

# **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. 2016** **PREVIOUS OUTLINE DATED:** **Sept. 2015**

**APPROVED:** **Colin Kirkwood** **June/16**  
**DEAN** **DATE**

**TOTAL CREDITS:** 2

**PREREQUISITE(S):** N/A

**HOURS: (Total)** 32

**Copyright ©2012 The Sault College of Applied Arts & Technology**  
*Reproduction of this document by any means, in whole or in part, without prior written permission of Sault College of Applied Arts & Technology is prohibited.*  
*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/ **All assignments must be completed, and are recorded on file. Failure to complete assignments are used as an indicator in X GRADE policy rewrites in respect of the final grade for ASR 115.**
  - - Rewrite exams may be granted by the course instructor at the end of the semester. The rewrite exam may be a theory exam if the student fails only that portion of the course or a practical project if the student fails that portion of the course.
  - **-If the student fails both portions of the course he will have to rewrite a theory exam to cover the theory portion of the course and complete a practical project to complete the practical portion of the course.**
  - -The final theory exam is evaluated separately from the practical project. Each portion of the evaluation must attain a passing mark of 70%. The final grade will equate 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.

If a faculty member determines that a student is at risk of not being successful in their academic pursuits and has exhausted all strategies available to faculty, student contact information may be confidentially provided to Student Services in an effort to offer even more assistance with options for success. Any student wishing to restrict the sharing of such information should make their wishes known to the coordinator or faculty member.

## **VI. SPECIAL NOTES:**

**1/** Course attendance is mandatory. If a student is absent, he/she must have a valid reason – documentation is required.

**2/** Students having missed more than 5 percent of the program through absences, shall not qualify for experience credit from Transport Canada, and will not be granted make-up or re-write options for theory tests and shop projects.

**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/** 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.

**5/** Valid reasons for being absent:

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

**CELL PHONES / LAPTOPS / ELECTRONIC DEVICES MUST NOT BE USED  
IN THE SHOP OR CLASSROOM**

**VII. COURSE OUTLINE ADDENDUM:**

The provisions contained in the addendum located in D2L and on the portal form part of this course outline.

**COURSE NOTE:**

**The prerequisite for ASR 126 is ASR 115. Successful completion of ASR 115 is a requirement.**