Introduction to Small Unmanned Aircraft Systems

South Dakota State University
Department of Geography GEOG 270 | Summer 2020 Online

Instructor: Ric Stephens 503.501.7397
Email: richard.stephens@sdstate.edu
Office Hours: By appointment

Catalog Course Description
This course provides an overview of small Unmanned Aircraft Systems (sUAS). Topics include the history of UAS, regulations, remote sensors, imagery equipment, industry and societal implications, career outlooks, ethical considerations, and the basic components required to operate an UAS. This course will prepare students for real-world safe operation of sUAS, and will provide basic understanding of the regulations in preparation for small Unmanned Aircraft Systems FAA 107 certification test. [CFR Part 107 are the Federal Aviation Administration regulations for the certification and operation of small Unmanned Aircraft Systems]

GEOG 270 can be completed as part of a course requirement for the ‘Certificate in small Unmanned Aircraft Systems,’ offered by the Department of Geography at South Dakota State University.

Course Pre-requisites and Co-requisite:
None

Instructional Methods
The online course will have weekly reading assignments, quizzes, an independent study project, and final test/exam. Study materials will be provided online in D2L and with the required textbooks. Students are encouraged to use the technical hardware supplied by the university for their project-based learning (PBL) independent study project.

Course Requirements
Textbooks (required)
© Small Unmanned Aircraft Systems Guide (“Guide”)
Brent Terwilliger PhD, David Ison PhD, John Robbins PhD, Dennis Vincenzi PhD
Aviation Supplies & Academics, Newcastle Washington, 2017
Exploring Designs, Operations, Regulations, & Economics.

© Remote Pilot Test Prep 2020: Study & Prepare (“Prep”)
Aviation Supplies & Academics, Newcastle Washington, 2019
asa2fly.com/testupdate
Pass your test and know what is essential to safely operate an unmanned aircraft—from the most trusted source in aviation training..

Course Websites
✈ Aviation Planning: Unmanned Aircraft Systems (UAS and aviation resources)
https://aviationplanning.design.blog/unmanned-aircraft-systems/

✈ Autonomous Aviation (optional Facebook Group for news)
https://www.facebook.com/groups/autonomousaviation/
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December 9, 2019

Course Objectives

- Students will learn history and technology of UAS aviation.
- Students will learn safety and ethical considerations for UAS operations.
- Students will learn Part 107 subject matter necessary to pass the Part 107 test and become a Certified Remote Pilot.

SDSU Resources

For all technical, institutional academic and student support services, please refer to the SDSU Resources on your Course Home in D2L.

Quizzes

10-question multiple-choice quizzes will be given on Monday each week for the first 8 weeks. They are due before midnight the following Sunday.

Independent Study Project

Each student will conduct an independent study project corresponding to their academic and professional interests related to autonomous aviation. Student projects must have instructor approval and be completed by midnight August 7th.

Part 107 Test or Final Exam

There are two options for the final evaluation: the FAA Part 107 test or a comprehensive class exam.

Part 107 Test

The Part 107 Test option is 60 multiple-choice questions at the SDSU Flight School.

Computer Assisted Testing Service (CATS)
South Dakota State University Aviation Resource Center
307 2nd Street SW, Brookings, SD.
Phone (605) 688-5769 / Site ID ABS57002.

There is a $150 fee for this test. If you are a Flight School student, you may complete the FAA ALC-451 exam as an alternative to the final exam. The PDF certificate must be submitted before midnight August 7th.

Final Exam

The Final Exam option is 60 multiple-choice questions from the reading assignments and course materials. The final exam is due before midnight August 7th.
## Introduction to Small Unmanned Aircraft Systems

