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):

COREQUISITE(S):   UAS 101 Unmanned Systems

CREDITS: 3   **HOURS**:   2 lecture 2 lab

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 (Required):

FAA-H-8083-25B - Pilot`s Handbook of Aeronautical Knowledge. Online free copy: https://www.faa.gov/regulations_policies/handbooks_manuals/aviation/phak/media/pilot_handbook.pdf

14 CFR part 47 Aircraft Registration. Online free copy: https://www.ecfr.gov/cgi-bin/text-idx?SID=6f18d5bd2d660997d246ba4fa2e3f944&mc=true&node=pt14.1.47&rgn=div5

14 CFR part 48 Registration and Marking Requirements for Small Unmanned Aircraft Systems. Online free copy:

https://www.ecfr.gov/cgi-bin/text-idx?SID=cdb5c00fec92548a02af3cb883d2059d&mc=true&node=pt14.1.48&rgn=div5

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INSTRUCTOR INFORMATION:

OFFICE HOURS:

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CORE COMPETENCIES: The following core competencies are embedded in this curriculum: Communicate effectively in both speech and writing; Apply appropriate mathematical and statistical concepts and operations to interpret data to solve problems; Use scientific method of inquiry, through the acquisition of scientific knowledge; Use computer systems or other appropriate forms of technology to achieve educational and personal goals; Understand ethical issues and situations; Address all informational needs by locating, evaluating and effectively using information.

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:	C+ = 77 < 80

A	=	90 < 100	C	=	70 < 77
B+	=	87 < 90	D	=	60 < 70
B	=	80 < 87	F	=	Below 60

DISABILITY SERVICES STATEMENT: Warren County Community College is committed to providing all students equal access to learning opportunities. Student Services is the campus office that works with students who have disabilities to provide and/or arrange reasonable accommodations. Students who have, or think they may have, a disability (e.g. mental health, learning, vision, hearing, physical or systemic), are invited to contact Student Services to arrange a confidential discussion at (908) 835-2300 or by email at StudentServices@warren.edu as soon as possible. Students registered for Disability Services with Student Services, who have requested accommodations for the current semester will be provided with an electronic letter detailing individual accommodations and are encouraged to contact the instructor early in the semester to discuss accommodations outlined in their letter.

INSTRUCTIONAL SUPPORT CENTER: The Instructional Support Center (ISC), located in Room 105 across from the library, provides academic support at no cost to WCCC students and is available for courses in which they are currently enrolled. The ISC is staffed with trained professional and peer tutors who are ready to help you understand and succeed. For scheduling or further information, visit the ISC in person, online at http://www.warren.edu/tutoring/ or by telephone at (908)835-2354.

STATEMENT AND POLICY ON CHEATING, PLAGIARISM AND ACADEMIC DISHONESTY: 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.

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.

REQUIRED FORMAT FOR RESEARCH PAPERS: Research papers written for any Warren County Community College class must conform to the required documentation style. Papers written for humanities (and some social science) classes will follow the most recent edition of the Modern Language Association (MLA) in-text citation and bibliographic methods. Social science and science papers will require the use of the most recent edition of the American Psychological Association (APA) in-text citation and bibliographic methods.

Please consult with your instructor regarding the correct documentation style to use in his/her class.

ATTENDANCE POLICY: Students are expected to attend all class sessions of courses in which they are enrolled and are responsible for all material presented in class and all homework assignments.

Grades are based on the quality of work completed in meeting the requirements for a particular course, as stated in the course syllabus and catalog description.

Excessive absence may be considered sufficient cause for dismissal from class by an instructor or other appropriate college staff member. Any decision to exclude a student from class or the College due to excessive absence shall be subject to review by the President in accordance with established procedures. Students who have not attended class are not entitled to a refund of tuition.

WCCC HAYTAIAN & MAIER LIBRARY

Text: 908-652-4445   Email: lstoll@warren.edu

http://warren.libguides.com

Please see the library's website above for current semester hours.

The WCCC Library offers a wide range of services to students specific to the information literacy goals of the College which includes suggesting research strategies, facilitating the use of both digital and print resources, as well as assisting students with citations to avoid plagiarism.

The library also serves as the College's computer space, with computers for students to use when the library is open. Students also have free, unlimited printing from the College's computers, as well as space to study.

The library is where students can get their college student ID cards. All students are required to get a student ID card and carry it while on campus for security purposes. To get a student ID card, you must bring another form of ID to the library. You may also be asked to bring a printed copy of your current class schedule. You can get a student ID card any time that the library is open. These cards do not expire and can be used for your duration at WCCC.

Additionally, the library participates in a national inter-library loan program which is available free to all students and faculty. You can submit ILL requests by emailing the librarian or by stopping by the library's circulation desk.

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:

ITINERARY: