Course Information

Catalog Description: This course covers the techniques and best practices required to safely and successfully utilize and operate drones for commercial purposes. Every aspect of flight operations is covered, from equipment, preflight planning and legal compliance to operational procedures, flight training, and data collection. Students work through the entire mission cycle, starting with legal compliance, planning, and then pre and post flight operations. Students will gain hands-on experience using the drone flight simulators in the Edward and Ellen Smith Drone Lab. In-class simulation training is to prepare them for an outdoor real flight experience at the Smith Drone Port. Students will purchase a $180 flight simulator.

Prerequisite(s): None

Corequisite(s): UAS 101 – Unmanned Systems

Credits: 3

Hours: 3

Required Text(s):

- Halliday, B. (2017). *Drones: Mastering flight techniques*. Brian Halliday. ISBN: 13: 978-1978441514
- Langer, M. (2018). *FAR Part 107 explained: A definitive guide for serious drone pilots*. Flying M Productions. ISBN: 13: 978-1973363477
- Justice, T. (2017). *Ultimate UAS / drone pilot logbook: Safety Checklist, flight logbook, repair logbook, & maintenance logbook*. Buzzitsafe Drone. ISBN: 13: 978-1535059466

Supplemental Materials:

- Pilots Handbook of Aeronautical Knowledge, US Dept. of Trans., FAA
- 14 CFR part 47 Aircraft Registration
- 14 CFR part 48 Registration and Marking Requirements for Small Unmanned Aircraft Systems

Instructor Information

Instructor's Name:

Contact Information:

Office Hours:

Program Goals

1. Equip students with comprehensive knowledge of unmanned systems, including their standards, regulations, and operational frameworks, preparing them for FAA Part 107 certification and other regulatory requirements.
2. Develop proficiency in using geographic information systems (GIS) and remote sensing technologies, enabling students to analyze and interpret spatial data for applications in environmental monitoring, urban planning, and emergency response.
3. Foster a strong understanding of safety protocols, risk management strategies, and security measures in unmanned aviation to ensure compliance with industry standards and promote operational excellence.
4. Provide hands-on training in maintaining, repairing, and optimizing unmanned aircraft systems (UAS) to extend operational life and enhance performance in various industry settings.
5. Introduce students to advanced robotics, programming, and cutting-edge technologies, including infrared thermography and digital photography, to expand their expertise in innovative applications of unmanned systems.
6. Equip students with the skills and knowledge to contribute to the development and operation of innovative unmanned aerial transportation systems, addressing future urban and regional mobility challenges.

Class Core Competencies

The following core competencies are embedded in this curriculum:

- Communicate effectively in both speech and writing
- Use social sciences theories and concepts to analyze human behavior and social and political institutions and to act as responsible citizens
- Understand ethical issues and situations
- Address and information need by locating, evaluating, and effectively using information.

Class Learning Assessment

Student Learning Outcomes	Suggested Means of Assessment
Develop a mastery of UAS flight with and without GPS positioning.	Flight simulator activity
Develop a comprehensive understanding of Federal Airspace & basic aeronautical knowledge.	Tests, homework
Develop an understanding of current FAA Regulations, FAA updates, and FAA regulatory authority.	Tests, homework
Develop an understanding of the UAS remote control systems, its usage, limitations, and components.	Practical assessment through simulation
Understand how to manually fly drones with and without GPS positioning.	Practical assessment through simulation
Understand all elements of the FAA Part 107 Remote Pilot's Test.	In-class testing covering elements of the Remote Pilot Knowledge Test

Grading System

Letter Grade	Percentage Range
A	90 to 100 percent
B Plus (B+)	87 to 89.9 percent
B	80 to 86.9 percent
C Plus (C+)	77 to 79.9 percent
C	70 to 76.9 percent
D	60 to 69.9 percent
F	Below 60 percent

College Information

Disability Services
Disability Services Webpage

Statement and Policy on Cheating, Plagiarism, and Academic Conduct

Academic Conduct Policy (Policy 304) [PDF]

Students are required to perform all the work specified by the instructor and are responsible for the content and integrity of all academic work submitted. A violation of academic integrity will occur if a student: (1) knowingly represents work of others as one's own, (2) uses or obtains unauthorized assistance in any academic work, (3) gives fraudulent assistance to another student, or (4) furnishes false information or other misuse of college documents.

Unauthorized use of Artificial Intelligence (AI) is prohibited unless the instructor explicitly permits it in the syllabus or assignments. If tools such as ChatGPT are permitted by an instructor to be used for an assignment, they should be used with caution and with proper citation. In all such cases, you may only use the specific tools identified as acceptable and you must adhere to the College's standards for attribution, validation, and transparency.

In cases of suspected violation of academic integrity, the incident is to be reported to the Office of Academics. A student found guilty of violating the rule of academic integrity by the Vice President of Academics will be considered to have failed in personal obligation to the College; such failure will be subject to disciplinary action by the College. Unless otherwise notified, the instructor will allow students who are pending disciplinary action to attend class.

Tutoring and Testing at the Instructional Support Center (ISC)

- Instructional Support Center (ISC) Webpage

WCCC Library Services

- WCCC Library Website

Citation Styles and Formatting

Work submitted for any Warren County Community College course must conform to the required formatting and citation style that are specified by the instructor. The Library and Instructional Support Center can assist students with formatting and citations for assignments and papers.

WCCC Attendance Expectations

The College expects students to attend and participate in all classes. This involves sharing discussions and lectures in class, as well as interacting with other students.

Grades are based on the quality of work students complete in meeting the requirements for a particular course, as stated in the course syllabus and catalog description. Attendance, among other factors, may be an additional criterion for assigning grades. Students should realize that they are responsible for all class meetings and that work missed because of absences may affect their grades. Attendance in online classes is determined by the completion of assignments/ tests. Students who have not completed any assignments or tests will be considered non-attending and receive an NF grade in online classes.

Class Attendance Expectations

Topical Outline

1. Introduction to FAA
2. Introduction to drone simulator
3. Federal Airspace Overview
4. Review of Part 107
5. Human factors
6. Basic meteorology overview
7. Battery safety
8. Personal protective equipment
9. Introduction to risk analysis and management
10. Multi-rotor aero & quadcopter overview navigation operational planning
11. Using Kittyhawk operational weather
12. Pre and post flight operations
13. DJI Phantom practical overview
14. DJI Phantom application overview & in-depth review
15. Airspace safety
16. Basic photogrammetry
17. Introduction to mission planning
18. Practical overview
19. First Flight (at Smith Droneport) – On DJI Phantom in GPS Mode on tethered drones
20. Inspection operations practical (at Smith Droneport)
21. Aerial maneuvers practical (at Smith Droneport) – In DJI Atti Mode on tethered drones
22. Post flight operations

Grading Methods

Assignment	Points/Percentage

Class Itinerary

Week / Unit	Topic	Readings/Assignments