

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

**Begin Campus:** Any Penn State Campus

**End Campus:** Harrisburg

## Program Description

The goal of the Mechanical Engineering Technology program is to provide our students with the necessary training and education so that they can provide high-level technical support to a variety of industrial, commercial, consulting, and governmental organizations. The emphasis of our program is in the application of scientific and engineering principles. Technical communication in oral and written form is also emphasized. Our graduates are expected to appreciate the ethical and societal responsibilities of a technologist, the concepts of Continuous Quality Improvement and the continuing impact of globalization of design, manufacturing and marketing of technical goods and services. Our graduates are trained to deal with choice of materials and methods that are safe, environmentally and aesthetically acceptable and economically competitive. Typical responsibilities that may be assigned to our graduates are the development and evaluation of machines and mechanisms; development, organization and supervision of manufacturing processes and procedures; the instrumentation, control and testing of a process; quality control; technical marketing and sales; design of mechanical systems for heating and cooling and energy management.

The strengths of our program include:

- hands-on training;
- extensive laboratory experience;
- state of the art computer methods; excellent job placement;
- accreditation by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET).

Graduates who wish to continue their professional development can take the Fundamentals of Engineering exam in Pennsylvania, a prerequisite for taking the Professional Engineering exam.

## 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 hands-on and creative problem-solving.
- You like understanding how mechanical devices work.
- You work well within collaborative, multidisciplinary teams.
- You are interested in a career as an engineering technologist or testing engineer.

## Entrance to Major

Entry to the Mechanical Engineering Technology major requires a 2.00 or higher cumulative grade-point average.

## Re-enrollment

Associate degree students should file a re-enrollment form during the final semester of their associate degree. Students re-enrolling from an associate's degree into the bachelor's degree should run a degree audit from LionPATH, using the MET major code, to determine their curriculum requirements.

## Degree Requirements

**For the Bachelor of Science degree in Mechanical Engineering Technology, a minimum of 128 credits is required:**

| Requirement                | Credits |
|----------------------------|---------|
| General Education          | 45      |
| Requirements for the Major | 104     |

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

## Requirements for the Major

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 308   | Statistical Quality Control   | 3       |
| MATH 140  | Calculus With Analytic Geometry I   | 4       |
| MET 321   | Analytical Techniques   | 2       |
| MET 338   | Thermal/Fluids Laboratory   | 1       |
| MET 358   | Process Design Engineering  | 3       |
| MET 370   | Engineering Materials Laboratory  | 1       |
| MET 438   | Thermal Engineering B   | 3       |
| MET 454   | Automatic Controls  | 3       |
| MET 458   | Controls Laboratory   | 1       |
| MET 481   | Project Design  | 3       |
| MET 486   | Project Design  | 3       |
| <i>Prescribed Courses: Require a grade of C or better</i> |   |         |
| ENGR 320Y   | Design for Global Society   | 3       |
| MET 332   | Thermal Engineering A   | 3       |
| MET 336   | Engineering Fluid Mechanics   | 3       |
| MET 341   | Mechanical Measurements and Instrumentation                                   | 3       |
| MET 431   | Heat Transfer   | 3       |
| <b>Additional Courses</b>                                 |   |         |
| EDSGN 100<br>or EGT 120                                   | Cornerstone Engineering Design<br>Introduction to Graphics and Solid Modeling | 3       |

|   |   |     |
|---|---|-----|
| EET 101<br>& EET 109<br>or EET 320  | Electrical Circuits I<br>and Electrical Circuits Laboratory I<br>Industrial Electricity and Electronics | 3-4 |
| IET 101<br>or IET 311   | Manufacturing Materials, Processes, and<br>Laboratory<br>Elements of Metallurgy                         | 3   |
| IET 215<br>& IET 216<br>or IET 321  | Production Design<br>and Production Design Laboratory<br>Manufacturing Processes                        | 3-4 |
| MET 210W<br>or MET 365  | Machine Design<br>Design of Machine Elements  | 3   |
| PHYS 150<br>or PHYS 211   | Technical Physics I<br>General Physics: Mechanics   | 3-4 |
| PHYS 151<br>or PHYS 212   | Technical Physics II<br>General Physics: Electricity and Magnetism                                      | 3-4 |
| STAT 200<br>or MATH 141   | Elementary Statistics<br>Calculus with Analytic Geometry II   | 4   |
| <i>Additional Courses: Require a grade of C or better</i>   |   |     |
| Select 3 credits from the following:  |   | 3   |
| EMCH 211  | Statics   |     |
| ET 300  | Mechanics I: Statics  |     |
| MET 111   | Mechanics for Technology: Statics   |     |
| Select 3 credits from the following:  |   | 3   |
| EMCH 212  | Dynamics  |     |
| ET 321  | Dynamics  |     |
| MET 206   | Dynamics  |     |
| Select 3 credits from the following:  |   | 3   |
| EMCH 213  | Strength of Materials   |     |
| ET 322  | Strength of Materials   |     |
| MET 213   | Strength and Properties of Materials  |     |
| <b>Supporting Courses and Related Areas</b>   |   |     |
| Select 5-9 credits from the department approved list of courses   |   | 5-9 |
| Select 12 credits from 300-400 level technology and engineering elective courses in consultation with an academic adviser and in support of the student's interests |   | 12  |

