MECHATRONICS ENGINEERING TECHNOLOGY - B.S.

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

About This Program

Kent State's Bachelor of Science degree in Mechatronics Engineering Technology is perfect for the person who enjoys hands-on approaches to problem solving that require knowledge of the integration between mechanical, electrical and computer systems. It prepares you for a career in designing, building, troubleshooting and operating advanced mechatronics systems. With hands-on experience, industry-standard tools and experienced faculty, you'll gain the practical skills and knowledge needed to succeed in industry. 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*

Electro-mechanical and mechatronics technologists and technicians

- 3.0% about as fast as the average
- 14,600 number of jobs
- $59,800 potential earnings

Electrical and electronic engineering technologists and technicians

- 1.5% slower than the average
- 125,800 number of jobs
- $67,550 potential earnings

Mechanical engineering technologists and technicians

- 3.1% about as fast as the average
- 43,500 number of jobs
- $58,230 potential earnings

Architectural and engineering managers

- 2.6% slower than the average
- 198,100 number of jobs
- $149,530 potential earnings

* 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 English language proficiency unless they meet specific exceptions. For more information, visit the admissions website for international students.

Transfer Students: Students who have attended any other educational institution after graduating from high school must apply as undergraduate transfer students. For more information, visit the admissions website for transfer 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.

Admission policies for undergraduate students may be found in the University Catalog.

Some programs may require that students meet certain requirements before progressing through the program. For programs with progression requirements, the information is shown on the Coursework tab.

Program Requirements

Major Requirements

Code	Title	Credit Hours
Major Requirements (courses count in major GPA)		
ENGR 11000	INTRODUCTION TO ENGINEERING	3
ENGR 13585	COMPUTER AIDED ENGINEERING GRAPHICS	3
ENGR 15300	INTRODUCTION TO ENGINEERING ANALYSIS USING MATLAB®	2

ENGR 15301	INTRODUCTION TO ENGINEERING ANALYSIS USING MATLAB® LAB	1
ENGR 20000	PROFESSIONAL DEVELOPMENT IN ENGINEERING	1
ENGR 20002	MATERIALS AND PROCESSES	3
ENGR 23585	ADVANCED COMPUTER AIDED DESIGN	3
ENGR 27210	INTRODUCTION TO SUSTAINABILITY	3
ENGR 31000	CULTURAL DYNAMICS TECHNOLOGY (DIVD) (WIC) [1]	3
ENGR 33031	PROGRAMMABLE LOGIC CONTROLLERS	3
ENGR 33032	PROGRAMMABLE LOGIC CONTROLLERS II	3
ENGR 33033	HYDRAULICS/PNEUMATICS	3
ENGR 33041	CONTROL SYSTEMS	3
ENGR 33111 or MERT 22005 & MERT 22007	STATICS AND STRENGTH OF MATERIALS STATICS and STRENGTH OF MATERIALS	3-6
ENGR 33222	DIGITAL DESIGN FOR COMPUTER ENGINEERING	3
ENGR 33333	INDUSTRIAL ROBOTICS	3
ENGR 33700	QUALITY TECHNIQUES	3
ENGR 35550	LAW AND ETHICS FOR ENGINEERS	3
ENGR 43030	MECHATRONICS	3
ENGR 43080	INDUSTRIAL AND ENVIRONMENTAL SAFETY	3
ENGR 43099	MECHATRONICS CAPSTONE (ELR) (WIC) [1]	3
ENGR 43580	COMPUTER-AIDED MACHINE DESIGN	3
ENGR 47200	SYSTEMS ENGINEERING	3
Electricity and Electronics Electives, choose from the following:		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	
Programming Elective(s), choose from the following:		3-4
CS 13001	COMPUTER SCIENCE I: PROGRAMMING AND PROBLEM SOLVING	
CS 13011 & CS 13012	COMPUTER SCIENCE IA: PROCEDURAL PROGRAMMING and COMPUTER SCIENCE IB: OBJECT ORIENTED PROGRAMMING	
ENGR 26220 & ENGR 26222	PROGRAMMING FOR ENGINEERS and PROGRAMMING FOR ENGINEERS LABORATORY	
Technical Elective, choose from the following:		3
Any Aeronautics (AERN) course		
Any College of Aeronautics and Engineering (CAE) course		
Any Design Innovation (DI) course		
Any Engineering (ENGR) course		
Additional Requirements (courses do not count in major GPA)		
COMM 15000	INTRODUCTION TO HUMAN COMMUNICATION (KADL)	3
ECON 22060	PRINCIPLES OF MICROECONOMICS (KSS)	3
PHY 13001 & PHY 13021 or PHY 23101	GENERAL COLLEGE PHYSICS I (KBS) and GENERAL COLLEGE PHYSICS LABORATORY I (KBS) (KLAB) [2] or GENERAL UNIVERSITY PHYSICS I (KBS) (KLAB)	5
PHY 13002 & PHY 13022 or PHY 23102	GENERAL COLLEGE PHYSICS II (KBS) and GENERAL COLLEGE PHYSICS LABORATORY II (KBS) (KLAB) [2] or GENERAL UNIVERSITY PHYSICS II (KBS) (KLAB)	5
UC 10001	FLASHES 101	1

Mathematics Electives, choose from the following: [3]		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 course)		3
General Electives (total credit hours depends on earning 120 credits hour, including 39 upper-division credit hours)		5
Minimum Total Credit Hours:		**120**

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

[2] Students who wish to change their major to Mechatronics Engineering **must** take PHY 23101 and PHY 23102. Failing to do so will result in additional coursework.

