1. **COURSE TITLE\*: Airframe Metallic Structures**
2. **CATALOG – PREFIX/COURSE NUMBER/COURSE SECTION\*: AVIT 2301**
3. **PREREQUISITE(S)\*: COREQUISITE(S)\*:**
4. **COURSE TIME/LOCATION/MODALITY: (*Course Syllabus – Individual Instructor Specific*)**
5. **CREDIT HOURS\*: 4 LECTURE HOURS\*: 3**

 **LABORATORY HOURS\*: 1 (2 contact hrs) OBSERVATION HOURS\*:0**

1. **FACULTY CONTACT INFORMATION: *(Course Syllabus – Individual Instructor Specific)***
2. **COURSE DESCRIPTION\*:**

This course will introduce the student to aircraft structures and structural repair. The student will become familiar with the materials used in all aspects of aircraft construction. This course is a hands-on course in which the student will learn to identify different aircraft materials and their uses. Students will fabricate aircraft structures using aluminum by forming, bending, install and removing aircraft hardware and fasteners. Students will also investigate welding and inspect welded aircraft structures including soldering, brazing, gas and arc-welding**.**

1. **LEARNING OUTCOMES\*:**

Students will have knowledge of the following:

1. Inspection/testing of metal structures.
2. Types of sheet metal defects.
3. Selection of sheet metal repair materials.
4. Layout, forming, and drilling of sheet metal components.
5. Selection of rivets, and fasteners for a sheet metal repair.
6. Heat treatment processes for aluminum.
7. Rivet removal and installation methods.
8. Maintenance safety practices/precautions for sheet metal repairs or fabrications.
9. Flame welding gases.
10. Storage/handling of welding gases.
11. Inert-gas welding practices and techniques.
12. Purpose and types of shielding gases.
13. Types of steel tubing welding repairs.
14. Procedures for weld repairs.
15. **ADOPTED TEXT(S)\*:**

FAA-H-8083-31A (Airframe Vol 1&2)

 Aviation Maintenance Technician Handbook AC43.13-1B

<https://www.faa.gov/sites/faa.gov/files/regulations_policies/handbooks_manuals/aviation/amt_airframe_hb_vol_1.pdf>

<https://www.faa.gov/handbooksmanuals/aviation/aviation-maintenance-technician-handbook-airframe-volume-2>

<https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_43.13-1B_w-chg1.pdf>

**9a: SUPPLEMENTAL TEXTS APPROVED BY FULL TIME DEPARTMENTAL FACULTY (INSTRUCTOR MUST NOTIFY THE BOOKSTORE BEFORE THE TEXTBOOK ORDERING DEADLINE DATE PRIOR TO ADOPTION) \*\*\*.**

1. **OTHER REQUIRED MATERIALS: (SEE APPENDIX C FOR TECHNOLOGY REQUEST FORM.)\*\***
2. **GRADING SCALE\*\*\*:**

Grading will follow the policy in the catalog. The scale is as follows:

A: 90 – 100

 B: 80 – 89

 C: 70 – 79

 D: 60 – 69

 F: 0 – 59

Grades of 69 and below will not meet the requirements of the FAA for Mechanic

Certificate.

1. **GRADING PROCEDURES OR ASSESSMENTS: (*Course Syllabus – Individual Instructor Specific)***

Test count – 40% of Final Grade

 Quizzes count – 10% of Final Grade

 Lab Grade counts – 50% of Final Grade

Class and lab attendance will be graded, two points will be deducted from the grade for each day missed. Quizzes cannot be made up. No test can be taken late without prior approval of the instructor.

1. **COURSE METHODOLOGY: *(Course Syllabus – Individual Instructor Specific)***

May included but not limited to lecture and problems solving, group and lab projects, in-class and home assignments, quizzes and tests. Lab project will be individual and group. Attendance to class and lab is required.