## 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/>)

## Harrisburg

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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 Harrisburg 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      |
| ENGL 15, 15S, 30T, or ESL 15 <sup>‡</sup> | 3 STAT 200 or MATH 141 <sup>†</sup>     | 4            |
| MATH 140 <sup>†</sup>                     | 4 PHYS 150 or 211 <sup>†</sup>          | 3-4          |
| CHEM 110 <sup>†</sup>                     | 3 CAS 100A or 100S <sup>‡</sup>         | 3            |
| CHEM 111 <sup>†</sup>                     | 1 General Education Course <sup>†</sup> | 3            |
| EDSGN 100S                                | 3 General Education Course <sup>†</sup> | 3            |
| General Education Course <sup>†</sup>     | 3                                       |              |
|   | <b>17</b>                               | <b>16-17</b> |

| Second Year                               |   |         |
|---|---|---------|
| Fall                                      | Credits Spring                                | Credits |
| PHYS 151 or 212 <sup>†</sup>              | 3-4 ET 321, EMCH 212, or MET 206 <sup>*</sup> | 3       |
| ET 300, EMCH 211, or MET 111 <sup>*</sup> | 3 ET 322, EMCH 213, or MET 213 <sup>*</sup>   | 3       |
| IET 308                                   | 3 EET 320 or 101 <b>and</b> 109               | 3-4     |
| IET 321 or 215 <b>and</b> 216             | 3-4 ENGL 202C <sup>‡</sup>                    | 3       |
| General Education Course <sup>†</sup>     | 3 Elective as approved by adviser             | 3       |

**15-17**

**15-16**

| Third Year                                  |                                   |         |
|---|-----------------------------------|---------|
| Fall  | Credits Spring                    | Credits |
| IET 311 or 101                              | 3 MET 321                         | 2       |
| MET 332 <sup>*</sup>                        | 3 MET 358                         | 3       |
| MET 336 <sup>*</sup>                        | 3 MET 365                         | 3       |
| MET 338                                     | 1 MET 438                         | 3       |
| MET 370                                     | 1 ENGR 320Y <sup>††</sup>         | 3       |
| General Education Course <sup>†</sup>       | 3 Elective as approved by adviser | 3       |
| General Education Course (GHW) <sup>†</sup> | 1.5                               |         |

**15.5**

**17**

| Fourth Year                                      |  |         |
|--|--|---------|
| Fall   | Credits Spring                                     | Credits |
| MET 341 <sup>*</sup>                             | 3 MET 431 <sup>*</sup>                             | 3       |
| MET 454  | 3 MET 486  | 3       |
| MET 458  | 1 300-400 level Technology or Engineering Elective | 3       |
| MET 481  | 3 300-400 level Technology or Engineering Elective | 3       |
| 300-400 level Technology or Engineering Elective | 3 General Education Course (GHW) <sup>†</sup>      | 1.5     |
| 300-400 level Technology or Engineering Elective | 3 Elective as approved by adviser                  | 3       |

**16**

**16.5**

### Total Credits 128-132

- \* 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

- <sup>1</sup> CHEM 111 - Experimental Chemistry I  
Students may substitute either CHEM 112 (3) or BIOL 141 (3) for the combination of CHEM 111 (1) and PHYS 214 (2).
- <sup>2</sup> PHYS 150 - Technical Physics I  
Electives are approved by the academic adviser
- <sup>3</sup> 300-400 level Technology or Engineering Elective  
See Program Notes below for eligible electives

### 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.

### Program Notes

Technology or Engineering Electives include:

- MET 308 - Computer Aided Solid Modeling and Analysis (3)
- MET 417 - Finite Element Analysis (3)
- MET 432 - Fluid Power (3)
- MET 435 - Building Energy Systems (3)
- MET 462 - Internal Combustion Engine Design (3)
- ENVE 430 - Sustainable Engineering (3)
- or others offered by the program.

## Career Paths

Mechanical Engineering Technology is a broad engineering discipline that provides a number of career possibilities. The Mechanical Engineering Technology program prepares students to provide high-level technical support to a variety of industrial, commercial, consulting, and governmental organizations.

### Careers

Mechanical Engineering Technology graduates should experience good employment potential. Opportunities are expected to grow to keep pace with the demand for technical products. According to the U.S. Bureau of Labor Statistics and O\*NET, opportunities for Mechanical Engineering Technologists will grow at a rate of 5-9% through 2026.

### Professional Resources

- American Society of Mechanical Engineers (<https://www.asme.org/>)

## Accreditation

The Bachelor of Science in Mechanical Engineering Technology at Penn State Harrisburg is accredited by the Engineering Technology Accreditation Commission of ABET, <https://www.abet.org>, under the 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 Harrisburg

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