

Transportation, Distribution and Logistics Career Cluster
Aviation Maintenance I
Course Number 47.46200

Course Description:

Aviation Maintenance I is the second course in the Aviation Maintenance career pathway. Students will build a solid knowledge base in the basics of aircraft maintenance, performance, and design. Classroom and laboratory activities assure a thorough understanding of the aviation environment. The prerequisite for this course is Fundamentals of Aerospace.

**Schools that are not Federal Aviation Administration certificated Code of Federal Regulations (CFR) Part 147 facilities and lack equipment, to include aircraft, engines and support equipment, may require students to describe, explain, and/or simulate maintenance tasks to demonstrate requisite knowledge and skills.*

Course Standard 1

TDL-AM1-1

The following standard is included in all CTAE courses adopted for the Career Cluster/Pathways. Teachers should incorporate the elements of this standard into lesson plans during the course. The topics listed for each element of the standard may be addressed in differentiated instruction matching the content of each course. These elements may also be addressed with specific lessons from a variety of resources. This content is not to be treated as a unit or separate body of knowledge but rather integrated into class activities as applications of the concept.

Standard: Demonstrate employability skills required by business and industry.

The following elements should be integrated throughout the content of this course.

1.1 Communicate effectively through writing, speaking, listening, reading, and interpersonal abilities.

Person-to-Person Etiquette	Telephone and Email Etiquette	Cell Phone and Internet Etiquette	Communicating At Work	Listening
Interacting with Your Boss	Telephone Conversations	Using Blogs	Improving Communication Skills	Reasons, Benefits, and Barriers
Interacting with Subordinates	Barriers to Phone conversations	Using Social Media	Effective Oral Communication	Listening Strategies
Interacting with Co-workers	Making and Returning Calls		Effective Written Communication	Ways We Filter What We Hear
Interacting with Suppliers	Making Cold Calls		Effective Nonverbal Skills	Developing a Listening Attitude
	Handling Conference Calls		Effective Word Use	Show You Are Listening
	Handling Unsolicited Calls		Giving and Receiving Feedback	Asking Questions
				Obtaining Feedback
				Getting Others to Listen

Nonverbal Communication	Written Communication	Speaking	Applications and Effective Résumés
Communicating Nonverbally	Writing Documents	Using Language Carefully	Completing a Job Application
Reading Body Language and mixed Messages	Constructive Criticism in Writing	One-on-One Conversations	Writing a Cover Letter

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Matching Verbal and Nonverbal communication		Small Group Communication	Things to Include in a Résumé
Improving Nonverbal Indicators		Large Group Communication	Selling Yourself in a Résumé
Nonverbal Feedback		Making Speeches	Terms to Use in a Résumé
Showing Confidence Nonverbally		Involving the Audience	Describing Your Job Strengths
Showing Assertiveness		Answering Questions	Organizing Your Résumé
		Visual and Media Aids	Writing an Electronic Résumé
		Errors in Presentation	Dressing Up Your Résumé

1.2 Demonstrate creativity by asking challenging questions and applying innovative procedures and methods.

Teamwork and Problem Solving	Meeting Etiquette
Thinking Creatively	Preparation and Participation in Meetings
Taking Risks	Conducting Two-Person or Large Group Meetings
Building Team Communication	Inviting and Introducing Speakers
	Facilitating Discussions and Closing
	Preparing Visual Aids
	Virtual Meetings

1.3 Exhibit critical thinking and problem solving skills to locate, analyze and apply information in career planning and employment situations.

Problem Solving	Customer Service	The Application Process	Interviewing Skills	Finding the Right Job
Transferable Job Skills	Gaining Trust and Interacting with Customers	Providing Information, Accuracy and Double Checking	Preparing for an Interview	Locating Jobs and Networking
Becoming a Problem Solver	Learning and Giving Customers What They Want	Online Application Process	Questions to Ask in an Interview	Job Shopping Online
Identifying a Problem	Keeping Customers Coming Back	Following Up After Submitting an Application	Things to Include in a Career Portfolio	Job Search Websites
Becoming a Critical Thinker	Seeing the Customer's Point	Effective Résumés:	Traits Employers are Seeking	Participation in Job Fairs
Managing	Selling Yourself and the Company	Matching Your Talents to a Job	Considerations Before Taking a Job	Searching the Classified Ads
	Handling Customer Complaints	When a Résumé Should be Used		Using Employment Agencies
	Strategies for Customer Service			Landing an Internship
				Staying Motivated to Search

1.4 Model work readiness traits required for success in the workplace including integrity, honesty, accountability, punctuality, time management, and respect for diversity.

