

University of Arkansas - Fort Smith
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General Syllabus

UAS 2243 Fixed-Wing Flight Lab

Credit Hours: 3

Lecture Hours: 2

Laboratory Hours: 2

Prerequisites: UAS 2113 UAS Maintenance and UAS 2124 Multi-Rotor Flight Lab

Effective Catalog: 2018-2019

I. Course Information

A. Catalog Description

Students will learn to fly fixed-wing UAS starting with a visual simulator and concluding with a student-built aircraft. Students will build a FPV grade fixed-wing aircraft. Specific training on applications of fixed UAS for agricultural operations will be explored.

B. Additional Information

This course provides an in-depth, hands-on approach to fixed-wing UAS operations. Students will assemble a small fixed-wing UAS suitable for carrying an FPV system and a nadir positioning camera. Proper setup; rigging; weight and balance techniques; and autopilot integration will be emphasized.

II. Student Learning Outcomes

A. Subject Matter

Upon successful completion of this course, the student will be able to:

1. Demonstrate specifying, assembling, and testing a fixed-wing UAS.
2. Demonstrate ability to integrate and configure autopilot/flight control system with data links.
3. Safely operate a fixed-wing UAS using visual line of sight operations and first person viewing operations.
4. Safely operate fixed-wing UAS in prototypical workplace applications and scenarios

B. University Learning Outcomes

This course enhances student abilities in the following areas:

Analytical Skills

Critical Thinking: Students will use analytical/critical thinking skills to draw conclusions and/or solve problems. They will access and evaluate appropriate information through written and electronic means and think critically to reach viable solutions to a problem and to justify those solutions to build and maintain a FPV grade fixed-wing aircraft.

Quantitative Reasoning: Students will apply appropriate mathematical models to solve problems, represent mathematical information symbolically, visually, numerically and verbally and interpret data needed to build and maintain a FPV grade fixed-wing aircraft.

Communication Skills (Written and Oral)

Students will compose coherent documents appropriate for intended audience to document fixed-wing UAS operations.

III. Major Course Topics

- A. System Safety
 - B. Fixed-wing Flight Mechanics
 - C. Fixed-wing aircraft fabrication and performance
 - D. Autopilot Integration
 - E. Payload Integration
 - F. Flight Safety and Operation
 - G. Principles of Flight Testing
 - H. Visual Line of Sight (VLOS) Flight Operations
 - I. First Person Viewing (FPV) Flight Operations
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