

Department:

Precision Agriculture

Course Description:

This course introduces Unmanned Aerial Systems (UAS) platforms, their history, and commercial applications, with special emphasis in Precision Agriculture, Federal Aviation Administration (FAA) regulatory framework, data collection, privacy issues, and navigation concepts. Although instruction will cover content that is needed to pass the certification test for flying drones, no certification will be awarded as part of this class in the actual flight of unmanned aerial vehicles. Further training and instruction will be required for students wishing to acquire and/or pilot aerial vehicles, and students will be responsible for pursuing that certification through testing.

Course Competencies:

Upon completion of the course, the student should be able to:

1. Demonstrate the effective knowledge of the application of various aerial data gathering devices.
2. Cite the laws, regulations, and certification required for piloting unmanned and manned aerial vehicles.
3. Identify opportunities for agriculture to expand the use of aerial vehicles.

Course Content:

- A. Explain the history of Unmanned Aerial Systems (UAS) and define the key concepts
 1. Outline the major factors that have influenced the history of UAS
 2. Describe the basic safety procedures for UAS
 3. Explain the difference between UAS and Unmanned Aerial Vehicle (UAV)
 4. Explain the role of the FAA in regards to establishing Air Space
- B. Identify the System Composition of the UAS
 1. Identify the three components of UAS
 2. Explain the role of the control station
 3. Identify the different platform types and discuss advantages and disadvantages of each
 4. Explain communications between UAVs and other systems
- C. Identify the various sensors, their capabilities and limitations as a function of platform application
 1. Differentiate the categories of systems based upon air vehicle types
 2. Describe onboard data storage, transmission and retrieval
 3. Identify the advantages and disadvantages between powered and unpowered vehicles
 4. List the various sensors with their advantages and disadvantages
- D. Understand the issues related to data collection and privacy
 1. Identify the policy, guidance and regulatory challenges of privacy
 2. Identify the operational and technological challenges of data collection

3. Relate the ethical considerations for UAS use
4. Explain the national security issues
- E. Identify applications of UAS in various industries
- F. Explain sense and avoid challenges in terms of flight safety
 1. Identify the challenges
 2. Describe the relevant technologies
 3. List the flight right of way rules
 4. Summarize the Traffic Alert and Collision Avoidance System (TCAS)

Learning Assessments:

Competencies may be evaluated by multiple measures, including discussion questions, graded assignments, comprehensive assignments, a research paper, projects, presentations, portfolios, quizzes, and exams.

Instructional Materials:

Textbook: ASA Test Prep Board. (2019). *UAS Remote Pilot TEST PREP*. New Castle, WA: Aviation Supplies and Academics, Inc. ISBN-13: 978-1619546660

Other printed materials and videos will be provided in this course.

Guidelines for Requesting Accommodations Based on Documented Disability or Medical Condition

It is the intention of Highland Community College to work toward full compliance with the Americans with Disabilities Act, to make instructional programs accessible to all people, and to provide reasonable accommodations according to the law.

Students should understand that it is their responsibility to self-identify their need(s) for accommodation and that they must provide current, comprehensive diagnosis of a specific disability or medical condition from a qualified professional in order to receive services. Documentation must include specific recommendations for accommodation(s). Documentation should be provided in a timely manner prior to or early in the semester so that the requested accommodation can be considered and, if warranted, arranged.

In order to begin the process all students **must** complete the "Disabilities Self-Identification Form" on our [Disability Services website](#).

This form can also be accessed at the Highland Community College homepage under Students Services/Student Resources/Disability Service or by contacting the Disabilities Coordinator.

A Note on Harassment, Discrimination and Sexual Misconduct

Highland Community College seeks to assure all community members learn and work in a welcoming and inclusive environment. Title VII, Title IX, and College policy prohibit harassment, discrimination and sexual misconduct. Highland Community College encourages anyone experiencing harassment, discrimination or sexual misconduct to talk to report to the Vice President for Student Services, the Human Resources Director or complete an [online report](#) about what happened so that they can get the support they need and Highland Community College can respond appropriately.

There are both confidential and non-confidential resources and reporting options available to you. Highland Community College is legally obligated to respond to reports of sexual misconduct, and therefore we cannot guarantee the confidentiality of a report, unless made to a confidential resource. Responses may vary from support services to formal investigations. As a faculty member, I am required to report incidents of sexual misconduct and thus cannot guarantee confidentiality. I must provide our Title IX coordinator with relevant details such as the names of those involved in the incident. For more information about policies and resources or reporting options, please review our [Equity Grievance Policy](#).