ul style="list-style-type: none"> – Lecture in class
5	3	<ul style="list-style-type: none"> – Identify and describe aerospace hardware 	<ul style="list-style-type: none"> – Lecture in class – Demonstration
6	3	<ul style="list-style-type: none"> – Identify and describe aerospace hardware 	<ul style="list-style-type: none"> – Lecture in class – Exercise
7	1,2,3,4,5,6	<ul style="list-style-type: none"> – Exam #1 	
8	2	<ul style="list-style-type: none"> – Assembling methods 	<ul style="list-style-type: none"> – Lecture in class
9	3	<ul style="list-style-type: none"> – Safetying methods 	<ul style="list-style-type: none"> – Lecture in class
10	3	<ul style="list-style-type: none"> – Bending metals – Sealant 	<ul style="list-style-type: none"> – Lecture in class – Demonstration
11	4	<ul style="list-style-type: none"> – Rigid and flexible hoses 	<ul style="list-style-type: none"> – Lecture in class
12	6	<ul style="list-style-type: none"> – Conference on safety at work 	<ul style="list-style-type: none"> – Conference room
13	2,3	<ul style="list-style-type: none"> – Describe alloys and heat treatments 	<ul style="list-style-type: none"> – Lecture in class
14	1,2,3,4,5,6	<ul style="list-style-type: none"> – revision 	<ul style="list-style-type: none"> – Exercise – Kahoot
15	1,2,3,4,5,6	<ul style="list-style-type: none"> – Final exam 	<ul style="list-style-type: none"> –

Laboratory

WEEK	LEARNING OBJECTIVE	CONTENT	PERSONAL STUDIES ACTIVITIES
1 and 2	1,2,3,5,6	– Firewall	– Practical – Demonstration
2 and 4		– Angle brackets	
5,6,7		– Manifold – Studs – Threads repair (helicoil)	
8,9,10		– Assembling – Torque	
11		– Metal bending	
12 and 13		– Safetying	
14	1,2,3,4,5,6	– Rigid and flexible hoses – Final exam part #1	– Practical – Demonstration Preparation
15	1,2,3,5,6	– Final exam part #2	– Practical

7 SYNTHESIS OF SUMMATIVE EVALUATION METHODS

Theory

Description of Evaluation Activity	Context	Learning objective(s)	Evaluation Criteria ¹	Due Date (approximate date assignment due or exam given)	Weighting (%)
Written exam with multiple choice and short answer questions.	In class, individually, without course notes	1,2,3,5,6	• Accuracy of answers	Week 7	20 %
Written exam with multiple choice and short answer questions.	In class, individually, without course notes	1,2,3,4,5,6	• Accuracy of answers	Week 15	20 %
				TOTAL for theory	40 %

Laboratory

Description of Evaluation Activity	Context	Learning objective(s)	Evaluation Criteria ²	Due Date (approximate date assignment due or exam given)	Weighting (%)
Firewall	In class, individually, with course notes	1,2,3,5,6	According to the correction grid given at the beginning of the project	Week 2	0% Formative
Angle bracket	In class, individually, with course notes	1,2,3,5,6	According to the correction grid given at the beginning of the project	Week 4	20 %
Modification	In class, individually, with course notes	1,2,3,5,6	According to the correction grid given at the beginning of the project	Weeks 14 and 15	40 %
				TOTAL for laboratory	60 %
				TOTAL course	100%

8 REQUIRED MATERIAL

- Safety glasses
- Steel-capped shoes
- Approved work clothing
- 0-6 inch mechanic ruler (optional)
- Sharpie pencil with ultra fine black tip

9 MEDIAGRAPHY

ÉTATS-UNIS, DEPARTMENT OF TRANSPORTATION. FEDERAL AVIATION ADMINISTRATION. Acceptable methods, techniques and practices; v.1: Aircraft inspection and repair, AC 43.13-1A, v. 2: Aircraft alterations, AC 43.13-2A, Washington, D.C. US Government Printing Office, 1977, 2 volumes.

CRANE, Dale. Aircraft hydraulic systems, Basin, Wyo., Aviation Maintenance Publishers, c 1975, 91 p.

FEMINIER, Didier. Cellules et systèmes d'aéronefs, Outremont, Modulo, c 1982, 315 p.

HURTS, Dale. Aircraft Structural Technician, 2002, Standard Aircraft Handbook, 5e édition.

LEAVELL, Stuart et Stanley BUNGAY. Standard aircraft handbook, 5d ed., édition Larry Reithmaier, Calif., Aero, 1991, 232 p.

MCNICKLE, L.S. L'hydraulique simplifiée, trad. par J. Faisan-dier, Paris, Dunod, c 1979, 215 p.

MERRILL, Samuel W. Fluid Power for Aircraft: Modern Hydraulic Technology, 3th ed., Peston, Ida., Intermountain Air Press, c 1974, 286 p.

SANDERSON, JEPPESON. A & P Technician General Textbook, Englewood, Co., 1996. *

SANDERSON, JEPPESON. A & P Technician Airframe Textbook, Englewood, Co., 1992.

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 one week.

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.

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-presentacion-materielle-des-travaux-ecrits-du-cegep/>.

11 OTHER DEPARTMENTAL REGULATIONS

In the laboratory, it is forbidden to bring food or drink.

For the hangars and laboratories of the A, B and D wings, wearing closed-toe shoes, safety glasses and the ÉNA overall or polo and pans set is mandatory.

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

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

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

12 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.

13 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".

<https://mareussite.cegepmontpetit.ca/ena/mes-ressources/soutien-aux-apprentissages/centre-de-services-adaptes/>.