

## Course outline

COURSE TITLE: **Aircraft Instrumentation**

PROGRAM: **280.C0** Aircraft Maintenance

DISCIPLINE: 280 Aeronautics

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

Teacher(s)	Office	☎ extension	✉ e-mail or website
Isabelle Clavet	C182	4807	isabelle.clavet@cegepmontpetit.ca

### Office hours

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Morning					
Afternoon		12h00 à 14h00			12h00 à 14h00
Other					

Coordinator(s)	Office	☎ extension	✉ e-mail
Joaquin Mora	C160	4220	joaquin.mora@cegepmontpetit.ca
Jeanne Dumas Roy	C160	4470	jeanne.dumasroy@cegepmontpetit.ca

## 1 CONTEXT OF THIS COURSE WITHIN THE PROGRAM

This course is offered during the fourth session of the program. It is intended for future Category M Aircraft Maintenance Engineers (AME). The objective is to enable them to diagnose and determine appropriate maintenance intervention for various aircraft instruments. In order to do this, they must know the terminology, their roles and operating principles. They must also be able to interpret the technical documentation provided by aircraft manufacturers.

This course presents a fairly complete overview of all types of instruments found onboard an aircraft.

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 [Student Guide](#) website under the heading « Information/AME and AML licences ».

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

Perform maintenance of aircraft systems.

## 3 MINISTERIAL OBJECTIVE(S) AND COMPETENCIES

**0263** Verify the operation of simple alternating-current circuits on an aircraft.

**0265** Verify communications, navigation and instrumentation systems.

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

At the end of the course, the student will be able to perform functional checks, recognize and diagnose any deviations from the standards established by the manufacturer and Transport Canada and certify the operation of a several navigation instruments.

## 5 TEACHING AND LEARNING STRATEGIES

### Theory

The theoretical part of the course is organized into different themes covering most instruments found on aircrafts and their principal of operation. Various courseware is used for learning and study matter such as formal lectures, digital notebooks, audio-visual support and short videos.

### Laboratory

The practical part of the course is organised into various learning activities in the laboratory.

Students are to perform the different activities in rotation and in teams of three or four.

Various courseware is used during the activities for learning and study matter such as laboratory notebooks, datasheets, question sheets. Student also have access to various aircraft, component and test equipment technical manuals as required.

## 6 COURSE PLAN

### LEARNING OBJECTIVES

1. Identification and description of the various instruments installed onboard an aircraft such as flight, navigation, engine, flight control and various system and condition instruments.
2. Function and operation of the various instruments installed onboard an aircraft such as flight, navigation, engine, flight control and various system and condition instruments.
3. Description and basic operation of the Flight Director (FD) and Automatic flight Systems including the autopilot (AP) system.
4. Description and basic operation of the Flight Management System (FMS).
5. Description and basic operation of a centralized failure maintenance system.

