

# UAS 110: REMOTE SENSING AND GIS FOR DRONE OPERATORS

## Citrus College Course Outline of Record

Heading	Value
Effective Term:	Fall 2025
Credits:	3
Total Contact Hours:	54
Lecture Hours :	54
Lab Hours:	0
Hours Arranged:	0
Outside of Class Hours:	108
Total Student Learning Hours:	162
Transferable to CSU:	No
Transferable to UC:	No
Grading Method:	Standard Letter

## Catalog Course Description

Introduction to drone mapping and geo-spatial data collection/analysis tools to prepare students for employment in the UAS/UAV industry. Instruction includes hands-on experience in drone mission planning, performance of aerial data collection and production of site reports, orthomosaic images and 3D models. Other topics include requesting FAA airspace authorization, utilization of ground control points, crews and visual observers, night operation procedures and operational safety and emergency procedures. 54 lecture hours.

## Course Objectives

- Develop skills and knowledge necessary for gaining employment in the UAV/UAS industry
- Demonstrate skills in drone mapping software, data collection methods and Geo-Spatial tools
- Performance of hands-on skills in autonomous drone flight, placement and implementation of GPS ground control points and pre-flight LAANC authorization requests

## Major Course Content

1. Introduction to commercial geo-spatial tools and methods
  - a. Intro to use of aerial mapping and modeling software
  - b. Intro to the use of FAA airspace and LAANC authorization platforms
  - c. Intro to commercial/public safety drone applications
  - d. Current industry employment opportunities and salary expectations
2. Preparation for real-world commercial autonomous drone flights
  - a. Utilizing crews and visual observers on site
  - b. Night operations procedures
  - c. Operational Safety and Emergency procedures
  - d. Use and placement of Ground Control Points and GPS data for increased model/map accuracy
  - e. Pre and Post flight procedures and best practices

3. Develop knowledge and skills in geo-spatial mapping software
  - a. Hands-on use of drones to create autonomous pre-planned flight
  - b. Hands-on use of drones to create a 3D model of building/field site
  - c. Data processing and development of site reports and 3D models
  - d. Post-processing reports and presentation of data

## Suggested Reading Other Than Required Textbook

Summary of small unmanned aircraft rule (PART 107)  
[https://www.faa.gov/uas/resources/policy\\_library/media/Part\\_107\\_Summary.pdf](https://www.faa.gov/uas/resources/policy_library/media/Part_107_Summary.pdf)  
 Remote Pilot # Small Unmanned Aircraft Systems Airman Certification Standards [https://www.faa.gov/training\\_testing/testing/acs/media/uas\\_acs.pdf](https://www.faa.gov/training_testing/testing/acs/media/uas_acs.pdf)  
 Remote Pilot – Small Unmanned Aircraft Systems Study Guide [https://www.faa.gov/regulations\\_policies/handbooks\\_manuals/aviation/media/remote\\_pilot\\_study\\_guide.pdf](https://www.faa.gov/regulations_policies/handbooks_manuals/aviation/media/remote_pilot_study_guide.pdf)  
 Pilot's Handbook of Aeronautical Knowledge [https://www.faa.gov/regulations\\_policies/handbooks\\_manuals/aviation/phak/](https://www.faa.gov/regulations_policies/handbooks_manuals/aviation/phak/)

## Examples of Required Writing Assignments

3D modeling of site Drone Mapping Mission This assignment requires students to complete a drone mapping mission scenario to plan, fly and generate models for an autonomous flight and develop a flight plan in our mapping software to collect the 3D model data. Students will be required to observe weather data and conditions for the planned collection day and judge appropriate conditions for flight. Students will participate by using a drone and monitor the flight as visual observers always maintaining line-of-sight on the drone and communicating with each other over two-way radios. Students will participate in autonomous data collection using a drone and monitor the flight as visual observers always maintaining line-of-sight on the drone and communicating with each other over two-way radios. Students will participate during the data processing and help to quality control images taken, check for issues as well as produce a 3D model of the building to be presented in print and jpg format. Check your group number and syllabus schedule to see when your group will be performing the flight portion of the mission. Students will be required to write a detailed report discussing the following:

- Description of the process of site planning before the flight
- Description of the weather data for that day based on UAV forecast
- Description of field site and safety hazards
- Description of scheduled group flight data collection in the field and how crew members were utilized during the flight to ensure safety
- Description of the post-processing stage and the creation of the model
- Discussion of "best practices" and what would be done differently if the project could be repeated
- Detail as to what occurred the day of the flights and any issues that occurred before, during or after the flight with the drones or crew members
- Write a minimum of 3-5 pages double spaced at 12font

## Examples of Outside Assignments

Drone Deploy Fundamentals Certification This course is designed to educate you in how to map with a drone, you will become certified in how to use Drone Deploy software. You will be given access to DroneDeploy and be required to completed a series of courses on the DroneDeploy website in order to earn the Fundamentals Certification. These courses will not be on Canvas and will require internet access in order to complete the video and webpage courses. The certificate earned at the end of

the Drone Deploy Fundamentals training must be submitted to your instructor by the deadline and given in paper or PDF form. Access to the site will be monitored by the instructor and access can be denied for flights if the courses are not completed by the deadline

## **Instruction Type(s)**

Lecture, Online Education Lecture