Course Number: TRGA-1101  
OCAS Code: None  
Course Length: 84 Hours  
Career Cluster: Transportation, Distribution & Logistics  
Career Pathway: Aviation Maintenance Technology  
Career Major(s): General Aviation  

Pre-requisite(s): Students will use the principles of simple machines, sound, fluid and heat dynamics. The relationship between pressure, volume and temperature of air masses and liquid will be covered. The student will study basic aerodynamics and the effect of atmospheric temperature, humidity, pressures and forces on aircraft airfoil surfaces. The fundamentals of mathematics in the aviation maintenance profession will also be taught.

Textbooks:  
Dale Crane, Dictionary of Aviation Terms, Aviation Supplies and Academics, 1997  

Course Objectives:  

A. Lesson: FRACTIONS  
1. Define terms related to the principles of mathematics.  
2. Add, subtract, multiply, and divide whole numbers.  
3. Add, subtract, multiply, and divide decimal fractions. (Level 3) (App. B,H,27)  
4. Add, subtract, multiply, and divide common fractions. (Gen. H11)  
5. Add and subtract mixed numbers.  
6. Use a calculator to convert numbers between common fractions and decimals. (Gen. H7.)  
7. Convert decimal numbers to percentages. (Level 3) (App. B,H,26)  

B. Lesson: SIGNED NUMBERS, ROOTS, AND POWERS  
1. Multiply and divide by scientific notations. (Level 3) (App. B,H,26)  

C. Lesson: APPLIED ALGEBRA  
3. Perform algebraic operations involving addition, subtraction, multiplication, and division. (Level 3) (App. B,H,27)  

D. Lesson: APPLIED GEOMETRY AND TRIGONOMETRY  
   (Gen. H3,H4,H5,H6,)  
2. Solve trigonometric problems showing the relationship between sine, co-sine and
tangent.
3. Use conversion tables to convert units between English and metric systems.

E. Lesson: BASIC PHYSICS FUNDAMENTALS
1. Define terms related to the principles of physics. (Gen. J9)
2. Discuss the physical states of matter.
3. Discuss potential and kinetic energy.

F. Lesson: SIMPLE MACHINES
1. Discuss work and power.
3. Discuss stress and strain.

G. Lesson: LAWS OF MOTION
1. Discuss Newton's Laws of Motion. (Gen. J12)
2. Discuss vectors.

H. Lesson: HEAT DYNAMICS
1. Discuss the relationship between heat and energy.
2. Explain methods of heat transference.
3. Explain the relationship between the use of the four commonly used temperature scales.
4. Convert temperatures between common temperature scales. (Gen. J1,J5)

I. Lesson: FLUID DYNAMICS
1. Discuss the three types of pressure.
2. Discuss general gas laws.

J. Lesson: BASIC AERODYNAMICS
1. Define terms related to basic aerodynamics.
2. Discuss characteristics of the atmosphere and measurement processes used in monitoring atmospheric conditions.
3. Determine density altitude using a density-altitude chart. (Gen.J3)
4. Discuss the four forces of flight.
5. Discuss laws of physics pertaining to aerodynamics.
6. Discuss airfoil characteristics and fundamentals of lift production. (Level 2) (App.B,J,30)
7. Describe normal airflow around an airfoil and how a stall is produced.
8. Discuss auxiliary lift devices.
9. Discuss characteristics of drag and how it affects aircraft performance.
10. Describe how the center of pressure moves as the angle of attack of an asymmetrical airfoil changes and the effect the center of pressure's movement has on an aircraft in flight.
11. Discuss supersonic and hypersonic aerodynamics and Mach number.
12. Discuss airfoil sections, critical Mach numbers for supersonic airfoils, and engine inlets for high-speed flight.
13. Identify basic components of aircraft.
14. Discuss primary and secondary flight control surfaces.
15. Discuss the functions of aircraft controls and their operation.
16. Discuss the three axes of motion of an airplane.
17. Identify types of aircraft structures.
18. Discuss types and conditions of aircraft stability, and how it's affected by the various axes.
19. Explain how load factor is produced while an aircraft is in a coordinated level turn.
20. Discuss operational and design characteristics of control systems used in heavy aircraft.

**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.