

Evergreen *Mapping with Drones* Certificate

(For Summer Quarter, 2024)

The Evergreen certificate program - “Flying and Mapping with Drones” - provides students with hands-on skills for flying small Unmanned Aerial Vehicles (sUAVs), commonly known as ‘drones’. Learn to fly drone cameras safely. Produce professional quality photos, and videos. Pass your FAA drone pilot exam. Create maps and analyze remote sensing data for GIS integration. Publish a story map of a drone project.

Teaching Modes and Requirements

The two drone courses are offered in-person only. There are no prerequisites for taking these courses and students can take either or both courses. The certificate can be achieved during a single summer session by taking both courses. Both courses are offered on Saturdays through the entire summer quarter. The Saturday morning course is for students who are interested in flight, FAA certification, photography and video skills. In the afternoon course Students learn drone imagery processing for GIS integration, map creation in 2D and 3D, spatial accuracy, and multispectral applications of drone imagery.

Drone imagery can be configured to serve the needs of land managers, environmental monitoring professionals, infrastructure planners, archaeological researchers and more. The Evergreen courses are taught by two professional practitioners of drone mapping with thousands of hours of drone flight experience across a variety of conservation and industry projects. The courses present the latest in the rapidly changing drone technology, processing software, following the best-practices used today.

Faculty Points of Contact:

The following faculty co-teach the two courses in the Drone Certification track.

- Mike Ruth (ruthm@evergreen.edu)
- Ryan Richardson (richardr@evergreen.edu)

Details are shown below about each of the two courses that comprise this certificate.

Drone Classes Offered in Summer Session

The following two Drone certification courses are offered in Summer 2024. The courses are offered on Saturdays, in-person, on the Olympia campus.

1. Learn to Fly Drones (Saturday Mornings) ... and Prepare to Take the FAA Part 107 Pilot Examination

Students will learn to fly drones, while also learning the body of knowledge needed to take and pass the FAA pilot examination and be certified as a professional *sUAV Part 107* pilot. This course is designed for the newcomer to drone technology – with no expectations that students have any prior drone or other aviation experience.

Evergreen's certified drone pilots will instruct students in drone flight, through training exercises designed to build aviation confidence, while capturing aerial photography and high-quality video. Each weekly drone flight exercise builds skills through increasing flight school assignments. The flight skills build student awareness of best-practices, for flight planning, safety, and compliance with FAA rules and other regulations. Strong flight skills are the foundation for high quality photography and video creation from aerial drone cameras.

This course covers drone technology components, cameras and settings, and related flight instrumentation. Modules are provided on photo and video editing techniques that rely on the Acrobat Creative Cloud software (provided to students at no cost, through Evergreen's site license).

Each weekly class cover a module of the Federal Aviation Administration body of knowledge about aviation and airframes, rules of national airspace, airframe loading, aviation weather, and other important safety and operational topics. Practice tests will be offered to help students assess their readiness to take and pass the FAA Part 107 pilot examination upon completion of the course.

Classes are offered every Saturday **morning** of the summer session (ten weeks). The course is open to graduate and undergraduate students.

There is no prerequisite to take this course. Students will be advised about drone purchase options upon student registration. Students with financial need to borrow a drone to take this course should discuss directly with faculty.

2. GIS and Mapping with Drone Imagery (Sat. Afternoons)

This course is designed for students who want to use collections of drone images for mapping and spatial analysis. From planning the drone flight mission, to processing hundreds of drone images and ground control, students will learn methods to integrate drone imagery into a GIS (Geographic Information System).

Drone (sUAV) devices can collect hundreds (even thousands) of individual aerial photographs. These collections serve needs for landscape study and mapping - in forestry, prairie, marine environment, and infrastructure studies and many more fields of GIS applications. This course relies on the *Drone-to-Map* software (by Esri, Inc) for processing drone image collections and creating map layers suitable for GIS analysis.

Topics include the creation of maps and 3D terrain models, integration of precise ground control (to improve accuracy of the imagery layers), analysis of multispectral drone imagery, and methods of spatial analysis - all derived from drone imagery collections. Attention will be paid to the nuances of drone mission planning, helping students to plan for high quality and suitability of the drone image collections for GIS analysis. Students will learn how to integrate drone imagery into story maps, for web publication and portfolio creation.

Students are not required to know how to fly drones for this course. Those students who are also taking the morning “Learn to Fly” course will enjoy learning how their drone flight and photography skills also support rigorous mapping applications of drone imagery for mapping and analysis of spatial phenomena and terrain surfaces.

Classes are offered every Saturday **afternoon** of the full summer session (ten weeks). Open to undergraduate and graduate students.

There is no prerequisite to take this course. This course can be taken independently or in parallel with the “Learn to Fly” morning course.

Students who complete both courses will be granted a certificate in Drone Mapping from The Evergreen State College.