

# ENGINEERING, B.S.

**Begin Campus:** Abington, Brandywine, DuBois, Hazleton

**End Campus:** Abington, Brandywine, DuBois, Hazleton

## Program Description

The General Engineering program provides students with a broad foundation in engineering with specialization in a technically and professionally relevant topic. Students must choose the Multidisciplinary Engineering Design option at Abington, Brandywine, and Great Valley campuses; Applied Materials option at the DuBois campus; or the Alternative Energy and Power Generation option at the Hazleton campus. From this degree program, students will acquire the ability to work as members of a team toward successful attainment of a common goal, thus preparing them to work in for-profit or nonprofit organizations, or to further their studies in graduate school. Typical employment for General Engineering graduates includes positions such as engineer, product engineer, process engineer, manufacturing engineer, development engineer, and materials engineer. With employment opportunities such as these and others, graduates of the General Engineering program can attain professional and economically sustaining employment in their desired regional area. This degree program develops written and oral communication skills, culminating in a two-semester senior design course sequence consisting of a project based largely on student interest and faculty input.

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

- You have an interest in various different engineering disciplines and would like to diversify your skill set as much as possible.
- You want to concentrate your studies on product, process, and manufacturing engineering.
- You are passionate about the design and development of products.
- You have an interest in alternative and renewable energy and power generation.

## Entrance to Major

In addition to the minimum grade-point average (GPA) requirements described in the University Policies, all College of Engineering entrance to major course requirements must also be completed with a minimum grade of C: CHEM 110, MATH 140, MATH 141, MATH 250 or MATH 251, PHYS 211, and PHYS 212. All of these courses must be completed by the end of the semester during which the admission to major process is carried out.

## Degree Requirements

**For the Bachelor of Science degree in General Engineering, a minimum of 127 credits are required:**

Requirement	Credits
General Education	45
Requirements for the Major	109

### 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 (<http://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.)

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

### Knowledge Domains

- **Arts (GA):** 6 credits
- **Health and Wellness (GHW):** 3 credits
- **Humanities (GH):** 6 credits
- **Social and Behavioral Sciences (GS):** 6 credits
- **Natural Sciences (GN):** 9 credits

### Integrative Studies (may also complete a Knowledge Domain requirement)

- **Inter-Domain or Approved Linked Courses:** 6 credits

27 of these 45 credits are included in the Requirements for the Major.

## 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 (<http://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.

### Requirements for the Major

This includes 27 credits of General Education courses: 9 credits of GN courses; 6 credits of GQ courses; 3 credits of GS courses; 9 credits of GWS courses.

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 (<http://senate.psu.edu/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#82-44>).

### Common Requirements for the Major (All Options)

Code	Title	Credits
<b>Prescribed Courses</b>		
CHEM 111	Experimental Chemistry I	1
EDSGN 100	Introduction to Engineering Design	3
EMCH 213	Strength of Materials	3
ENGR 490	Senior Design I	1
ENGR 491W	Senior Design II	3
MATH 231	Calculus of Several Variables	2
PHYS 214	General Physics: Wave Motion and Quantum Physics	2
<i>Prescribed Courses: Require a grade of C or better</i>		
CHEM 110	Chemical Principles I	3
EMCH 211	Statics	3
MATH 140	Calculus With Analytic Geometry I	4
MATH 141	Calculus with Analytic Geometry II	4
MATH 251	Ordinary and Partial Differential Equations	4
PHYS 211	General Physics: Mechanics	4
PHYS 212	General Physics: Electricity and Magnetism	4
<b>Additional Courses</b>		
Select 1 credit of First-Year Seminar		1
CAS 100A	Effective Speech	3
or CAS 100B	Effective Speech	
ECON 102	Introductory Microeconomic Analysis and Policy	3
or ECON 104	Introductory Macroeconomic Analysis and Policy	
ENGL 15	Rhetoric and Composition	3
or ENGL 30	Honors Freshman Composition	
ENGL 202C	Effective Writing: Technical Writing	3
or ENGL 202D	Effective Writing: Business Writing	
Select one of the following:		3
CMPSC 121	Introduction to Programming Techniques	
CMPSC 200	Programming for Engineers with MATLAB	
CMPSC 201	Programming for Engineers with C++	
<i>Additional Courses: Require a grade of C or better</i>		
Select one of the following:		3

ENGR 350	Computational Modeling Methods	
EMCH 407	Computer Methods in Engineering Design	
EMCH 461	Finite Elements in Engineering	

