

# UNMANNED AIRCRAFT SYSTEMS FLIGHT OPERATIONS - B.S.

College of Aeronautics and Engineering  
School of Aeronautics  
www.kent.edu/cae

## About This Program

Ready to pilot the systems that are reshaping how industries respond, deliver and connect? The Unmanned Aircraft Systems Flight Operations program combines hands-on drone training with expertise in airspace integration, policy and real-world mission planning, preparing students to lead in industries like public safety, agriculture, infrastructure, logistics and advanced air mobility. Read more...

## Contact Information

- cae@kent.edu | 330-672-2892
- Speak with an Advisor
- Chat with an Admissions Counselor

## Program Delivery

- **Delivery:**
  - In person
- **Location:**
  - Kent Campus

## Examples of Possible Careers and Salaries\*

### Compliance officers

- 4.6% about as fast as the average
- 337,600 number of jobs
- \$71,100 potential earnings

### Surveying and mapping technicians

- 0.7% little or no change
- 58,400 number of jobs
- \$46,200 potential earnings

### Additional careers

- Airborne sensor operator
- (Drone) film and video editor and camera operator
- (Drone) photographer
- Regulatory and safety compliance
- UAS compliance officer
- UAS flight operations manager
- UAS pilot/remote pilot
- UAS program manager

- UAS safety inspector
- UAS systems integrator

\* Source of occupation titles and labor data comes from the U.S. Bureau of Labor Statistics'

Occupational Outlook Handbook. Data comprises projected percent change in employment over the next 10 years; nation-wide employment numbers; and the yearly median wage at which half of the workers in the occupation earned more than that amount and half earned less.

## Admission Requirements

The university affirmatively strives to provide educational opportunities and access to students with varied backgrounds, those with special talents and adult students who graduated from high school three or more years ago.

**First-Year Students on the Kent Campus:** First-year admission policy on the Kent Campus is selective. Admission decisions are based upon cumulative grade point average, strength of high school college preparatory curriculum and grade trends. Students not admissible to the Kent Campus may be administratively referred to one of the seven regional campuses to begin their college coursework. For more information, visit the admissions website for first-year students.

**First-Year Students on the Regional Campuses:** First-year admission to Kent State's campuses at Ashtabula, East Liverpool, Geauga, Salem, Stark, Trumbull and Tuscarawas, as well as the Twinsburg Academic Center, is open to anyone with a high school diploma or its equivalent. For more information on admissions, contact the Regional Campuses admissions offices.

**International Students:** All international students must provide proof of proficiency of the English language (unless they meet specific exceptions) through the submission of an English language proficiency test score or by completing English language classes at Kent State's English as a Second Language Center before entering their program. For more information, visit the admissions website for international students.

**Former Students:** Former Kent State students or graduates who have not attended another college or university since Kent State may complete the reenrollment or reinstatement form on the University Registrar's website.

**Transfer Students:** Transfer students must have a minimum 2.250 overall GPA in all college-level coursework for admission to the Unmanned Aircraft Systems Flight Operations major.

**International Students:** All international students must provide proof of proficiency of the English language (unless they meet specific exceptions) through the submission of an English language proficiency test score or by completing English language classes at Kent State's English as a Second Language Center before entering their program. For more information, visit the admissions website for international students.

## Program Requirements

### Major Requirements

Code	Title	Credit Hours
<b>Major Requirements (courses count in major GPA)</b>		
AERN 15000	INTRODUCTION TO AERONAUTICS	3
AERN 15745	NON-PILOT ELEMENTS OF FLIGHT THEORY	3
AERN 25100	INTRODUCTION TO AVIATION MANAGEMENT	3
AERN 25250	ELEMENTS OF AVIATION WEATHER	3

