

**Transportation, Distribution and Logistics Career Cluster
Aviation Maintenance II
Course Number 47.46300**

Course Description:

Aviation Maintenance II is the third course in the Aviation Maintenance career pathway. Students continue to build and expand their 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 Aviation Maintenance I.

**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-AM2-1

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 |

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| Maintaining Honesty | Demonstrating Responsibility | Establishing Credibility | Avoiding Gossip | Dealing with a Difficult Boss |
| 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-AM2-2

Explore aircraft materials and perform inspection processes.

***Schools that are not Federal Aviation Administration certificated 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.**

- 2.1 Identify and accurately select proper hand tools.
- 2.2 Identify and accurately select aircraft hardware and materials.
- 2.3 Install or remove different types of nuts, bolts, and fasteners.
- 2.4 Identify and accurately select substitution fasteners.
- 2.5 Identify types of nonferrous aircraft metals and describe applications for each one.
- 2.6 Identify and explain steel alloys and their applications.
- 2.7 Demonstrate how to safety a series of nuts, bolts, cannon plugs, and turnbuckles.
- 2.8 Measure inside and outside diameters with micrometers.
- 2.9 Measure the thickness of a thin sheet of steel or aluminum.
- 2.10 Describe the relationship between hardness and tensile strength.
- 2.11 Select the proper heat treating process for a specific application.
- 2.12 Describe the different types of heat treating processes.
- 2.13 Perform basic heat treatment.*
- 2.14 Explain the process of eddy current inspection.
- 2.15 Perform an eddy current particle inspection.*
- 2.16 Explain the process of ultra sound.
- 2.17 Perform an ultra sound particle inspection.*
- 2.18 Explain the process of magnetic particle inspection.
- 2.19 Perform a magnetic particle inspection.*
- 2.20 Explain the principles of dye penetrant inspection.
- 2.21 Perform a dye penetrant inspection and interpret the results.
- 2.22 Explain the desirable characteristics of a completed weld.
- 2.23 Inspect welded assemblies for defects.
- 2.24 Check for metal fatigue.
- 2.25 Identify and select appropriate nondestructive testing methods.

Course Standard 3

TDL-AM2-3

Demonstrate an understanding of the practice aircraft ground operations and servicing procedures.

***Schools that are not Federal Aviation Administration certificated 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.**

- 3.1 Identify and describe various grades of aviation gasoline and jet fuels.
- 3.2 Describe the properties of aviation fuel.
- 3.3 Demonstrate safety precautions around aircraft and engines.
- 3.4 Select correct fuel for a specific aircraft.
- 3.5 Demonstrate standing fire guard.
- 3.6 Accurately measure fuel in tanks and add fuel to aircraft.*
- 3.7 Identify and describe types of aircraft fires.
- 3.8 Select the appropriate fire extinguishing agent for a specific fire.
- 3.9 Start, ground operate, move, service, and secure aircraft and identify typical ground operation hazards.
- 3.10 Demonstrate starting aircraft engines.*
- 3.11 Operate engine through power range and shut down engine.*
- 3.12 Demonstrate performing a functional check on all systems.*
- 3.13 Identify and use the different types of ground support equipment.
- 3.14 Demonstrate starting taxi, towing, parking, and directing traffic with hand signals.
- 3.15 Prepare an aircraft for outside storage.*
- 3.16 Secure aircraft for outside storage using appropriate tie downs.*

Course Standard 4

TDL-AM2-4

Practice aircraft cleaning and corrosion control.

***Schools that are not Federal Aviation Administration certificated 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.**

- 4.1 Identify and select cleaning materials.
- 4.2 Identify hazards of using caustic cleaning agents.
- 4.3 Demonstrate cleaning aircraft.*
- 4.4 Demonstrate cleaning of an aircraft tire.
- 4.5 Demonstrate cleaning typical engine parts.
- 4.6 Inspect and accurately identify different types of corrosion.
- 4.7 Describe the forms of corrosion found on aircraft.
- 4.8 List the corrosion prone areas on an aircraft.
- 4.9 Accurately select materials, remove corrosion, and apply protective coating.
- 4.10 Demonstrate removing rust from ferrous parts and apply protective finish.

Course Standard 5

TDL-AM2-5

Calculate the relationship of voltage, current, and resistance in electrical circuits.

***Schools that are not Federal Aviation Administration certificated 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.**

- 5.1 Demonstrate the relationship among current, voltage, and resistance.
- 5.2 Measure voltage drops using a voltmeter.
- 5.3 Compare voltage drops with current flow.
- 5.4 Calculate and measure amperage.
- 5.5 Measure resistance and check for continuity.
- 5.6 Calculate and measure drop across resistors.

Course Standard 6

TDL-AM2-6

Interpret electrical circuit diagrams.

- 6.1 Identify and interpret electrical symbols and their functions, including solid state devices and functions.
- 6.2 Trace circuits in aircraft wiring diagrams.
- 6.3 Identify electrical malfunctions by reference to circuit diagrams.
- 6.4 Use circuit diagram to assist in troubleshooting.

Course Standard 7

TDL-AM2-7

Observe voltage, current, resistance, and continuity.

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- 7.1 Identify and explain the prefixes kilo-, milli-, micro-, meg-, and mega-.
- 7.2 Demonstrate the use of direct current (DC) electrical instruments.
- 7.3 Connect voltmeter and ammeter in circuits and obtain correct readings.
- 7.4 Demonstrate the use of an ohmmeter to locate open, closed, and shorted circuits.

Course Standard 8

TDL-AM2-8

Calculate electrical power of various devices.

- 8.1 Calculate and measure power requirements for various electrical devices in aircraft electrical systems.
- 8.2 Calculate and measure electric power required to operate an electric motor given efficiency and load.
- 8.3 Calculate and measure total electric power to be furnished by a generator for a specified airplane.

Course Standard 9

TDL-AM2-9

Calculate capacitance and inductance.

- 9.1 Explain laws of magnetism, polarity, natural magnetism, relays, and solenoids.
- 9.2 Discuss effects of current polarity, generator action, transformer action, and self-induction.
- 9.3 Describe self and mutual inductance and solve series and parallel circuits.
- 9.4 Explain dielectric material, factors affecting capacitance, and voltage ratings.
- 9.5 Explain alternating current (AC) and resistance, inductance and capacitance (RLC) circuits.
- 9.6 Measure capacitance and inductance.

Course Standard 10

TDL-AM2-10

Examine and service aircraft batteries.

***Schools that are not Federal Aviation Administration certificated 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.**

- 10.1 Differentiate among types of batteries, capacity, and ratings.
- 10.2 Identify characteristics of aircraft storage batteries.
- 10.3 Perform inspection of an aircraft battery.
- 10.4 Remove, inspect, clean, and install a battery.

Course Standard 11

TDL-AM2-11

Explore solid state devices and their applications.

- 11.1 Identify and describe the properties of semiconductor materials.
- 11.2 List properties of P-N junction diodes.
- 11.3 Demonstrate the effect of forward and reverse bias on a diode.
- 11.4 Describe the applications of different diodes.
- 11.5 Read and describe solid state device symbols.

Course Standard 12

TDL-AM2-12

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

- 12.1 Explain the purpose, mission, objectives, motto, colors, official dress and other distinguishing characteristics of SkillsUSA.
- 12.2 Explain how participation in SkillsUSA can promote lifelong responsibility for community service, professional growth and development.
- 12.3 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.
- 12.4 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.