### Supporting Courses and Related Areas

Select 4 credits, in consultation with an adviser, in General Technical Electives from the program approved list 4

### Requirements for the Option

Select an option 45

### Requirements for the Option

#### Applied Materials Option (45 credits)

*Available at the following campuses: DuBois*

Code	Title	Credits
<b>Prescribed Courses</b>		
CHEM 112	Chemical Principles II	3
CHEM 113	Experimental Chemistry II	1
EMCH 212	Dynamics	3
ENGR 320	Materials Properties Measurement I	3
MATSE 400	Crystal Chemistry	3
MATSE 413	Solid-State Materials	3
STAT 200	Elementary Statistics	4
ENGR 421	Materials Properties Measurements II	4
ENGR 450	Materials Design and Applications	3
MATSE 402	Materials Process Kinetics	3
MATSE 411	Processing of Ceramics	3
MATSE 417	Electrical and Magnetic Properties	3
MATSE 430	Materials Characterization	3
<i>Prescribed Courses: Require a grade of C or better</i>		
MATSE 201	Introduction to Materials Science	3
<b>Additional Courses</b>		
<i>Additional Courses: Require a grade of C or better</i>		
ME 300	Engineering Thermodynamics I	3
or EME 301	Thermodynamics in Energy and Mineral Engineering	

### Alternative Energy and Power Generation Option (45 credits)

*Available at the following campuses: Hazleton*

Code	Title	Credits
<b>Prescribed Courses</b>		
CHEM 112	Chemical Principles II	3
CHEM 113	Experimental Chemistry II	1
EE 314	Signals and Circuits II	3
EGEE 302	Principles of Energy Engineering	3
EME 303	Fluid Mechanics in Energy and Mineral Engineering	3
ME 345	Instrumentation, Measurements, and Statistics	4
EE 485	Energy Systems and Conversion	3
EGEE 420	Hydrogen and Fuel Cells	3
<i>Prescribed Courses: Require a grade of C or better</i>		
EE 210	Circuits and Devices	4
<b>Additional Courses</b>		
Select three of the following:		9
EE 488	Power Systems Analysis I	
EGEE 437	Design of Solar Energy Conversion Systems	

EGEE 438	Wind and Hydropower Energy Conversion	
EGEE 441	Electrochemical Engineering Fundamentals	
NUCE 401	Introduction to Nuclear Engineering	

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

ME 300	Engineering Thermodynamics I	3
or EME 301	Thermodynamics in Energy and Mineral Engineering	

#### Supporting Courses and Related Areas

Select 6 credits in Engineering Technical Elective courses, any 400-level courses in the College of Engineering or any 400-level courses with the Energy and Geoenvironmental Engineering (EGEE) abbreviation. Other substitutions outside the approved list must be approved by petition.	6
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#### Multidisciplinary Engineering Design Option (45 credits)

*Available at the following campuses: Abington, Brandywine*

Code	Title	Credits
<b>Prescribed Courses</b>		
CMPEN 271	Introduction to Digital Systems	3
EDSGN 401	Engineering Systems Design	3
EDSGN 402	Materials and Manufacturing	4
EDSGN 403	Product Realization	3
EDSGN 495	Internship	1
EE 210	Circuits and Devices	4
EE 316	Introduction to Embedded Microcontrollers	3
ENGR 407	Technology-Based Entrepreneurship	3

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

EE 310	Electronic Circuit Design I	4
EMCH 212	Dynamics	3
EDSGN 410	Robotics Design and Applications	4

#### Additional Courses

CHEM 112	Chemical Principles II (or any GN)	3
CHEM 113	Experimental Chemistry II (or any GN)	1

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

Select one of the following:	3	
EME 301	Thermodynamics in Energy and Mineral Engineering	
ME 201	Introduction to Thermal Science	
ME 300	Engineering Thermodynamics I	

#### Supporting Courses and Related Areas

Select 3 credits in Engineering Technical Elective courses, in consultation with an adviser, from department list.	3
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## Program Educational Objectives

The Engineering program offers a broad and cross-disciplinary curriculum that prepares students in a variety of technical areas and professional skills for the practice and future development in their profession. Due to their experience in our program, within few years of graduation, we expect our graduates to have the ability to:

1. Practice engineering in their chosen area in the private industry or the government.
2. Assume an increasing level of responsibility and leadership within their respective organizations.