### THEORY

WEEK	# OBJECTIVE	CONTENT	MODE OF INSTRUCTION AND LEARNING ACTIVITIES	DOCUMENTATIONS, RESOURCES, TECHNOLOGICAL TOOLS AND URL ADDRESS
1	Distinguish and describe the elements and characteristics common to the instruments.  <b>Objective #1</b>	<ul style="list-style-type: none"> <li>▪ Course introduction and presentation of the Course Outline</li> <li>▪ The elements of an instrument</li> <li>▪ The characteristics of an instrument</li> <li>▪ Types of errors</li> </ul>	<p>Course outline presentation with audio-visual support.</p> <p>Formal lectures with audio-visual support.</p> <p>Group discussions. Personal notes.</p> <p>Student study and review of course contents presented.</p>	<p>Course outline.</p> <p>Course PowerPoint presentations.</p> <p>Digital notebook.</p>
2	Describe different methods of transmitting and displaying information.  <b>Objective #1,2</b>	<ul style="list-style-type: none"> <li>▪ Electro-mechanical and mechanical indicators</li> <li>▪ Liquid crystal alphanumeric or electroluminescent diode indicators</li> <li>▪ Cathode ray tubes (CRTs) and liquid crystal screens</li> <li>▪ Synchro transmitters</li> </ul> <p>Digital transmission line (digital ARINC Bus)</p>	<p>Formal lectures with audio-visual support.</p> <p>Group discussions. Personal notes.</p> <p>Student study and review of course contents presented.</p>	<p>Course PowerPoint presentations.</p> <p>Digital notebook.</p>
3	Describe the role and operation of atmospheric reference instruments.  Recognize the requirements for maintaining navigability.  <b>Objective #1,2</b>	<ul style="list-style-type: none"> <li>▪ Atmosphere and atmosphere type</li> <li>▪ Pitot and static circuits</li> <li>▪ Altimeter</li> <li>▪ Vertical speed indicator</li> <li>▪ Pressurization control instruments</li> <li>▪ Anemometer, machmeter, excessive speed warning</li> <li>▪ Aerodynamic data computer</li> <li>▪ Applicable airworthiness standards</li> </ul> <p>Inspection, common maintenance, precautions</p>	<p>Formal lectures with audio-visual support.</p> <p>Group discussions. Personal notes.</p> <p>Student study and review of course contents presented.</p>	<p>Course PowerPoint presentations.</p> <p>Digital notebook.</p>
4	Describe the operation and role of basic magnetic and gyroscopic instruments.  <b>Objective #1,2</b>	<ul style="list-style-type: none"> <li>▪ Magnetic compass</li> <li>▪ Characteristics and properties of a gyroscope</li> <li>▪ Gyroscope training</li> <li>▪ Turn and side slope indicator and turn coordinator</li> <li>▪ Artificial horizon</li> </ul>	<p>Formal lectures with audio-visual support.</p> <p>Group discussions. Personal notes.</p> <p>Student study and review of</p>	<p>Course PowerPoint presentations.</p> <p>Digital notebook.</p>

WEEK	# OBJECTIVE	CONTENT	MODE OF INSTRUCTION AND LEARNING ACTIVITIES	DOCUMENTATIONS, RESOURCES, TECHNOLOGICAL TOOLS AND URL ADDRESS
		<ul style="list-style-type: none"> <li>▪ Gyroscopic compass</li> <li>▪ Erector systems</li> <li>▪ Gyromagnetic compass</li> <li>▪ Introduction to the inertial navigation system</li> <li>▪ Gyrolaser</li> <li>▪ Applicable airworthiness standards</li> </ul> Inspection, common maintenance, precautions	course contents presented.	
6 and 7	Describe the role and operation of engine control and aircraft system instruments.  <b>Objective #1,2</b>	<ul style="list-style-type: none"> <li>▪ Temperature measurement</li> <li>▪ Pressure measurement</li> <li>▪ Quantity gauges</li> <li>▪ Tachometers</li> <li>▪ Synchroscope</li> <li>▪ Flowmeter</li> <li>▪ Torquemeter</li> <li>▪ Engine pressure ratio</li> <li>▪ Vibration measurement</li> <li>▪ Angle of attack measurement</li> <li>▪ Stall protection system</li> </ul>	Formal lectures with audio-visual support.  Group discussions. Personal notes.  Student study and review of course contents presented.	Course PowerPoint presentations.  Digital notebook.
8 and 9	Describe the role, architecture, and operation of a centralized failure management system.  <b>Objective #5</b>	<ul style="list-style-type: none"> <li>▪ An example of architecture</li> <li>▪ EICAS (Engine indicating &amp; crew alerting system) or ECAM (Electronic centralized aircraft monitoring)</li> <li>▪ Maintenance diagnostic system</li> </ul>	Formal lectures with audio-visual support.  Group discussions. Personal notes.  Student study and review of course contents presented.	Course PowerPoint presentations.  Digital notebook.
11 to 13	Describe the role and operation of navigation instruments.  <b>Objective #1,2</b>	<ul style="list-style-type: none"> <li>▪ ADF</li> <li>▪ VOR</li> <li>▪ DME</li> <li>▪ ILS</li> <li>▪ Radio altimeter</li> <li>▪ INS</li> <li>▪ GPS</li> <li>▪ ATC transponder</li> <li>▪ Collision avoidance system (TCAS)</li> <li>▪ Ground proximity warning system (GPWS)</li> </ul> Weather radar	Formal lectures with audio-visual support.  Group discussions. Personal notes.  Student study and review of course contents presented.	Course PowerPoint presentations.  Digital notebook.
14	Describe the operation of the autopilot and flight director systems, the flight management system, and the flight recorders.  <b>Objective #3,4</b>	<ul style="list-style-type: none"> <li>▪ Architecture of an autopilot system</li> <li>▪ Basic and higher functions</li> <li>▪ Auto-throttle</li> <li>▪ Flight director</li> <li>▪ Introduction to flight management system (FMS)</li> <li>▪ Flight data acquisition recording system (FDARS)</li> <li>▪ Flight data acquisition unit (FDAU)</li> <li>▪ Flight data recorder (FDR)</li> <li>▪ Quick access recorder (QAR)</li> <li>▪ Cockpit voice recorder (CVR)</li> </ul>	Formal lectures with audio-visual support.  Group discussions. Personal notes.  Student study and review of course contents presented.	Course PowerPoint presentations.  Digital notebook.

