AERONAUTICAL SYSTEMS ENGINEERING TECHNOLOGY - B.S.

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

About This Program

Interested in building the systems that keep aircraft, and entire industries, moving? Focusing on systems thinking, hands-on problem solving and industry-relevant skills, the Aeronautical Systems Engineering Technology program equips students to meet contemporary challenges in both aeronautics and broader technical areas. 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*

Aerospace engineers

- 2.8% slower than the average
- 66,400 number of jobs
- $118,610 potential earnings

Aircraft mechanics and service technicians

- 4.6% about as fast as the average
- 137,200 number of jobs
- $66,440 potential earnings

Avionics technicians

- 4.4% about as fast as the average
- 22,800 number of jobs
- $67,840 potential earnings

Electrical engineers

- 4.6% about as fast as the average
- 193,100 number of jobs
- $100,830 potential earnings

Electronics engineers, except computer

- 1.4% slower than the average
- 134,900 number of jobs
- $107,540 potential earnings

Mechanical engineers

- 3.9% about as fast as the average
- 316,300 number of jobs
- $90,160 potential earnings

Additional careers

- Aerodynamics/computational fluid dynamics (CFD) engineer
- Aircraft design engineer
- Astrodynamics/orbit analyst
- Avionics engineer
- Design engineer
- Flight control/dynamics engineer
- Flight test/test evaluation engineer
- Fluid mechanics engineer
- Guidance, navigation and control (GNC) engineer
- Manufacturing engineer
- Product engineer
- Propulsion engineer (jet/prop/turbomachinery/rocket)
- Research and development (R&D) engineer
- Sales engineer
- Space system engineer
- Spacecraft design engineer
- Structural/stress/material engineer/analyst (aircraft/spacecraft)
- Systems engineer
- Thermal engineer/thermal system design
- Thermodynamics engineer

Accreditation

The Bachelor of Science degree in Aeronautical Systems Engineering Technology is accredited by the Engineering Technology Accreditation Commission of ABET, www.abet.org, under the General Criteria and the Program Criteria for Aeronautical Engineering Technology and Similarly Named Programs. This degree program is also accredited by the Aviation Accreditation Board International (www.aabi.aero).

* 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.

Admission to the Aeronautical Systems Engineering Technology major is selective.

New Students: Admission into this major requires a minimum 2.700 unweighted high school GPA. Students who do not meet this requirement will be admitted to the Industrial Engineering Technology major. Students may change their major to Aeronautical Systems Engineering Technology after satisfying the below requirements for current students.

Note: Applicants should understand that this is a math-intensive program. Students admitted to the program are expected to demonstrate prerequisite knowledge on a math placement exam (the ALEKS exam) prior to starting their first semester. Students who do not obtain the minimum score required to place into MATH 12011 are at risk of delaying graduation.

Current Students: Students may change their major to Aeronautical Systems Engineering Technology if they meet the following criteria:

- Minimum 2.500 overall Kent State GPA
- Minimum C grade in both ENGR 11001 and ENGR 11002
- Minimum C grade in either MATH 11022 or MATH 12011

Transfer Students: Transfer students must have completed minimum 12 credit hours of college-level coursework with a minimum 2.500 overall GPA for admission to the Aeronautical Systems Engineering Technology major. Students with less than 12 credit hours completed will be evaluated based on their high school transcript using the criteria in the above "new student" section.

