# Aviation Fundamentals Course No. 40410 Credit: 0.5

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

Pathways and CIP Codes:Aviation Production (15.0000) - Design & Production Strand; **Aviation Maintenance (47.0607)**

Course Description: A **technical level** course that serves as an introduction to aviation fundamentals related to materials, processes, and history of Aviation.

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: uNDERSTAND THE AVIAITION MANUFACTURING AND CAREER FIELDS

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 1.1 | Identify the key milestones in aviation history. |  |
| 1.2 | Explain the historical importance of Kansas in aviation history. |  |
| 1.3 | Identify Aviation clusters in the US and around the world.  |  |
| 1.4 | Describe what is produced in the identified Aviation Clusters. |  |
| 1.5 | Identify career fields in aviation and explain to roles of pilots, aviation maintaince technicians, and air traffic controllers. |  |

Benchmark 2: Identify the major components of an aIRCRAFT

Competencies

| # | DESCRIPTION | RATING |
| --- | --- | --- |
| 2.1 | Identify the primary assemblies including fuselage, wings, empennage, power plant, and the main components of each primary assembly.  |  |
| 2.2 | Identify the common configurations of the power plant; nose mount, wing mount, mounted on pylons. |  |
| 2.3. | Identify the components and function of the primary assemblies and their relationship to one another. |  |
| 2.4. | Identify the major categories of aircraft. |  |
| 2.5. | Identify airplanes based upon their commercial purposes, wing location, tail configuration, engine type and location, and landing gears. |  |
| 2.6. | Explain the advantages and disavatages of each configuration. |  |

Benchmark 3: uNDERSTAND THE PRINICPALS OF FLIGHT

Competencies

| # | DESCRIPTION | RATING |
| --- | --- | --- |
| 3.1. | Explain how planes fly. |  |
| 3.2. | Identify the four forces which impact flight; lift, thrust, gravity and drag. |  |
| 3.3. | Explain the impact of atmospheric pressure on an airplane. |  |
| 3.4. | Explain Bernoulli’s principle, its application in a wind tunnel, and its impact on the lift of an aircraft. |  |
| 3.5. | Identify airfoil shapes and their components. |  |
| 3.6. | Explain the relationship between airfoil and wing design. |  |
| 3.7. | Explain the center of gravity of an airplane. |  |
| 3.8. | Identify the three axes of control: vertical axis, lateral axis, longitudinal axis, and the type of stability associated with each axis. |  |
| 3.9 | Identify each type of airplane movement, pitch, roll and yaw, and the primary control surface associated with each. |  |
|  3.10 | Identify the secondary flight control systems and their impact on the three axes. |  |

Benchmark 4: uNDERSTAND aVIATION mANUFACTURING pROCESS AND REGULATIONS

Competencies

| # | DESCRIPTION | RATING |
| --- | --- | --- |
| 4.1. | Identify the 5 common types of materials used in aircraft construction: metals, composites, plastics, woods, fabrics. |  |
| 4.2. | Explain the strengths and weaknesses of each type of material. |  |
| 4.3. | Identify the evolution of aircraft materials. |  |
| 4.4. | Identify the common aircraft fasteners (bolts, rivets) and their roles. |  |
| 4.5. | Identify the methods of airplane construction. |  |
| 4.6. | Interpret the purpose and importance of regulation in the aviation industry (how aircraft certified). |  |
| 4.7. | Explain the importance of quality control systems in manufacturing. |  |
| 4.8. | Explain how LEAN manufacturing process have improved production. |  |
|  4.9 | Interpret the purpose and importance of regulation in the aviation industry. |  |
| 4.10 | Investigate an aerospace accident, how it occurred, how a solution was developed and what regualtion implemented to prevent further such events.  |  |

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

Instructor Signature:

For more information, contact:

CTE Pathways Help Desk

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