

**COURSE OUTLINE**

**COURSE:** **Blueprint Reading for Aircraft Maintenance**

**PROGRAM:** 280.C0 Aircraft Maintenance

**DISCIPLINE :** 280 Aeronautics

**WEIGHTING:** Theory: 1 Practical Work: 2 Personal Study: 2

<b><u>Instructor(s)</u></b>	<b><u>Office</u></b>	<b><u>Extension</u></b>	<b><u>e-mail or web site</u></b>
Pierre-Luc Vachon	A-183	4488	<a href="mailto:pierre-luc.vachon@ena.ca">pierre-luc.vachon@ena.ca</a>

**OFFICE HOURS**

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Morning					
Afternoon					
Other					

Outside of the hours of availability, it is possible to contact the instructor by using MIO to make an appointment.

<b><u>Coordinator(s)</u></b>	<b><u>Office and phone extension</u></b>		<b><u>e-mail or web site</u></b>
Dominique Gonthier	A-183	4671	<a href="mailto:dominique.gonthier@ena.ca">dominique.gonthier@ena.ca</a>
Julien Mercier	A-183	4477	<a href="mailto:julien.mercier@ena.ca">julien.mercier@ena.ca</a>

## **CONTEXT OF THIS COURSE IN THE PROGRAM**

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

By the end of this course, the student will have developed the ability to sketch and interpret clear technical drawings as well as visual aids used in documentation.

**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 ».

## **COMPETENCE OF PORTRAIT OF GRADUATE**

Mastering aeronautical maintenance working techniques

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

**025P** Interpret schematics, detailed, assembly and installation drawings.

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

Interpret schematics, detailed, assembly and installation drawings.

## **TEACHING AND LEARNING STRATEGIES**

Using technical drawings of aircraft components, students will learn to interpret information presented in graphic and written form in order to eventually carry out work on aircraft.

Each week students will have a one-hour lecture class followed immediately by two hours of practice to reinforce learning. Most work will have a formative evaluation.

**COURSE PLAN** (course plan schedule can change)

**LEARNING OBJECTIVES**

1. Using a reference plane, locate and orient each component on an aircraft.
2. Interpret the nomenclature of assembly and installation drawings.
3. Interpret the geometry of parts or of a mechanism.
4. Identify blueprints, schematics and other documents required to carry out requested work.
5. Interpret the relations between views, cuts and sections of a technical drawing.
6. Distinguish categories of drawings, schematics and technical proposals.
7. Interpret information written on the drawing (title block, notes, revisions, tables, nomenclature).
8. Interpret specialized symbols.
9. Interpret information in a mechanical or electric schematic.
10. Locate interfaces of each component of a mechanism in order to represent its geometrical shape.
11. Interpret information in a detailed schematic.
12. Make sketches and detailed schematics.

All activities are at school

<b>WEEK</b>	<b># OBJ.</b>	<b>CONTENT</b>	<b>MODE OF INSTRUCTION AND LEARNING ACTIVITIES</b>	<b>TECHNOLOGICAL TOOLS AND RESOURCES (URL address)</b>
1 - 4	1 - 4	<ul style="list-style-type: none"> <li>▪ Aircraft reference plane systems.</li> <li>▪ Positioning and orienting components on an aircraft using blueprint information.</li> <li>▪ Using zones on design sheets.</li> <li>▪ Interpreting lists of assembly parts having several configurations.</li> <li>▪ Identifying interfaces of each component.</li> <li>▪ Locating the required parts on the drawing.</li> <li>▪ Interpreting cascade family tree diagrams.</li> <li>▪ Establishing connections between a cascade diagram, nomenclature, standard and manufactured components.</li> <li>▪ Developing spatial vision.</li> <li>▪ Obtaining precise information from blueprints.</li> <li>▪ Interpreting the geometry of parts that are machine-cut, shaped and made from composite materials.</li> <li>▪ Locating the elements to use from a family tree diagram of an aircraft.</li> <li>▪ Selecting appropriate documents for the task that needs to be done.</li> <li>▪ Interpreting pagination system using the ATA-100 standard.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Exercises in class (formative)</li> <li>▪ Homework and reports (summative)</li> </ul>	

<b>WEEK</b>	<b># OBJ.</b>	<b>CONTENT</b>	<b>MODE OF INSTRUCTION AND LEARNING ACTIVITIES</b>	<b>TECHNOLOGICAL TOOLS AND RESOURCES (URL address)</b>
5 - 7	5 - 6	<ul style="list-style-type: none"> <li>▪ Interpreting American orthogonal projections.</li> <li>▪ Interpreting connections between different views of a part.</li> <li>▪ Interpreting views of a cut, of sections and of enlarged views.</li> <li>▪ Interpreting legends related to types of lines.</li> <li>▪ Distinguishing between figurative drawings (isometric, exploded view), definition drawings and assembly and installation drawings.</li> <li>▪ Distinguishing between sketches, drawings, schematics and technical proposals.</li> <li>▪ Interpreting drawings of components in composite materials.</li> <li>▪ Distinguishing electric symbols.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Exercises in class (formative)</li> <li>▪ Homework and reports (summative).</li> </ul>	
8 - 10	7 - 8	<ul style="list-style-type: none"> <li>▪ Interpreting titles, part numbers , materials, scales.</li> <li>▪ Interpreting designations (threads, bending), revisions and annotations.</li> <li>▪ Interpreting traceability of a component.</li> <li>▪ Interpreting symbols associated with sheet metal components.</li> <li>▪ Interpreting different standardized symbols associated with electrical components.</li> <li>▪ Interpreting abbreviations associated with technical drawings.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Exercises in class (formative)</li> <li>▪ Homework and reports (summative).</li> </ul>	
11 - 13	9 – 10	<ul style="list-style-type: none"> <li>▪ Interpreting annotations referring to dimensions, geometry, tolerances, symbols and revisions.</li> <li>▪ Interpreting simple electric schematics</li> <li>▪ Identifying standards</li> <li>▪ Interpreting geometry.</li> <li>▪ Interpreting the principle characteristics of components.</li> <li>▪ Identifying interfaces of each component.</li> <li>▪ Obtaining required information from the blueprint to carry out requested work.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Exercises in class (formative).</li> <li>▪ Homework and reports (summative).</li> </ul>	
14 - 15	11 - 12	<ul style="list-style-type: none"> <li>▪ Interpreting written and graphic information from a schematic</li> <li>▪ Representing components that comply with technical design standards (in particular ASME standards Y14.5-M, 1994).</li> <li>▪ Write notes indicating dimension tolerances, materials, appropriate treatment and any other important information.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Exercises in class (formative).</li> <li>▪ Homework and reports (summative).</li> </ul>	