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
Major Requirements (courses count in major GPA)		
AERN 15745	NON-PILOT ELEMENTS OF FLIGHT THEORY	3
AERN 35020	AIRCRAFT PROPULSION SYSTEMS	3
AERN 35040	AIRCRAFT SYSTEMS I	3
AERN 35150	AIRCRAFT STRUCTURES	3
AERN 45030	AIRCRAFT SYSTEMS II	3
AERN 45150	APPLIED FLIGHT DYNAMICS I	3
BA 44152	PROJECT MANAGEMENT	3
or ENGR 36620	PROJECT MANAGEMENT IN ENGINEERING	
ENGR 11001	INTRODUCTION TO ENGINEERING	2
ENGR 11002	INTRODUCTION TO ENGINEERING LABORATORY	1
ENGR 13586 & ENGR 13587	COMPUTER AIDED DESIGN I and COMPUTER AIDED DESIGN I LABORATORY [1]	3
or MERT 12001	COMPUTER-AIDED DESIGN	
ENGR 15300	ENGINEERING COMPUTING AND PROBLEM SOLVING	2
ENGR 15301	ENGINEERING COMPUTING AND PROBLEM SOLVING LABORATORY	1
ENGR 20000	PROFESSIONAL DEVELOPMENT IN ENGINEERING	1
ENGR 20002	MATERIALS AND PROCESSES [1]	3
or MERT 12004	MANUFACTURING PROCESSES	
ENGR 30001	APPLIED THERMODYNAMICS [1]	3
or MERT 42000	THERMODYNAMICS FOR ENGINEERING TECHNOLOGY	
ENGR 33031	PROGRAMMABLE LOGIC CONTROLLERS	3
ENGR 33033	HYDRAULICS/PNEUMATICS	3
ENGR 33041	CONTROL SYSTEMS	3
ENGR 33111	STATICS AND STRENGTH OF MATERIALS [1]	3-6
or MERT 22005 & MERT 22007	STATICS and STRENGTH OF MATERIALS	
ENGR 35550	LAW AND ETHICS FOR ENGINEERS	2
ENGR 45151	APPLIED FLIGHT DYNAMICS II	3
ENGR 47200	SYSTEMS ENGINEERING	3
ENGR 48099	ENGINEERING CAPSTONE I (ELR) [2]	3
ENGR 48199	ENGINEERING CAPSTONE II (ELR) (WIC) [2, 3]	3
Aeronautics (AERN) Elective		3
Engineering (ENGR) Elective		3
Electrical Circuits Electives, choose from the following: [1]		4-7
EERT 12000 & EERT 12001	ELECTRIC CIRCUITS I and ELECTRIC CIRCUITS II	
ENGR 21020 & ENGR 21022	SURVEY OF ELECTRICITY AND ELECTRONICS and SURVEY OF ELECTRICITY AND ELECTRONICS LABORATORY	
ENGR 35500 & ENGR 35501	SIGNALS AND CIRCUITS and SIGNALS AND CIRCUITS LABORATORY	
Additional Requirements (courses do not count in major GPA)		
CAE 12260	SOLVING PROBLEMS IN AERONAUTICS AND ENGINEERING [4]	1-3
COMM 15000	INTRODUCTION TO HUMAN COMMUNICATION (KADL)	3
ECON 22060	PRINCIPLES OF MICROECONOMICS (KSS)	3
PHY 13001 & PHY 13021	GENERAL COLLEGE PHYSICS I (KBS) and GENERAL COLLEGE PHYSICS LABORATORY I (KBS) (KLAB) [5]	5
or PHY 23101	GENERAL UNIVERSITY PHYSICS I (KBS) (KLAB)	
PHY 13002 & PHY 13022	GENERAL COLLEGE PHYSICS II (KBS) and GENERAL COLLEGE PHYSICS LABORATORY II (KBS) (KLAB) [5]	5
or PHY 23102	GENERAL UNIVERSITY PHYSICS II (KBS) (KLAB)	
UC 10001	FLASHES 101	1
Mathematics Electives, choose from the following: [1,6]		6-8
MATH 11022 & MATH 12002	TRIGONOMETRY (KMCR) and ANALYTIC GEOMETRY AND CALCULUS I (KMCR)	
MATH 12011 & MATH 12012	CALCULUS WITH PRECALCULUS I (KMCR) and CALCULUS WITH PRECALCULUS II (KMCR)	
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) (cannot be ECON)		3
General Electives (total credit hours depends on earning 120 credit hours, including 39 upper-division credit hours)		5
Minimum Total Credit Hours:		**120**

[1] Preferred option for students: ENGR 13586, ENGR 13587, ENGR 20002, ENGR 21020, ENGR 21022, ENGR 30001, ENGR 33111, MATH 12011 and MATH 12012. Some options may require coursework outside of this program.

[2] ENGR 48099 and ENGR 48199 must be taken during the same academic year. ENGR 48099 is only offered during the fall semester and ENGR 48199 is only offered during the spring semester.

[3] A minimum C grade must be earned to fulfill the writing-intensive requirement.

[4] Students scoring 34 or below on the ALEKS math assessment are required to enroll in CAE 12260 until they successfully complete MATH 00022.

[5] Students who desire to change their major to Aerospace Engineering or Mechatronics Engineering should take PHY 23101 and PHY 23102. Failing to do so may result in additional coursework.

[6] Students who desire to change their major to Aerospace Engineering or Mechatronics Engineering should take MATH 11022 and MATH 12002. Failing to do so will result in additional coursework.

Graduation Requirements

Minimum Major GPA	Minimum Overall GPA
2.500	2.500

- A minimum C grade may be required in some courses.

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
	CAE 12260	SOLVING PROBLEMS IN AERONAUTICS AND ENGINEERING	1
	COMM 15000	INTRODUCTION TO HUMAN COMMUNICATION (KADL)	3
	ENGR 11001	INTRODUCTION TO ENGINEERING	2
	ENGR 11002	INTRODUCTION TO ENGINEERING LABORATORY	1
	ENGR 15300	ENGINEERING COMPUTING AND PROBLEM SOLVING	2
	ENGR 15301	ENGINEERING COMPUTING AND PROBLEM SOLVING LABORATORY	1
	UC 10001	FLASHES 101	1
	Mathematics Elective		3
	Kent Core Requirement		3
	Credit Hours		**17**
	Semester Two		
	ENGR 13586 & ENGR 13587 or MERT 12001	COMPUTER AIDED DESIGN I and COMPUTER AIDED DESIGN I LABORATORY or COMPUTER-AIDED DESIGN	3
	ENGR 20002 or MERT 12004	MATERIALS AND PROCESSES or MANUFACTURING PROCESSES	3
!	PHY 13001 & PHY 13021 or PHY 23101	GENERAL COLLEGE PHYSICS I (KBS) and GENERAL COLLEGE PHYSICS LABORATORY I (KBS) (KLAB) or GENERAL UNIVERSITY PHYSICS I (KBS) (KLAB)	5
!	Mathematics Elective		3-5
	Credit Hours		**14**
	Semester Three		
	ECON 22060	PRINCIPLES OF MICROECONOMICS (KSS)	3

