

**SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY
SAULT STE MARIE, ON**



COURSE OUTLINE

Course Title: AIRCRAFT STRUCTURES

Code No.: ASR103 Semester: 1

Program: AIRCRAFT STRUCTURAL REPAIR

Author: STEVE LACHOWSKY

Date: June 1998 Previous Outline Date: Fall 1993

Approved:

Kitty DeRosario

Dean

aug 26/98

Date

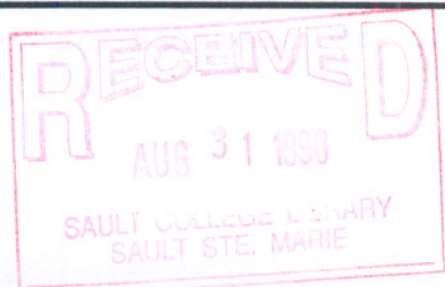
Total Credits: 4

Prerequisite(s):

Length of Course: 4 HRS./WK.

Total Credit Hours: 68

Copyright © 1998 Sault College of Applied Arts & Technology
Reproduction of this document by any means, in whole or in part, without the prior
written permission of Sault College of Applied Arts & Technology is prohibited.
For additional information, please contact Kitty DeRosario, Dean, School of Trades
& Technology, (705) 759-2554, Ext. 642.



COURSE NAME

COURSE NUMBER**I. COURSE DESCRIPTION:**

Through the use of textbooks, film and in-class presentations, students will become familiar with the components used to construct both fixed wing and rotary wing aircraft structures. Weight and balance procedures and calculations are studied. Aircraft hardware is presented and discussed with the use of film and assigned textbooks.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

(Generic Skills Learning Outcomes placement on the course outline will be determined and communicated at a later date.)

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

- 1) Describe aircraft structural components used in the construction of fuselages and wings.

Potential Elements of the Performance:

- describe the five stresses acting on an aircraft during flight
- discuss the purpose of an aircraft fuselage
- identify the most common aircraft fuselage designs and their construction
- describe in detail, the semi-monocoque fuselage design
- describe the purpose of all the construction members in a fuselage design
- identify the components used to construct an aircraft wing and their purpose in the construction of the wing
- describe the factors considered in designing an aircraft wing
- discuss wing spar types and construction
- describe "honeycomb" material use in aircraft structures and the advantages
- identify various aircraft nacelles and engine mounts
- describe various types of engine cowlings found on modern aircraft

- 2) Discuss after repairs and modifications to aircraft structures, new weight and balance figures to derive the new centre of gravity of the aircraft.

Potential Elements of the Performance:

- discuss the reasons for re-weighing of aircraft
- describe the results of improper loading of aircraft
- describe the mandatory times aircraft must be re-weighed and the paperwork involved
- identify the sources from which weight and balance information can be obtained
- describe terms used in aircraft weight and balance calculations such as The Datum Line, The Monument, The Arm Tare Weight, etc.
- discuss Permanent and Temporary ballast on aircraft

COURSE NAME

COURSE NUMBER

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE (Continued)

Potential Elements of the Performance Continued.....

- identify when objects have a positive or negative arm when performing calculations
 - describe the procedures used to calculate a weight and balance given limited information on both conventional and tricycle type undercarriage
 - identify who obtains amended weight and balance information
 - describe where new weight and balance documentation is found in an A.M.O.
- 3) Identify aircraft hardware codes and part numbers associated with common aircraft bolts, washers and nuts. This section includes the use of aircraft parts manuals and helicoil installation procedures.

Potential Elements of the Performance:

- identify aircraft bolts by their respective head marks
- describe three types of material used to manufacture aircraft bolts
- discuss where specific types of aircraft bolts are used in specific areas of aircraft assembly
- identify both "JO-BOLTS" and Lock Bolts
- describe the various types of aircraft nuts and washers using both letter and number codes
- describe, given a number of aircraft hardware items, the part number associated with the item - i.e. AN9-C-H-17A
- describe how to install Heli Coils
- discuss how to obtain specific hardware using an aircraft parts catalogue and stores requisition form
- discuss the advantages of using JO-BOLTS instead of other aircraft hardware
- identify temperature restrictions on self-locking aircraft nuts
- describe when and where to use lock washers
- discuss the purpose of cotter pins

III. TOPICS:

- 1) Basic A/C Structures and Components
- 2) Weight & Balance Calculations
- 3) Aircraft Hardware

COURSE NAME

COURSE NUMBER**IV. REQUIRED RESOURCES/TEXTS/MATERIALS:**

A/C 65-15A

A/C 65-9A

Standard Aviation Maintenance Handbook**Teacher Handbooks****V. EVALUATION PROCESS/GRADING SYSTEM**

Three (3) written tests, each worth 33 1/3 % of the final grade.

Grading: A+ (94-100)

B (78-85)

A (86-93)

C (70-77)

R Repeat

VI. SPECIAL NOTES:**- Special Needs**

If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, learning disabilities), you are encouraged to discuss required accommodations with the instructor and/or contact the Special Needs Office, Room E1204, Ext. 493, 717, 491 so that support services can be arranged for you.

- 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 post-secondary institutions.

- Disclaimer for Meeting the Needs of the Learners**- Substitute Course Information is available at the Registrar's Office.****- Course Notes: All assignments must be completed prior to in-class presentation. Any assignments not complete will result in 10% removal from final grade in ASR103.****VII. PRIOR LEARNING ASSESSMENT**