

# MECHANICAL ENGINEERING TECHNOLOGY, B.S. (BEHREND)

**Begin Campus:** Any Penn State Campus

**End Campus:** Erie

## Program Description

This major may be taken either as a four-year baccalaureate program or in a "2+2" degree format. The latter allows graduates of associate degree programs in mechanical engineering technology or related areas to gain greater breadth and depth of knowledge in mechanical engineering technology. The baccalaureate program emphasizes applied design and analysis, complementing a hands-on manufacturing and materials focus. The graduate gains valuable knowledge of total manufacturing processes ranging from applied design to manufacture.

This major includes instruction in materials engineering, thermodynamics, heat transfer, hydraulics, finite-element analysis, and use of parametric solids modeling design packages, as well as supporting course work in mathematics and science. Oral and written communications are stressed, as is the ability to work within a team-oriented environment. The major culminates with a capstone design project involving an actual design or manufacturing problem sponsored by regional industry. This program is accredited by the Engineering Technology Accreditation Commission of ABET, [www.abet.org](http://www.abet.org) (<http://www.abet.org>).

Graduates have qualified for careers in a wide variety of industries that manufacture or use mechanical systems. Careers include positions in applied product design, manufacturing process development, field service support, supervision of manufacturing facilities, tool and die design, quality control, plant supervision and management, and technical sales.

## What is Mechanical Engineering Technology?

Mechanical engineering technology is the application of engineering and technology principles for the creation of products and mechanical systems. It emphasizes applied design and analysis of engineering systems and materials. Mechanical engineering technology differs from mechanical engineering in that its focus is the practical application and implementation of engineering principles as opposed to theoretical development and exploration of those principles.

### You Might Like This Program If...

- You like working with your hands.
- You are interested math, physics, and mechanical systems.
- You find complex problems exciting.
- You enjoy working on team-based projects.

## Entrance to Major

To be eligible for entrance to the Mechanical Engineering Technology major, a student must have

1. attained at least a 2.00 cumulative grade-point average, and
2. completed MATH 81 or MATH 26, and MATH 82 or MATH 22, and MATH 83 or MATH 140, and PHYS 250, and earned a grade of C or better in each of these courses.

## Degree Requirements

**For the Bachelor of Science degree in Mechanical Engineering Technology, a minimum of 131 credits is required:**

Requirement	Credits
General Education	45
Electives	0-1
Requirements for the Major	103-106

**18 of the 45 credits for General Education are included in the Requirements for the Major. This includes: 9 credits of GN courses; 6 credits of GQ courses; 3 credits of GWS courses.**

Per Senate Policy 83.80.5, the college dean or campus chancellor and program faculty may require up to 24 credits of coursework in the major to be taken at the location or in the college or program where the degree is earned.

### Requirements for the Major

A student enrolled in this major must earn at least a grade of C in each 300- and 400-level course.

To graduate, a student enrolled in the major must earn a grade of C or better in each course designated by the major as a C-required course, as specified by Senate Policy 82-44 (<https://senate.psu.edu/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#82-44>).

Code	Title	Credits
<b>Prescribed Courses</b>		
CHEM 110	Chemical Principles I	3
CHEM 111	Experimental Chemistry I	1
ENGL 202C	Effective Writing: Technical Writing	3
IET 215	Production Design	2
IET 216	Production Design Laboratory	2
MATH 211	Intermediate Calculus and Differential Equations with Applications	3
MET 214	Strength and Properties of Materials Laboratory	1
MET 107	Computer Applications for Technologists	3
PHYS 251	Introductory Physics II	4
<i>Prescribed Courses: Require a grade of C or better</i>		
MATH 210	Calculus with Engineering Technology Applications	3
MET 111	Mechanics for Technology: Statics	3
MET 213	Strength and Properties of Materials	3
MET 206	Dynamics	3
MET 210W	Machine Design	3
MET 306	Computer-Aided Design	3
MET 320	Strength of Materials II	3
MET 330	Thermodynamics	3
MET 331W	Heat Transfer	4
MET 341	Mechanical Measurements and Instrumentation	3