Workplace Ethics	Personal Characteristics	Employer Expectations	Business Etiquette	Communicating at Work
Demonstrating Good Work Ethic	Demonstrating a Good Attitude	Behaviors Employers Expect	Language and Behavior	Handling Anger
Behaving Appropriately	Gaining and Showing Respect	Objectionable Behaviors	Keeping Information Confidential	Dealing with Difficult Coworkers
Maintaining Honesty	Demonstrating Responsibility	Establishing Credibility	Avoiding Gossip	Dealing with a Difficult Boss

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Playing Fair	Showing Dependability	Demonstrating Your Skills	Appropriate Work Email	Dealing with Difficult Customers
Using Ethical Language	Being Courteous	Building Work Relationships	Cell Phone Etiquette	Dealing with Conflict
Showing Responsibility	Gaining Coworkers' Trust		Appropriate Work Texting	
Reducing Harassment	Persevering		Understanding Copyright	
Respecting Diversity	Handling Criticism		Social Networking	
Making Truthfulness a Habit	Showing Professionalism			
Leaving a Job Ethically				

1.5 Apply the appropriate skill sets to be productive in a changing, technological, diverse workplace to be able to work independently and apply team work skills.

Expected Work Traits	Teamwork	Time Management
Demonstrating Responsibility	Teamwork Skills	Managing Time
Dealing with Information Overload	Reasons Companies Use Teams	Putting First Things First
Transferable Job Skills	Decisions Teams Make	Juggling Many Priorities
Managing Change	Team Responsibilities	Overcoming Procrastination
Adopting a New Technology	Problems That Affect Teams	Organizing Workspace and Tasks
	Expressing Yourself on a Team	Staying Organized
	Giving and Receiving Constructive Criticism	Finding More Time
		Managing Projects
		Prioritizing Personal and Work Life

1.6 Present a professional image through appearance, behavior and language.

On-the-Job Etiquette	Person-to-Person Etiquette	Communication Etiquette	Presenting Yourself
Using Professional Manners	Meeting Business Acquaintances	Creating a Good Impression	Looking Professional
Introducing People	Meeting People for the First Time	Keeping Phone Calls Professional	Dressing for Success
Appropriate Dress	Showing Politeness	Proper Use of Work Email	Showing a Professional Attitude
Business Meal Functions		Proper Use of Cell Phone	Using Good Posture
Behavior at Work Parties		Proper Use in Texting	Presenting Yourself to Associates
Behavior at Conventions			Accepting Criticism
International Etiquette			Demonstrating Leadership
Cross-Cultural Etiquette			
Working in a Cubicle			

1.7 Understand that there are distinct regulatory English language eligibility requirements in Title 14 of the Code of Federal Regulations (CFR); in part 61 for pilots and flight and ground instructors; part 63 for Flight Engineers and flight navigators; and part 65 for air traffic control (ATC) tower operators, aircraft dispatchers, mechanics, repairmen, and parachute riggers. In addition, the standards found in International Civil Aviation Organization (ICAO) Annex 1 require that certain Airman Certificates have an endorsement for English language proficiency in order for those airmen to act as required crew of an aircraft internationally.

**Support of CTAE Foundation Course Standards and Georgia Standards of Excellence
L9-10RST 1-10 and L9-10WHST 1-10:**

Georgia Standards of Excellence ELA/Literacy standards have been written specifically for technical subjects and have been adopted as part of the official standards for all CTAE courses.

Course Standard 2

TDL-AM1-2

Perform algebraic operations relating to aviation.

- 2.1 Perform aviation exercises that include adding, subtracting, multiplying, and dividing positive whole numbers.
- 2.2 Perform aviation exercises that include adding, subtracting, multiplying, and dividing signed numbers.
- 2.3 Perform aviation exercises that include adding, subtracting, multiplying and dividing common fractions and decimals.
- 2.4 Perform aviation exercises that include converting fractions to decimals and decimals to fractions.
- 2.5 Perform aviation exercises that include basic algebraic manipulations.

Course Standard 3

TDL-AM1-3

Extract roots and raise numbers to a given power relating to aviation.

- 3.1 Perform aviation exercises that include raising whole numbers, decimals, and fractions to a given power.
- 3.2 Perform aviation exercises that include using powers of ten to express large numbers.
- 3.3 Perform aviation exercises that include converting from base ten to base two and vice versa.
- 3.4 Perform aviation exercises that include determining square roots.

Course Standard 4

TDL-AM1-4

Calculate the area and volume of various geometrical shapes relating to aviation.

- 4.1 Perform aviation exercises that include computing various linear measurements.
- 4.2 Apply formulas to determine the area of aircraft wings.
- 4.3 Apply formulas to calculate volume in exercises relating to aviation.
- 4.4 Calculate the volume of fuel tanks of an aircraft and express in gallons.
- 4.5 Calculate the displacement of an aircraft engine.

Course Standard 5

TDL-AM1-5

Compute ratio, proportion, and percentage problems relating to aviation.

- 5.1 Solve aviation exercises that include sample percentage problems.
- 5.2 Solve aviation exercises that include converting percentages to a decimal or fraction.
- 5.3 Perform aviation exercises that include common ratios and proportions.
- 5.4 Solve aviation exercises that include computing compression ratios from specified volumes.