[3] Applicants to this program 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 fail to obtain the minimum score required to place into MATH 12002 are at risk of delaying graduation.

Graduation Requirements

Minimum Major GPA	Minimum Overall GPA
2.250	2.000

Roadmap

This roadmap is a recommended semester-by-semester plan of study for this major. However, courses designated as critical (!) must be completed in the semester listed to ensure a timely graduation.

	Semester One		Credits
	COMM 15000	INTRODUCTION TO HUMAN COMMUNICATION (KADL)	3
	ENGR 20002	MATERIALS AND PROCESSES	3
	ENGR 27210	INTRODUCTION TO SUSTAINABILITY	3
	UC 10001	FLASHES 101	1
	Mathematics Elective		3
	Kent Core Requirement		3
	Credit Hours		**16**
	Semester Two		
	ENGR 11000	INTRODUCTION TO ENGINEERING	3
	ENGR 15300	INTRODUCTION TO ENGINEERING ANALYSIS USING MATLAB®	2
	ENGR 15301	INTRODUCTION TO ENGINEERING ANALYSIS USING MATLAB® LAB	1
!	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 13585	COMPUTER AIDED ENGINEERING GRAPHICS	3
	ENGR 20000	PROFESSIONAL DEVELOPMENT IN ENGINEERING	1
!	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
	Kent Core Requirement		3
		Credit Hours	**15**
Semester Four			
	ENGR 23585	ADVANCED COMPUTER AIDED DESIGN	3
	ENGR 33033	HYDRAULICS/PNEUMATICS	3
	Electricity and Electronics Electives		4-7
	Programming Elective(s)		3-4
	Kent Core Requirement		3
		Credit Hours	**16**
Semester Five			
	ENGR 33031	PROGRAMMABLE LOGIC CONTROLLERS	3
	ENGR 33041	CONTROL SYSTEMS	3
	ENGR 33111 or MERT 22005 *and* MERT 22007	STATICS AND STRENGTH OF MATERIALS or STATICS *and* STRENGTH OF MATERIALS	3-6
	ENGR 33700	QUALITY TECHNIQUES	3
	Kent Core Requirement		3
		Credit Hours	**15**
Semester Six			
	ENGR 33032	PROGRAMMABLE LOGIC CONTROLLERS II	3
	ENGR 33333	INDUSTRIAL ROBOTICS	3
	ENGR 47200	SYSTEMS ENGINEERING	3
	Technical Elective		3
	Kent Core Requirement		3
		Credit Hours	**15**
Semester Seven			
	ENGR 33222	DIGITAL DESIGN FOR COMPUTER ENGINEERING	3
	ENGR 35550	LAW AND ETHICS FOR ENGINEERS	3
	ENGR 43030	MECHATRONICS	3
	ENGR 43580	COMPUTER-AIDED MACHINE DESIGN	3
	General Elective		3
		Credit Hours	**15**
Semester Eight			
	ENGR 31000	CULTURAL DYNAMICS TECHNOLOGY (DIVD) (WIC)	3
	ENGR 43080	INDUSTRIAL AND ENVIRONMENTAL SAFETY	3
	ENGR 43099	MECHATRONICS CAPSTONE (ELR) (WIC)	3
	Kent Core Requirement		3
	General Elective		2
		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. 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.

Full Description

The Bachelor of Science degree in Mechatronics Engineering Technology integrates mechanical, electrical, computer and controls. Mechatronics engineering technology revolves around the design, construction and operation of automated systems, robots and intelligent products, which result from the integration of software and hardware.

Using automated systems is becoming more popular for operating equipment/machinery in a host of situations, including on assembly and manufacturing lines, on automobiles and aircraft and in electrical power

generations to reduce labor costs, increase precision and accuracy and provide quality and safety for workers.

Graduates from the mechatronics engineering technology program manage and support the design, operation and analysis of mechanical and electrical devices connected with automated systems, robots and computer-integrated manufacturing. They can work in any company that develops, designs or manufactures and markets these devices. Opportunities exist in manufacturing sales as well as research.

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

Information on the program's education objectives and student enrollment and graduation data can be found on the college website.

Students may apply early to the Master of Engineering Technology degree (Mechanical Engineering Technology concentration) 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.