

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ON

COURSE OUTLINE

COURSE TITLE: GENERAL REPAIRS II

CODE NO: ASR108

SEMESTER: II

PROGRAM: AIRCRAFT STRUCTURAL REPAIR TECHNICIAN

AUTHOR: STEVE LACHOWSKY

DATE: APRIL 1995

PREVIOUS OUTLINE DATED: FEBRUARY 1994

APPROVED: *L. P. Croxall*
Dean, School of Engineering Tech.

95-04-10
Date

COURSE NAME: GENERAL REPAIRS II

CODE NO.: ASR108

TOTAL CREDIT HOURS: 345 HOURS (28 CREDITS)

PREREQUISITE(S):

I. PHILOSOPHY/GOALS:

Students will research using textbooks, structural repair manuals and teacher hand outs and perform major structural repairs. Topics such as aircraft fabric covering, aircraft corrosion control, aircraft bonded structures, and float repairs will be examined. This course utilizes specialized tools and large sheet metal fabricating machinery.

II. STUDENT PERFORMANCE OBJECTIVES:

Upon successful completion of this course the student will:

1. Describe and demonstrate aircraft major structural repairs.
2. Discuss various topics affecting aircraft structures such as corrosion.
3. Discuss cable construction and identify special fasteners and blind rivets.
4. Identify the acceptable methods of repairing aircraft fabric coverings.
5. Discuss basic float repairs.
6. Identify aircraft jig construction and use.
7. Discuss basic wooden structure repairs.

III. TOPICS TO BE COVERED:

1. General Repairs
2. Aircraft Fabric Coverings
3. Aircraft Corrosion Control
4. Aircraft Bonded Structures
5. Aircraft Cable Construction
6. Aircraft Wooden Structures

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[Signature]
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IV. LEARNING ACTIVITIES

1.0 General Repairs

Upon successful completion of this unit the student will be able to:

- 1.1 Describe various panel repairs and discuss the procedures you should follow to complete this repair.
- 1.2 Describe how to repair aircraft stringer repairs.
- 1.3 Describe the various bulkhead repairs.
- 1.4 Describe the various spar repairs.
- 1.5 Describe the procedures in completing a leading edge and trailing edge repair on a wing or control surface.
- 1.6 Decide the number of items required to complete a repair by reading blueprints or aircraft structural repair manuals.
- 1.7 Identify using repair schematics on the procedures used to repair various float damage.
- 1.8 Identify the various items used in the construction of a float.
- 1.9 Describe how to install turn lock fasteners and identify the various parts of turn lock fasteners.
- 1.10 Discuss the coding system used to identify fastener diameter and length.
- 1.11 Identify various fasteners.
- 1.12 Install and remove various fasteners correctly.
- 1.13 Describe the special fasteners called the Rivnut.

REQUIRED RESOURCES

Textbook: A/C 65-15A
Chapter V - pg. 127-133

Chapter V - pg. 189-197

Textbook: Aircraft
Sheetmetal-EA-SM
Chapter VII - pg. 73-85

Teacher handouts

Textbook: A/C 65-9A
Chapter VI - pg. 141-143

Textbook: A/C 65-15A
Chapter V - pg. 177-189

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LEARNING ACTIVITIES

- 1.14 Discuss how to install Rivnuts and the operation of hand tools used for installation.
- 1.15 Discuss Hi Shear Rivet identification, installation and removal.
- 1.16 Discuss blind rivet types, installation, removal and calculating the proper size required to complete a repair.
- 1.17 Describe the difference in friction lock and mechanical lock rivets.
- 1.18 Discuss both cherry and cherry max. rivets.
- 1.19 Discuss lock bolt styles and installation.
- 1.20 Identify the various types of aircraft jigs and explain their purpose and operation procedures.
- 1.21 Discuss the reason for safetying aircraft structures and safetying methods.
- 1.22 Describe how to cotterpin aircraft bolts.
- 1.23 Discuss the "snap ring" locking procedures.
- 1.24 Describe how to operate safely all large sheet metal fabricating machinery.

REQUIRED RESOURCES

Textbook: Aircraft Sheetmetal
EA-SM
Chapter V - pg. 41-61

Textbook: A/C 65-15A
Chapter V - pg. 155-160

Textbook: A/C 65-15A
Chapter V - pg. 141-144

Textbook: A/C 65-9A
Chapter VI - pg. 145-150

Textbook: A/C 65-15A
Chapter V - pg. 136-141

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LEARNING ACTIVITIES

2.0 Aircraft Fabric Covering

Upon successful completion of this unit the student will be able to:

- 2.1 Identify the types of fabrics used to repair aircraft fabric covered structures.
- 2.2 Discuss various terms used throughout the repair process.
- 2.3 State the purpose and procedures for various repairs.
- 2.4 Describe various wing fabric repairs.
- 2.5 List the causes of fabric deterioration.
- 2.6 Discuss areas where fabric damage will most likely occur.
- 2.7 Discuss dope application and problems associated with this method of repair.
- 2.8 Discuss various stitching involved with fabric repairs.
- 2.9 Discuss the various safety equipment associated with these repairs.

