

# APPLIED ENGINEERING - B.S.

**College of Aeronautics and Engineering**  
 Aeronautics and Technology Building  
 Kent Campus  
 330-672-2892  
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## Description

The Bachelor of Science degree in Applied Engineering provides a focus on the application of management, design and technical skills for the design and integration of systems, the execution of new product designs, the improvement of manufacturing processes and the management and direction of physical and/or technical functions of a firm or organization.

The major includes instruction in basic engineering principles, project management, processes, production and operations, systems integration and control, quality and statistics. Students learn in the classroom, as well as through hands-on experiments and real-world internships.

The degree program can also function as a completer degree for students with associate degrees in engineering technology.

The Applied Engineering major comprises the following concentrations:

- The **Applied Engineering and Technology Management** concentration provides students the necessary skills and knowledge to manage in technical environment. Graduates will have an understanding of materials, facility design, quality and safety.
- The **Foundry Technology** concentration prepares students for employment in the metal casting industry. Graduates of the program will have completed coursework in Materials & Processes, Cast Metals, Metallurgy and Material Science, Solid Modeling and Solidification and applied their knowledge and skills in the capstone course, Foundry Tooling and Pattern Making. They will also have taken several management courses and have experience with programmable logic controllers, hydraulics & pneumatics and computer-aided manufacturing.

### Fully Offered At:

- Kent Campus

## Accreditation

The B.S. degree in Applied Engineering - Applied Engineering and Technology Management concentration is accredited by the Association of Technology, Management and Applied Engineering (ATMAE).

## 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.

**Freshman Students on the Kent Campus:** The freshman admission policy on the Kent Campus is selective. Admission decisions are based upon the following: cumulative grade point average, ACT and/or SAT scores, strength of high school college preparatory curriculum and

grade trends. The Admissions Office at the Kent Campus may defer the admission of students who do not meet admissions criteria but who demonstrate areas of promise for successful college study. Deferred applicants may begin their college coursework at one of seven regional campuses of Kent State University. For more information on admissions, including additional requirements for some academic programs, visit the admissions website for new freshmen.

**Freshman Students on the Regional Campuses:** Kent State campuses at Ashtabula, East Liverpool, Geauga, Salem, Stark, Trumbull and Tuscarawas, as well as the Regional Academic Center in Twinsburg, have open enrollment admission for students who hold a high school diploma, GED or equivalent.

**English Language Proficiency Requirements for International Students:** All international students must provide proof of English language proficiency (unless they meet specific exceptions) by earning a minimum 525 TOEFL score (71 on the Internet-based version), minimum 75 MELAB score, minimum 6.0 IELTS score or minimum 48 PTE score, or by completing the ESL level 112 Intensive Program. For more information on international admission, visit the Office of Global Education's admission website.

**Transfer, Transitioning and Former Students:** For more information about admission criteria for transfer, transitioning and former students, please visit the admissions website.

## Program Learning Outcomes

Graduates of this program will be able to:

1. Develop technical competencies based on engineering principles.
2. Integrate communications, social and physical sciences to develop critical thinking and quantitative skills.
3. Develop the necessary skill set to solve complex technological problems from a systems and sustainability perspective.

## 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.

Destination Kent State: First Year Experience	1
Course is not required for students with 25 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
Writing-Intensive Course (WIC)	1 course
Students must earn a minimum C grade in the course.	
Upper-Division Requirement	39 (or 42)
Students must successfully complete 39 upper-division (numbered 30000 to 49999) credit hours to graduate. Students in a B.A. and/or B.S. degree in the College of Arts and Sciences must complete 42 upper-division credit hours.	

