

**Course Outline**

**COURSE:** AMT 226                      **DIVISION:** 50                      **ALSO LISTED AS:**

**TERM EFFECTIVE:** Fall 2019                      **CURRICULUM APPROVAL DATE:** 05/14/2018

**SHORT TITLE:** DRONE FLT OPER AND PILOT CERT

**LONG TITLE:** Drone Flight Operations and Pilot Certification

Units	Number of Weeks		Contact Hours/Week		Total Contact Hours
3	18	Lecture:	2	Lecture:	36
		Lab:	3	Lab:	54
		Other:	0	Other:	0
		Total:	5	Total:	90

**COURSE DESCRIPTION:**

This course will instruct students in the basic flight operations for both fixed wing and rotor wing drone aircraft, as well as prepare them to take the FAA pilot certification exam. **PREREQUISITE:** AMT 225

**PREREQUISITES:**

**COREQUISITES:**

**CREDIT STATUS:** D - Credit - Degree Applicable

**GRADING MODES**

- L - Standard Letter Grade
- P - Pass/No Pass

**REPEATABILITY:** N - Course may not be repeated

**SCHEDULE TYPES:**

- 02 - Lecture and/or discussion

## **STUDENT LEARNING OUTCOMES:**

1. Perform flight skills outdoors for either a fixed wing or rotor-wing aircraft. (SLO's 7,2)

Measure of assessment: Demonstration

Year assessed, or planned year of assessment: 2018

Semester: Fall

2. Demonstrate knowledge of the FAA regulations for piloting drones by completing the written practice test with a score of 70% or higher. (SLO's 2,7,)

Measure of assessment: Homework, Exam

Year assessed, or planned year of assessment: 2018

## **CONTENT, STUDENT PERFORMANCE OBJECTIVES, OUT-OF-CLASS ASSIGNMENTS**

Curriculum Approval Date: 05/14/2018

Lecture content:

8 Hours:

- 1) Introduction - Picking the Drone That's Right for You, Finding Support and Resources
- 2) Safety - Staying Safe with Your Drone - FAA Pilot Certification Knowledge Requirements Regarding Physiological/Medical Factors that Affect Pilot Performance
- 3) Before You Fly - Setting Up Your Drone
- 4) Knowing the Law - Introduction to FAA Regulations - Obtaining FAA Reference Material - Certification Requirements

Student Performance Objectives: Explain the areas one should consider before buying a drone. Describe various drone features. Identify the drone that's best for you. Discuss three resources that one could use to interact with other drone enthusiasts. List a drone's component parts. Discuss the FAA Regulations required to pilot a drone and the certification process. Identify the imminent dangers with drones. Discuss the FAA's physiological/medical factors, including drugs and alcohol that could affect a drone pilot's performance.

18 Hours:

- 1) Flight - Controlling Your Drone, Basic Flight Operations for Multi-Rotor and Fixed Wing Systems
- 2) FAA Pilot Certification Knowledge Requirements Regarding When and Where To Fly: Airspace Classification, Operating Requirements, and Flight Restrictions and The Effects of Weather on a Drone's Performance
- 3) Maintaining Your Drone - DIY Repairs and Maintenance

Student Performance Objectives: Explain how a drone is controlled. Discuss Radio Frequency, Wi-Fi Controls and GPS as it relates to controlling a drone. Analyze the differences between Multi-Rotor and Fixed Wing Systems. Discuss the FAA Pilot Certification information relating to when and where to fly and the effects of weather on a drone's performance. Describe the reasons why a post-flight check of your drone is important. List the resources that you can utilize to find information on how to do minor repairs and maintenance on your drone.

8 Hours:

1) FAA Pilot Certification Knowledge Requirements Continued:

- a) Drone Loading
- b) Emergency Procedures
- c) Crew Resource Management
- d) Radio Communication Procedures
- e) Determining the Performance of Drones
- f) Aeronautical Decision-Making and Judgment
- g) Airport Operations
- h) Maintenance and Pre-flight Inspection Procedures

Student Performance Objectives: Discuss how the weight of a load can affect the stability, balance and flight time of a drone. Explain the process you would follow for an in-flight emergency. Describe the effect of temperature on density and the effect of humidity on density. Discuss proper radio communication procedures and traffic advisory practices. Name the steps for good decision-making. List the factors that can cause humans to make decisions. State the goals of risk management. Name the types of airports and the sources for airport data.

2 Hour: Final

Lab Content:

21 Hours:

- 1) Flight Controls; RC Transmitters; Mobile Apps; Batteries; Other Important Features - Composition and Payload Capacity
- 2) Flight Simulator Software
- 3) Component Parts of Multi-Rotor and Fixed Wing Systems
- 4) Safety Practices, Including Reviewing FAA Regulations
- 5) Assembling a Drone

Student Performance Objectives: Describe and demonstrate how flight controls work. State the purpose of RC Transmitters and Mobile Apps and demonstrate their use. Explain how to avoid fires with proper battery care. Recognize and explore the composition and payload capacity of various drones. Demonstrate flight skills using flight simulator software and equipment. Identify the component parts of Multi-Rotor Systems and Fixed Wing Systems. Demonstrate how to assemble propellers and landing gear on your drone. Examine how to avoid propeller dangers. Identify the quirks of your drone to avoid accidents.

