onGEO Professional Certificate Course: onGEO-FAA425

FAA Part 107 Drone Test Prep & Beyond

Summer 2025-2 Session: *Syllabus*

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> **Disclaimer**: Participating in and/or completing this course does not guarantee a passing grade on the FAA Part 107 test.

Course Description:

This course covers the fundamentals, regulations, application of Unmanned Aircraft System (UAS) flight according to the Federal Aviation Administration (FAA) laws, specifically part 107. Under part 107 (*Flying Under the Small UAS Rule*) there is an extensive amount of details on basics of UAS mechanics, regulations, airspace, weather, operations, and processing of data that pilots need to be aware of. In this course, we will cover all of this material and begin to show the power of UAS imagery with correct processing technique. Additionally, to further help people prepare for the part 107 exam that is actually (administered by the FAA), past test questions will be provided throughout the course. It should be noted that while this course is an IN-DEPTH review of UAS flight and associated rules, taking the course does not ensure that the user will pass the part 107 exam. Come join us and learn about the future of drone technology and proper safe usage!

Course Audience:

Government regulations are strict in terms of proper UAS piloting. This course is ideal for all levels from hobbyists to professionals. This field of geospatial technologies is greatly expanding in a wide variety of fields from agriculture to teaching and in research, in order to safely and properly pilot drones passing the part 107 exam is not only essential but required by law. This course, while designed to help students of all levels to prepare for the exam, is stringent and detailed in the topics covered as they are topics found on the part 107 exam.

Course Goals:

The learner will obtain background, knowledge, and skills required to safely operate UAS and to prepare for taking the FAA part 107 exam. Students will learn to read aviation maps, understand operating terminology, and start to understand the full potential usages for UAS.

Course Learning Outcomes (Objectives):

With the successful completion of this course, you will be able to:

- understand the regulations developed by the FAA, who these regulations pertain to, and how to properly / safely partake in UAS activities.
- identify airspace types and know the UAS operation procedures in each airspace type.
- read weather maps / charts and understand what conditions are optimal for UAS flights.
- know emergency management procedures including who to contact in the event of emergencies.
- understand maintenance and set up of UAS technology in order to fly safely and prevent loss of expensive materials.
- prepare unmanned missions.
- see the utility of remote sensing and its applications to UAS.

Course Requirements and Recommendations:

Required

- **Textbook**: *None.*
- **Reference**: FAA CT-8080-2H, *Airman Knowledge Testing Supplement for Sport Pilot, Recreational Pilot, Remote Pilot,*

and Private Pilot.

- **Technological**:
    - **Computer** – A PC or Mac can be used to access D2L for lesson material.
    - **Web browser** -- Preferably Mozilla Firefox, Google Chrome, or Microsoft Edge. Use of other browsers may lead to quiz and lab malfunctions.
- **General**:
    - You are required to complete each lesson and are responsible for all of its associated components (for example, web links, lesson questions, assigned readings, demonstrations, reality checks, assessments, and so on).
    - You are also required to take the assessments and submit your responses to labs ON TIME. *Please contact your instructor* if you have circumstances that prevent you from submitting the assignments by their due date to work out an alternate date.

Highly recommended

- **Textbook**: *None.*
- **HIGH-SPEED internet connection**: You will need a high-speed internet connection to take this course. Students attempting to take this course with a dial-up connection will have difficulty dealing with the large files associated with our lessons and, more importantly, exercises.

> **Please Note**:
> All course emails will be sent to your Michigan State (mail.msu.edu) or MSU Guest email account only via the D2L system. You will need to check this email account at least once a day for emails from your Instructor and Online Geography staff. If you need to, please set your Michigan State account to forward your emails to an account that you do check frequently.

Course Organization:

While a team of faculty and staff developed and still manages the course, an Instructor teaches each section. Moreover, this course is delivered through a series of online lessons, features, and exercises. Within each lesson there are multiple parts and each part has a course assessment associated with it. Course assessments are accomplished through exercises or self-assessments or both. Within every lesson there are demonstrations (short videos) and reality check material (sometimes videos other times reading materials) to help you further develop your UAS knowledge base. The reality check materials are intended to highlight real world applications and help the student prep for actual field data collection. At the end of the course there is an exam, based on authentic questions from the part 107 exam.