Total Credit Hour Requirement	120
Some bachelor's degrees require students to complete more than 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
<b>Total Credit Hours:</b>	<b>36-37</b>

## Program Requirements

### Major Requirements

Code	Title	Credit Hours
<b>Major Requirements (courses count in major GPA)</b>		
ENG 20002	INTRODUCTION TO TECHNICAL WRITING	3
TECH 13580	ENGINEERING GRAPHICS I	3
TECH 20002	MATERIALS AND PROCESSES	3
TECH 21020	SURVEY OF ELECTRICITY AND ELECTRONICS	3
TECH 21022	SURVEY OF ELECTRICITY AND ELECTRONICS LABORATORY	1
TECH 23581	COMPUTER-AIDED ENGINEERING GRAPHICS	3
TECH 31000	CULTURAL DYNAMICS OF TECHNOLOGY (DIVD) (WIC) <sup>1</sup>	3
TECH 31016	MANUFACTURING TECHNOLOGY	3
TECH 31020	AUTOMATED MANUFACTURING	3
TECH 31065	CAST METALS	3
TECH 33031	PROGRAMMABLE LOGIC CONTROLLERS	3
TECH 33033	HYDRAULICS/PNEUMATICS	3
TECH 33700	QUALITY TECHNIQUES	3
TECH 36620	PROJECT MANAGEMENT IN ENGINEERING AND TECHNOLOGY	3
TECH 43080	INDUSTRIAL AND ENVIRONMENTAL SAFETY	3
<b>Additional Requirements (courses do not count in major GPA)</b>		
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 13002	GENERAL COLLEGE PHYSICS II (KBS)	4
PHY 13021	GENERAL COLLEGE PHYSICS LABORATORY I (KBS) (KLAB)	1
PHY 13022	GENERAL COLLEGE PHYSICS LABORATORY II (KBS) (KLAB)	1
PSYC 11762	GENERAL PSYCHOLOGY (DIVD) (KSS)	3
PSYC 31773	INDUSTRIAL PSYCHOLOGY	3
UC 10097	DESTINATION KENT STATE: FIRST YEAR EXPERIENCE	1
Kent Core Composition		6
Kent Core Humanities and Fine Arts (minimum one course from each)		9
<b>Concentrations</b>		
Choose one of the following:		36

Applied Engineering and Technology Management Foundry Technology	
Minimum Total Credit Hours:	120

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

## Applied Engineering and Technology Management Concentration Requirements

Code	Title	Credit Hours
<b>Concentration Requirements (courses count in major GPA)</b>		
MGMT 24056	BUSINESS ANALYTICS I	3
TECH 10001	INFORMATION TECHNOLOGY	3
TECH 20001	ENERGY/POWER	3
TECH 33870	FACILITY DESIGN AND MATERIAL HANDLING	3
TECH 43060	MANAGEMENT OF TECHNOLOGY INNOVATION	3
TECH 43550	COMPUTER-AIDED MANUFACTURING	3
TECH 43800	APPLIED ENGINEERING TECHNOLOGY SEMINAR (ELR)	3
<b>Additional Requirements (courses do not count in major GPA)</b>		
ECON 22060	PRINCIPLES OF MICROECONOMICS (KSS)	3
General Electives (total credit hours depends on earning 120 credit hours, including 39 upper-division credit hours)		12
Minimum Total Credit Hours:		36

## Foundry Technology Concentration Requirements

Code	Title	Credit Hours
<b>Concentration Requirements (courses count in major GPA)</b>		
TECH 26010	INTRODUCTION TO COMPUTER ENGINEERING TECHNOLOGY	3
TECH 31010	ENGINEERING AND PROFESSIONAL ETHICS	3
TECH 33111	STATICS AND STRENGTH OF MATERIALS	3
TECH 33363	MATERIALS SCIENCE AND TECHNOLOGY	3
TECH 34002	ADVANCED COMPUTER-AIDED DESIGN II	3
TECH 43550	COMPUTER-AIDED MANUFACTURING	3
TECH 41065	SOLID MODELING AND SOLIDIFICATION	3
TECH 45099	CAPSTONE: FOUNDRY TOOLING AND PATTERN MAKING (ELR)	3
<b>Additional Requirements (courses do not count in major GPA)</b>		
CHEM 10050	FUNDAMENTALS OF CHEMISTRY (KBS)	3
MGMT 24163	PRINCIPLES OF MANAGEMENT	3
HRM 34180	HUMAN RESOURCE MANAGEMENT	3
Kent Core Social Sciences (must be from two disciplines)		3
Minimum Total Credit Hours:		36