	ENGR 33111 or MERT 22005 **and** MERT 22007	STATICS AND STRENGTH OF MATERIALS or STATICS *and* STRENGTH OF MATERIALS	3-6
!	PHY 13002 & PHY 13022 or PHY 23102	GENERAL COLLEGE PHYSICS II (KBS) and GENERAL COLLEGE PHYSICS LABORATORY II (KBS) (KLAB) or GENERAL UNIVERSITY PHYSICS II (KBS) (KLAB)	5
	Electrical Circuits Electives		4-7
	Credit Hours		**15**
	Semester Four		
	AERN 15745	NON-PILOT ELEMENTS OF FLIGHT THEORY	3
!	AERN 35040	AIRCRAFT SYSTEMS I	3
	ENGR 20000	PROFESSIONAL DEVELOPMENT IN ENGINEERING	1
	ENGR 33031	PROGRAMMABLE LOGIC CONTROLLERS	3
	Kent Core Requirement		3
	General Elective		3
	Credit Hours		**16**
	Semester Five		
	AERN 45030	AIRCRAFT SYSTEMS II	3
	ENGR 30001 or MERT 42000	APPLIED THERMODYNAMICS or THERMODYNAMICS FOR ENGINEERING TECHNOLOGY	3
	ENGR 33033	HYDRAULICS/PNEUMATICS	3
	ENGR 33041	CONTROL SYSTEMS	3
	Kent Core Requirement		3
	Credit Hours		**15**
	Semester Six		
	AERN 35150	AIRCRAFT STRUCTURES	3
	AERN 45150	APPLIED FLIGHT DYNAMICS I	3
	ENGR 47200	SYSTEMS ENGINEERING	3
	Kent Core Requirement		3
	General Elective		2
	Credit Hours		**14**
	Semester Seven		
	AERN 35020	AIRCRAFT PROPULSION SYSTEMS	3
	ENGR 35550	LAW AND ETHICS FOR ENGINEERS	2
	ENGR 45151	APPLIED FLIGHT DYNAMICS II	3
!	ENGR 48099	ENGINEERING CAPSTONE I (ELR)	3
	Engineering (ENGR) Elective		3
	Credit Hours		**14**
	Semester Eight		
	BA 44152 or ENGR 36620	PROJECT MANAGEMENT or PROJECT MANAGEMENT IN ENGINEERING	3
!	ENGR 48199	ENGINEERING CAPSTONE II (ELR) (WIC)	3
	Aeronautics (AERN) Elective		3
	Kent Core Requirement		3
	Kent Core Requirement		3
	Credit Hours		**15**
	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. Apply knowledge, techniques, skills and modern tools of mathematics, science, engineering and technology to solve broadly defined engineering problems appropriate to the discipline.
2. Design systems, components or processes meeting specified needs for broadly defined engineering problems appropriate to the discipline.
3. Apply written, oral and graphical communication in broadly defined technical and non-technical environments, and an ability to identify and use appropriate technical literature.
4. Conduct standard tests, measurements and experiments and analyze and interpret the results to improve processes.
5. Function effectively as a member as well as a leader on technical teams.

The educational objectives of the program are the following:

1. Drive positive change in the community by engaging in careers in the field of aeronautical, systems and other engineering technologies in a manner that promotes excellence and integrity.

2. Practice forward-thinking through continued education by way of graduate education, professional development and other continued self-motivated learning.
3. Successfully navigate the ever-changing trajectory of the world, practicing compassion as you strive to meet your personal career goals.

Full Description

The Bachelor of Science degree in Aeronautical Systems Engineering Technology successfully prepares graduates of the future to work in multi-disciplinary teams in aeronautical, systems and other engineering technology fields in ways that positively improve efficiency, reduce waste and increase sustainability. The program prepares graduates to enter careers in the design, installation, manufacturing, testing, evaluation, technical sales and maintenance of aeronautical/aerospace systems. Students gain technical expertise in engineering materials, statics, strength of materials, applied aerodynamics, applied propulsion and electronics. Graduates have strengths in the analysis, applied design, development, implementation and oversight of more advanced aeronautical/aerospace systems and processes.

Applicants to this program should understand that this is a math-intensive program.

Students may apply early to the Master of Engineering Technology degree and double count 9 credit hours of graduate courses toward both degree programs. See the Combined Bachelor's/Master's Degree Program Policy in the University Catalog for more information. Students wishing to pursue aerospace engineering at the graduate level must complete additional undergraduate math courses beyond what is required for this program.