



COURSE OUTLINE

ASR111

Prepared: Paul Davis Approved:

Course Code: Title	ASR111: METALLURGY & HEAT TREATING PROCESSES
Program Number: Name	4067: AIRCRAFT STRUCT TECH
Department:	AIRCRAFT STRUCTURAL REPAIR
Semester/Term:	18W
Course Description:	Metallurgy is the study of metals, their properties and pertaining to aircraft - their structural applications. The student will also become familiar with the different heat treating processes used to improve these metals for aircraft structural use. Topics include ferrous and non-ferrous metals, heat treatment processes for aircraft steels and aluminum alloys and mechanical properties - hardness testing.
Total Credits:	2
Hours/Week:	2
Total Hours:	32
Vocational Learning Outcomes (VLO's):	<p>4067 - AIRCRAFT STRUCT TECH</p> <p>#1. Safely use the tools, equipment and identify materials needed to carry out various sheet metal repairs.</p> <p>#2. Demonstrate a working knowledge of the principles of aircraft design by applying theory and shop practice.</p> <p>#7. Refer to specific aircraft manuals such as Aircraft Pocket Manual and Hardware Manual to determine safe and acceptable procedures and parts.</p> <p>#13. Fabricate sheet metal parts with the use of shop equipment and manuals.</p> <p>#16. Demonstrate honesty and integrity to match the requirements of the aircraft industry.</p>
Essential Employability Skills (EES):	<p>#1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.</p> <p>#2. Respond to written, spoken, or visual messages in a manner that ensures effective communication.</p> <p>#5. Use a variety of thinking skills to anticipate and solve problems.</p> <p>#6. Locate, select, organize, and document information using appropriate technology and information systems.</p> <p>#7. Analyze, evaluate, and apply relevant information from a variety of sources.</p> <p>#10. Manage the use of time and other resources to complete projects.</p> <p>#11. Take responsibility for ones own actions, decisions, and consequences.</p>
<small>Please refer to program web page for a complete listing of program outcomes where applicable.</small>	

Course Evaluation: Passing Grade: 70%, B

Other Course Evaluation & Assessment Requirements: Grade
Definition Grade Point Equivalent
A+ 90 - 100% 4.00
A 80 - 89%
B 70 - 79% 3.00
C 60 - 69% 2.00
D 50 - 59% 1.00
F (Fail) 49% and 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.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Assignments	10%
Test #24A	45%
Test #24B	45%

Books and Required Resources:

Aviation Maintenance Technician Handbook
ISBN: 978-1-56027-716-3

Course Outcomes and Learning Objectives:

Course Outcome 1.

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

Learning Objectives 1.

- 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 "Alclad" 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 metals
- discuss heat treatment of 2024T3 rivets

Course Outcome 2.

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

Learning Objectives 2.

- identify the procedures used to operate both the Brinell and Rockwell hardness testers
- describe how to identify the hardness of aluminum using the Barcol tester
- discuss, using charts, the ultimate and shearing strength of various types of alloyed aluminum

Date:

Monday, December 18, 2017

Please refer to the course outline addendum on the Learning Management System for further information.