## Graduation Requirements

Minimum Major GPA	Minimum Overall GPA
2.250	2.000

## Roadmaps

- Applied Engineering and Technology Management Concentration
  - Foundry Technology Concentration
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## APPLIED ENGINEERING AND TECHNOLOGY MANAGEMENT CONCENTRATION

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.

<b>Semester One</b>		<b>Credits</b>
!	MATH 11010 ALGEBRA FOR CALCULUS (KMCR)	3
!	TECH 10001 INFORMATION TECHNOLOGY	3
!	TECH 13580 ENGINEERING GRAPHICS I	3
	TECH 20002 MATERIALS AND PROCESSES	3
	UC 10097 DESTINATION KENT STATE: FIRST YEAR EXPERIENCE	1
Kent Core Requirement		3
Credit Hours		16
<b>Semester Two</b>		
!	COMM 15000 INTRODUCTION TO HUMAN COMMUNICATION (KADL)	3
!	MATH 11022 TRIGONOMETRY (KMCR)	3
	PSYC 11762 GENERAL PSYCHOLOGY (DIVD) (KSS)	3
	TECH 23581 COMPUTER-AIDED ENGINEERING GRAPHICS	3
Kent Core Requirement		3
Credit Hours		15
<b>Semester Three</b>		
!	ENG 20002 INTRODUCTION TO TECHNICAL WRITING	3
	MGMT 24056 BUSINESS ANALYTICS I	3
!	PHY 13001 GENERAL COLLEGE PHYSICS I (KBS)	4
!	PHY 13021 GENERAL COLLEGE PHYSICS LABORATORY I (KBS) (KLAB)	1
	TECH 31016 MANUFACTURING TECHNOLOGY	3
Credit Hours		14
<b>Semester Four</b>		
!	ECON 22060 PRINCIPLES OF MICROECONOMICS (KSS)	3
!	PHY 13002 GENERAL COLLEGE PHYSICS II (KBS)	4
!	PHY 13022 GENERAL COLLEGE PHYSICS LABORATORY II (KBS) (KLAB)	1
!	TECH 31065 CAST METALS	3
	TECH 33033 HYDRAULICS/PNEUMATICS	3
Kent Core Requirement		3
Credit Hours		17
<b>Semester Five</b>		
!	PSYC 31773 INDUSTRIAL PSYCHOLOGY	3
	TECH 21020 SURVEY OF ELECTRICITY AND ELECTRONICS	3
	TECH 21022 SURVEY OF ELECTRICITY AND ELECTRONICS LABORATORY	1
	TECH 31000 CULTURAL DYNAMICS OF TECHNOLOGY (DIVD) (WIC)	3
	TECH 31020 AUTOMATED MANUFACTURING	3
	TECH 33700 QUALITY TECHNIQUES	3
Credit Hours		16
<b>Semester Six</b>		
!	TECH 33031 PROGRAMMABLE LOGIC CONTROLLERS	3
	TECH 33870 FACILITY DESIGN AND MATERIAL HANDLING	3
	TECH 36620 PROJECT MANAGEMENT IN ENGINEERING AND TECHNOLOGY	3
Kent Core Requirement		3
Kent Core Requirement		3
Credit Hours		15

<b>Semester Seven</b>		
!	TECH 20001 ENERGY/POWER	3
	TECH 43060 MANAGEMENT OF TECHNOLOGY INNOVATION	3
	TECH 43550 COMPUTER-AIDED MANUFACTURING	3
General Electives		6
Credit Hours		15
<b>Semester Eight</b>		
	TECH 43080 INDUSTRIAL AND ENVIRONMENTAL SAFETY	3
	TECH 43800 APPLIED ENGINEERING TECHNOLOGY SEMINAR (ELR)	3
General Electives		6
Credit Hours		12
Minimum Total Credit Hours:		120

