SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE:	GENERAL REPAIRS I		
CODE NO. :	ASR124	**SEMESTER:**	1
PROGRAM:	AIRCRAFT STRUCTURAL REPAIR		
AUTHOR:	DEVIN YORK		
DATE:	September 2015	**PREVIOUS OUTLINE DATED:**	September 2014
APPROVED:	*"Colin Kirkwood"* **DEAN**		
TOTAL CREDITS:	14		
PREREQUISITE(S):	N/A		
HOURS (Total):	216		

I. COURSE DESCRIPTION:

Using established guidelines, textbooks and in-class presentations, students will complete solid shank rivet installations. Various rivet styles and sizes will be installed into sheetmetal of various thicknesses. Specific formulas will be used to complete layout on sheetmetal assignments. Installation of special fasteners will also be completed. The acceptable procedures for installing and removing of special fasteners will be demonstrated. Countersinking, dimpling and micro-shaving operations will also be completed. The use of hand tools will be studied and safe operation techniques will be demonstrated. The proper maintenance of hand tools and shop equipment will be covered. Personal safety requirements will also be discussed. Practical projects will be assigned and must be completed.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

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

1. Identify the most common type of solid shank rivets used in the aircraft industry and the procedures to complete rivet layouts.

Potential Elements of the Performance:

- identify two most common types of rivets used
- discuss the various terms associated with rivet layout procedures such as pitch and edge distance
- discuss the minimum and maximum pitch for various rivet head styles
- describe using formulas, charts and structural repair manuals, the proper number of rivets to be used for a repair
- discuss factors affecting rivet layout results
- layout a basic sheet metal repair given minimum information
- describe how to layout various rivet patterns for rectangular and circular repairs
- identify the equipment used to perform accurate layout repairs

2. Identify, install and removal of solid shank rivets using various hand tools. Inspection of acceptable and unacceptable rivet installation will be completed.

Potential Elements of the Performance:

- identify common solid shank rivets using codes and rivet head identification marks (i.e. AN470 AD-3-4 rivet)
- describe how to determine the proper length of rivet shank for a specific repair
- describe and requisition proper rivet sizes from stores for a repair
- discuss how to operate various hand tools used to install solid shank rivets
- discuss how to install solid shank rivets properly
- identify a properly installed rivet
- describe various terms used in rivet installation such as “drawing” and skip riveting
- identify how to remove rivets properly using proper drill bit sizes and equipment
- identify the purpose of clecos and the various colours associated with cleco sizes
- discuss the advantages of using rivets instead of aircraft hardware
- determine proper bucking bar sizes and rivet gun sizes for a specific repair
- discuss proper maintenance of hand tools
- describe the purpose of using rivet squeezers and hole duplicator tools
- identify the purpose of de-burring sheet metal holes after drilling operations
- discuss how to protect aluminum from corrosion
- discuss the causes of poorly installed rivets
- determine which rivets require heat treating prior to installation
- identify areas where stainless steel rivets must be used

3. Complete specialized repairs and processes such as Countersinking, Dimpling, Micro-shaving and Straight Line Bend procedures.

Potential Elements of the Performance:

- describe two methods of countersinking aircraft sheet metal
- determine which method should be used for a specific repair
- describe the types of CSK drill bits used for repair
- identify when the dimpling process should be used
- describe various ways of dimpling aircraft skins
- discuss both “Radius” and “Coin Dimpling” processes
- discuss micro-shaving process
- describe how to calculate straight bends on aircraft repairs
- identify terms such as “sight line, radius and nose radius bar” used in straight bend repairs
- identify the term “setback”
- identify the machinery used to roll metal and bend aluminum sheets
- describe how to use and adjust machinery for the purpose of performing straight bends or curved repairs
- identify machinery used to shear aluminum such as the manual and electric shears
- discuss the safety features and precautions of band saw operation
- fabricate both straight bend repairs and curved item repairs as per sample item
- complete basic micro shaving operations as per instructor guidelines

4. Complete study of special fastener and blind rivet installation techniques and removal procedures

Potential Elements of the Performance:

- mechanical lock and friction lock rivet installation and removal procedures
- cherry max rivet installation and removal procedures
- huck bolt and lock bolt installation and removal procedures
- hi lok, hi lite and high shear fastener installation and removal procedures
- rivet installation and removal procedures
- anchor nut installation and removal procedures

III. TOPICS:

1. Sheetmetal layout and repairs
2. Solid Shank Rivet Identification & Installation Procedures
3. General Repairs and Processes
4. Special Fasteners & Blind Rivets
5. Straight Line Bending and Micro-Shaving

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

A/C 65-15A textbook { ONLINE }
AC 43.13-1B { ONLINE }
FAA-H-8083-30 / 31 textbooks
Teacher handouts
D2L

V. EVALUATION PROCESS/GRADING SYSTEM

Multiple Choice Tests (5) accounting 40% towards final grade.

Solid Shank Rivet	20%
CSK, Dimpling & Layout	5%
General Repairs	5%
Special Fasteners	5%
Bend Allowance & Micro-shaving	5%

Practical Lab Assignments account for 60% toward final grade.

Note:
The grade given for Project #21 (ASR102 student presentation – flight control systems) will be used as a lab assignment.

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

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:

Grade	Definition	Grade Point Equivalent
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% or 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 Note:

The prerequisite for ASR 128 is ASR 124. Successful completion of ASR 124 is a requirement.

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.