# Unmanned Aircraft Systems (UAS) Course No. 40490 Credit: 1.0

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| **Student name:**  |  | **Graduation Date:** |  |

Pathways and CIP Codes:Aviation Maintenance (47.0000) - Avionics & Airframe Strand

Course Description: **Application Level:** A course that will provide students with the academic knowledge about commercial remote pilot operations, while also giving hands-on experience planning and executing UAS missions. (Prerequisite: Aviation Fundaments or Aviation Systems.)

Directions:The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.

**RATING SCALE:**

4. Exemplary Achievement: Student possesses outstanding knowledge, skills or professional attitude.

3. Proficient Achievement:Student demonstrates good knowledge, skills or professional attitude. Requires limited supervision.

2. Limited Achievement:Student demonstrates fragmented knowledge, skills or professional attitude. Requires close supervision.

1. Inadequate Achievement:Student lacks knowledge, skills or professional attitude.

0. No Instruction/Training:Student has not received instruction or training in this area.

## Benchmark 1: Drones and their Components

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 1.1 | Compare the types of missions that might be flown by both fixed-wing and multicopter drones. |  |
| 1.2 | Compare the ways that multicopters achieve thrust and lift with those of airplanes. |  |
| 1.3 | Identify the similarities and differences between categories of unmanned aerial systems (UAS). |  |
| 1.4 | Summarize safe and smart practices for flying UAS. |  |
| 1.5 | Relate control inputs made to a multicopter to changes in the platform’s thrust. |  |

## Benchmark 2: Part 107 and Beyond

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 2.1 | Identify the major topics covered by the Code of Federal Regulations (CFR) 14 Part 107. |  |
| 2.2 | Construct a list of rules, using research on local ordinances and knowledge of NTIA guidelines, that the class should adhere to while flying an UAS. |  |
| 2.3 | Develop a logical argument for how to approach certain operational scenarios taking into consideration federal regulations, local ordinances, and operational best practices. |  |
| 2.4 | Distinguish between UAS operations included within Part 107 and those that are excluded from the rule. |  |
| 2.5 | Recall best practices and guidelines suggested by the NTIA. |  |
| 2.6 | Summarize the process by which a remote pilot can become certificated under Part 107. |  |
| 2.7 | Summarize the process in which a remote pilot can register an UAS under Code of Federal Regulations (CFR) 14 Part 107. |  |

## Benchmark 3: Weather and Performance

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 3.1 | Assess weather conditions based on reports, forecasts, and observations to decide if an unmanned operation can be completed safely, and how it can best be conducted. |  |
| 3.2 | Identify and describe different ways that atmospheric conditions and aerodynamic principles might impact Unmanned Aircraft System (UAS) performance. |  |
| 3.3 | Assess real-world scenarios to determine risks posed by factors such as density altitude, wind, or vortex ring state, and identify ways to mitigate them. |  |
| 3.4 | Make observations and draw conclusions about how an Unmanned Aerial Vehicle’s (UAV) Center-of-Gravity (CG) can shift in flight, using manufacturer data, experimentation, and weight and balance formulas. |  |
| 3.5 | Identify different characteristics that an Unmanned Aerial Vehicle (UAV) might exhibit if it is overloaded or unbalanced in flight. |  |

## Benchmark 4: UAS Safety and Management

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 4.1 | Assess the readiness of a UAS for safe operation through careful examination of its components using a risk matrix assessment to mitigate identified risks (e.g. common abnormalities and emergencies). |  |
| 4.2 | Identify important components of a UAS that should be inspected prior to every flight (e.g. construct a preflight checklist). |  |
| 4.3 | Identify the various members of a multi-person drone crew and explain their roles, including key elements of effective communication in a UAS operation. |  |
| 4.4 | Make observations about aeronautical decision making (ADM) in a variety of scenarios, and identify hazardous attitudes. |  |
| 4.5 | Research and build emergency checklists for a UAS. |  |

## Benchmark 5: Planning and Executing a Mission

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 5.1 | Demonstrate concepts on the practical act of controlling and flying the classroom drone. |  |
| 5.2 | Draw conclusions about the type of UAS that would be ideal, given a specific mission to be flown. |  |
| 5.3 | Relate the appropriateness of a drone’s payload to the operation it will be performing. |  |
| 5.4 | Summarize common sensors that can be found in flight controllers, as well as the flight modes that they make possible. |  |
| 5.5 | Apply concepts to plan and execute an operation using a drone. |  |

I certify that the student has received training in the areas indicated.

Instructor Signature:

For more information, contact:

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