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

COURSE OUTLINE

Course Title: METALLURGY AND HEAT TREATING
PROCESS

Code No.: ASR111   **Semester:** 2

Program: AIRCRAFT STRUCTURAL REPAIR

Author: STEVE LACHOWSKY

Date: Dec. 2001   **Previous Outline Date:** DEC. 2000

Approved: _____   _____
              Dean   **Date**

Total Credits: 2
Prerequisite(s):
Length of Course: 2 Hrs./Wk.   **Total Credit Hours:** 36

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_____   _____
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I.   COURSE DESCRIPTION:

Basic metallurgy and heat treating process will be discussed as it pertains to aluminum, steel and titanium metals. Various procedures used to increase hardness and durability will be researched. Testing using specialized equipment will be demonstrated.

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)   Understand the heat-treating process used to heat-treat ferrous and nonferrous metals and to discuss and identify all terminology used in the heat treating process.

Potential Elements of the Performance:

• describe how aluminum is produced
• identify the major alloy in a sheet of aluminum by the part number stamped on the sheet
• discuss various terms associated with the heat treatment process of aluminum
• describe why we heat treat aluminum and the changes that occur in the metal
• discuss the characteristics associated with magnesium
• discuss heat treatment of ferrous metals and the various methods used in the heat treatment of ferrous metals
• describe the purpose of having "Aldad" on aluminum
• identify with the use of charts, the temperature that specific metals are heat treated at
• describe, using charts, the precipitation heat treatment procedures to be used to heat treat aluminum
• identify the "soaking" temperature of various alloyed
• discuss heat treatment of 2024T3 rivets

2)   Discuss and identify various hardness testing methods performed on ferrous and non-ferrous metals

Potential Elements of the Performance:

• identify the procedures used to operate both the Brinell and Rockwell Hardness Test Equipment
• describe how to identify the hardness of aluminum using the Barcol Tester
• discuss, using charts, the ultimate and shearing strength of various alloyed aluminum

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III.   TOPICS:

1)   Heat Treatment of Metals
2)   Hardness Testing

IV.   REQUIRED RESOURCES/TEXTS/MATERIALS:

A/C 65-9A   Teacher Handouts

V.   EVALUATION PROCESS/GRADING SYSTEM

One Written Test (1) – accounts for 100% of Final Grade
ASSIGNMENTS: See special notes
GRADING: A+ - 94 – 100%
                        A - 86 - 93%
                        B - 78 - 85%
                        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.

-    All assignments must be completed. Any assignments not completed will result in the
    removal of 10% from the final grade in ASR110.

VII.   PRIOR LEARNING ASSESSMENT

Students who wish to apply for advanced credit in the course should consult the instructor.

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