3. Communicate effectively and work collaboratively with internal and external stakeholders in multidisciplinary, advanced technological and multicultural work environments.
4. Maintain a strong commitment to ethical practice with sensitivity for environmental, societal, and economic contexts at local and global levels.
5. Engage in continuous learning through graduate school, professional training programs, and independent study.

## Student Outcomes

Student outcomes describe what students are expected to know and be able to do by the time of graduation. The B.S. Engineering program is designed to enable students to:

1. Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. Communicate effectively with a range of audiences
4. Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. Acquire and apply new knowledge as needed, using appropriate learning strategies.

## 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 need to plan the chosen program of study, and referrals to other specialized resources.

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

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## Suggested Academic Plan Multi-Disciplinary Engineering Design Option at Abington 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.

**If you are starting at a campus other than the one this plan is ending at, please refer here:**

<http://advising.engr.psu.edu/degree-requirements/academic-plans-by-major.aspx>

#### First Year

Fall	Credits Spring	Credits
CHEM 110 (GN) <sup>*#</sup>	3 CAS 100A or 100B (GWS) <sup>††</sup>	3
CHEM 111	1 CHEM 112 (or any GN)	3
EDSGN 100	3 CHEM 113 (or any GN)	1
ENGL 15, 30, or ESL 15 (GWS) <sup>††</sup>	3 General Education Course (GHW)	1.5
First Year Seminar	1 MATH 141 (GQ) <sup>*#†</sup>	4

MATH 140 (GQ) <sup>*#†</sup>	4 PHYS 211 <sup>**</sup>	4
	15	16.5

#### Second Year

Fall	Credits Spring	Credits
CMPEN 271	3 EMCH 212 <sup>*</sup>	3
CMPSC 121, 201, or 200	3 EMCH 213	3
EMCH 211	3 MATH 251	4
MATH 231	2 PHYS 214	2
PHYS 212	4 General Education Course	3
	15	15

#### Third Year

Fall	Credits Spring	Credits
EE 210	4 EE 316	3
ECON 102 or 104 <sup>†</sup>	3 EE 310	4
EDSGN 401	3 ENGL 202C (GWS)	3
ME 201, 300, or EME 301	3 EDSGN 402	4
General Education Course	3 General Education Course	3
	16	17

#### Fourth Year

Fall	Credits Spring	Credits Summer	Credits
EDSGN 410 <sup>*</sup>	4 Engr. Tech. Elective (ETE) EDSGN 420 or ME 480	3 Internship (EDSGN 495)	1
ENGR 350 <sup>*</sup>	3 ENGR 407	3	
ENGR 490	1 ENGR 491	3	
EDSGN 403	3 General Education Course	3	
General Education Course (GHW)	1.5 General Education Course	3	
General Technical Elective(s) (GTE)	4		
	16.5	15	1

Total Credits 127

\* 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 University 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.

GWS, GQ, GHW, GN, GA, GH, and GS are abbreviations used to identify General Education program courses. General Education includes Foundations (GWS and GQ) and Knowledge Domains (GHW, GN, GA, GH, GS, and Integrative Studies). Foundations courses (GWS and GQ) require a grade of 'C' or better.

Integrative Studies courses are required for the General Education program. N is the suffix at the end of a course number used to designate an Inter-Domain course and Z is the suffix at the end of a course number used to designate a Linked course.

### College Notes

General Technical Electives (GTE) are four credits of engineering, science or mathematics at a similar or higher level required for the major. Choose at least four credits from the program approved list of courses: BIOL 141(3), BIOL 142(1), CHEM 202(3), CHEM 210(3), CMPEN 270(4), CMPEN 271(3), CMPEN 275(1), EDSGN 110(2), EDSGN 210(2), E MCH 315(2), E MCH 316(1), MATH 220 GQ(2-3), MATH 232(2) and PHYS 213(2). Other GTE credits will be considered through the petition process.

Upper division engineering courses will be offered in combination at both Penn State Abington and Penn State Great Valley

EDSGN 495(1) requires 300 hours of work and may be scheduled during the summer semester after the second or third year

### Course lists:

General Technical Electives (GTE) are 4 credits of engineering, science, or mathematics at a similar or higher level required for the major. Choose from:

