

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO



Sault College

COURSE OUTLINE

COURSE TITLE: MECHANICS OF FLIGHT
CODE NO. : ASR102 **SEMESTER:** 1
PROGRAM: AIRCRAFT STRUCTURAL REPAIR
AUTHOR: Larry Canduro
DATE: Sept. 2009 **PREVIOUS OUTLINE DATED:** Jan. 2009
APPROVED: "B. Punch" Sept.09

	Chair	DATE
TOTAL CREDITS:	3	
PREREQUISITE(S):		
HOURS: (Total)	48	

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For additional information, please contact Brian Punch, Chair
School of The Natural Environment, Technology & Skilled Trades
(705) 759-2554, Ext. 2681

I. COURSE DESCRIPTION:

This course deals with the various forces acting on an aircraft in flight. Presentations deal with airfoil design, flight control systems, aircraft axis and various terms associated with aircraft controllability and stability for fixed wing and rotary wing aircraft. Various aircraft control systems will be researched by the students.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

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

1. Discuss and understand how an aircraft maintains flight, forces acting on A/C during flight. Various terms such as wing condition, center of pressure, angle of attack and aircraft stability and maneuverability.

Potential Elements of the Performance:

- describe how an aircraft produces lift using Bernoulli's Principle.
 - identify the four forces acting on an aircraft during flight
 - discuss terms such as relative wind, airfoil, wing camber, wing chord, center of pressure and angle of attack
 - describe the three axis of an aircraft and the terminology associated with the aircraft movements about the three axis
 - discuss aircraft stability and the various factors associated and affecting stability
 - describe lateral, longitudinal and vertical stability
 - describe profile and induced drag as they affect aircraft flight
 - discuss flight theory for rotary wing aircraft
2. Research and discuss various aircraft control systems as presented by both instructor and students groups. Rebalancing techniques of control surfaces will be presented.

Potential Elements of the Performance:

- identify primary and secondary control systems of a fixed wing aircraft and how they operate
- describe various systems and the components found in the system
- describe the flight control systems for helicopters
- research a complete flight control system using the supplied manufacturers training manuals and parts books
- identify which control system affects aircraft movement or pilot selection

Potential Elements of the Performance Continued...

- present personal assignment to the class pertaining to their system as assigned by the instructor
- discuss the purpose of spoilers, slats, slots and stall strips associated with wing components
- describe the purpose of rebalancing aircraft components after repair using the “static” balancing method

III. TOPICS:

1. Theory of Flight
2. Flight Control Systems

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

A/C 65-15A A&P Mechanics Airframe Handbook
 A/C 65-9A A&P Mechanics General Handbook

V. EVALUATION PROCESS/GRADING SYSTEM:

Two multiple choice tests -- each accounts for 50 percent of the final grade.

Test #3 Mechanics of Flight
 Test #5 Flight Control Systems

Note: Students in the Aircraft Structural Repair Program require a minimum of seventy (70) percent in a course to obtain a passing grade. This equates to a “B” grade.

The following semester grades will be assigned to students in postsecondary courses:

<u>Grade</u>	<u>Definition</u>	<u>Grade Point Equivalent</u>
A+	90 - 100%	4.00
A	80 – 89%	4.00
B	70 – 79%	3.00
C	60 - 69%	2.00
D	50 - 59%	1.00
F (Fail)	49% and below	0.00
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in field /clinical placement or non-graded subject area.	

U	Unsatisfactory achievement in field/clinical placement or non-graded subject area.
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:

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.

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.

Prior Learning Assessment:

Students who wish to apply for advance credit transfer (advanced standing) should obtain an Application for Advance Credit from the program coordinator (or the course coordinator regarding a general education transfer request) or academic assistant. Students will be required to provide an unofficial transcript and course outline related to the course in question. Please refer to the Student Academic Calendar of Events for the deadline date by which application must be made for advance standing.

Credit for prior learning will also be given upon successful completion of a challenge exam or portfolio.

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

Disability Services:

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

Communication:

The College considers **WebCT/LMS** as the primary channel of communication for each course. Regularly checking this software platform is critical as it will keep you directly connected with faculty and current course information. Success in this course may be directly related to your willingness to take advantage of the **Learning Management System** communication tool.

Plagiarism:

Students should refer to the definition of “academic dishonesty” in *Student Code of Conduct*. A professor/instructor may assign a sanction as defined below, or make recommendations to the Academic Chair for disposition of the matter. The professor/instructor may (i) issue a verbal reprimand, (ii) make an assignment of a lower grade with explanation, (iii) require additional academic assignments and issue a lower grade upon completion to the maximum grade “C”, (iv) make an automatic assignment of a failing grade, (v) recommend to the Chair dismissal from the course with the assignment of a failing grade. 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.

Student Portal:

The Sault College portal allows you to view all your student information in one place. **mysaultcollege** gives you personalized access to online resources seven days a week from your home or school computer. Single log-in access allows you to see your personal and financial information, timetable, grades, records of achievement, unofficial transcript, and outstanding obligations, in addition to announcements, news, academic calendar of events, class cancellations, your learning management system (LMS), and much more. Go to <https://my.saultcollege.ca>.

Electronic Devices in the Classroom:

Students who wish to use electronic devices in the classroom will seek permission of the faculty member before proceeding to record instruction. With the exception of issues related to accommodations of disability, the decision to approve or refuse the request is the responsibility of the faculty member. Recorded classroom instruction will be used only for personal use and will not be used for any other purpose. Recorded classroom instruction will be destroyed at the end of the course. To ensure this, the student is required to return all copies of recorded material to the faculty member by the last day of class in the semester. Where the use of an electronic device has been approved, the student agrees that materials recorded are for his/her use only, are not for distribution, and are the sole property of the College.

Attendance:

Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session.

It is the departmental policy that once the classroom door has enclosed, the learning process has begun. Late arrivers will not be granted admission to the room.

COURSE NOTE: All assignments must be completed. Failure to complete assignments will result in removal of 10% from the test associated with the assignment.