Transportation, Distribution and Logistics Career Cluster
Unmanned Aircraft Systems
Course Number 47.49000

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 |

<table>
<thead>
<tr>
<th>Nonverbal Communication</th>
<th>Written Communication</th>
<th>Speaking</th>
<th>Applications and Effective Résumés</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communicating Nonverbally</td>
<td>Writing Documents</td>
<td>Using Language Carefully</td>
<td>Completing a Job Application</td>
</tr>
<tr>
<td>Reading Body Language and mixed Messages</td>
<td>Constructive Criticism in Writing</td>
<td>One-on-One Conversations</td>
<td>Writing a Cover Letter</td>
</tr>
<tr>
<td>Matching Verbal and Nonverbal communication</td>
<td>Small Group Communication</td>
<td>Things to Include in a Résumé</td>
<td></td>
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</tbody>
</table>
### Improving Nonverbal Indicators
- Nonverbal Feedback
- Showing Confidence Nonverbally
- Showing Assertiveness

### Large Group Communication
- Making Speeches
- Involving the Audience
- Answering Questions
- Visual and Media Aids
- Errors in Presentation

### Selling Yourself in a Résumé
- Terms to Use in a Résumé
- Describing Your Job Strengths
- Organizing Your Résumé
- Writing an Electronic Résumé
- Dressing Up Your Résumé

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

#### Teamwork and Problem Solving
- Thinking Creatively
- Taking Risks
- Building Team Communication

#### Meeting Etiquette
- Preparation and Participation in Meetings
- Conducting Two-Person or Large Group Meetings
- 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
- Transferable Job Skills
- Becoming a Problem Solver
- Identifying a Problem
- Becoming a Critical Thinker
- Managing

#### Customer Service
- Gaining Trust and Interacting with Customers
- Learning and Giving Customers What They Want
- Keeping Customers Coming Back
- Seeing the Customer’s Point
- Selling Yourself and the Company
- Handling Customer Complaints

#### The Application Process
- Providing Information, Accuracy and Double Checking
- Online Application Process
- Following Up After Submitting an Application
- Effective Résumés: Things to Include in a Career Portfolio
- Matching Your Talents to a Job
- When a Résumé Should be Used

#### Interviewing Skills
- Preparing for an Interview
- Questions to Ask in an Interview
- Effective Résumés: Traits Employers are Seeking
- Considerations Before Taking a Job
- Using Employment Agencies

#### Finding the Right Job
- Locating Jobs and Networking
- Job Shopping Online
- Job Search Websites
- Participation in Job Fairs
- Searching the Classified Ads
- Using Employment Agencies
- 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
- Demonstrating Good Work Ethic
- Behaving Appropriately
- Maintaining Honesty

#### Personal Characteristics
- Demonstrating a Good Attitude
- Gaining and Showing Respect
- Demonstrating Responsibility

#### Employer Expectations
- Behaviors Employers Expect
- Objectionable Behaviors
- Establishing Credibility

#### Business Etiquette
- Language and Behavior
- Keeping Information Confidential
- Avoiding Gossip

#### Communicating at Work
- Handling Anger
- Dealing with Difficult Coworkers
- Dealing with a Difficult Boss

- Staying Motivated to Search
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.**

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

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

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

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# 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.

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# 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.

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# 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.

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# 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.