**LABORATORY**

WEEK	# OBJECTIVE	CONTENT	<u>MODE OF INSTRUCTION AND LEARNING ACTIVITIES</u>	DOCUMENTATIONS, RESOURCES, TECHNOLOGICAL TOOLS AND URL ADDRESS
1 and 2	<p>Concepts and principles of operation of instruments and test equipment.</p> <p>Performing the work in accordance with safety rules and operating procedures of the laboratory equipment.</p> <p><b>Objective #1,2</b></p>	<ul style="list-style-type: none"> <li>▪ Course introduction and presentation of the Course Outline</li> <li>▪ Demonstration of various test benches.</li> <li>▪ Descriptions of tests to be carried out during the course.</li> </ul> <p>Procedures and precautions.</p>	<p>Course outline presentation with audio-visual support.</p> <p>Laboratory activity presentation with audio-visual support.</p> <p>Group discussions. Personal notes.</p>	<p>Course outline.</p> <p>PowerPoint presentations.</p>
3 to 6	<p><b>Perform tests on a CHT indicator (Cylinder Head Temperature)</b></p> <ul style="list-style-type: none"> <li>- Identify compliance standards and appropriate procedures.</li> <li>- Use appropriate testing equipment.</li> <li>- Compare data obtained for each check in order to comply with the manufacturer and CAR's standards.</li> <li>- Meticulously record test results.</li> </ul> <p><b>Objective #1,2</b></p>	<ul style="list-style-type: none"> <li>▪ Test bench specification.</li> <li>▪ Calibration of test equipment.</li> <li>▪ Tolerances.</li> <li>▪ Tests to run scale error, friction error, hysteresis error.</li> <li>▪ Description of the test equipment: components, operation.</li> <li>▪ Description of the CHT: components, operation.</li> </ul>	<p>Prior reading of the laboratory documents.</p> <p>Complete data sheets in the laboratory notebooks.</p> <p>Complete question sheets provided by the teacher.</p>	<p>Aircraft technical manuals.</p> <p>Component manuals.</p> <p>Test bench manuals.</p> <p>Canadian Aircraft Regulations.</p> <p>ENA technical library.</p> <p>Transport Canada website: <a href="https://tc.canada.ca">https://tc.canada.ca</a></p>
3 to 6	<p><b>Perform tests on a manometer (Dead weight test)</b></p> <ul style="list-style-type: none"> <li>- Identify compliance standards and appropriate procedures.</li> <li>- Use appropriate testing equipment.</li> <li>- Compare data obtained for each check in order to comply with the manufacturer and CAR's standards.</li> <li>- Meticulously record test results.</li> </ul> <p><b>Objective #1,2</b></p>	<ul style="list-style-type: none"> <li>▪ Test bench specification.</li> <li>▪ Calibration of test equipment.</li> <li>▪ Tolerances.</li> <li>▪ Tests to run scale error, friction error, hysteresis error.</li> <li>▪ Description of the test equipment: components, operation.</li> <li>▪ Description of the manometer: components, operation.</li> </ul>	<p>Prior reading of the laboratory documents.</p> <p>Complete data sheets in the laboratory notebooks.</p> <p>Complete question sheets provided by the teacher.</p>	<p>Aircraft technical manuals.</p> <p>Component manuals.</p> <p>Test bench manuals.</p> <p>Canadian Aircraft Regulations.</p> <p>ENA technical library.</p> <p>Transport Canada website: <a href="https://tc.canada.ca">https://tc.canada.ca</a></p>
3 to 6	<p><b>Perform checks on an Altimeter.</b></p> <ul style="list-style-type: none"> <li>- Identify compliance standards and appropriate procedures.</li> <li>- Use appropriate testing equipment.</li> <li>- Compare data obtained for each check in order to comply with the manufacturer and CAR's standards.</li> </ul>	<ul style="list-style-type: none"> <li>▪ CAR standards.</li> <li>▪ Component's manuals.</li> <li>▪ Manufacturer's test bench procedure.</li> <li>▪ Calibrating test equipment.</li> <li>▪ Frequency of performing tests.</li> <li>▪ Test points to simulate.</li> <li>▪ Tolerances.</li> <li>▪ Scale error, hysteresis error, persistence, friction error, case sealing, barometric scale error.</li> </ul>	<p>Prior reading of the laboratory documents.</p> <p>Complete data sheets in the laboratory notebooks.</p> <p>Complete question sheets provided by the teacher.</p>	<p>Aircraft technical manuals.</p> <p>Component manuals.</p> <p>Test bench manuals.</p> <p>Canadian Aircraft Regulations.</p> <p>ENA technical library.</p>

