# Composites Course No. 40640 Credit: 1.0

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| **Student name:**  |  | **Graduation Date:** |  |

Pathways and CIP Codes:Aviation Production (15.000) - Production Strand

Course Description: An **application level** course designed to teach students the fundamentals of composite theory, materials, equipment, and processes.

Directions:The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.

**RATING SCALE:**

4. Exemplary Achievement: Student possesses outstanding knowledge, skills or professional attitude.

3. Proficient Achievement:Student demonstrates good knowledge, skills or professional attitude. Requires limited supervision.

2. Limited Achievement:Student demonstrates fragmented knowledge, skills or professional attitude. Requires close supervision.

1. Inadequate Achievement:Student lacks knowledge, skills or professional attitude.

0. No Instruction/Training:Student has not received instruction or training in this area.

## Benchmark 1: Composite theory, fundamentals of materials, use of equipment and processes.

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 1.1 | Apply safety standards associated with the aviation and/or advanced manufacturing composite industry |  |
| 1.2 | Understand the use of blueprints, picture sheets, and ply tables/maps used in aerospace and/or advanced manufacturing |  |
| 1.3 | Apply quality controls to the lab environment: appropriate documentation, material control concepts, and lean concepts |  |
| 1.4 | State the terminology commonly found in the composites industry. |  |
| 1.5 | Identify the materials - properties and roles commonly found in the composites industry. |  |
| 1.6 | Compare the tools and equipment commonly found in the composites industry. |  |
| 1.7 | Identify the role of documentation in the lay up process |  |
| 1.8 | Identify the roles of the tools/ materials commonly used in preparation for the layup process : tool/mold, release agent, tacky tape |  |
| 1.9 | Describe and discuss the process commonly associated with the aviation and/or advanced manufacturing composite industry |  |
| 1.10 | Identify the concepts associated with material/fiber orientation |  |
| 1.11 | Practice layup skills associated with core pre preg materials, pre preg materials and wet layup |  |
| 1.12 | Employ appropriate handling of composite part techniques |  |
| 1.13 | Apply appropriate net trim techniques. |  |
| 1.14 | Perform surface preparation |  |
| 1.15 | Apply composite fabrication skills and techniques to industry-based projects |  |
| 1.16 | Define techniques and requirements in composite inspection |  |

## Benchmark 2: Assembly and repair

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 2.1 | Utilize the planning paper/engineering drawing to determine type of makeup of part materials (Kevlar, fiberglass, carbon fiber, or hybrid). |  |
| 2.2 | Demonstrate correct methods for drilling holes. |  |
| 2.3 | Identify fastener types – inserts, threaded fasteners. |  |
| 2.4 | Apply co-bonding/co- curing process. |  |
| 2.5 | Demonstrate countersinking with composites. |  |
| 2.6 | Employ non-structural secondary bonding techniques. |  |
| 2.7 | Recommend procedures for quality assurance inspection. |  |
| 2.8 | Demonstrate structural secondary bonding techniques. |  |
| 2.9 | Describe the inspection process in composite repair. |  |
| 2.10 | Perform basic NDI skills. |  |
| 2.11 | Apply industry standards to damage assessment. |  |
| 2.12 | Demonstrate structural repairs using both wet layup and pre-preg materials. |  |
| 2.13 | Employ composite documentation skills. |  |
| 2.14 | Utilize disassembly techniques in the composite repair problem. |  |
| 2.15 | Practice damage removal procedures in the composite repair process. |  |
| 2.16 | Perform core removal and replacement procedures in the repair process. |  |
| 2.17 | Describe laser layout and ply locating in composite fabrication. |  |
| 2.18 | Describe automated fiber placement in composite fabrication. |  |

I certify that the student has received training in the areas indicated.

Instructor Signature:

For more information, contact:

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