Course Standard 6

TDL-AM1-6

Explore temperature and heat terminology.

- 6.1 Demonstrate and define heat terminology related to aviation.
- 6.2 Demonstrate and determine aviation exercises related to temperature.
- 6.3 Identify and describe methods of heat transfer.

Course Standard 7

TDL-AM1-7

Calculate pressure, temperature, and volume of air mass relating to aviation.

- 7.1 Solve appropriate gas law problems related to aircraft cylinders.
- 7.2 Discuss the effects of atmosphere on aircraft power plants, cabin atmosphere, aircraft structure, and aircraft performance.
- 7.3 Apply general gas law to pressure, volume, and temperature changes.

Course Standard 8

TDL-AM1-8

Understand basic aerodynamics and theory of flight principles.

- 8.1 Sketch an airfoil and diagram air flow patterns.
- 8.2 Define Bernoulli's principle.
- 8.3 Discuss the effects of air density and temperature changes on aircraft performance.

Course Standard 9

TDL-AM1-9

Determine physical factors affecting engine output.

- 9.1 Describe the effects of air density on engine power.
- 9.2 Define work as related to engine output.
- 9.3 Define power related to engine output.

Course Standard 10

TDL-AM1-10

Use the relationship of pressure, area, and force in aerospace applications.

- 10.1 Solve applicable hydraulic and pneumatic problems involving pressure, area, and force.
- 10.2 Draw sketches of a simple hydraulic system.

Course Standard 11

TDL-AM1-11

Understand and explain the origin of sound.

- 11.1 Identify and explain the nature of sound and frequency.
- 11.2 Discuss machine numbers and decibel levels.

Course Standard 12

TDL-AM1-12

Utilize principles of simple machines.

- 12.1 Demonstrate uses of simple machines.

Course Standard 13

TDL-AM1-13

Understand and explain centrifugal and centripetal force.

- 13.1 Apply Newton's three laws to examples in aviation.
- 13.2 Label a diagram to illustrate centrifugal and centripetal force.

Course Standard 14

TDL-AM1-14

Read and interpret aircraft drawings.

- 14.1 Identify and interpret basic lines and symbols used in aircraft drawings and schematic diagrams.
- 14.2 Interpret dimensions on aircraft drawings.
- 14.3 Read, interpret, describe, and locate components on aircraft drawings.
- 14.4 Make sketches and drawings of repairs and alterations.
- 14.5 Read and interpret drawings to include scale, title block, and changes.
- 14.6 Interpret installation diagrams, service bulletins, and engineering changes.
- 14.7 Read and interpret manufacturers' charts and graphs.

Course Standard 15

TDL-AM1-15

Calculate aircraft weight and balance.

- 15.1 Identify types and sources of information required to perform weight and balance procedures.
- 15.2 Prepare an aircraft for weighing, weigh aircraft, and compute empty weight C.G. and useful load.
- 15.3 Use FAA specifications and type data sheets to identify leveling and weighing information, identify useful load and empty center of gravity, and determine location of pilot passenger seats.
- 15.4 Compute the effects of equipment changes on the empty weight, center of gravity, and useful load of an aircraft.
- 15.5 Perform complete weight and balance check and record data.
- 15.6 Solve a typical helicopter weight, load and balance problem.
- 15.7 Analyze weight and balance records.

Course Standard 16

TDL-AM1-16

Construct and manipulate fluid lines and fittings.

- 16.1 Demonstrate bending aluminum tubing using hand and tool methods.
- 16.2 Demonstrate forming single and double flares on aluminum tubing.
- 16.3 Demonstrate cutting and deburring tubing.
- 16.4 Demonstrate performing file or sand tubing.
- 16.5 Demonstrate forming a bead on different sizes and types of tubing.
- 16.6 Recognize and report defects in metal tubing.
- 16.7 Demonstrate repairing damaged aluminum line assembly using a union.
- 16.8 Demonstrate reworking tubing.
- 16.9 Identify and accurately select hose and fittings.
- 16.10 Demonstrate fabricating and installing flexible hose.
- 16.11 Demonstrate installing sections of tubing and inspect installation.
- 16.12 Perform an operational check of system.

Course Standard 17

TDL-AM1-17

Examine how SkillsUSA is a co-curricular part of career and technical education through leadership development, school and community service projects, and competitive events.

- 17.1 Explain the purpose, mission, objectives, motto, colors, official dress and other distinguishing characteristics of SkillsUSA.
- 17.2 Explain how participation in SkillsUSA can promote lifelong responsibility for community service, professional growth and development.
- 17.3 Explore the impact and opportunities that SkillsUSA can develop to bring business and industry together with education in a positive working relationship through innovative leadership and career development programs.
- 17.4 Explore the local, state, and national opportunities available to students through participation in SkillsUSA, including but not limited to conferences, competitions, community service, philanthropy, and other SkillsUSA activities.