AERN 25350	FUNDAMENTALS OF AIR TRAFFIC CONTROL	2
AERN 25351	FUNDAMENTALS OF AIR TRAFFIC CONTROL LABORATORY	1
AERN 25800	INTRODUCTION TO UNMANNED AIRCRAFT SYSTEMS	3
AERN 30000	PROFESSIONAL DEVELOPMENT IN AERONAUTICS	1
AERN 35020	AIRCRAFT PROPULSION SYSTEMS	3
AERN 35040	AIRCRAFT SYSTEMS I	3
AERN 35250	UNMANNED AIRCRAFT SYSTEMS LAW AND REGULATIONS	2
AERN 35650	NON-PILOT INSTRUMENT FLIGHT THEORY	3
AERN 35810	UNMANNED AIRCRAFT SYSTEMS	3
AERN 35830	UNMANNED AIRCRAFT SYSTEMS SENSING AND SENSOR SYSTEMS	3
AERN 35840	UNMANNED AIRCRAFT SYSTEMS COMMAND, CONTROL AND COMMUNICATIONS	3
AERN 35892	SMALL UNMANNED AIRCRAFT SYSTEMS FLIGHT PRACTICUM (ELR)	2
AERN 45030	AIRCRAFT SYSTEMS II	3
AERN 45130	PHYSIOLOGY AND HUMAN FACTORS IN AVIATION	3
AERN 45135	AVIATION SAFETY THEORY	3
AERN 45150	APPLIED FLIGHT DYNAMICS I	3
AERN 45250	AVIATION LAW	3
AERN 45791	AVIATION SECURITY AND POLICY SEMINAR (WIC) <sup>1</sup>	3
AERN 45800	UNMANNED AIRCRAFT SYSTEMS FLIGHT OPERATIONS THEORY	4
AERN 45892	UNMANNED AIRCRAFT SYSTEMS FLIGHT PRACTICUM (ELR)	2
ENGR 45151	APPLIED FLIGHT DYNAMICS II	3
Aeronautics (AERN) Electives		6
<b>Additional Requirements (courses do not count in major GPA)</b>		
CAE 12260	SOLVING PROBLEMS IN AERONAUTICS AND ENGINEERING <sup>2</sup>	1-3
COMM 15000	INTRODUCTION TO HUMAN COMMUNICATION (KADL)	3
MATH 11010	ALGEBRA FOR CALCULUS (KMCR)	3
MATH 11022	TRIGONOMETRY (KMCR)	3
PHY 13001	GENERAL COLLEGE PHYSICS I (KBS)	4
PHY 13012	COLLEGE PHYSICS II (KBS)	2
PHY 13021	GENERAL COLLEGE PHYSICS LABORATORY I (KBS) (KLAB)	1
PHY 13022	GENERAL COLLEGE PHYSICS LABORATORY II (KBS) (KLAB)	1
UC 10001	FLASHES 101	1
Kent Core Composition		6
Kent Core Humanities and Fine Arts (minimum one course from each)		9
Kent Core Social Sciences (must be from two disciplines)		6
General Electives (total credit hours depends on earning 120 credit hours, including 39 upper-division credit hours)		6
<b>Minimum Total Credit Hours:</b>		<b>120</b>

<sup>1</sup> A minimum C grade must be earned to fulfill the writing-intensive requirement.

<sup>2</sup> Students scoring 34 or below on the ALEKS math assessment are required to enroll in CAE 12260 until they successfully complete MATH 00022.

## Graduation Requirements

Minimum Major GPA	Minimum Overall GPA
2.500	2.500

## Roadmap

This roadmap is a recommended semester-by-semester plan of study for this program. Students will work with their advisor to develop a sequence based on their academic goals and history. Courses designated as critical (!) must be completed in the semester listed to ensure a timely graduation.

Semester One		Credits
AERN 15000	INTRODUCTION TO AERONAUTICS	3
AERN 15745	NON-PILOT ELEMENTS OF FLIGHT THEORY	3
AERN 25350	FUNDAMENTALS OF AIR TRAFFIC CONTROL	2
AERN 25351	FUNDAMENTALS OF AIR TRAFFIC CONTROL LABORATORY	1
AERN 25800	INTRODUCTION TO UNMANNED AIRCRAFT SYSTEMS	3
CAE 12260	SOLVING PROBLEMS IN AERONAUTICS AND ENGINEERING	1
MATH 11010	ALGEBRA FOR CALCULUS (KMCR)	3
UC 10001	FLASHES 101	1
<b>Credit Hours</b>		<b>17</b>

Semester Two		Credits
MATH 11022	TRIGONOMETRY (KMCR)	3
Aeronautics (AERN) Elective		3
Kent Core Requirement		3
Kent Core Requirement		3
Kent Core Requirement		3
<b>Credit Hours</b>		<b>15</b>

Semester Three		Credits
AERN 25100	INTRODUCTION TO AVIATION MANAGEMENT	3
AERN 25250	ELEMENTS OF AVIATION WEATHER	3
AERN 35650	NON-PILOT INSTRUMENT FLIGHT THEORY	3
AERN 35810	UNMANNED AIRCRAFT SYSTEMS	3
Kent Core Requirement		3
<b>Credit Hours</b>		<b>15</b>

Semester Four		Credits
AERN 35830	UNMANNED AIRCRAFT SYSTEMS SENSING AND SENSOR SYSTEMS	3
COMM 15000	INTRODUCTION TO HUMAN COMMUNICATION (KADL)	3
PHY 13001	GENERAL COLLEGE PHYSICS I (KBS)	4
PHY 13021	GENERAL COLLEGE PHYSICS LABORATORY I (KBS) (KLAB)	1
General Elective		3
<b>Credit Hours</b>		<b>14</b>

Semester Five		Credits
AERN 30000	PROFESSIONAL DEVELOPMENT IN AERONAUTICS	1
AERN 35020	AIRCRAFT PROPULSION SYSTEMS	3
AERN 45130	PHYSIOLOGY AND HUMAN FACTORS IN AVIATION	3

