

Kansas State Polytechnic: College of Technology and Aviation

## Unmanned Aircraft Systems Minor

(15 credit hours)

Students must achieve a minimum GPA of 2.5 and a grade of "C" or better is required in all coursework.

### Required Courses (9 hours)

3	UAS 270	Introduction to Unmanned Aircraft Systems
3	COT 674	Processing Techniques for Low Altitude Remotely Sensed Data
3	COT 675	Acquisition and Advanced Processing of LARS Data

### Elective Courses (6 hours)

3	UAS 370	Small Unmanned Aircraft Systems Design and Construction
3	UAS 373	Small Unmanned Aircraft Design and Construction for Non-Aviators
1	UAS 461	Autonomous Flight Simulation Lab
3	UAS 463	Introduction for Autopilots and Mission Planning for Non-Aviators
2	UAS 465	Autopilot Integration

### UAS 270 - Introduction to Unmanned Aircraft Systems

Credits: (3) | Typically Offered: Spring

Introduction to the history of Unmanned Aircraft Systems and survey of current UAS platforms, terminology, challenges to airspace integration and operational theory.

### COT 674 - Processing Techniques for Low-Altitude Remotely Sensed Data

Credits: (3) | Typically Offered: Fall

Students learn techniques for exploring remotely sensed data using geographic information systems and image processing software. Topics include manipulation of vector and raster data, management of spatial databases, image stitching, georeferencing, orthorectification, the use and interpretation of metadata and "best practices" in data management techniques.

### COT 675 - Acquisition and Advanced Processing of LARS Data

Credits: (3) | Typically Offered: Spring | Prerequisite: COT 674.

Topics begun in COT 674 are further developed. Advanced topics include: multi-spectral data acquisition and processing, exploitation of full-motion video, interpretation of geospatial and remotely sensed data, geostatistical methods of data analysis, photogrammetric measurements, and an introduction to big data concepts.

### **UAS 370 - Small Unmanned Aircraft Systems Design and Construction**

Credits: (3) | Typically Offered: Fall

Topics include: Unmanned Aircraft System platform, payload and component design and interfacing, system and vehicle maintenance, and systems integration.

Note: Studio format incorporating lecture and lab elements.

Corequisite: UAS 270.

### **UAS 373 - Small Unmanned Aircraft Design and Construction for Non-Aviators**

Credits: (3) | Typically Offered: Fall

Topics include: Unmanned Aircraft System platform, payload and component design and interfacing, system and vehicle maintenance, and systems integration. Intended for non-pilot majors and those without the FAA certifications and ratings required for UAS 370.

### **UAS 461 - Autonomous Flight Simulation Lab**

Credits: (1) | Typically Offered: Spring

This course provides the student with simulation on high-end, sophisticated, proprietary autopilot systems in preparation for field operations flying aircraft equipped with similar autopilot/avionics packages.

Note: Two hours of lab per week.

Prerequisite: UAS 370.

Corequisite: UAS 465.

### **UAS 463 - Introduction for Autopilots and Mission Planning for Non-Aviators**

Credits: (3) | Typically Offered: Spring

Focus is on mission planning and operations within the context of the simulated environment. Students are introduced to commercial, open source and/or proprietary autopilots and are required to complete simulated training missions with the ultimate goal of demonstrating skills competency and knowledge acquisition through evaluations of proficiency (e.g., through “check-outs” or “check-rides”). Students will integrate autopilots into selected fixed-wing platforms. Intended for non-UAS majors and those without the FAA certifications and ratings required for UAS 370, UAS 461 and UAS 465.

Note: Studio format incorporating lecture and lab elements.

Prerequisite: UAS 373.

### **UAS 465 - Autopilot Integration**

Credits: (2) | Typically Offered: Spring

Using open source ground station software and commercial-off-the-shelf (COTS), open source autopilot firmware and hardware, students learn techniques for integrating autopilots into their selected fixed-wing platform and for exploring precision autonomous flight in preparation for conducting field operations to acquire remotely sensed data.

Prerequisite: UAS 370.

Corequisite: UAS 461.