MET 415	Finite Element Analysis Applications I	3
MET 425	Finite Element Analysis Applications II	3
MET 432	Fluid Power	3
MET 470	Materials Engineering	3
MET 480	Senior Capstone	1
MET 485	Senior Industrial Project	3
PHYS 250	Introductory Physics I	4

**Additional Courses**

Select one of the following: 3-4

EET 100	Electric Circuits, Power, and Electronics	
EET 101	Electrical Circuits I	
EET 105 & EET 109	Electrical Systems and Electrical Circuits Laboratory I	

Select one of the following: 6-7

EGT 101 & EGT 102 & EGT 114 & EGT 201 & EGT 205	and Introduction to Computer Aided Drafting and Spatial Analysis and Computer-Aided Drafting and Advanced Computer Aided Drafting and Transition From 2-D CAD to Solid Modeling	
EGT 120 & EGT 121	Introduction to Graphics and Solid Modeling and Applied Solid Modeling	

*Additional Courses: Require a grade of C or better*

IET 101 or MET 105	Manufacturing Materials, Processes, and Laboratory Mechanical Systems	3
MATH 22 or MATH 82	College Algebra With Analytic Geometry and Applications II Technical Mathematics II	3
MATH 26 or MATH 81	Plane Trigonometry and Applications of Trigonometry Technical Mathematics I	3
MATH 83 or MATH 140	Technical Calculus Calculus With Analytic Geometry I	4

**Supporting Courses and Related Areas**

Select 6 credits of technical electives from school-approved list 6

Select 2-3 credits of business electives from school-approved list 2-3

**General Education**

Connecting career and curiosity, the General Education curriculum provides the opportunity for students to acquire transferable skills necessary to be successful in the future and to thrive while living in interconnected contexts. General Education aids students in developing intellectual curiosity, a strengthened ability to think, and a deeper sense of aesthetic appreciation. These are requirements for all baccalaureate students and are often partially incorporated into the requirements of a program. For additional information, see the General Education Requirements (<https://bulletins.psu.edu/undergraduate/general-education/baccalaureate-degree-general-education-program/>) section of the Bulletin and consult your academic adviser.

The keystone symbol appears next to the title of any course that is designated as a General Education course. Program requirements may also satisfy General Education requirements and vary for each program.

**Foundations (grade of C or better is required and Inter-Domain courses do not meet this requirement.)**

- Quantification (GQ): 6 credits
- Writing and Speaking (GWS): 9 credits

**Breadth in the Knowledge Domains (Inter-Domain courses do not meet this requirement.)**

- Arts (GA): 3 credits
- Health and Wellness (GHW): 3 credits
- Humanities (GH): 3 credits
- Social and Behavioral Sciences (GS): 3 credits
- Natural Sciences (GN): 3 credits

**Integrative Studies**

- Inter-Domain Courses (Inter-Domain): 6 credits

**Exploration**

- GN, may be completed with Inter-Domain courses: 3 credits
- GA, GH, GN, GS, Inter-Domain courses. This may include 3 credits of World Language course work beyond the 12th credit level or the requirements for the student's degree program, whichever is higher: 6 credits

**University Degree Requirements****First Year Engagement**

All students enrolled in a college or the Division of Undergraduate Studies at University Park, and the World Campus are required to take 1 to 3 credits of the First-Year Seminar, as specified by their college First-Year Engagement Plan.

Other Penn State colleges and campuses may require the First-Year Seminar; colleges and campuses that do not require a First-Year Seminar provide students with a first-year engagement experience.

First-year baccalaureate students entering Penn State should consult their academic adviser for these requirements.

**Cultures Requirement**

6 credits are required and may satisfy other requirements

- United States Cultures: 3 credits
- International Cultures: 3 credits

**Writing Across the Curriculum**

3 credits required from the college of graduation and likely prescribed as part of major requirements.

**Total Minimum Credits**

A minimum of 120 degree credits must be earned for a baccalaureate degree. The requirements for some programs may exceed 120 credits. Students should consult with their college or department adviser for information on specific credit requirements.

**Quality of Work**

Candidates must complete the degree requirements for their major and earn at least a 2.00 grade-point average for all courses completed within their degree program.

