APT A151: UNMANNED AIRCRAFT SYSTEMS LAB

Item	Value
Curriculum Committee Approval Date	12/08/2021
Top Code	302020 - Piloting
Units	1 Total Units
Hours	54 Total Hours (Lab Hours 54)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Standard Letter (S)

Course Description

Commercial UAS operators are becoming a new occupation within the aviation industry. The purpose of UAS is widespread and may decrease unnecessary risks to pilots in certain environments. The Unmanned Aircraft Systems industry is expected to generate an estimated 100,000 jobs and $82.1 billion in economic impact in the next decade according to the Association for Unmanned Vehicle Systems International (AUVSI). Additionally, the Federal Aviation Administration (FAA) predicts 10,000 unmanned aircraft systems could be airborne in the U.S. skies by 2020. PREREQUISITE: APT A131 or concurrent enrollment. Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Performs within the tolerances for each flight maneuver required by in the Federal Aviation Administration (FAA) Practical Test Standards for Unmanned Aircraft Systems.

Course Objectives

- 1. Demonstrate mastery of pre-flight safety procedures for UAS operations.
- 2. Demonstrate mastery of controller calibration techniques and processes.
- 3. Demonstrate mastery of approach, landing, and shut-down operations and procedures.

Lecture Content

Lab Only

Lab Content

Emergency planning and communication. The characteristics and potential hazards of lithium batteries: Safe transportation, such as proper inspection and handling Safe charging Safe usage Risks of fires involving lithium batteries Loss of aircraft control link and fly-aways. Loss of Global Positioning System (GPS) signal during flight and potential consequences. Frequency spectrums and associated limitations. Basic maintenance. Preflight inspection. Techniques to mitigate mechanical failures of all elements used in sUAS operations, such as the battery and/or any device(s) used to operate the sUAS. General loading and performance: Effects of loading changes Balance, stability, and center of gravity The importance and use of performance data to predict the effect on the aircrafts performance of an sUAS. Operating limitations for sUAS. Maximum groundspeed Altitude limitations Minimum visibility Cloud clearance requirements Visual line of sight (VLOS) aircraft operations.

Method(s) of Instruction

- Lab (04)

Instructional Techniques

Equipment Proficiency Demonstrations

Reading Assignments

Read technical and operations manuals from each UAS (drone) manufacturer.

Writing Assignments

Completion of flight plans and flight logs, weight and balance exercises and aircraft performance problems.

Out-of-class Assignments

N/A

Demonstration of Critical Thinking

In flight problem solving exercises based on FAA Private Pilot Practical Test Standards

Required Writing, Problem Solving, Skills Demonstration

Completion of flight plans and flight logs, weight and balance exercises and aircraft performance problems.

Eligible Disciplines

Aviation (flight, navigation, ground school, air traffic control): Any bachelors degree and two years of professional experience, or any associate degree and six years of professional experience.

Other Resources

1. Technical and operations manuals from each UAS (drone) manufacturer.