

**SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY  
SAULT STE. MARIE, ONTARIO**



Sault College

**COURSE OUTLINE**

**COURSE TITLE:** Engine, Airframes and Instruments 2  
**CODE NO. :** AVF245-1                      **SEMESTER:** Four  
**PROGRAM:** Aviation Technology (Flight)  
**AUTHOR:** Earl Turner  
**DATE:** September 6, 2005      **PREVIOUS OUTLINE DATED:** May 12, 2004

**APPROVED:**

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	<b>DEAN</b>	<b>DATE</b>

**TOTAL CREDITS:** 2  
**PREREQUISITE(S):** AVT 115  
**HOUR/WEEK:** 1

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For additional information, please contact Colin, Kirkwood, Dean  
School of Technology, Skilled Trades, Natural Resources & Business  
Extension 2688

## **I. COURSE DESCRIPTION:**

A study of engines and airframes including the internal combustion engine and the basic gas turbine engine, fuels and fuel systems, lubrication and oil, ignition systems, engine instruments, propellers, airframes, and electrical systems at the Commercial Pilot Level.

## **II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:**

Upon successful completion of this course, the student will demonstrate the ability to:

1. Describe the layout and operation of the various types of aircraft engines and their systems.

### Potential Elements of the Performance:

- Knowledge of piston engine layout, operational cycles etc.
- Knowledge of turbine theory, layout, gas flow etc.
- Knowledge of propeller terminology, types, operation etc.
- Knowledge of fuel, lubrication, induction, exhaust and ignition systems.
- Ability to properly operate engines efficiently while optimizing their reliability and longevity.
- Ability to detect and troubleshoot common engine problems.
- Rationalization of the checklists and procedures associated with aircraft engines.

2. Describe the various types and styles of airframe construction and materials.

### Potential Elements of the Performance:

- Knowledge of various construction material and their properties.
- Knowledge of the various airframe styles and types of construction.
- Understanding of stress and strain and the limitations imposed on airframes.
- Understanding of corrosion concerns.
- Ability to properly operate airframes efficiently while optimizing their reliability and longevity.
- Ability to detect common airframe defects.

3. Describe aircraft systems such as electrical, pneumatic, vacuum, hydraulic, heating/ventilating etc.

### Potential Elements of the Performance:

- Knowledge of the various systems.
- Ability to operate the systems.
- Ability to detect faults and troubleshoot the systems.
- Rationalization of the checklists and procedures associated with aircraft systems.

### III. TOPICS:

1. Piston Engines.
2. Systems Associated with Piston Engines.
3. Propellers.
4. Turbine Engines.
5. Airframes.
6. Electrical Systems.
7. Other Systems.

### IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

1. From the Ground Up
2. Flight Training Manual
3. Sault College Ground School Manual – Zlin Z-242 L

### V. EVALUATION PROCESS/GRADING SYSTEM:

Enter description of how they will be graded

The student will be assessed by a combination of attendance and deportment, quizzes, tests and a final exam. Weighting of each will be as follows: 30% for quizzes, 30% for all tests prior to the final exam and 40% for the final exam. A minimum mark of 70% is required to pass the course. Make-up tests are not permitted except in accordance with section VI of this outline.

- Unexcused absences will result in 2% deduction of the final mark for each occurrence, arriving for class late will result in a 1% deduction of the final mark for each occurrence, and violations of the dress code will result in a 1% deduction of the final mark for each occurrence. Refer to the SOP GEN 1.3 for dress code policies and SOP GEN 1.6.7 for policy regarding absence from classes
- Quizzes will be given without prior notice.
- If it is necessary to write a second final exam in order to pass the course, the highest grade achievable will be a "C". (See make-up policy in section VI)
- Students may request a deferment of a test for compassionate reasons. Compassionate Grounds for deferment will include but not be limited to death of an immediate family member, personal illness, or recent diagnosis of a serious illness of a family member. **Make-ups will not be permitted after the fact for compassionate reasons.**
- **"F" grades in any subject at the end of a semester will result in termination from the Aviation program.**
- Although attitude, co-operation, etc., are not graded, students may be terminated based on their performance in this area (see section VI). These attributes are also considered in the selection of the Air Canada Award and other scholarships.
- Dates of tests will be announced at least 1 week in advance.
- A classroom code of conduct can be found in the SOP General section, and will be adhered to.

The following semester grades will be assigned to students in this course:

<u>Grade</u>	<u>Definition</u>	<u>Grade Point Equivalent</u>
A+	90 -100%	4.00
A	80 - 89%	3.00
B	70 - 79%	2.00
C	assigned if a make-up exam was required to complete the course	0.00
F (Fail)	below 70%	
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.	
NR	Grade not reported to Registrar's office.	
W	Student has withdrawn from the course without academic penalty.	

## **VI. SPECIAL NOTES:**

### **Attitude and Conduct**

Attitude plays an important role in your ability to exercise good judgement. Although attitude is not being graded, it affects your ability to learn as well as your safety as a student and future as a professional pilot. Students who display a strong tendency towards any of the five hazardous attitudes pose a grave risk to themselves and others. For this reason, students exhibiting one or several hazardous attitudes will be counselled and if necessary, will be put on a behavioural contract. If this is ineffective in modifying unacceptable behaviour, then the student will be withdrawn from the program.

The five hazardous attitudes are identified as Anti-authority, Impulsivity, Invulnerability, Machismo, and Resignation. These hazardous attitudes are described in "Human Factors for Aviation – Basic Handbook" on pages 151 and 152.

### **Make-up Policy**

- No make-ups on tests occurring prior to final exams.
- No make-ups on quizzes.
- Make-up exams will only be done under a learning plan.
- If the overall mark achieved for this course is less than 70%, a second final exam may be written at the discretion of the professor for this course. The second exam will be averaged with the first exam to determine the resulting exam mark, and this will be used to determine the final overall mark.
- In the event that a second final exam is required, the highest achievable overall grade for this course will be a C
- Any student that requires 100% or greater on a make-up exam to pass the course will not be allowed to write a make-up exam.

**Special Needs:**

If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your instructor and/or the Special Needs office. Visit Room E1101 or call Extension 2493, 2703, or 2491 so that support services can be arranged for you.

**Retention of course outlines:**

It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other postsecondary institutions.

**Plagiarism:**

Students should refer to the definition of “academic dishonesty” in *Student Rights and Responsibilities*. Students who engage in “academic dishonesty” will receive an automatic failure for that submission and/or such other penalty, up to and including expulsion from the course/program, as may be decided by the professor/dean. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

**Course outline amendments:**

The Professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

Substitute course information is available in the Registrar's office.

**VII. PRIOR LEARNING ASSESSMENT:**

Students who wish to apply for advanced credit in the course should consult the professor. Credit for prior learning will be given upon successful completion of a challenge exam or portfolio.

**VIII. DIRECT CREDIT TRANSFERS:**

Students who wish to apply for direct credit transfer (advanced standing) should obtain a direct credit transfer form from the Dean's secretary. Students will be required to provide a transcript and course outline related to the course in question.