

**SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY**

**SAULT STE. MARIE, ONTARIO**



**COURSE OUTLINE**

**COURSE TITLE:** INTRODUCTION TO COMPOSITES  
**CODE NO. :** ASR115 **SEMESTER:** 1  
**PROGRAM:** AIRCRAFT STRUCTURAL REPAIR  
**AUTHOR:** Devin York  
**DATE:** **Sept. 2013** **PREVIOUS OUTLINE DATED:** **Sept. 2012**  
**APPROVED:** "C.Kirkwood"  
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**DEAN** **DATE**  
**TOTAL CREDITS:** 2  
**PREREQUISITE(S):** N/A  
**HOURS: (Total)** 32

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*For additional information, please contact Colin Kirkwood, Dean, Environment/Technology/Business, extension 2688.*

**I. COURSE DESCRIPTION:**

This course is comprised of 32 hours of theory/practical work designed to introduce the student to the manufacturing and repair of advanced composites for modern aircraft.

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

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

1. Identify the types of composite materials being used in aircraft structures.

Potential Elements of the Performance:

- Define modern composites
- Give examples of composite materials
- Describe the composite materials being used in aircraft structures
- Explain the advantages and disadvantages of composites for aircraft use

2. Identify and describe laminated structural materials.

Potential Elements of the Performance:

- Describe glass fiber and other fiber reinforcement products
- Explain polyester and epoxy resin systems
- Understand how thixotropic agents are used

3. Explain the types of laminated construction.

Potential Elements of the Performance:

- Lay up, moulds and parting agents
- Laminated stack-ups
- Sandwich panel construction

4. Describe general manufacturing and repair techniques.

Potential Elements of the Performance:

- Assessment of damage
- Criteria of a good manufactured part or a good repair
- Equipment required
- Safety equipment and precautions

5. Describe the general repair procedures.

Potential Elements of the Performance:

- Surface scratches
- Step cut repair
- Dents in sandwich structure
- Potted repairs
- Skin penetrated and core damage

6. Manufacture two glass fiber laminates.

Potential Elements of the Performance:

- Tools (molds) to be provided
- Assign cloth style number and orientation for each ply
- Room temperature cure epoxy wet resin used

### **III. TOPICS:**

1. Introduction to Composites
2. Laminated Structural Materials
3. General Manufacturing and Repair Techniques
4. General Repair Procedures

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

Advanced Composites (Cindy Foreman)  
Teacher Handouts  
D2L

**V. EVALUATION PROCESS/GRADING SYSTEM:**

Two tests worth 100% of the final grade.  
Tests #28 A and B

Test #28A 50%  
#28B 50%

**Notes:**

- 1/ 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.**
- 2/ Course attendance is mandatory. If a student is absent, he/she must have a valid reason – documentation is required. If a student is absent for all of the in-class theory or shop demonstrations for which a test/project is assigned, he/she will not be granted permission to complete the test/project.**
- 3/ If a student misses a test, he/she must have a valid reason – documentation is required. In addition, the instructor must be notified prior to the test, or the student will receive a mark of zero, with no make-up option.**
- 4/ All assignments must be completed. Failure to complete assignments will result in removal of 10% from the test associated with the assignment.**
- 5/ Re-writes for tests, and Repeats for shop projects will not be granted.**

**Valid reasons for being absent:**

- **Illness – supported by doctor’s note**
- **Family death or serious illness – supported by applicable documents**

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 been closed, the learning process has begun. Late arrivers will not be granted admission to the room.***

**CELL PHONES MUST NOT BE USED IN THE SHOP OR  
CLASSROOM**