**SYNTHESIS OF SUMMATIVE EVALUATION METHODS**

Description of evaluation activity	Context	Learning objective(s)	Evaluation criterias	Due date (approximate)	Weighting (%)
Assignments <ul style="list-style-type: none"> <li>▪ Imperial system</li> <li>▪ Orthogonal projections</li> <li>▪ Questionnaires on blueprint reading</li> <li>▪ Nomenclature</li> <li>▪ Technical sketch</li> <li>▪ Aircraft reference plane system</li> </ul>	<u>Individual Work:</u> <ul style="list-style-type: none"> <li>▪ Produce and complete views as per drawing standards</li> <li>▪ Perform operations on fractions</li> <li>▪ Answer a questionnaire related to a drawing</li> </ul>	1 - 2	Accuracy of answer.	#1: Week 3 (5%) #2: Week 11 (5%)	10%
<ul style="list-style-type: none"> <li>▪ Mini-test</li> <li>▪ Orthogonal Projections</li> <li>▪ Technical sketches</li> </ul>	<ul style="list-style-type: none"> <li>▪ 1h individual test without documentation</li> <li>▪ Complete the views according to drawing standards</li> <li>▪ Perform operations on fractions</li> <li>▪ Answer a questionnaire related to a drawing</li> </ul>	2 - 5	Compliance with drawing standards.	Week 5	15%
Exam 1 <ul style="list-style-type: none"> <li>▪ Orthogonal Projections</li> <li>▪ Interpreting a drawing from a questionnaire</li> <li>▪ Making a sketch</li> <li>▪ Interpreting nomenclature</li> <li>▪ Interpreting aircraft reference planes</li> </ul>	<ul style="list-style-type: none"> <li>▪ 2h individual test without documentation</li> <li>▪ Create a family tree drawing</li> <li>▪ Complete the views according to drawing standards</li> <li>▪ Answer a questionnaire related to a drawing</li> </ul>	1 - 3 & 5		Week 7	30%
Report	<u>Team work in groups of 2 or 3</u>  Case study: describing the installation of a drain	All	Logical sequence of installation.  Compliance with drawing standards.	Week 13	10%
Final Exam	<ul style="list-style-type: none"> <li>▪ 2h50 individual test with all documentation allowed</li> <li>▪ Interpreting drawings from questionnaires</li> <li>▪ Theory questions</li> </ul>	All	Accuracy of answer.  Compliance with drawing standards.	Week 15	35%

**Total : 100%**

## REQUIRED MATERIAL

- Coop: Course pack # 5634, 5635 and 5298
- ¼ inch graph paper pad
- Lead pencil with white eraser
- Ruler with Imperial system

## MEDIAGRAPHY

Delmar. *Blueprint Reading for Machinists*. Albany, N.Y. : Delmar Publishers, c1972.

Giesecke, F. & Al. *Dessin technique*. Montréal : Édition du renouveau pédagogique, c1987, 453 p. (cote de la bibliothèque : A 604.2G455t 1980 Fn 1987).

Many other references are included in: *Dessin technique et dessin industriel*.

## REQUIREMENTS TO PASS THE COURSE

### 1. Passing Mark

The student must obtain a minimum of 60% at the end of the semester.

### 2. Tardiness

Students who arrive late after the beginning of the first period of a course are considered absent for this period.

### 3. 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.

### 4. 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.

### 5. 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 in the documentation center on the Cégep web site [www.cegepmontpetit.ca/normes](http://www.cegepmontpetit.ca/normes) under the heading *Liens éclair, Bibliothèques, « Méthodologie »*.

## **METHODS OF COURSE PARTICIPATION**

Using the equipment, machines and the Department laboratories outside of class hours is strictly forbidden unless an agreement has been made with the Department coordinator.

Appropriate clothing, safety glasses and safety shoes or boots must be worn in the workshops. For safety and security reasons, sandals, shorts and any other inappropriate clothing will not be permitted.

Students whose behavior creates a risk for other people will receive a warning from the teacher; if there is no change then they will be excluded from the laboratory until the situation is reviewed by the instructor and the Coordinator of the Aircraft Techniques de genie aérospatial Department.

Students who do not comply with the rules taught in class regarding the proper usage and maintenance of tools and equipment may be suspended from the course until the situation can be reviewed by the teacher and the Department coordinator.

### **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 the specific regulations for this course:

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

## **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, Conditions d'admission et de cheminement scolaire, Politique relative à l'usage, à la qualité et à la valorisation de la langue*

*française, Politique pour un milieu d'études et de travail exempt de harcèlement et de violence, Procédures 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://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.

## **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 « [servicesadptesena@cegepmontpetit.ca](mailto:servicesadptesena@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.

## **APPENDIX**

The activity periods in the Course Outline are approximate. Changes may be made to adapt to any logistical problems that might arise during the session.