

# MECHANICAL ENGINEERING, B.S. (BEHREND)

**Begin Campus:** Any Penn State Campus

**End Campus:** Erie

## 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, 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
CHEM 110 <sup>*#†</sup>	3 CMPSC 200 <sup>†</sup>	3
CHEM 111 <sup>†6</sup>	1 ECON 102 or 104 <sup>†</sup>	3
EDSGN 100S <sup>†3,5</sup>	3 MATH 141 <sup>*#††</sup>	4
ENGL 15 or 30H <sup>†</sup>	3 MATH 220 <sup>*†</sup>	2
MATH 140 <sup>*#††</sup>	4 PHYS 211 <sup>*#†</sup>	4
General Education Course (GA/GH/GS)	3	
	<b>17</b>	<b>16</b>

#### Second Year

Fall	Credits Spring	Credits
EMCH 211 <sup>*</sup>	3 EE 211	3
MATH 230	4 EMCH 212 <sup>*</sup>	3
MATH 251 <sup>*</sup>	4 EMCH 213 <sup>*</sup>	3
PHYS 212 <sup>†</sup>	4 ME 300 <sup>*</sup>	3
General Education Course (GHW)	1.5 PHYS 214 <sup>†6</sup>	2
	General Education Course (GA/GH/GS)	3
	<b>16.5</b>	<b>17</b>

#### Third Year

Fall	Credits Spring	Credits
ENGL 202C <sup>††</sup>	3 CAS 100 <sup>††</sup>	
ME 320 <sup>*</sup>	3 ME 357 <sup>*</sup>	3
ME 345W <sup>*4</sup>	4 ME 365 <sup>*7</sup>	1
ME 349 <sup>*</sup>	3 ME 367 <sup>*</sup>	3
ME 380 <sup>*7</sup>	3 ME 410 <sup>*</sup>	3
	MATSE 259 <sup>*7</sup>	3
	<b>16</b>	<b>13</b>

#### Fourth Year

Fall	Credits Spring	Credits
ME 448 <sup>*1</sup>	3 ME 449 <sup>*2</sup>	3
ME 468 <sup>*</sup>	3 Program Elective (School Approved List) <sup>*</sup>	3
Lab Elective (300, 400-Level) <sup>*</sup>	1 Program Elective (School Approved List) <sup>*</sup>	3
Program Elective (School Approved List) <sup>*</sup>	3 General Education Course (GA/GH/GS)	3
Program Elective (School Approved List) <sup>*</sup>	3 General Education Course (GA/GH/GS)	3
General Education Course (GA/GH/GS)	3 General Education Course (GHW)	1.5
	<b>16</b>	<b>16.5</b>

#### Total Credits 128

- \* 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> The following course is only offered in the **FALL** semester: ME 448

<sup>2</sup> The following courses are only offered in the **SPRING** semester: ME 449

<sup>3</sup> Course will satisfy First-Year Seminar requirement.

<sup>4</sup> Course will satisfy Writing Across the Curriculum requirement.

<sup>5</sup> Students starting at a location other than Penn State Behrend must take EDSGN 100 plus a seminar course.

<sup>6</sup> Interested students may substitute BIOL 141 or CHEM 112 for both CHEM 111 and PHYS 214.

<sup>7</sup> ME 380 or the combination of MATSE 259 and ME 365 can be taken in either semester of the Third Year.

#### 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.

#### School-Approved Electives for Mechanical Engineering: This elective list is subject to change.

Mechanical Engineering students at Behrend are required to take four 3-credit courses and one 1-credit lab (13 total credits) of technical electives. The courses must be selected from one of the following two thematic areas:

#### Technical

Take one Lab Course:

- ME 308 Fluid Flow and Heat Transfer Laboratory
- ME 424 Additive Manufacturing Lab
- ME 465 Introduction to Manufacturing Laboratory
- ME 492

Take two courses from Group 1:

- BME 402 Biomedical Instrumentation and Measurements
- BME 443 Biomedical Materials
- EMCH 471 Engineering Composite Materials
- ME 370 Vibration of Mechanical Systems
- ME 401 Refrigeration and Air Conditioning
- ME 408 Energy Systems
- ME 428 Applied Computational Fluid Dynamics
- ME 467 Applied Finite Element Analysis
- ME 469 Metallic Manufacturing Processes
- ME 491 Bioengineering Applications of Mechanical Engineering

Take one course from Group 2:

- Any course in Group 1
- BME 406 Medical Imaging
- IE 405 Deterministic Models in Operations Research
- IE 456 Industrial Robot Applications
- IE 470 Manufacturing System Design and Analysis
- MATH 412 Fourier Series and Partial Differential Equations
- MATH 449 Applied Ordinary Differential Equations
- MATH 455 Introduction to Numerical Analysis I
- MATH 456 Introduction to Numerical Analysis II
- MATH 482 Mathematical Methods of Operations Research
- PHYS 400 Intermediate Electricity and Magnetism
- PHYS 419 Theoretical Mechanics
- PHYS 458 Intermediate Optics
- STAT 414 Introduction to Probability Theory

Take one course from Group 3:

- Any course in Group 1 or 2
- IE 302 Engineering Economy
- ME 494 Research Project\*
- ME 495 Internship\* (2 rotations required)
- ME 496 Independent Studies\*
- ME 497 Special Topics\*
- MET 457 Lean Manufacturing
- MGMT 409 Project Management for Non-business Majors
- PSYCH 444 Engineering Psychology (fall, NOTE: requires PSYCH 100)
- QC 450 Quality Control and Quality Improvement

\*Selection of ME 494-ME 497 courses require written approval of the program coordinator.

### Engineering Management

Take one Lab Course:

- ME 308 Fluid Flow and Heat Transfer Laboratory
- ME 424 Additive Manufacturing Lab
- ME 465 Introduction to Manufacturing Laboratory
- ME 492

Take the following two courses:

- MGMT 409 Project Management for Non-business Majors
- IE 302 Engineering Economy

Take two additional courses from the following list:

- BME 402 Biomedical Instrumentation and Measurements
- BME 406 Medical Imaging
- BME 443 Biomedical Materials
- EMCH 471 Engineering Composite Materials
- IE 405 Deterministic Models in Operations Research
- IE 456 Industrial Robot Applications
- IE 470 Manufacturing System Design and Analysis
- MATH 482 Mathematical Methods of Operations Research
- ME 370 Vibration of Mechanical Systems
- ME 401 Refrigeration and Air Conditioning
- ME 408 Energy Systems
- ME 428 Applied Computational Fluid Dynamics
- ME 467 Applied Finite Element Analysis
- ME 469 Metallic Manufacturing Processes
- ME 491 Bioengineering Applications of Mechanical Engineering

Students in the Engineering Management thematic who also complete either the Operations and Supply Chain Management minor or the Technical Sales minor may substitute 400-level SCM courses for the 6 additional credits of 400-level IE, MATH or ME courses.

### Advising Notes:

- Only students who have gone through the entrance-to-major process and have been accepted into this major may register for junior and senior-level ME courses.