18 Hours:

- 1) Basic Flight Operations for Multi-Rotor and Fixed Wing Systems
- 2) Review FAA Pilot Certification Knowledge Requirements Regarding When and Where To Fly: Airspace Classification, Operating Requirements, and Flight Restrictions and The Effects of Weather on a Drone's Performance

Student Performance Objectives: Demonstrate how to steer your drone in all directions. Review the FAA Pilot Certification regulations relating to when and where to fly and the effects of weather on a drone's performance. Discuss controlled airspace, uncontrolled airspace, special use airspace and other airspace areas. Demonstrate the effects of weather on a drone's performance.

12 Hours:

- 1) Payload Capacity
- 2) Emergency Situations
- 3) Radio Communication
- 4) Human Factors and Safety
- 5) Maintenance and Pre-flight Inspection Procedures

Student Performance Objectives: Demonstrate drone flight skills caring different payload weights. Recognize the process that would be followed for an in-flight emergency. Practice proper radio communication procedures. Apply the steps for good decision-making. Perform a pre-flight inspection on your drone.

2 Hours: Final

**METHODS OF INSTRUCTION:**

lecture, discussion, demonstration, guided practice

**OUT OF CLASS ASSIGNMENTS:**

Required Outside Hours: 18

Assignment Description: Read related chapters in the textbook. Research the various types of drones that are available, including their features and cost and come prepared to discuss your findings with the class. Access the FAA's Remote Pilot - Small Unmanned Aircraft Systems Study Guide and read the section on Physiological/Medical Factors Affecting Pilot Performance. Complete the practice quiz on related FAA regulations.

Required Outside Hours: 36

Assignment Description: Read related chapters in the textbook and the FAA's Remote Pilot - Small Unmanned Aircraft Systems Study Guide relating to When and Where To Fly: Airspace Classification, Operating Requirements, and Flight Restrictions and The Effects of Weather on Small Unmanned Aircraft Performance. Complete the practice quizzes on the related FAA regulations. Homework: Prepare a Pre-Flight and Post-Flight Checklist for your Drone and come prepared to discuss your list with the class.

Required Outside Hours: 18

Assignment Description: Read the FAA's Remote Pilot - Small Unmanned Aircraft Systems Study Guide relating to the topics presented in class. Report/Presentation: Select one of the chapters from the FAA's Remote Pilot - Small Unmanned Aircraft Systems Study Guide and write a 1 - 2 page report on its contents and how they relate to you as a Drone pilot and present the information to the class. Take the FAA Part 107 Remote Pilot Drone Knowledge Exam Practice Test.

**METHODS OF EVALUATION:**

Writing assignments

Percent of total grade: 10.00 %

Homework

Problem-solving assignments

Percent of total grade: 10.00 %

Report, Presentation

Skill demonstrations

Percent of total grade: 40.00 %

Performance exams

Objective examinations

Percent of total grade: 40.00 %

**REPRESENTATIVE TEXTBOOKS:**

Required Representative Textbooks

Prepware Remote Pilot - UAS Remote Pilot Test Prep. ASA,

Mark LaFay. Drones for Dummies. Hoboken, NJ: Wiley Publishing,2015.

ISBN: 978-1-119-04978-4

Reading Level of Text, Grade: 10th Verified by: MS Word

U.S. Department of Transportation. Remote Pilot - Small Unmanned Aircraft Systems Study Guide. Washington, DC: Federal Aviation Administration,2016.

Reading Level of Text, Grade: 10th Verified by: MS Word

Required Other Texts and Materials

Students will need to provide their own drone for use in lab activities. Software such as: Portable Hard Drive and Mini Scan Disks.

## **ARTICULATION and CERTIFICATE INFORMATION**

Associate Degree:

CSU GE:

IGETC:

CSU TRANSFER:

Not Transferable

UC TRANSFER:

Not Transferable

## **SUPPLEMENTAL DATA:**

Basic Skills: N

Classification: Y

Noncredit Category: Y

Cooperative Education:

Program Status: 1 Program Applicable

Special Class Status: N

CAN:

CAN Sequence:

CSU Crosswalk Course Department:

CSU Crosswalk Course Number:

Prior to College Level: Y

Non Credit Enhanced Funding: N

Funding Agency Code: Y

In-Service: N

Occupational Course: C

Maximum Hours: 5

Minimum Hours: 5

Course Control Number: CCC000582325

Sports/Physical Education Course: N

Taxonomy of Program: 095000