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### Course Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Assignments</th>
</tr>
</thead>
</table>
| 1    | Jun 1 | History of UAS: Where did they come from and where are they headed?  
Autonomous Aviation Evolution | 📚 Guide Ch 1  
_quiz 1 |
| 2    | Jun 8 | Applications of sUAS: Understanding Uses  
Privacy, Private Property, and Nuisance | 📚 Guide Ch 2  
_quiz 2 |
| 3    | Jun 15 | Variety of Design: Exploring the Technological Possibilities  
Unmanned Aerial Vehicles & Equipment | 📚 Guide Ch 3  
_quiz 3 |
| 4    | Jun 22 | Legal, Environmental, and Operational Considerations: A Map to Navigate the Maze  
Regulations | 📚 Guide Ch 4  
_prep Ch 1  
_quiz 4 |
| 5    | Jun 29 | National Airspace System  
FAA Drone Zone | Low Altitude Authorization and Notification Capability (LAANC) | 📚 Prep Ch 2  
_quiz 5 |
| 6    | Jul 6  | Weather  
Mission Planning | 📚 Prep Ch 3  
_quiz 6 |
| 7    | Jul 13 | Loading and Performance  
UAS Mapping & 3D Modeling | 📚 Prep Ch 4  
_quiz 7 |
| 8    | Jul 20 | Operations  
Business of Unmanned Aviation: From Agencies to Startups | 📚 Prep Ch 5  
_guide Ch 5  
_quiz 8 |
| 9    | Jul 27 | Preparing for the Future: Accurate Information Makes All the Difference  
Autonomous Aviation Trends & Projections | 📚 Guide Ch 6 |
Test-taking Strategies | 📚 Part 107 Test or Final Exam  
Independent Study Project |

### Exams and Assignments

<table>
<thead>
<tr>
<th>Exams and Assignments</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes (8) 10-question multiple-choice</td>
<td>80</td>
</tr>
<tr>
<td>Independent Study Project</td>
<td>60</td>
</tr>
<tr>
<td>Part 107 Test or Final Exam</td>
<td>60</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>200</strong></td>
</tr>
</tbody>
</table>

_The standard percent grade will be used to determine the 4.0 scale_
Academic Success / Early Alert

As your instructor, my goals are to support your success in this course and provide a meaningful learning experience. For that reason, if there are academic performance concerns that may impede your success, I will communicate with you and those dedicated to supporting your success using ConnectState. Notifications will be sent to your Jacks Email account and can be reviewed in the ConnectState platform. If you receive a notification, please come see me or seek assistance from your advisor, the Student Success Center, or other campus resources.

Access to ConnectState is found on the MyState dashboard page and uses the same login credentials as My State.

Board of Regents Statements

ADA Statement: Any student who feels s/he may need an accommodation based on the impact of a disability should contact Nancy Hartenhoff-Crooks (or successor) Coordinator of Disability Services (605-688-4504 or Fax, 605-688-4987) to privately discuss your specific needs. The Office of Disability Services is located in room 065, the University Student Union.

Freedom in Learning Statement: Students are responsible for learning the content of any course of study in which they are enrolled. Under Board of Regents and University policy, student academic performance shall be evaluated solely on an academic basis and students should be free to take reasoned exception to the data or views offered in any courses of study. Students who believe that an academic evaluation is unrelated to academic standards but is related instead to judgment of their personal opinion or conduct should first contact the instructor of the course. If the student remains unsatisfied, the student may contact the Department Head, Dean, or both, of the college which offers the class to initiate a review of the evaluation.

Student Academic Integrity and Appeals: The University has a clear expectation for academic integrity and does not tolerate academic dishonesty. University Policy 2.4 sets forth the definitions of academic dishonesty, which includes but is not limited to, cheating, plagiarism, fabrication, facilitating academic dishonesty, misrepresentation, and other forms of dishonesty relating to academics. The Policy and its Procedures also set forth how charges of academic dishonesty are handled at the University. Academic Dishonesty is strictly proscribed and if found may result in student discipline up to and including dismissal from the University.

Veterans and Active Duty Military Personnel: Veterans and Active Duty Military Personnel with special circumstances (e.g., upcoming deployments, drill requirements, disabilities, and other qualifying needs) are welcome and encouraged to communicate these, in advance if possible, to the instructor in order to address attendance requirements or other actions in accordance with SDBOR and University policies and procedures.

Diversity and Inclusion: In this class, people of all ethnicities, gender identities, religions, ages, sexual orientations, disabilities, socioeconomic backgrounds, regions, and nationalities are strongly encouraged to share their perspectives and experiences. Over the course of the semester, please honor the uniqueness of your fellow classmates and refrain from personal attacks or demeaning comments of any kind. If you feel your differences may in some way isolate you from South Dakota State University’s community or if you have any specific accommodations, please speak with me about your concerns and what we can do together to help you become an active and engaged member of our class and community.