PHY 13012	COLLEGE PHYSICS II (KBS)	2
PHY 13022	GENERAL COLLEGE PHYSICS LABORATORY II (KBS) (KLAB)	1
Kent Core Requirement		3
Kent Core Requirement		3
Credit Hours		16
Semester Six		
AERN 35040	AIRCRAFT SYSTEMS I	3
AERN 35892	SMALL UNMANNED AIRCRAFT SYSTEMS FLIGHT PRACTICUM (ELR)	2
AERN 45150	APPLIED FLIGHT DYNAMICS I	3
Aeronautics (AERN) Elective		3
Kent Core Requirement		3
Credit Hours		14
Semester Seven		
AERN 35840	UNMANNED AIRCRAFT SYSTEMS COMMAND, CONTROL AND COMMUNICATIONS	3
AERN 45030	AIRCRAFT SYSTEMS II	3
AERN 45135	AVIATION SAFETY THEORY	3
AERN 45250	AVIATION LAW	3
ENGR 45151	APPLIED FLIGHT DYNAMICS II	3
Credit Hours		15
Semester Eight		
AERN 35250	UNMANNED AIRCRAFT SYSTEMS LAW AND REGULATIONS	2
AERN 45791	AVIATION SECURITY AND POLICY SEMINAR (WIC)	3
AERN 45800	UNMANNED AIRCRAFT SYSTEMS FLIGHT OPERATIONS THEORY	4
AERN 45892	UNMANNED AIRCRAFT SYSTEMS FLIGHT PRACTICUM (ELR)	2
General Elective		3
Credit Hours		14
Minimum Total Credit Hours:		120

## University Requirements

All students in a bachelor’s degree program at Kent State University must complete the following university requirements for graduation.

**NOTE:** University requirements may be fulfilled in this program by specific course requirements. Please see Program Requirements for details.

Flashes 101 (UC 10001)	1 credit hour
Course is not required for students with 30+ transfer credits (excluding College Credit Plus) or age 21+ at time of admission.	
Diversity Domestic/Global (DIVD/DIVG)	2 courses
Students must successfully complete one domestic and one global course, of which one must be from the Kent Core.	
Experiential Learning Requirement (ELR)	varies
Students must successfully complete one course or approved experience.	
Kent Core (see table below)	36-37 credit hours
Writing-Intensive Course (WIC)	1 course
Students must earn a minimum C grade in the course.	
Upper-Division Requirement	39 credit hours

Students must successfully complete 39 upper-division (numbered 30000 to 49999) credit hours to graduate.	
Total Credit Hour Requirement	120 credit hours

## Kent Core Requirements

Kent Core Composition (KCMP)	6
Kent Core Mathematics and Critical Reasoning (KMCR)	3
Kent Core Humanities and Fine Arts (KHUM/KFA) (min one course each)	9
Kent Core Social Sciences (KSS) (must be from two disciplines)	6
Kent Core Basic Sciences (KBS/KLAB) (must include one laboratory)	6-7
Kent Core Additional (KADL)	6
Total Credit Hours:	36-37

## Program Learning Outcomes

Graduates of this program will be able to:

1. Demonstrate a comprehensive understanding of unmanned aircraft systems (UAS), including their design, operation and maintenance.
2. Demonstrate the ability to effectively plan, execute and manage UAS missions for a variety of applications, ensuring optimal performance, data accuracy and safety.
3. Interpret and apply current and future regulations related to airspace, privacy, safety and data protection.
4. Demonstrate and employ critical thinking and problem-solving techniques when unexpected issues arise to make informed decisions, adapt strategies and ensure the successful completion of missions while prioritizing safety and mission goals.

The educational goals of the program are the following:

1. Exhibit the qualities of excellence, integrity, leadership, management and professionalism within their area of professional specialization in aviation.
2. Demonstrate a professional commitment to safety and contribute to the safety culture within their area of professional specialization in aviation.
3. Demonstrate the ability to improve aerospace for generations to come through experiential learning, creativity and innovation within their area of professional specialization in aviation.
4. Manifest the college's core values in the areas of collaboration, compassion, inclusiveness, innovation, integrity, respect and perseverance within their area of professional specialization in aviation.

## Full Description

The Bachelor of Science degree in Unmanned Aircraft Systems Flight Operations is for students who aspire to become professional unmanned aircraft pilots (drone pilot). This program is focused on the safe operations of unmanned aircraft systems (UAS), regulations, the technology of autonomous systems and policies regarding the operations of unmanned aerial elements.

The mission of the Bachelor of Science degree in Unmanned Aircraft Systems Flight Operations, as a Federal Aviation Administration (FAA) Collegiate Training Institution for UAS (UAS-CTI), is to cultivate a new generation of professionals equipped with the knowledge, skills and

technological awareness to excel in the dynamic field of unmanned aviation, and provide students with a comprehensive education that combines cutting-edge technological expertise with a deep understanding of the regulatory, operational and safety considerations essential to the responsible and effective use of unmanned aircraft systems and advanced air mobility (AAM).