WEEK	# OBJECTIVE	CONTENT	MODE OF INSTRUCTION AND LEARNING ACTIVITIES	DOCUMENTATIONS, RESOURCES, TECHNOLOGICAL TOOLS AND URL ADDRESS
	- Meticulously record test results. <b>Objective #1,2</b>	<ul style="list-style-type: none"> <li>▪ Description of testing equipment; digital barometer, vacuum chamber, vacuum pump.</li> <li>▪ Description of barometric altimeter; ID plate, components, operation.</li> </ul>		Transport Canada website: <a href="https://tc.canada.ca">https://tc.canada.ca</a>
3 to 6	<b>Perform checks on a Turn and Bank indicator.</b> - Identify compliance standards and appropriate procedures. - Use appropriate testing equipment. - Compare data obtained for each check in order to comply with the manufacturer and CAR's standards. - Meticulously record test results. <b>Objective #1,2</b>	<ul style="list-style-type: none"> <li>▪ Manufacturer's specifications</li> <li>▪ Calibrating test equipment</li> <li>▪ Tests: check inclinometer, needle</li> <li>▪ Tolerances</li> <li>▪ Description of testing equipment: power source, turntable, strobe light</li> <li>▪ Description of turn and bank indicator: ID plate, components, operation</li> </ul>	Prior reading of the laboratory documents.  Complete data sheets in the laboratory notebooks.  Complete question sheets provided by the teacher.	Aircraft technical manuals. Component manuals. Test bench manuals. Canadian Aircraft Regulations.  ENA technical library.  Transport Canada website: <a href="https://tc.canada.ca">https://tc.canada.ca</a>
8 to 11	<b>Perform checks on a Directional Gyro (DG)</b> - Identify compliance standards and appropriate procedures. - Use appropriate testing equipment. - Compare data obtained for each check in order to comply with the manufacturer and CAR's standards. - Meticulously record test results. <b>Objective #1,2</b>	<ul style="list-style-type: none"> <li>▪ Manufacturer's specifications.</li> <li>▪ Calibration of test equipment.</li> <li>▪ Tests: free rotation of the rotor, rotor speed, drift, erector mechanism, locking mechanism, starting the rotor, housing seal, flow.</li> <li>▪ Tolerances.</li> <li>▪ Description of the testing equipment: pneumatic power source, Scorsby table.</li> <li>▪ Description of the directional gyro indicator: ID plate, components, operation.</li> </ul>	Prior reading of the laboratory documents.  Complete data sheets in the laboratory notebooks.  Complete question sheets provided by the teacher.	Aircraft technical manuals. Component manuals. Test bench manuals. Canadian Aircraft Regulations.  ENA technical library.  Transport Canada website: <a href="https://tc.canada.ca">https://tc.canada.ca</a>
8 to 11	<b>Perform checks on a Tachometer</b> - Identify compliance standards and appropriate procedures. - Use appropriate testing equipment. - Compare data obtained for each check in order to comply with the manufacturer and CAR's standards. - Meticulously record test results. <b>Objective #1,2</b>	<ul style="list-style-type: none"> <li>▪ CAR standards.</li> <li>▪ Test bench specification.</li> <li>▪ Calibration of test equipment.</li> <li>▪ Tolerances.</li> <li>▪ Tests to run: scale error, friction error, hysteresis error.</li> <li>▪ Description of the test equipment: components, operation.</li> <li>▪ Description of the tachometer: components, operation.</li> </ul>	Prior reading of the laboratory documents.  Complete data sheets in the laboratory notebooks.  Complete question sheets provided by the teacher.	Aircraft technical manuals. Component manuals. Test bench manuals. Canadian Aircraft Regulations.  ENA technical library.  Transport Canada website: <a href="https://tc.canada.ca">https://tc.canada.ca</a>