**Limitations on Source and Time for Credit Acquisition**

The college dean or campus chancellor and program faculty may require up to 24 credits of course work in the major to be taken at the location or in the college or program where the degree is earned. Credit used toward degree programs may need to be earned from a particular source or

within time constraints (see Senate Policy 83-80 (<https://senate.psu.edu/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#83-80>)). For more information, check the Suggested Academic Plan for your intended program.

## Academic Advising

The objectives of the university's academic advising program are to help advisees identify and achieve their academic goals, to promote their intellectual discovery, and to encourage students to take advantage of both in-and out-of class educational opportunities in order that they become self-directed learners and decision makers.

Both advisers and advisees share responsibility for making the advising relationship succeed. By encouraging their advisees to become engaged in their education, to meet their educational goals, and to develop the habit of learning, advisers assume a significant educational role. The advisee's unit of enrollment will provide each advisee with a primary academic adviser, the information needed to plan the chosen program of study, and referrals to other specialized resources.

READ SENATE POLICY 32-00: ADVISING POLICY (<https://senate.psu.edu/policies-and-rules-for-undergraduate-students/32-00-advising-policy/>)

## Erie

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## Suggested Academic Plan

The suggested academic plan(s) listed on this page are the plan(s) that are in effect during the 2023-24 academic year. To access previous years' suggested academic plans, please visit the archive (<https://bulletins.psu.edu/undergraduate/archive/>) to view the appropriate Undergraduate Bulletin edition (Note: the archive only contains suggested academic plans beginning with the 2018-19 edition of the Undergraduate Bulletin).

## Mechanical Engineering Technology, B.S. at Erie Campus

The course series listed below provides **only one** of the many possible ways to move through this curriculum. The University may make changes in policies, procedures, educational offerings, and requirements at any time. This plan should be used in conjunction with your degree audit (accessible in LionPATH as either an **Academic Requirements** or **What If** report). Please consult with a Penn State academic adviser on a regular basis to develop and refine an academic plan that is appropriate for you.

### First Year

Fall	Credits Spring	Credits
EGT 120	3 EGT 121	3
ENGL 15 or 30H <sup>††</sup>	3 MATH 83 <sup>*#†</sup>	4
IET 101 <sup>*</sup>	3 MET 111 <sup>*</sup>	3
MATH 41 <sup>*†#†</sup>	4 PHYS 250 <sup>*#†</sup>	4
PSU 7	1 General Education Course	3
General Education Course	3	
	<b>17</b>	<b>17</b>

### Second Year

Fall	Credits Spring	Credits
IET 215	2 CHEM 110 <sup>†</sup>	3
MATH 210 <sup>*</sup>	3 CHEM 111 <sup>†</sup>	1
MET 213 <sup>*</sup>	3 EET 100	3
MET 214	1 IET 216	2
MET 107	3 MATH 210 <sup>*</sup>	3
MET 206 <sup>*</sup>	3 MET 320 <sup>*</sup>	3
	MATH 211 <sup>†</sup>	3
	<b>15</b>	<b>18</b>

### Third Year

Fall	Credits Spring	Credits
CAS 100 <sup>††</sup>	3 ENGL 202C <sup>††</sup>	3
MET 210W <sup>*</sup>	3 MET 331W <sup>*</sup>	4
MET 306 <sup>*</sup>	3 MET 341 <sup>*</sup>	3
MET 330 <sup>*</sup>	3 MET 415 <sup>*</sup>	3
PHYS 251 <sup>†</sup>	4 MET 432 <sup>*</sup>	3
	General Education Course (GHW)	1.5
	<b>16</b>	<b>17.5</b>

### Fourth Year

Fall	Credits Spring	Credits
MET 425 <sup>*</sup>	3 MET 485 <sup>*2</sup>	3
MET 470 <sup>*1</sup>	3 Technical Elective (300,400-level) <sup>*</sup>	3
MET 480 <sup>*1</sup>	1 General Education Course	3
Technical Elective (300,400-level) <sup>*</sup>	3 General Education Course	3
Business Elective	3 General Education Course	3
General Education Course	3 General Education Course (GHW)	1.5
	<b>16</b>	<b>16.5</b>

### Total Credits 133

\* Course requires a grade of C or better for the major

‡ Course requires a grade of C or better for General Education

# Course is an Entrance to Major requirement

† Course satisfies General Education and degree requirement

### University Requirements and General Education Notes:

US and IL are abbreviations used to designate courses that satisfy Cultural Diversity Requirements (United States and International Cultures).