Your instructors, associated staff, and course authors

This session, **Dr. Yi Shi** is responsible for this course. Dr. Shi will take care of the content instruction, weekly communication, and final grading. Please ***email*** *Dr. Shi with any questions or comments*.

Beth Weisenborn and Juliegh Bookout are staff members of Online Geography (onGEO) courses at Michigan State University, so you may receive notices from them occasionally.

Bob Goodwin, Erin Bunting, Joe Welsh (all from MSU RS&GIS), Dr. Yi Shi and Beth Weisenborn (both from onGEO) wrote this course in collaboration

Lessons

This course consists of **5 online lessons** (or lectures), which contain various features. Please check the schedule (final page of this document) for the order and timing of the lessons and assessments.

Lesson/Lab	Topic
0	Getting Started; Getting to Know You - Part 1: Course organization, navigation, and support - Part 2: How is the part 107 exam is structured
1	**F.A.A. Regulations** - Part 1: General Operating Rules - Part 2: Part 107 Operating Rules - Part 3: Pilot Certification - Part 4: Applying for a Waiver - **Reality Check**: What You Must Know for the Exam - **Demonstration Video**: Applying for a Part 107 Waiver - **Exercise**: Registering Your Small Unmanned Aircraft for Recreational, Commercial, Governmental, or Other Purposed Under Part 107
2	**National Airspace** - Part 1: Introduction - Part 2: Airspace - Part 3: Interpreting VFR Sectional Charts - Part 4: Interpreting Other Aeronautical Chart Symbols - Part 5: Notices to Airmen - Part 6: Geographic Coordinates - **Reality Check**: What Must You Remember When Preparing to Fly? - **Demonstration Video**: Airspace; Sectional-chart Symbology - **Exercise**: Using SkyVector as a Resource for sUAS Flight Preparation
3	**Weather** - Part 1: The Atmosphere - Part 2: Atmospheric Pressure - Part 3: Atmospheric Stability - Part 4: Winds - Part 5: Precipitation - Part 6: Clouds and Visibility - Part 7: Weather Reports, Forecasts, and Charts - **Reality Check**: How Do Certain Weather Conditions Affect a UAS? - **Demonstration Video**: Weather and Clouds; METAR Interpretation - **Exercise**: Interpreting METARs and TAFs
4	**Operations** - Part 1: Maintenance and Inspection - Part 2: Communication - Part 3: Airport Operations - Part 4: Emergency Procedures - Part 5: Aircraft Loading - Part 6: Decision Making - Part 7: Physiology - **Reality Check**: Key Items to Keep in Mind - **Demonstration Video**: Pre-flight Check - **Exercise**: UAV Operation Scenarios
5	**Data Collection & Processing** - Part 1: Flying - Part 2: Capturing and using data - Part 3: Introduction to data analysis - **Reality Check**: What Can Be Accomplished with Drones? - **Demonstration Video**: None - **Exercise**: Building and Executing Autonomous Missions in DJI GS Pro

Review quizzes

There are *ungraded* ***review quizzes***, self-assessments, ***for each lesson***. The purpose of these quizzes is to allow you to test your understanding of the material from the online lessons. You may take the review quizzes as many times as you would like to prepare for the course assessments.

Quizzes

There are *graded* ***quizzes for each lesson***. The purpose of these quizzes is to allow you to test your understanding of the material from the online lessons. The quizzes will be open for you to take at your convenience. The score of your first attempt of each quiz will be used to calculate your final grade. You may, however, take the quizzes as many times as you would like to prepare for the FAA part 107 exam.