WEEK	# OBJECTIVE	CONTENT	MODE OF INSTRUCTION AND LEARNING ACTIVITIES	DOCUMENTATIONS, RESOURCES, TECHNOLOGICAL TOOLS AND URL ADDRESS
8 to 11	<p><b>Perform tests with the magnetic compass</b></p> <p>- Identify compliance standards and appropriate procedures.</p> <p>- Use appropriate testing equipment.</p> <p>- Compare data obtained for each check in order to comply with the manufacturer and CAR's standards.</p> <p>- Meticulously record test results.</p> <p><b>Objective #1,2</b></p>	<ul style="list-style-type: none"> <li>▪ CAR standards.</li> <li>▪ Running procedure.</li> <li>▪ Calibration of test equipment.</li> <li>▪ Run frequency, test points to simulate, tolerances.</li> <li>▪ Tests to run liquid, compensation mechanism, friction, magnet neutralisation, compensation chart.</li> <li>▪ Description of the master compass: components, operation</li> <li>▪ Description of the magnetic compass: components, operation.</li> </ul>	<p>Prior reading of the laboratory documents.</p> <p>Complete data sheets in the laboratory notebooks.</p> <p>Complete question sheets provided by the teacher.</p>	<p>Aircraft technical manuals.</p> <p>Component manuals.</p> <p>Test bench manuals.</p> <p>Canadian Aircraft Regulations.</p> <p>ENA technical library.</p> <p>Transport Canada website: <a href="https://tc.canada.ca">https://tc.canada.ca</a></p>
8 To 11	<p><b>Perform checks on pitot-static circuits.</b></p> <p>- Identify compliance standards and appropriate procedures.</p> <p>- Use appropriate testing equipment.</p> <p>- Compare data obtained for each check in order to comply with the manufacturer and CAR's standards.</p> <p>- Meticulously record test results.</p> <p><b>Objectives #1,2</b></p>	<ul style="list-style-type: none"> <li>▪ Excerpts of CAR standards. Leak test (CAR 571), calibration test (CAR 605/625).</li> <li>▪ Excerpts from aircraft maintenance manuals (where applicable).</li> <li>▪ Procedures of manufacturer's test bench.</li> <li>▪ Test equipment calibration.</li> <li>▪ Testing</li> <li>▪ Test point simulation.</li> <li>▪ Tolerances.</li> <li>▪ Description of testing equipment: components and operation principle.</li> <li>▪ Description of pitot-static circuit: components and operation principle.</li> </ul>	<p>Prior reading of the laboratory documents.</p> <p>Complete data sheets in the laboratory notebooks.</p> <p>Complete question sheets provided by the teacher.</p>	<p>Aircraft technical manuals.</p> <p>Component manuals.</p> <p>Test bench manuals.</p> <p>Canadian Aircraft Regulations.</p> <p>ENA technical library.</p> <p>Transport Canada website: <a href="https://tc.canada.ca">https://tc.canada.ca</a></p>
12 to 14	<p><b>Glass cockpit instrument identification.</b></p> <p>On aircraft activity</p> <p>(Aircraft to be determined)</p> <p><b>Objectives #1,2,5</b></p>	<p>Identification of various instruments in a glass cockpit environment.</p> <ul style="list-style-type: none"> <li>▪ Flight Instruments</li> <li>▪ Navigation Instruments</li> <li>▪ Engine Instruments</li> <li>▪ Various system Instruments</li> </ul>	<p>Go and see activity on the specified aircraft.</p> <p>Complete the activity book provided by the teacher.</p>	<p>Aircraft technical manuals.</p> <p>ENA technical library.</p>
12 To 14	<p><b>Pitot-static system identification &amp; operation.</b></p> <p>On aircraft activity</p> <p>(Aircraft to be determined)</p> <p><b>Objectives #1,2</b></p>	<p>Identification of the pitot-static system.</p> <ul style="list-style-type: none"> <li>▪ Pitot-static probes</li> <li>▪ Static ports</li> <li>▪ Components</li> </ul> <p>Basic operation of the pitot-static system.</p>	<p>Go and see activity on the specified aircraft.</p> <p>Complete the activity book provided by the teacher.</p>	<p>Aircraft technical manuals.</p> <p>ENA technical library.</p>



