



This course is comprised of 128 hours of theory/practical work related to the manufacturing and repair of aircraft composite parts. Advanced composite materials, manufacturing techniques and repair methods will be used by the student to build and repair aircraft structural components. All practical work will take place in the composite lab.

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

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

### 1. ***Understand the advanced composite theory that supports aircraft structural manufacturing and repair work.***

#### Potential Elements of the Performance:

- safety, handling and environment issues specific to composites
- fiber reinforcement materials, terminology, fabric types and weaves
- matrix materials; types of matrix and adhesive resins
- core materials; types of honeycomb, foam, wood and syntactic cores, potting compound
- pre-preg materials (B-stage cure)
- using a warp clock for manufacturing and repair lay-up
- damage assessment and evaluation methods
- specific manufacturing and repair methods
- duplicate plaster and plastic mould construction methods
- typical composite processes; vacuum bagging, curing, machining, lay-up and orientation

### 2. ***Manufacture and repair composite parts using the modern, advanced methods that are specific to aircraft maintenance work.***

#### Potential Elements of the Performance:

- the necessary health and safety precautions
- safe handling and disposal of composite materials, resins and solvents
- manufacturing and repair of laminates
- manufacturing of sandwich panels using manufacturer's specific lay-up details
- repair of sandwich panels using manufacturer's specific repair methods
- core replacement repairs with honeycomb and foam core

- sandwich panels
- damage evaluation using the given manufacturer's repair limits
- typical composite processes; removal of paint , removal of damage, water removal and cleaning the repair area, lay-up and ply orientation, core orientation, vacuum bagging and hot bonding, edge trimming and final inspection
- fabricate a duplicate plaster mold from an original manufacturing tool (mold)
- installation of Click Bond fasteners

### III. TOPICS:

1. Safety, Handling and Environment
2. Fiber Reinforcement Materials
3. Matrix Materials
4. Core Materials
5. Working With Composites (Manufacturing and Repair)
6. Typical Composite Repairs

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

Advanced Composites (Cindy Foreman)  
Teacher Handouts  
D2L

### V. EVALUATION PROCESS/GRADING SYSTEM:

#### **Two multiple choice tests:**

Test #29 A and B Advanced Composites (50 % of the final grade)

Test #29A 50%  
#29B 50%

#### **Practical work:**

Practical projects (Average mark for all projects is worth 50 % of the final grade.)

**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. 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/ 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:

<b>Grade</b>	<b><u>Definition</u></b>	<i>Grade Point Equivalent</i>
A+	90 – 100%	4.00
A	80 – 89%	
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:**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.*

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.

**NOTE:** Prerequisite for 126 is ASR 115.

**NOTE:** Successful completion in ASR 126 with a grade { B }  
– 70% in both practical and theory is a requirement { INDIVIDUALLY }.

**CELL PHONES 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.