UAS 120: DRONE REGULATIONS, ETHICS AND CREW RESOURCE MANAGEMENT

Citrus College Course Outline of Record

Heading	Value
Effective Term:	Fall 2025
Credits:	3
Total Contact Hours:	54
Lecture Hours :	54
Lab Hours:	0
Hours Arranged:	0
Outside of Class Hours:	108
Total Student Learning Hours:	162
Transferable to CSU:	No
Transferable to UC:	No
Grading Method:	Standard Letter

Catalog Course Description

This comprehensive course is designed to provide students with a thorough understanding of the regulatory framework, ethical considerations, and crew resource management principles relevant to the operation of drones (Unmanned Aerial Vehicles, UAVs). As drones become increasingly integrated into various industries and recreational activities, it is imperative for operators to possess a solid grasp of the legal requirements, ethical dilemmas, and effective teamwork strategies associated with their use. 54 lecture hours.

Course Objectives

- Develop an understanding of the ethics and regulations related to the aerial, land, and submersible drone/ROV industry. Compare and contrast the legal responsibilities of drone operators with the benefits to society.
- Demonstrate knowledge of local and federal drone laws and FAA regulations, weather and meteorology terminology, National Airspace Systems rules and regulations, drone flight operations, aircraft systems, flight planning and knowledge of image acquisition by Unmanned Aircraft Systems.
- Develop an understanding of the role of an RPIC and the reponibilities of crew resource management. Discussions on Visual observer and crew training. Professional mission planning, operations and understanding of legal issues surrounding drone operations. Discussions on autonomous operations, public safety and environmental applications, BVLOS regulations, drone delivery methods and mission planning. Various autonomous drone systems would be utilized to gain hands-on skills in autonomous mission planning and flight.
- Interpret possible hazards and development of checklists/logbooks for flight preparation, drone/battery maintenance,payload capabilities, use of visual observers and field data collection method best practices.

Major Course Content

Week 1: Introduction to Drones

- Overview of drone technology and its applications
- Historical development and evolution of drones
- Introduction to different types of drones and their capabilities

Week 2: Regulatory Framework

- Overview of FAA regulations governing drone operations
- Understanding airspace classifications and restrictions
- Licensing and certification requirements for drone pilots
- International regulations and considerations

Week 3: Local Regulations and Compliance

- Exploration of local ordinances and regulations affecting drone operations
- Understanding the process for obtaining permits and authorizations
- Case studies of legal issues and compliance challenges

Week 4: Ethical Considerations in Drone Operations

- Introduction to ethics and its importance in drone usage
- Privacy considerations and legal implications
- Data security and protection of sensitive information
- Environmental impact and sustainability

Week 5: Ethical Decision-Making

- Frameworks for ethical decision-making in drone operations
- Case studies and scenarios exploring ethical dilemmas
- Role-playing exercises to practice ethical decision-making skills

Week 6: Crew Resource Management (CRM) Principles

- Introduction to CRM and its significance in drone operations
- Effective communication strategies within a drone operation team
- Situational awareness and risk management techniques
- Decision-making processes and error management

Week 7: Teamwork and Collaboration

- Importance of teamwork and collaboration in drone operations
- Strategies for fostering a positive team culture
- Role allocation and task distribution within a drone operation team
- Practical exercises and simulations to enhance teamwork skills

Week 8: Integration and Application

- Integration of regulatory knowledge, ethical considerations, and CRM principles in practical scenarios
- Guest speakers from industry sharing real-world experiences and insights
- Final project: development of a comprehensive drone operation plan incorporating regulatory compliance, ethical considerations, and CRM strategies

Week 9: Review and Assessment

- Review of key concepts covered throughout the course
- Assessment of student learning through quizzes, assignments, and discussions
- Reflection on personal growth and learning outcomes

Week 10: Future Trends and Opportunities

- Exploration of emerging trends and developments in drone technology and regulation
- Discussion of career opportunities and paths in the drone industry
- Reflection on the ethical responsibilities of drone operators in shaping the future of UAVs