## 7 SYNTHESIS OF SUMMATIVE EVALUATION METHODS

### THEORY

Description of Evaluation Activity	Context	Learning objective(s)	Evaluation Criteria	Due Date	Weighting (%)
Exam #1	Individual  Multiple choice and written / Closed book	#1,2  Material from weeks 1 to 4	Relevance and accuracy of answers.  Coherent and concise explanations.	Week 5	15%
Exam #2	Individual  Multiple choice and written / Closed book.	#1,2,5  Material from weeks 6 to 9	Relevance and accuracy of answers.  Coherent and concise explanations.	Week 10	20%
Exam #3	Individual  Multiple choice and written / Closed book.	#1,2,3,4  Material from weeks 11 to 14	Relevance and accuracy of answers.  Coherent and concise explanations.	Week 15	25%
				<b>SUBTOTAL</b>	<b>60%</b>

### LABORATORY

Description of Evaluation Activity	Context	Learning objective(s)	Evaluation Criteria	Due Date	Weighting (%)
Exam #1	Individual  Written / Open Book	Labs 1-4	Relevance and accuracy of answers.  Coherent and concise explanations.	Week 7	20%
Exam #2	Individual  Written / Open Book	Labs 8-11	Relevance and accuracy of answers.  Coherent and concise explanations	Week 15	20%
				<b>SUBTOTAL</b>	<b>40 %</b>

<b>TOTAL</b>	<b>100%</b>
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## 8 REQUIRED MATERIAL

Theory classes: A paper copy of the study document is recommended but not mandatory. Students that prefer to take class notes on a **laptop** can do so but no cellphones will be allowed in class.

Laboratory: Safety glasses, safety shoes and overalls (or approved ÉNA work clothes) are mandatory. Students not complying with this rule will not be admitted in the laboratory.

Paper copy of the lab documents is recommended but not mandatory. Students that prefer to take class notes on a **laptop** can do so but no cellphones will be allowed in class.

You can consult the information document which contains the minimum configuration and answers to frequently asked questions <https://www.cegepmontpetit.ca/ena/futurs-etudiants/programmes-d-etudes/maintenance-d-aeronefs#description>

## 9 MEDIAGRAPHY

Aviation Technician Training Series, Avionics Fundamentals, Éditeur I.A.P. 1987.

CRANE Dale, Aircraft Instruments Systems, Éditeur Aviation Maintenance Publishers Inc.  
629.135 C 891a

Orford Air Training School, Navigation aérienne, Les aides radio, Éditeur Modulo. P 629.1351 098 r 4Fq Oxford Air Training School, Navigation aérienne, Instruments de bord, Québec, Ministère de l'éducation, SGME 1981. 629.1352 098 i Fq.

PALLETT EHJ, Automatic Flight Control, Éditeur Granada, Toronto, 1983. 629.1352 p 166 1983 PALLETT EHJ, Aircraft Instruments, Éditeur Pitman Publishing Limited, 629.135 p 1662 Édition 1972-79, 629.135 p 1662 Édition 1981.

PALLETT EHJ, Aircraft Instruments and Integrated System, édition Longman Scientific & Technical, 1992.629.135 P 166 ai

POWELL J, Aircraft Radio Systems, Éditeur Pitman Publishing Limited, 1981. 629.135 p 8843

Transports Canada, Règlement de l'aviation canadien (RAC 523, 525, 571, 605-625

Jeppesen, Avionics Fundamentals. Éditeur : Sanderson Training Products. 629.135A958

## 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

Presence at exams is obligatory. Any absence from an evaluation activity which is not justified by a serious reason will mean a mark of zero and failure of this evaluation. According to article 5.2.5.1 of the *Institutional Policy on the Evaluation of Student Achievement* (IPESA). *“it is the student’s responsibility to take the necessary means to meet his teacher and explain the motives for his absence with a supporting document explaining his absence. If the motives are serious and recognized as such by the teacher, the teacher and the student will agree to the terms of the delay for doing the evaluation or assignment.”*

In addition, the IPESA indicates that *“if a student is late for an evaluation activity with no justifiable reason, the teacher can refuse to allow the student to participate in the said activity.”*

Serious reasons that can be considered are: illness (with a medical certificate), death of a family member (with a death certificate), a force majeure or overpowering event, activities authorized by the College, and legal reason (proof of the court summons).

### 3. Submitting Assignments

All assignments must be submitted by the date, time and place designated by the teacher (s). Unless there is an agreement with the teacher, late assignments are penalized by the deduction of 10% per day, and a mark of zero will be given when the assignment is six days late. Any assignments due in the fifteenth week cannot be submitted late.

### 4. Presentation of Written Work

The teacher (s) will provide students with information and guidelines regarding the presentation of written work. When the presentation of an assignment is judged 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-presentation-materielle-des-travaux-ecrits-du-cegep/>.

### 5. Plagiarism and other breaches of academic integrity

- a) Plagiarism consists of copying, translating, paraphrasing, in whole or in part, the work of another person and wrongfully attributing it to oneself, with or without their consent, and constitutes a breach of academic integrity.
- b) The use of works generated entirely or partially by artificial intelligence, if not authorized by the professor, is also considered a breach of academic integrity.
- c) Acts of fraud, such as impersonating another student during a summative assessment, deceiving, cheating, or falsifying documents or results, also constitute breaches of academic integrity.
- d) Any collaboration in such acts or any attempt to commit them is also considered a breach of intellectual ethics.

Any violation of intellectual honesty, as well as any attempt at or collaboration in such an action will result in a mark of "0" for the exam, the assignment or the evaluation activity in question. In this case, the teacher will make a written report to departmental coordination which will be transmitted to the Dean of Studies in accordance with article 5.6.1 IPESA.

## 11 METHODS OF COURSE PARTICIPATION

Accident prevention is the responsibility of each and every individual. We invite you to familiarize yourself with all health and safety measures at <https://mareussite.cegepmontpetit.ca/ena/mes-outils/sante-et-securite/>.

Bringing food or beverages into the laboratories is strictly prohibited.

Attire worn by students in laboratories and workshops must feature the ÉNA logo. The use of hooded sweatshirts with drawstrings is not permitted due to safety risks when using equipment or machinery. ÉNA-branded clothing is available for purchase at the ÉNA Coop (room C163-A).

Authorized pants include work pants or jeans without any decorations (nails, metal parts, etc.).

Personal Protective Equipment (PPE) is essential for the safety of students and is mandatory in laboratories, workshops, and hangars. This includes wearing safety footwear (boots or shoes) and safety glasses. Protective clothing such as lab coats or uniforms is only necessary when required.

## **12 OTHER DEPARTMENTAL REGULATIONS**

Students are invited to consult the website for the specific rules for this course:

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

## **13 INSTITUTIONAL POLICIES AND REGULATIONS**

Any student registered at Cégep Édouard-Montpetit must read the content of certain institutional policies and regulations and comply with them.

The French titles for these 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**

N/A