

UAV Mapping and Analysis - Fall 2023

ID 351b - Satellite GIS Center, CIS 111

Classes Thursdays 9:10-11 am

Field trips TBD based on group availability

Instructor: Charlie Bettigole | (c) 860-921-8249
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Office hours: W 2:30-3:30 (GIS) | Th 1 - 2:30 (CIS)
& by appt: calendly.com/bettigole

Course Description:

In this two credit course, students will gain an understanding of the practical applications of UAVs for landscape mapping through discussion and hands-on experience. We will dive into hardware, software, and best practices for UAV research, and we will work with datasets that allow students to build orthoimagery, DEMs and point clouds. Additionally, we will be reviewing materials necessary for passing the FAA Part 107 UAV Pilot Exam through course materials from dronepilot101. The course will culminate in students independently planning, executing, and analyzing a drone mission for a local organization

Communication:

In the interest of learning collectively, all course communications will come through **Slack** - skidmoregis.slack.com. This includes class announcements as well as questions for the instructor. During the day, I will attempt to respond as quickly as possible. I will check slack once in the evenings during the week around 9 pm, and will check in once a day over the weekend. For urgent matters please text me at the number listed above.

Assignments:

This class is listed as S/U. It's going to be hard to get a U if you show up and work collaboratively with your classmates

Learning Goals:

- Pass the FAA Part 107 Remote Pilot Exam
- Understand the latest in drone technology, including drones, sensors, and software
- Learn about Federal and local policy for UAV flights
- Plan a drone mission, including pre-flight checklist, assigning mission roles, and maintaining a safe working environment
- Learn the processes of creating orthomosaics and 3D point clouds from drone imagery

The Final Project:

In teams of two, you will independently coordinate with a local partner to identify a study area to map, plan a mission using DroneLink, execute the mission, analyze imagery with Agisoft Metashape, and present a series of deliverables, including orthomosaics, DSMs, a short report, and social media posts.

Teams must meet with Charlie at least three days prior to the mission to review DroneLink flight plans. If you have not yet passed your FAA Part 107, you must be accompanied on your mission by a certified pilot (lab assistant or Charlie).

Drone Practice

We will have two opportunities for in-class drone flights, but I will also make available other times to build flight hours with our DJI Mini 2. Students must demonstrate competence with takeoffs, landings, FPV/visual navigation, drone setup, battery changes, and basic video recording.

Course Schedule

- 9/7 - Class intro, drone presentations, setting up FAA [profiles and test dates](#)
- 9/14 - FAA presentation/prep, Group 1
- 9/21 - FAA presentation/prep, Group 2
- 9/28 - FAA presentation/prep, Group 3 and Mission Prep for 10/5 including overview of flight planning software and DJI Flight Controls
- 10/5 - Drone Practice Day (Baseball Diamond)
- 10/12 - Image Analysis and Processing
- 10/19 - Drone Practice Day w/ GCP (Diamond)
- 10/26 - Image Analysis w/GCP
- 11/2 - Project Work Time / Guest Speaker
- 11/9 - Project Work Time / Guest Speaker
- 11/16 - Final Presentations

Academic Integrity and the Honor Code

As students of Skidmore College you will be held to the academic and ethical standards outlined in the [Academic Integrity Handbook](#). You should take a moment to review this handbook, in particular the sections on Definitions and Guidelines and the Academic Integrity Checklist. It is your responsibility to become familiar with the standards of Academic Integrity at Skidmore, and violations will not be tolerated in this course.

*Learning to write concise, scientific text to accompany your maps is critically important to the success of this course. While it can indeed be a useful tool, the use of generative AI (e.g. **ChatGPT**) is not permitted in this course. Any unattributed use of AI will be counted as plagiarism (and can be detected on the Spring).*

Academic Services

The Office of Student Academic Services (located on the first floor of the Starbuck Center) offers a wide variety of services to improve academic skills and help students take full advantage of the academic opportunities available at Skidmore. For example, current services include (but are not limited to): peer tutoring; one-on-one or small group academic support; support for students with disabilities; ESL support (including additional professional tutoring support to the Writing Center); support to some students on waivers, returning from medical leaves, and recipients of Unsatisfactory Work Notices.

If you are a student with a disability and believe you will need academic accommodation, you must formally request accommodation from Meg Hegener, Coordinator for Student Access Services. You will also need to provide documentation which verifies the existence of a disability and supports your request. For further information, please call 580-8150 or stop by the office of Student Academic Services in Starbuck Center.

Title IX Statement and Reporting Responsibilities

Skidmore College considers sexual and gender-based misconduct to be one of the most serious violations of the values and standards of the College. Unwelcome sexual contact of any form is a violation of students' personal integrity and their right to a safe environment and therefore violates Skidmore's values. Sexual and gender-based

misconduct is also prohibited by federal and state regulations. Skidmore College faculty are committed to supporting our students and upholding gender equity laws as outlined by Title IX. If a student chooses to confide in a member of Skidmore's faculty or staff regarding an issue of sexual or gender-based misconduct, that faculty or staff member is obligated to tell Skidmore's Title IX Coordinator or Title IX Deputy Coordinator. The Title IX Coordinator or Deputy Coordinator will assist the student in connecting with all possible resources for support and options for reporting both on and off campus. Identities and details will be shared only with those who need to know to support the student and to address the situation through the college's processes. If the student wishes to confide in a confidential resource, the Counseling Center Staff, Health Services, and Victim Advocates (anonymous) are all options available.

More information can be found at the Sexual and Gender-Based Misconduct website or by contacting the Title IX Coordinator, Joel Aure (jaure@skidmore.edu), 580-5708, or Deputy Coordinator for Student Affairs, Gabriela Melillo (gmelillo@skidmore.edu), 580-5022.

Conscientious Religious Observance Policy

Skidmore College acknowledges that our community is one of many faiths with a diverse range of practices and observances important to each tradition. In order to fulfill our mission to educate a diverse population of talented students and our commitment to inclusion regardless of religious and spiritual tradition, we seek to practice an equitable and consistent approach in providing religious accommodations. If religious observance requires absence from class or you anticipate a conflict with assignments or due dates, please notify your instructor prior to the absence or conflict so that accommodations can be arranged. Although not required, please provide notification about a pending religious holiday at the start of the semester or at least one week before the holiday. As an option, you may use the form available [here](#).

Accommodations for your absence should not reduce the overall expectations of a course nor unduly burden you for requesting accommodation. Students shall not suffer academic, athletic, or employment penalties because of the conscientious

observance of any religious day or days. Faculty must permit students to take a makeup examination without any penalty if they have to miss an examination due to religious observances. Similarly, faculty must permit students to submit missed assignments by an agreed upon due date, without penalty.

If a student, supervisor, coach, or faculty member feels the policy is being violated, they should contact the Dean of Faculty Office at 518-580-5705 (Palamountain 416), the Dean of Students Office at 518-580-5760 (Case Center 313), or Human Resources at 518-580-5800 (Barrett Center first floor). The full policy can be found [here](#).

Diversity and Inclusion

Skidmore College is committed to fostering a diverse and inclusive community in which members develop their abilities to live in a complex and interconnected world. Consistent with our educational mission, we recognize ourselves as a community that respects individual identities based on varying sociocultural characteristics such as race, ethnicity, gender identity and expression, sexual orientation, national origin, first language, religious and spiritual tradition, age, ability, socioeconomic status and learning style. We strive to create a socially just world that honors the dignity and worth of each individual, and we seek to build a community centered on mutual respect and openness to ideas—one in which individuals value cultural and intellectual diversity and share the responsibility for creating a welcoming, safe and inclusive environment. We recognize that our community is most inclusive when all members participate to their full capacity in the spirited and sometimes challenging conversations that are at the center of the college's educational mission.