

## Kansas State Polytechnic: College of Technology and Aviation

# Unmanned Aircraft Systems

### Overview

This option of study prepares students for careers in the field of unmanned aircraft systems (UAS), also known as remotely piloted aircraft (RPA), or drones. The operation of UAS for a wide variety of research and commercial applications is a rapidly growing area of aviation and students will be prepared to safely deploy unmanned vehicles in response to emerging challenges and opportunities.

K-State's UAS curriculum is unique, emphasizing foundational courses in areas of manned and unmanned flight, aircraft systems and maintenance. Coursework is designed to enable payload to platform integration and to equip students with the skills necessary to think critically in a rapidly developing technical field. "Hands-on" flying is emphasized throughout the curriculum.

### Points of pride

Kansas State University is one of the first two universities in America to offer a Bachelor of Science option in unmanned aircraft systems. The program uses a hands-on learning approach.

K-State was the first entity of any kind to receive FAA approval to conduct UAS flight training in the National Airspace System.

The KSU UAS program operates a large, diverse fleet, consisting of more than thirty multi-rotor, single-rotor and fixed-wing unmanned aircraft.

Kansas State University's participation in the FAA's UAS Center of Excellence facilitates important research aimed at the safe integration of UAS into the National Airspace System.

A large, enclosed area (300'x200'x50' – the size of two football fields at a height of 50 feet) enables research and training flights on campus, proximate to the airport, throughout the year.

Many opportunities are provided for students to participate in interdisciplinary, undergraduate-level research and/or commercial flight operations.

### Academics

Modeled on the structure of the FAA Part 141 manned flight training regulation, the K-State UAS program, emphasizing the skills necessary to fly unmanned aircraft as well as conduct field operations and maintenance, is unique among university programs. Kansas State was the first entity in the United States to receive FAA approval to conduct academic and commercial flight training. A second and distinct approval granted by the FAA, authorizes the K-State UAS program to conduct commercial research operations, something in which a limited number of students are offered opportunities to participate. Additionally, Kansas State Polytechnic's proximity to Crisis City, operated by the Kansas Division of Emergency Management, and other accessible restricted airspace provides an ideal setting for learning to fly unmanned aircraft. A three million cubic foot netted enclosure located on the campus enables research flights and flight training in Class D Airspace, in a natural environment, through all four seasons.

As a member and Core Institution of the FAA's UAS Center of Excellence, the mission of the Kansas State Polytechnic UAS program is to enable and promote the safe incorporation of UAS into the National Airspace System. We use our experience operating and maintaining unmanned aircraft to enhance operator training and to establish the operational guidelines, policies and procedures to be used in facilitating the adoption and commercialization of this rapidly evolving technology. We also work closely with private contractors, government and government-affiliated agencies to ensure the safe integration of UAS into local, national and international airspace.

### Suggested coursework

#### Unmanned Aircraft Systems, bachelor's degree option

(127 credit hours)

##### Freshman

Fall semester (17 credit hours)

3	AVT 100	Introduction to Aviation
3	ENGL 100	Expository Writing I
3	MATH 100	College Algebra
3	PHILO 105	Introduction to Critical Thinking
4	PPIL 111	Private Pilot
1	PPIL 113	Private Pilot Flight Lab

Spring semester (14 credit hours)

3	ECON 110	Principles of Macroeconomics
3	MATH 205	General Calculus and Linear Algebra
3	PPIL 112	Professional Instrument Pilot
1	PPIL 114	Professional Instrument Pilot Flight Lab
1	UAS 115	Professional UAS Multi-rotor Flight Lab
3	UAS 270	Introduction to Unmanned Aircraft Systems

##### Sophomore

Fall semester (17 credit hours)

4	ECET 100	Basic Electronics
3	MATH 150	Plane Trigonometry
6	UAS 312	UAS Flight Instructor Ground School
1	UAS 314	Multi-rotor Instructor Flight Lab
3	UAS 370	Small Unmanned Aircraft Systems Design and Construction

Spring semester (18 credit hours)

3	AVT 340	Human Factors in Aviation
3	ENGL 200	Expository Writing II
3	PSYCH 110	General Psychology
4	PHYS 113	General Physics I
3	UAS 275	Small Unmanned Aircraft Maintenance I
2	UAS 357	Unmanned Aircraft Fixed-wing Flight Lab

##### Junior

Fall semester (17 credit hours)

3	BUS 110	Introduction to Business
3	COMM 106	Public Speaking I
3	UAS 285	Small Unmanned Aircraft Maintenance II
3	UAS 353	Command and Control Links and Circuitry
2	UAS 367	Advanced Unmanned Aircraft Fixed-Wing Flight Lab
3	UAS 387	Crew Resource Management for Unmanned Aircraft Systems

Spring semester (14 credit hours)

3	BUS 315	Supervisory Management
3	ENGL 302	Technical Writing
3	STAT 325	Introduction to Statistics
2	UAS 417	Fixed-wing Instructor Flight Lab
1	UAS 461	Autonomous Flight Simulation Lab
2	UAS 465	Autopilot Integration

## Senior

### Fall semester (15 credit hours)

- 3 AVT 450 Aviation Safety Management
- 3 UAS 300 Unmanned Aircraft Systems  
Powerplant Fundamentals
- 3 UAS 467 Small Unmanned Aircraft Systems  
Payloads
- 3 UAS 470 Flight and Field Operations
- 3 Aviation Elective\*

### Spring semester (15 credit hours)

- 3 AVT 445 Aviation Law
- 3 Aviation/Electronics/Computer Elective\*
- 3 Humanities/Social Science/Business Elective
- 3 Natural Science Elective

### Culminating Experience (3 hours)

Choose from the following):

- 3 AVT 497 Senior Project
  - 3 COT 495 Industrial Internship
  - 1 ETB 480 UAS Senior Design Project I
- and
- 2 ETB 481 UAS Senior Design Project II

\* Marked electives must be upper-level courses, 300 and above.

### For more information about the unmanned aircraft systems program, contact:

Kansas State Polytechnic  
Office of Admissions  
2310 Centennial Road  
Salina, KS 67401-8196  
785-826-2640  
polytechnic@k-state.edu

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Post-Graduation Statistics  
k-state.edu/postgrad-stats  
ksdegreestats.org

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