**14. COURSE OUTLINE: *(Course Syllabus – Individual Instructor Specific)***

***(Insert sample course outline with learning outcomes tied to assignments / topics.)***

**Below is an example of how you might fill-in the course outline of classwork, assignments, tests, et al…**

|  |  |  |
| --- | --- | --- |
| **WEEK** | **DESCRIPTION** | **LEARNING OUTCOMES #** |
| WEEK 1 | Types of sheet metal structures, structural loads, stresses, rivet joints, aluminum alloys, | 1, 2 |
| WEEK 2 | Sheet metal tools, marking tools, punches, cutting tools, shop tools, drills. | 1, 2, 3 |
| WEEK 3 | Quiz 1Layout and forming, bend radius, bend allowance, computations for layouts, forming bend, compound curves and contours, bumping, flanging, joggling. | 4, 8 |
| WEEK 4 | Installation of solid rivets, rivet layout patterns, rivet hole preparation, rivet hole preparation for flush rivets, rivet installation | 5 |
| WEEK 5 | Test 1Evaluating driven rivets, rivet removal, NACA flush riveting, team riveting | 7 |
| WEEK 6 | Drill bits, forming tools. | 4 |
| WEEK 7 | Clecos, clamping tools, solid rivets.  | 5 |
| WEEK 8 | Friction lock rivets, mechanical lock rivets, Cherrymax, high sheer rivets, lock bolts, hi-loks, Cherrybuck rivets, Jo-bolts | 5 |
| WEEK 9 | MidtermDzus fasteners, Airloc, Camlock. | 6 |
| WEEK 10 | Heat treatment, non-heat treatable alloys, magnesium alloys, titanium alloys, stainless steel, aluminum honeycomb, cladding, oxide films, paint finishes | 6 |
| WEEK 11 | Assessment of damaging sheet metal, inspection of riveted joints, inspection of corrosion, repair of stressed skins, skin panel replacement. | 2 |
| WEEK 12 | Flush patches, stringer repair, specialized repairs, spar repairs, leading edge repairs. | 3 |
| WEEK 13 | Test 2Oxyacetylene welding, arc welding, gas metal arc welding, tungsten inert gas welding, types of welding joints, evaluating welding joints | 9, 10 |
| WEEK 14 | Brazing and soldering, torch brazing, soldering of electrical wires and connections, welding of aluminum | 11, 12 |
| WEEK 15 | Structural welding repairs, landing gear and engine mount repairs, gas welding, oxyacetylene cutting | 13, 14 |
| WEEK 16 | Final Exam |  |

* Types of sheet metal structures, structural loads, stresses, rivet joints, aluminum alloys,
* Sheet metal tools, marking tools, punches, cutting tools, shop tools, drills.
	+ Quiz 1
* Layout and forming, bend radius, bend allowance, computations for layouts, forming bend, compound curves and contours, bumping, flanging, joggling.
* Installation of solid rivets, rivet layout patterns, rivet hole preparation, rivet hole preparation for flush rivets, rivet installation.
	+ Test 1
* Evaluating driven rivets, rivet removal, NACA flush riveting, team riveting.
* Drill bits, forming tools.
* Clecos, clamping tools, solid rivets.
* Friction lock rivets, mechanical lock rivets, Cherrymax, high sheer rivets, lock bolts, hi-loks, Cherrybuck rivets, Jo-bolts.
	+ Midterm
* Dzus fasteners, Airloc, Camlock.
* Heat treatment, non-heat treatable alloys, magnesium alloys, titanium alloys, stainless steel, aluminum honeycomb, cladding, oxide films, paint finishes.
* Assessment of damaging sheet metal, inspection of riveted joints, inspection of corrosion, repair of stressed skins, skin panel replacement.
* Flush patches, stringer repair, specialized repairs, spar repairs, leading edge repairs.
	+ Test 2
* Oxyacetylene welding, arc welding, gas metal arc welding, tungsten inert gas welding, types of welding joints, evaluating welding joints.
* Brazing and soldering, torch brazing, soldering of electrical wires and connections, welding of aluminum.
* Structural welding repairs, landing gear and engine mount repairs, gas welding, oxyacetylene cutting,
	+ Final Exam

**15. SPECIFIC MANAGEMENT REQUIREMENTS\*\*\*:**

**16. FERPA: \***

Students need to understand that their work may be seen by others. Others may see your work when being distributed, during group project work, or if it is chosen for demonstration purposes. Students also need to know that there is a strong possibility that your work may be submitted to other entities for the purpose of plagiarism checks.

**17. ACCOMMODATIONS: \***

Students requesting accommodations may contact Ryan Hall, Accessibility Coordinator at rhall21@sscc.edu or 937-393-3431, X 2604.

Students seeking a religious accommodation for absences permitted under Ohio’s Testing Your Faith Act must provide the instructor and the Academic Affairs office with written notice of the specific dates for which the student requires an accommodation and must do so no later than fourteen (14) days after the first day of instruction or fourteen (14) days before the dates of absence, whichever comes first. For more information about Religious Accommodations, contact Ryan Hall, Accessibility Coordinator at rhall21@sscc.edu or 937-393-3431 X 2604.

**18. OTHER INFORMATION\*\*\*:**

**SYLLABUS TEMPLATE KEY**

**\*** Item cannot be altered from that which is included in the master syllabus approved by the Curriculum Committee.
**\*\*** Any alteration or addition must be approved by the Curriculum Committee
**\*\*\*** Item should begin with language as approved in the master syllabus but may be added to at the discretion of the faculty member.