BIOL 141 Introductory Physiology (3 cr.)  
 BIOL 142 Physiology Laboratory (1 cr.)  
 CHEM 202 Fundamentals of Organic Chemistry I (3 cr.) or CHEM 210 Organic Chemistry I (3 cr.)  
 CMPEN 270 Digital Design: Theory and Practice (4 cr.)  
 CMPEN 271 Introduction to Digital Systems (3 cr.)  
 CMPEN 275 Digital Design Laboratory (1 cr.)  
 EDSGN 110 Spatial Analysis in Engineering Design (2 cr.)  
 EDSGN 210 Tolerancing and Spatial Models (2 cr.)  
 EMCH 212 Dynamics (3 cr.) (Alternative Energy and Power Distribution Option only)  
 EMCH 315 Mechanical Response of Engineering Materials (2 cr.)  
 EMCH 316 Experimental Determination of Mechanical Response of Materials (1 cr.)  
 MATH 220 Matrices (2-3 cr.)  
 MATH 232 Integral Vector Calculus (2 cr.)  
 MATH 310 Elementary Combinatorics (3 cr.)  
 PHYS 213 General Physics: Fluids and Thermal Physics (2 cr.)  
 Other GTE credits will be considered through the petition process.

Engineering Technical Electives are 3 credits of engineering courses at the 300 or 400 level. Choose from:

EDSGN 420 Advanced Robotics Design and Applications (3 cr.)  
 ME 380 Machine Dynamics (3 cr.)  
 ME 345 Instrumentation, Measurements, and Statistics (4 cr.)  
 ME 357 System Dynamics (3 cr.)

ME 480 Mechanism Design and Analysis (3 cr.)

Students are expected to complete the version of CMPSC that is required for their intended major. The requirement varies across College of Engineering majors. Students should plan the CMPSC course requirement carefully with the assistance of an academic adviser.

### These courses offered at Abington in fall semester only:

CMPEN 271 Introduction to Digital Systems (3 cr.)  
 EMCH 211 Statics (3 cr.)

### These courses offered at Abington in spring semester only:

CHEM 112 Chemical Principles II (3 cr.)  
 CHEM 113 Experimental Chemistry II (1 cr.)  
 EE 210 Circuits and Devices (4 cr.)  
 EMCH 212 Dynamics (3 cr.)  
 EMCH 213 Strength of Materials (3 cr.)  
 MATH 251 Ordinary and Partial Differential Equations (4 cr.)  
 PHYS 214 General Physics: Wave Motion and Quantum Physics (2 cr.)

## Multi-Disciplinary Engineering Design Option at Brandywine 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.

**If you are starting at a campus other than the one this plan is ending at, please refer here:**

<http://advising.engr.psu.edu/degree-requirements/academic-plans-by-major.aspx>

### First Year

Fall	Credits Spring	Credits
CHEM 110 (GN) <sup>*#</sup>	3 CAS 100A or 100B (GWS)	3
CHEM 111	1 CHEM 112 (or any GN)	3
EDSGN 100	3 CHEM 113 (or any GN)	1
ENGL 15, 30, or ESL 15 (GWS) <sup>††</sup>	3 General Education Course (GHW)	1.5
First Year Seminar	1 MATH 141 (GQ) <sup>*†#</sup>	4
MATH 140 (GQ) <sup>*†#</sup>	4 PHYS 211 (GN) <sup>*#</sup>	4
	15	16.5

### Second Year

Fall	Credits Spring	Credits
CMPEN 271	3 EMCH 212 <sup>*</sup>	3
CMPSC 121, 201, or 200	3 EMCH 213	3
EMCH 211	3 MATH 251	4
MATH 231	2 PHYS 214	2

PHYS 212	4 General Education Course	3	
	15	15	
<b>Third Year</b>			
<b>Fall</b>	<b>Credits Spring</b>	<b>Credits</b>	
EE 210	4 EE 316	3	
ECON 102 or 104 <sup>†</sup>	3 EE 310	4	
EDSGN 401	3 ENGL 202C	3	
ME 201, 300, or EME 301	3 EDSGN 402	4	
General Education Course	3 General Education Course	3	
	16	17	
<b>Fourth Year</b>			
<b>Fall</b>	<b>Credits Spring</b>	<b>Credits Summer</b>	<b>Credits</b>
EDSGN 410*	4 Engr. Tech. Elective (ETE) EDSGN 420 or ME 480	3 Internship (EDSGN 495)	1
ENGR 350*	3 ENGR 407	3	
ENGR 490	1 ENGR 491	3	
EDSGN 403	3 General Education Course	3	
General Education Course (GHW)	1.5 General Education Course	3	
General Technical Elective(s) (GTE)	4		
	16.5	15	1

Total Credits 127

\* 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 University 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.

