

**Transportation, Distribution and Logistics Career Cluster
Unmanned Aircraft Systems
Course Number 47.48910**

Course Description:

This course provides a foundation to prepare a student to earn a commercial license to pilot an unmanned aircraft system. Topics discussed include weather and effects of weather on an unmanned aircraft; types and uses of unmanned aircraft; pre-flight planning and checks; FAA requirements; technology and remote instrumentation; radio communications, plus much more. Students will have an opportunity to earn their remote pilot license by taking and successfully passing the FAA Part 107 Exam.

Course Standard 1

TDL-UAS-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
Matching Verbal and Nonverbal communication		Small Group Communication	Things to Include in a Résumé

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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 teamwork 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			

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-UAS-2

Compare and contrast the types and uses of unmanned aircraft.

- 2.1 Distinguish the industrial classifications and nomenclature of unmanned aircraft lightweight/hobby determining utility of drones based on required mission parameters; weight categorization of drones.
- 2.2 Understand the various current commercial uses of unmanned aircraft and potential future entrepreneurial possibilities (e.g., agriculture; public safety; photography; real estate; film; construction; military).
- 2.3 Summarize the classifications and relevant specifications of unmanned aircraft for hobby, FAR part 107, industrial, and military.

Course Standard 3

TDL-UAS-3

Formulate and develop a plan for adhering to unmanned flight ethics, safety and FAA requirements.

- 3.1 Explain the FAA rules and regulations for unmanned flight missions of all categories (e.g., personal, commercial).
- 3.2 Describe and explain the registration requirements of unmanned aircraft.
- 3.3 Differentiate the various types of airspace, authorizations, and waivers.
- 3.4 Summarize the various types of communications with Air Traffic Control personnel before, during and after a flight mission.
- 3.5 Explain the Visual Flight Rules for unmanned aircraft.
- 3.6 Compare and contrast the implications of local and state unmanned aircraft laws.
- 3.7 Cite evidence related to physiological factors affecting pilot performance with unmanned aircraft.
- 3.8 Differentiate the ultimate impact of aeronautical decision making and judgement with unmanned aircraft.
- 3.9 Explain and implement SMS (safety management system) impact on unmanned aircraft mission.

Course Standard 4

TDL-UAS-4

Explain the steps and procedures involved in the pre-flight planning and checks.

- 4.1 Classify and record the mission and relevant flight requirements.
- 4.2 Explain and make observations regarding a NOTAMs (Notices to Airmen) purpose, process, and importance.
- 4.3 Identify patterns for unmanned flight missions in various weather conditions, and the effects of weather on small unmanned aircraft.
- 4.4 Interpret weather reports for local or regional operation of unmanned flights dependent on size of unmanned drone and distance of flight.
- 4.5 Understand the importance of a pre-flight inspection in accordance with the unmanned aircraft manufacturer's instruction (e.g. power system, communication, blade surfaces and rotors).
- 4.6 Assess the impact of airspace, terrain, obstructions and population on the scheduled flight mission.
- 4.7 Understand and verify the range requirements and limitations for specific unmanned aircraft on the scheduled flight mission.

Course Standard 5

TDL-UAS-5

Describe and apply the payload regulations for use of small unmanned aircraft.

- 5.1 Identify patterns regarding how weight, stability, load factors and weight/balance specifications from manufacturer's specifications impact unmanned aircraft and missions.
- 5.2 Collect observations and become familiar with larger unmanned aircraft capabilities and manufacturer's specifications for weight, stability, and load factors.

Course Standard 6

TDL-UAS-6

Summarize, choose and utilize appropriate technologies as relatable to unmanned aircraft.

- 6.1 Compare and contrast various software and flight applications for unmanned aircraft related technology.
- 6.2 Determine and identify appropriate technologies for unmanned aircraft missions.

Course Standard 7

TDL-UAS-7

Construct results of unmanned aircraft flight using line-of-sight controls and remote instrumentation.

- 7.1 Demonstrate proficiency in manually operating unmanned aircraft in line of sight applications.
- 7.2 Develop, upload, and execute a remote or autonomous unmanned aircraft mission profile.

Course Standard 8

TDL-UAS-8

Formulate and explain technical flight and radio communication skills with aviators in the area of operation.

- 8.1 Demonstrate clear and concise communication with ground and tower personnel.
- 8.2 Identify patterns for proficient communications and aviation phraseology including phonetic alphabet and basic aeronautical terms.
- 8.3 Demonstrate basic knowledge of radio operations with ground and tower personnel, traffic advisory practices in uncontrolled airspace.
- 8.4 Demonstrate familiarity and ability to communicate with pilots operating in the area of operation.
- 8.5 Ability to communicate location, duration and mission objective.
- 8.6 Summarize the process and steps for completing an incident report.

Course Standard 9

TDL-UAS-9

Record and update accurate logs for unmanned flights and missions pre and post flight.

- 9.1 Record personal flight time and experience after each unmanned flight and mission.
- 9.2 Summarize required steps and procedures for maintenance record keeping of each unmanned flight and mission.
- 9.3 Distinguish the need for protecting, maintaining, and delivering mission data.

Course Standard 10

TDL-UAS-10

Apply concepts necessary for unmanned flight mechanics and maintenance after each unmanned flight and mission.

- 10.1 Demonstrate competency in scheduled operator/pilot repair and maintenance.
- 10.2 Review processes and troubleshooting steps to correct malfunctions of the unmanned aircraft system.
- 10.3 Compare necessary procedures and steps to complete essential repairs and maintenance after each unmanned flight/mission.
- 10.4 Complete and summarize procedures for unmanned aircraft (e.g. firmware updates, camera inspection, thermal issues and infra-red technology inspection, GPS).

Course Standard 11

TDL-UAS-11

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

- 11.1 Explain the purpose, mission, objectives, motto, colors, official dress and other distinguishing characteristics of SkillsUSA.
- 11.2 Explain how participation in SkillsUSA can promote lifelong responsibility for community service, professional growth and development.
- 11.3 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.
- 11.4 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.