W, M, X, and Y are the suffixes at the end of a course number used to designate courses that satisfy University Writing Across the Curriculum requirement.

General Education includes Foundations (GWS and GQ), Knowledge Domains (GHW, GN, GA, GH, GS) and Integrative Studies (Inter-domain) requirements. N or Q (Honors) is the suffix at the end of a course number used to help identify an Inter-domain course, but the inter-domain attribute is used to fill audit requirements. Foundations courses (GWS and GQ) require a grade of 'C' or better.

<sup>1</sup> The following course is only offered in the FALL semester.

<sup>2</sup> The following courses are only offered in the **SPRING** semester.

#### **Program Notes:**

- Permissible Math substitutions: MATH 26 instead of MATH 81, MATH 22 instead of MATH 82, and MATH 140 instead of MATH 83.

#### **Advising Notes:**

- Only students who have gone through the entrance-to-major (ETM) process and have been accepted into the MET or IBE majors may register for junior and senior-level MET courses.

## **Career Paths**

Mechanical engineering technology coursework and laboratory experiences emphasize development of your skills in applied design and analysis. You'll also receive instruction in the selection and application of manufacturing processes and engineering materials. Penn State Behrend has a comprehensive support system to help you identify and achieve your goals for college and beyond. Meet with your academic adviser often and take advantage of the services offered by the Academic and Career Planning Center beginning in your first semester.

## **Careers**

Penn State Behrend's B.S. in Mechanical Engineering Technology graduates conceptualize new designs and use computer-aided design and measurement technologies to analyze designs, select materials, and discover ways to optimize manufacturing processes and quality control. They work in the automotive, aeronautical, petroleum, defense, medical, power generation, transportation, and materials fields. Their careers include applied product design, manufacturing processes development, field service engineering, quality control, plant management, and technical sales. Employers of recent Behrend MET graduates include Boeing, Cummins, Exxon Mobile, Wabtec, General Dynamics, Komatsu, SKF, Sandia National Laboratory, U.S. Steel, Westinghouse, Zurn Industries, and Parker.

MORE INFORMATION ABOUT POTENTIAL CAREER OPTIONS FOR GRADUATES OF THE MECHANICAL ENGINEERING TECHNOLOGY PROGRAM (<https://behrend.psu.edu/school-of-engineering/academic-programs/mechanical-engineering-technology/>)

## **Opportunities for Graduate Studies**

Graduate programs in mechanical engineering technology delve more deeply into methods of analysis, statistical methods, computer network applications, and applied dynamics. Or, you can use a master's degree to learn management skill; Penn State Behrend offers a Master of Manufacturing Management (M.M.M) degree program for aspiring organizational leaders.

MORE INFORMATION ABOUT OPPORTUNITIES FOR GRADUATE STUDIES (<https://behrend.psu.edu/school-of-engineering/academic-programs/master-of-manufacturing-management/>)

## **Professional Resources**

- ABET (<https://www.abet.org/>)
- American Society of Mechanical Engineers (<https://www.asme.org/>)
- Institution of Engineering and Technology (<https://www.theiet.org/>)
- Society of Women Engineers (<https://swe.org>)
- National Society of Black Engineers (<https://www.nsbe.org>)

## **Accreditation**

The Bachelor of Science in Mechanical Engineering Technology at Penn State Behrend is accredited by the Engineering Technology Accreditation Commission of ABET, <https://www.abet.org>, under the commission's General Criteria and the Mechanical Engineering Technology Program Criteria.

## **Professional Licensure/Certification**

Many U.S. states and territories require professional licensure/certification to be employed. If you plan to pursue employment in a licensed profession after completing this program, please visit the Professional Licensure/Certification Disclosures by State (<https://www.psu.edu/state-licensure-disclosures/>) interactive map.

## **Contact**

### **Erie**

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