GWS, GQ, GHW, GN, GA, GH, and GS are abbreviations used to identify General Education program courses. General Education includes Foundations (GWS and GQ) and Knowledge Domains (GHW, GN, GA, GH, GS, and Integrative Studies). Foundations courses (GWS and GQ) require a grade of 'C' or better.

Integrative Studies courses are required for the General Education program. N is the suffix at the end of a course number used to designate an Inter-Domain course and Z is the suffix at the end of a course number used to designate a Linked course.

**College Notes**

General Technical Electives (GTE) are four credits of engineering, science or mathematics at a similar or higher level required for the major. Choose at least four credits from the program approved list of courses: BIOL 141(3), BIOL 142(1), CHEM 202(3), CHEM 210(3), CMPEN 270(4), CMPEN 271(3), CMPEN 275(1), EDSGN 110(2), EDSGN 210(2), E MCH 315(2), E MCH 316(1), MATH 220 GQ(2-3), MATH 232(2) and PHYS 213(2). Other GTE credits will be considered through the petition process.

Upper division engineering courses will be offered at Penn State Great Valley.

**EDSGN 495(1) requires 300 hours of work and may be scheduled during the summer semester after the second or third year.****Applied Materials Option at DuBois 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.**If you are starting at a campus other than the one this plan is ending at, please refer here:**<http://advising.engr.psu.edu/degree-requirements/academic-plans-by-major.aspx>**First Year**

<b>Fall</b>	<b>Credits Spring</b>	<b>Credits</b>
CHEM 110 (GN) <sup>*#</sup>	3 CAS 100 (GWS) <sup>††</sup>	3
CHEM 111	1 CHEM 112 (GN)	3
EDSGN 100	3 CHEM 113	1
ENGL 15, 30, or ESL 15 (GWS) <sup>††</sup>	3 MATH 141 (GQ) <sup>*#†</sup>	4
First Year Seminar	1 PHYS 211 (GN) <sup>*#</sup>	4
MATH 140 (GQ) <sup>*‡#</sup>	4 General Education Course (GHW)	1.5
	15	16.5

**Second Year**

<b>Fall</b>	<b>Credits Spring</b>	<b>Credits</b>
ECON 102 or 104 <sup>†</sup>	3 CMPSC 121, 200, or 201	3
EMCH 211*	3 EMCH 213	3
General Education Course	3 MATH 251 <sup>*‡#</sup>	4
General Education Course (GHW)	1.5 ME 300 or EME 301*	3
MATH 231	2 PHYS 214*	2
PHYS 212	4	
	16.5	15

**Third Year**

<b>Fall</b>	<b>Credits Spring</b>	<b>Credits</b>
General Education Course	3 EMCH 212	3

General Technical Elective	2 ENGR 320	3
MATSE 201*	3 ENGR 350*	3
MATSE 400	3 MATSE 413	3
STAT 200	4 ENGL 202C	3
	General Technical Elective	2
	15	17

**Fourth Year**

Fall	Credits Spring	Credits
ENGR 421*	4 ENGR 450	3
ENGR 490	1 ENGR 491	3
General Education Course	3 General Education Course	3
General Education Course	3 MATSE 411	3
MATSE 402	3 MATSE 417 or ESC 417	3
MATSE 430	3	
	17	15

Total Credits 127

\* 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 University 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.

GWS, GQ, GHW, GN, GA, GH, and GS are abbreviations used to identify General Education program courses. General Education includes Foundations (GWS and GQ) and Knowledge Domains (GHW, GN, GA, GH, GS, and Integrative Studies). Foundations courses (GWS and GQ) require a grade of 'C' or better.

Integrative Studies courses are required for the General Education program. N is the suffix at the end of a course number used to designate an Inter-Domain course and Z is the suffix at the end of a course number used to designate a Linked course.

**College Notes**

General Technical Electives are 4 credits of engineering, science or mathematics at a similar or higher level required for the major.

**Choose from:** BIOL 141 GN(3), BIOL 142(1), CHEM 202(3) or CHEM 210(3), CMPEN 270(4), CMPEN 271(3), CMPEN 275(1), EDGSGN 110(2), EDGSGN 210(2), E MCH 212(3) (Alternative Energy and Power Distribution Track only), E MCH 315(2), E MCH 316(1), MATH 220 GQ(2-3), MATH 232(2), MATH 310(3), and PHYS 213 GN(2).

Other GTE credits will be considered through the petition process.