3.0 Aircraft Corrosion Control

Upon successful completion of this unit the student will be able to:

- 3.1 Identify various types of corrosion which damages aircraft structures.
- 3.2 Discuss methods of removing and treatment of corrosion in aircraft structures.
- 3.3 Describe how to use equipment and chemicals associated with removing and treating corrosion.

REQUIRED RESOURCES

Textbook: A/C 65-15A
Chapter III - pg. 85-111

Textbook: EA-CC-1
Complete Book.

Textbook: A/C 65-9A
Chapter VI - pg. 174-185

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LEARNING ACTIVITIES

- 3.4 State the causes of corrosion.
- 3.5 Discuss areas prone for corrosion start up.

4.0 **Aircraft Bonded Structures**

Upon successful completion of this unit the student will be able to:

- 4.1 Identify a bonded structure and briefly describe why we use bonded structures in aircraft.
- 4.2 Describe honeycomb construction and where you may find this material on an aircraft structure.
- 4.3 Discuss fiberglass types and repairs.
- 4.4 State the purpose of using various chemicals in fiberglass repairs.
- 4.5 Describe the advantages of epoxy resin.
- 4.6 Discuss how to perform various repairs to fiberglass items.
- 4.7 Discuss how to repair various minor and major honeycomb damage.
- 4.8 Identify the equipment to perform these repairs and the safety precautions one must follow.

5.0 **Aircraft Cable Construction**

Upon successful completion of this unit the student will be able to:

- 5.1 Identify most common type of cables used for aircraft systems.
- 5.2 Describe the procedures used to swage terminal ends onto cable.

REQUIRED RESOURCES

Textbook: EA-NMR
Complete book.

Textbook: A/C 65-15A
Chapter V - pg. 200-209

Textbook: A/C 65-9A
Chapter VI - pg. 143-144

Teacher handouts.

LEARNING ACTIVITIES

- 5.3 Describe the procedures used to "nico-press" aircraft cable.
- 5.4 Discuss the purpose of various equipment used to fabricate aircraft cable.
- 5.5 Describe how to test cable after installation of terminal ends.
- 6.0 Wooden Aircraft Structures
Upon successful completion of this unit the student will be able to:
 - 6.1 Identify the aircraft woods required for structural and component repairs.
 - 6.2 Discuss terminology associated with wood.
 - 6.3 Describe the requirements for selecting aircraft wood for the purpose of repairs.
 - 6.4 Discuss the advantages of using plywood vs solid wood in aircraft repairs.
 - 6.5 Identify types of glues used for repairs and discuss gluing methods.
 - 6.6 Discuss moisture content in aircraft woods.
 - 6.7 Describe the surface conditions of gluing wooden structures and the importance of strong gluing joints.

REQUIRED RESOURCES

Teacher Handouts

Teacher Handouts

IV. LEARNING ACTIVITIES

- 6.8 Identify gluing pressures required during wooden structure repairs and the importance of using Caul Blocks and jigs.
- 6.9 Discuss laminated wood construction and methods of bending wood in jigs.
- 6.10 Describe basic spar splices, scarf joint repairs, and L/E and T/E repairs.
- 6.11 Identify jig manufacturing of rib jigs.
- 6.12 Discuss plywood repairs, including surface patches and splayed patch.
- 6.13 Identify the acceptable methods of finishing repaired wood surfaces.

REQUIRED RESOURCES

Teacher Handouts

V. EVALUATION METHODS: (INCLUDES ASSIGNMENTS, ATTENDANCE REQUIREMENTS ETC.)

4 Written Tests - 50%
35 Practical Projects - 50%

TOTAL - 100%

Grading will be as follows:

A+ = 94% - 100%
A = 86% - 93%
B = 78% - 85%
C = 70% - 77%
I = Incomplete

Any student absent beyond 5% will have their final grade adjusted by 1% per every three hours missed to a maximum of 5% (15 hours). If the course grade minus the 1% per three hours falls below 70% the student will automatically fail the course.

Any student absent more than the maximum 5% must make up the hours before the end of the semester or fail the course.

VI. REQUIRED STUDENT RESOURCES

A/C 65-15A - A & P Airframe Handbook
A/C 65-9A - A & P General Handbook
Aircraft Sheetmetal - EA-SM
Aircraft Corrosion Control - EA-CC-1
Aircraft Bonded Structures - EA-NMR

VII. ADDITIONAL RESOURCE MATERIALS AVAILABLE IN THE COLLEGE LIBRARY:

Book Section (title, publisher, edition, date, library call number if applicable - see attached example)

Periodical Section (Magazines, Articles)

Canadian Aircraft Operator

Audiovisual Section (Films, Filmstrips, Transparencies)

Transparencies - as per chapters and books pertaining to each topic.

VIII. SPECIAL NOTES

Students with special needs (eg. physical limitation, visual impairments, hearing impairments, learning disabilities) are encouraged to discuss required accommodations confidentially with the instructor.

