COMPOSITES  
Course Syllabus

Course Number: TRAM-2003  
OHLAP Credit: No

OCAS Code: None  
Course Length: 77 Hours

Career Cluster: Transportation, Distribution & Logistics  
Career Pathway: Aviation Maintenance Technology  
Career Major(s): Airframe Mechanic

Pre-requisite(s):

Course Description: Composite materials, including plastics will be studied. Inspection, repairs and use of tools on composite materials are performed by means of hands-on projects.

Textbooks:

Dale Crane, Dictionary of Aviation Terms, Aviation Supplies and Academics, 1997
FAA, FAR Handbook for Aviation Maintenance Technicians, Jeppesen, Sanders, Inc.. 2001
FAA, Standards for Aviation Maintenance Handbook, Jeppesen, Sanders, Inc.. 1985
DOT, Aircraft Inspection and Repair, Jeppesen, Sanders, Inc., 1998

Course Objectives:

A. Lesson: COMPOSITE MATERIALS
1. Match terms related to bonded structures to their correct definitions.
2. Discuss usages and characteristics of reinforcing fibers.
3. Discuss usages and characteristics of matrix materials.
4. Discuss usages and characteristics of core materials.
5. Restate types and characteristics of bonded structures.

B. Lesson: COMPOSITES MANUFACTURING
1. Discuss safety practices related to composite manufacturing/repair.
2. Discuss composite manufacturing/repair techniques.
3. Discuss the various methods of applying pressure during the curing process.
4. Discuss methods of, and various equipment used in, the curing process.
5. Discuss tools, equipment, and processes used in machining composites.
6. Discuss selection, installation, and removal of special fasteners for metallic, bonded, and composite structures.
7. Select and install special fasteners for bonded and composite structures. (Level 2) (App. C,I,D,10)

C. Lesson: COMPOSITE REPAIRS
1. Discuss classification and types of composite damage.
2. Discuss inspection and testing methods of composite structures.
3. Discuss general composite repair operations and procedures.
4. Discuss causes for composite repair failures.
5. Discuss typical composite repair procedures.
6. Discuss delaminations and their repairs.
7. Discuss damage and repairs to laminate structures.
8. Discuss damage and repairs to sandwich structures.
9. Discuss damage and repairs to honeycomb structures.
10. § Inspect bonded structures. (Level 2) (App. C,I,D,11) (AF-D4,D7)
11. § Demonstrate use of router to remove damaged area of honeycomb panels. (Level 2) (App. C,I,D,12)
12. § Clean honeycomb panels prior to patching. (Level 2) (App. C,I,D,12)
13. § Remove damage from bonded honeycomb with a router. (Level 2) (App. C,I,D,12)
14. § Perform core replacement and overlay on bonded honeycomb. (Level 2) (App. C,I,D,12)
15. § Inspect, test, and repair composite fabric, honeycomb, composite and laminated structures. (Level 2) (App. C,I,D,12)
16. § Remove special fasteners for metallic, bonded, and composite structures. (Level 2) (App. C,I,D,10)

D. Lesson: PLASTICS
1. Discuss characteristics of acrylic and cellulose acetate plastic material.
2. Discuss storage and handling of transparent plastics.
3. Discuss forming, sawing, drilling, and cementing transparent plastics.
4. Discuss repairing transparent plastics.
5. Discuss how to protect plastics during handling and repair operations.
6. § Stop drill a crack in plastic. (Level 2) (App. C,I,D,12)
7. § Repair surface scratches in transparent plastic laminates. (Level 2) (App. C,I,D,12)

Teaching Methods:
The class will primarily be taught by the lecture and demonstration method and supported by various media materials to address various learning styles. There will be question and answer sessions over material covered in lecture and media presentations. Supervised lab time is provided for students to complete required projects.

Grading Procedures:
1. Students are graded on theory and shop practice and performance.
2. Each course must be passed with seventy (70%) percent or better.
3. Grading scale: A=90-100%, B=80-89%, C=70-79%, F=0-69%.

Description of Classroom, Laboratories, and Equipment:
Tulsa Technology Center campuses are owned and operated by Tulsa Technology Center School District No. 18. All programs provide students the opportunity to work with professionally certified instructors in modern, well-equipped facilities.

Available Certifications/College Credit:
The student may be eligible to take state, national or industry exam after completion of the program. College credit may be issued from Oklahoma State University-Okmulgee or Tulsa Community College. See program counselor for additional information.

College Credit Eligibility:
The student must maintain a grade point average of 2.0 or better.