Suggested Reading Other Than Required Textbook

Remote Pilot # Small Unmanned Aircraft Systems Airman Certification Standards https://www.faa.gov/training_testing/testing/acs/media/uas_acs.pdf
Remote Pilot – Small Unmanned Aircraft Systems Study Guide https://www.faa.gov/regulations_policies/handbooks_manuals/aviation/media/remote_pilot_study_guide.pdf
Pilot's Handbook of Aeronautical Knowledge https://www.faa.gov/regulations_policies/handbooks_manuals/aviation/phak/
Summary of small unmanned aircraft rule (PART 107) https://www.faa.gov/uas/resources/policy_library/media/Part_107_Summary.pdf
Mapping Society and Technology Manson, S. M. (ed.) (2017). Mapping, Society, and Technology. Minneapolis, Minnesota: University of Minnesota Libraries Publishing. URL: http://z.umn.edu/mst
Policy Document Library https://www.faa.gov/uas/resources/policy_library/#107
Unmanned Aircraft Systems in the Cyber Domain Nichols, Randall K.; Mumm, Hans C.; Lonstein, Wayne D.; Ryan, Julie J.C.H.; Carter, Candice; and Hood, John-Paul, "Unmanned Aircraft Systems in the Cyber Domain" (2019). NPP eBooks. 27. https://newprairiepress.org/ebooks/27

Examples of Required Writing Assignments

Drones as Weapons Writing Assignment In this assignment, students consider the use of drones in war and must perform research to support an argument related to drone use as weapons.Students will complete an essay researching the use of Drone (UAVs) in warfare. Students must write 3-5 pages, 12 font, double-spaced with 5 minimum outside sources with work cited page. Students must answer the questions using the textbook and outside sources and follow the guidelines. First, students state their argument and use examples and evidence from the textbook and 2outside sources to defend their argument.Researching the use of Drones (UAVs) in warfareParagraph 1: How are drones used in warfare? Research three countries using them and describe their effectiveness from at least 2outside sources Paragraph 2: Why do many resist the use of drones in warfare? What issues or examples can be given against their use Paragraph 3: Discuss how drones are changing methods of warfare, use at least 1 outside source to discuss these changes and discuss technological improvements in drones Paragraph 4: Predict the future of drone use in warfare, argue for their proliferation or dimes and discuss examples to support your argument Essay will include a rubric that evaluates the essay on1st- Does the essay meet the requirements of length, citations etc and is clear, concise and addresses the essay prompt accuracy?2nd- Was each paragraph complete and answered the question required in detail using sources?3rd- Did the student fully research and explain the answer for each paragraph and did each paragraph include accurate examples and appropriate terminology related to the topic? 4th- Did the student discuss modern examples of drones used in warfare operations and argue for or against their use as weapons?

Examples of Outside Assignments

Commercial Drone Application Research Assignment Students will be required to choose a commercial field of the drone industry to research and write a 3-5 page, double space, 12 font,MLA or APA formatted report that includes a 1 page bibliography with at least 10 sources one of which must be a phone/email interview with professionals in the field of study currently working with drones. Students will begin by choosing 3 companies in their chosen field and write a brief summary of what the companies use the drone to do and their operations in the company. Next, perform an interview with someone working at one of the chosen companies to determine what the function of drones serve the company and what education in drones was necessary for hire. Next, students will write a report on what jobs are currently available basedon job searches for at least five employment sites and research the average salary of those in the chosen field and discuss what thepotential salary may be after further education in the field.Included in the report:- A brief history of the commercial field or use of drones chosen- List of current companies or organizations that are hiring in the field- Description or map showing where the most openings in the field are located geographically both nationally and internationally- Discussion of typical duties and responsibilities for a chosen career in the field- Phone/E-mail interview with person in the field: Example questions may include what is a typical day in your job? what education ortraining helped you get your job or helps you perform your duties? How did you first get interested in drones/UAVs?Reports will be graded based on students meeting the required format for length, use of sources, use of detail and clear descriptions of the career path, job search results, interview questions/answers and description of typical job duties

Instruction Type(s)

Lecture, Online Education Lecture