Exam

There is a *graded* ***final (cumulative) exam*** at the end of the course. The Final Exam covers material from Lessons 1 to 4; it does not include questions from the Data Collection and Processing lesson. The structure and wording of the questions are in the exact same manner as the FAA part 107 exam. The score of your first attempt of the final exam will be used to calculate your final grade. You may, however, take the exam as many times as you would like to prepare for the FAA part 107 exam.

Exercises

You are *required* to complete an *ungraded* ***exercise for every lesson*** and submit your answers in D2L by 11:59 p.m. (ET) on the date specified on the course schedule. Please *contact your instructor if you need extra time* to submit the exercise.

As with any course, it is the responsibility of the Instructor to uphold the standards suggested by the grading rubrics provided by the course authors.

Exercises are independent exercises; you are not to collaborate with fellow students on them. The exercises are designed to take approximately 1 hour to complete.

It is strongly suggested that you start your exercises early so that you have enough time to ask your instructor any questions you might have.

Course Policies:

MSU privacy statement (and use of course materials)

> From the MSU D2L Help Page: "Know your rights and University Policy: MSU expects that you will respect the rights of faculty and other students as you participate in the educational process. Participating in a D2L course means that you may have access to personal information and academic work produced by other students and faculty members, such as discussion board postings, drafts of papers and other work produced in the course. **Academic norms and MSU policy require that you must not reveal any information about classmates, coursework, content, or its authors to anyone outside the course**."

ALL of our course material in D2L is copyrighted property of MSU. This means that ALL course material in the D2L course site is protected and, other than one copy of the material for your own personal use, this material should not be distributed or posted in any form.

Academic integrity

You are expected to take this course in adherence to University and Department standards for Academic Integrity (The

Office of the Ombudsman at Michigan State University). Please visit this site for a more detailed explanation of academic dishonesty and, especially, plagiarism -- two serious offenses from the viewpoint of onGEO, the Geography Department, and the University.

Grading:

Calculating your final grade

Your ***final grade*** will be based on all of your ***graded assessments*** on a **Pass (70% or higher) or Fail (below 70%)** basis. Here is the breakdown:

Graded assessments
Getting to Know You. 5 points
Quiz 1. 20 points
Quiz 2. 20 points
Quiz 3. 20 points
Quiz 4. 20 points
Quiz 5. 20 points
Final Exam. 60 points
Total: 165 points

We highly recommend that all individual assessments achieve a level that demonstrates mastery of the material (at least 70% of the total points per assessment). Assessments may be re-submitted once to achieve a satisfactory score.

You can view your grades for the labs using your personal online gradebook (Assessments tab > Grades).

Extra credit

Given the number of assessments and abbreviated length of the session, no extra credit work will be considered.

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Summer 2025-2 Session: *Schedule*

Due dates for labs (by 11:59 PM (ET) on the due date provided):

- **F, July 11** **Exercise. F.A.A. Regulations: *Registering Your Small Unmanned Aircraft***
- **F, July 18** **Exercise. National Airspace: *Using SkyVector as a Resource for sUAS Flight Preparation***
- **F, July 25** none
- **F, August 1** **Exercise. Weather: *Interpreting METARs and TAFs***
- **F, August 8** **Exercise. Operations: *UAV Operation Scenarios***
- **F, August 15** **Exercise. *Data Collection and Processing***

Date	Lesson	Topic
June 30	-	Getting Started
June 30	-	Getting to Know You: unit contents are ***due by Tuesday, July 8***
June 30	-	Course Introduction
June 30	1	F.A.A. Regulations

Quiz 1: Covers material from Lesson 1

Friday, July 4 -- University is closed.

July 7	2	National Airspace

Quiz 2: Covers material from Lesson 2

July 14	--	--
July 21	3	Weather

Quiz 3: Covers material from Lesson 3

July 28	--	-- (finish up Weather, start Operations if you want)
Aug 4	4	Operations

Quiz 4: Covers material from Lesson 4

Aug 11	5	Data Collection and Processing

Quiz 5: Covers material from Lesson 5

Final Exam: Covers material from Lessons 1 to 4: ***due by Friday, August 15***