POLYMER ENGINEERING AND SCIENCE, B.S.

Begin Campus: Any Penn State Campus

End Campus: Erie

Degree Requirements

For the Bachelor of Science degree in Polymer and Engineering Science, a minimum of 130 credits is required:

Requirement	Credits
General Education	45
Requirements for the Major	112-113

27 of the 45 credits for General Education are included in the Requirements for the Major. This includes: 9 credits of GWS courses, 6 credits of GQ courses, 3 credits of GS courses, 9 credits of GN 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 grade of C or better is required for all courses in the major. To graduate, a student enrolled in the major must earn at least a C grade 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
Prescribed Courses		
Prescribed Courses: Require a grade of C or better		
CAS 100	Effective Speech	3
CHEM 110	Chemical Principles I	3
CHEM 111	Experimental Chemistry I	1
CHEM 112	Chemical Principles II	3
CHEM 113	Experimental Chemistry II	1
CHEM 210	Organic Chemistry I	3
CMPSC 200	Programming for Engineers with MATLAB	3
EDSGN 100S	Introduction to Engineering Design	3
EMCH 211	Statics	3
EMCH 213	Strength of Materials	3
EMCH 315	Mechanical Response of Engineering Materials	2
ENGL 15	Rhetoric and Composition	3
ENGL 202C	Effective Writing: Technical Writing	3
IE 424	Process Quality Engineering	3
MATH 140	Calculus With Analytic Geometry I	4
MATH 141	Calculus with Analytic Geometry II	4
MATH 220	Matrices	2-3
MATH 231	Calculus of Several Variables	2
MATH 251	Ordinary and Partial Differential Equations	4
MATSE 202	Introduction to Polymer Materials	3
MATSE 445	Thermodynamics, Microstructure, and Characterization of Polymers	3
MATSE 447	Rheology and Processing of Polymers	3
PES 213	Polymer Chemistry Lab	2
PES 305	Fluids/Heat Transfer	3
PES 320	Polymer Sustainability	3
PES 323	Rheology Lab	2
PES 340	Polymer Characterization	2
PES 341	Polymer Characterization Lab	1
PES 351	Polymer Processing Lab	1
PES 365	Processing for Polymer Product Performance	3
PES 440	Failure Analysis and Characterization	3
PES 441	Failure Analysis Lab	1
PES 446W	Senior Project 1	1
PES 447W	Senior Project 2	1
PES 448W	Senior Project 3	1
PES 460	Polymer Formulation for Processing and Design	3
PHYS 211	General Physics: Mechanics	4
PHYS 212	General Physics: Electricity and Magnetism	4
Additional Courses		
Additional Courses: Require a grade of C or better		
ECON 102	Introductory Microeconomic Analysis and Policy	3
or ECON 104	Introductory Macroeconomic Analysis and Policy	
Supporting Courses and Related Areas		
Supporting Courses and Related Areas: Require a grade of C or better		
Students majoring in Polymer Engineering and Science must complete a total of 12 credits (4 courses) of 400-level PES technical electives from the approved list. (Except where noted, courses taken to satisfy General Education requirements may not be used to satisfy PES technical elective requirements.)		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.