## Foundry Technology Concentration

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
!	MATH 11010 ALGEBRA FOR CALCULUS (KMCR)	3
!	TECH 13580 ENGINEERING GRAPHICS I	3
	TECH 20002 MATERIALS AND PROCESSES	3
	TECH 26010 INTRODUCTION TO COMPUTER ENGINEERING TECHNOLOGY	3
	UC 10097 DESTINATION KENT STATE: FIRST YEAR EXPERIENCE	1
Kent Core Requirement		3
Credit Hours		16
Semester Two		
	CHEM 10050 FUNDAMENTALS OF CHEMISTRY (KBS)	3
!	COMM 15000 INTRODUCTION TO HUMAN COMMUNICATION (KADL)	3
!	MATH 11022 TRIGONOMETRY (KMCR)	3
	TECH 23581 COMPUTER-AIDED ENGINEERING GRAPHICS	3
Kent Core Requirement		3
Credit Hours		15
Semester Three		
!	ENG 20002 INTRODUCTION TO TECHNICAL WRITING	3
!	PHY 13001 GENERAL COLLEGE PHYSICS I (KBS)	4
!	PHY 13021 GENERAL COLLEGE PHYSICS LABORATORY I (KBS) (KLAB)	1
	PSYC 11762 GENERAL PSYCHOLOGY (DIVD) (KSS)	3
	TECH 31016 MANUFACTURING TECHNOLOGY	3
Credit Hours		14
Semester Four		
	MGMT 24163 PRINCIPLES OF MANAGEMENT	3
!	PHY 13002 GENERAL COLLEGE PHYSICS II (KBS)	4
!	PHY 13022 GENERAL COLLEGE PHYSICS LABORATORY II (KBS) (KLAB)	1
	TECH 33033 HYDRAULICS/PNEUMATICS	3
Kent Core Requirement		3
Credit Hours		14
Semester Five		
!	PSYC 31773 INDUSTRIAL PSYCHOLOGY	3
	TECH 21020 SURVEY OF ELECTRICITY AND ELECTRONICS	3
	TECH 21022 SURVEY OF ELECTRICITY AND ELECTRONICS LABORATORY	1
	TECH 31000 CULTURAL DYNAMICS OF TECHNOLOGY (DIVD) (WIC)	3
	TECH 31020 AUTOMATED MANUFACTURING	3
Kent Core Requirement		3
Credit Hours		16
Semester Six		
	TECH 31065 CAST METALS	3
!	TECH 33031 PROGRAMMABLE LOGIC CONTROLLERS	3
	TECH 34002 ADVANCED COMPUTER-AIDED DESIGN II	3
	TECH 36620 PROJECT MANAGEMENT IN ENGINEERING AND TECHNOLOGY	3
Kent Core Requirement		3
Credit Hours		15

Semester Seven		
	TECH 33111 STATICS AND STRENGTH OF MATERIALS	3
	TECH 33700 QUALITY TECHNIQUES	3
	TECH 41065 SOLID MODELING AND SOLIDIFICATION	3
	TECH 43550 COMPUTER-AIDED MANUFACTURING	3
Kent Core Requirement		3
Credit Hours		15
Semester Eight		
	HRM 34180 HUMAN RESOURCE MANAGEMENT	3
	TECH 31010 ENGINEERING AND PROFESSIONAL ETHICS	3
	TECH 33363 MATERIALS SCIENCE AND TECHNOLOGY	3
	TECH 43080 INDUSTRIAL AND ENVIRONMENTAL SAFETY	3
	TECH 45099 CAPSTONE: FOUNDRY TOOLING AND PATTERN MAKING (ELR)	3
Credit Hours		15
Minimum Total Credit Hours:		120

