SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ON

COURSE OUTLINE

COURSE TITLE: METALLURGY AND HEAT TREATING PROCESS

CODE NO: ASR111 SEMESTER: II

PROGRAM: AIRCRAFT STRUCTURAL REPAIR TECHNICIAN

AUTHOR: STEVE LACHOWSKY

DATE: FEBRUARY 1994 PREVIOUS OUTLINE DATED: SPRING 1993

APPROVED: _____ 94-02-10
Dean, School of Engineering Tech. Date

COURSE NAME: METALLURGY & HEAT TREATING PROCESS CODE NO.: ASR111

TOTAL CREDIT HOURS: 30 Hours (2 credits)

PREREQUISITE(S):

I. PHILOSOPHY/GOALS:

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. STUDENT PERFORMANCE OBJECTIVES:

Upon successful completion of this course the student will:

Discuss basic heat treating procedures for both aluminum and steel metals.

Describe how to treat aluminum rivets.

Identify various terms used in the heat treating process.

Discuss hardness testing procedures and equipment.

III. TOPICS TO BE COVERED:

1. Heat Treatment of Metals
2. Hardness Testing

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IV. LEARNING ACTIVITIES

1.0 Heat Treatment

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

1.1 Describe how aluminum is produced.

1.2 Identify the major alloy in a sheet of aluminum by the part number stamped on the sheet.

1.3 Discuss various terms associated with the heat treatment process of aluminum.

1.4 Describe why we heat treat aluminum and the changes that occur in the metal.

1.5 Discuss the characteristics associated with magnesium.

1.6 Discuss heat treatment of ferrous metals and the various methods used in the heat treatment of ferrous metals.

1.7 Describe the purpose of having "ALdad" on aluminum.

1.8 Identify with the use of charts the temperature that specific metals are heat treated at.

1.9 Describe using charts the precipitation heat treatment procedures to be used to heat treat aluminum.

1.10 Identify the "soaking" temperature of various alloyed aluminum sheets using charts.

1.11 Discuss heat treatment of 2024T3 rivets.

REQUIRED RESOURCES

Textbook: A/C 65-9A
Chapter VI, pg. 194-218

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LEARNING ACTIVITIES

2.0 Hardness Testing

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

2.1 Identify the procedures used to operate both the Brinell and Rockwell Hardness Test Equipment.

2.2 Describe how to identify the hardness of aluminum using the Barcol Tester.

2.3 Discuss, using charts the ultimate and shearing strength of various alloyed aluminum.

REQUIRED RESOURCES

Textbook: A/C 65-9A
Chapter VI, pg. 218-220

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

One Written test - 100%

The grading method will be as follows:

A = 90% - 100%
B = 80% - 89%
C = 70% - 79%
I = Incomplete

VI. REQUIRED STUDENT RESOURCES

A & P General Handbook - A/C 65-9A

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)

Audiovisual Section (Films, Filmstrips, Transparencies)

Hardness of Metals - Vol. I & II
As per Chapter VI A/C 9A

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.

Your instructor reserves the right to modify the course as he/she deems necessary to meet the needs of the students.