**Alternative Energy and Power Generation Option at Hazleton 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.

**If you are starting at a campus other than the one this plan is ending at, please refer here:**

<http://advising.engr.psu.edu/degree-requirements/academic-plans-by-major.aspx>

**First Year**

Fall	Credits Spring	Credits
MATH 140 <sup>*†#†</sup>	4 MATH 141 <sup>*†#†</sup>	4
CHEM 110 <sup>*#†</sup>	3 PHYS 211 <sup>*#†</sup>	4
CHEM 111 <sup>†</sup>	1 CHEM 112 <sup>†</sup>	3
ENGL 15 or 30 <sup>††</sup>	3 CHEM 113 <sup>†</sup>	1
EDSGN 100	3 ECON 102 or 104 <sup>†</sup>	3
PSU 8	1 CAS 100A or 100B <sup>††</sup>	3
	15	18

**Second Year**

Fall	Credits Spring	Credits
MATH 251 <sup>*#</sup>	4 MATH 231	2
PHYS 212 <sup>*#†</sup>	4 EE 210 <sup>*</sup>	4
EMCH 211 <sup>*</sup>	3 EMCH 213	3
CMPSC 200 <sup>2</sup>	3 ME 300 <sup>*</sup>	3
GTE - General Tech Elective <sup>1</sup>	3 General Education Course	3
	17	15

**Third Year**

Fall	Credits Spring	Credits
EE 314	3 ENGR 350 <sup>*</sup>	3
EME 303	3 PHYS 214 <sup>†</sup>	2
ME 345	4 ENGL 202C or 202D <sup>††</sup>	3
General Education Course	3 General Education Course (GHW)	1.5
GTE - General Tech Elective <sup>1</sup>	1 EGEE 302	3
General Education Course (GHW)	1.5 NUCE 401 (Engrg. Tech. Elective) <sup>3</sup>	3
	15.5	15.5

**Fourth Year**

Fall	Credits Spring	Credits
EE 485	3 EE 488 (Engrg. Tech. Elective) <sup>3</sup>	3
EGEE 438 (Engrg. Tech. Elective) <sup>3</sup>	3 EGEE 420	3
EGEE 441 (Engrg. Tech. Elective) <sup>3</sup>	3 ENGR 491W	3
ENGR 490	1 General Education Course	3
General Education Course	3 EGEE 437 (Engrg. Tech. Elective) <sup>3</sup>	3
General Education Course	3	
	16	15

Total Credits 127

\* 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 University 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.

GWS, GQ, GHW, GN, GA, GH, and GS are abbreviations used to identify General Education program courses. General Education includes Foundations (GWS and GQ) and Knowledge Domains (GHW, GN, GA, GH, GS, and Integrative Studies). Foundations courses (GWS and GQ) require a grade of 'C' or better.

Integrative Studies courses are required for the General Education program. N is the suffix at the end of a course number used to designate an Inter-Domain course and Z is the suffix at the end of a course number used to designate a Linked course.

<sup>1</sup> General Technical Electives (GTE) are 4 credits of engineering, science, or mathematics at a similar or higher level required for the major. Consultation with adviser is recommended to select the proper course.

<sup>2</sup> Students can take CMPSC 200, CMPSC 201 or CMPSC 121. Consultation with adviser is recommended to select the proper course.

<sup>3</sup> Select 9 credits from NUCE 401, EE 488, EGEE 437, EGEE 438, EGEE 441 and 6 Engineering Technical Elective credits from any 400 level Engineering or EMS course. See adviser for details.

## **Career Paths**

Graduates from the engineering program have built successful careers in a variety of fields including systems engineering, design, process engineering, product development, manufacturing, materials, and energy and power.

MORE INFORMATION (<http://career.engr.psu.edu>)

## **Opportunities for Graduate Studies**

Graduates from the engineering program may advance their education with a graduate degree in a multitude of science, engineering, and technology fields.

MORE INFORMATION (<http://www.engr.psu.edu/students/grad-prospective/default.aspx>)

## **Accreditation**

The baccalaureate program in General Engineering is accredited by the Engineering Accreditation Commission of ABET, [www.abet.org](http://www.abet.org) (<http://www.abet.org>).

MORE INFORMATION (<http://www.abet.org>)

## **Contact**

### **University Park**

SCHOOL OF ENGINEERING DESIGN, TECHNOLOGY, AND PROFESSIONAL PROGRAMS

213 Hammond Building  
University Park, PA 16802  
814-865-2952

<http://www.sedtapp.psu.edu>

### **Abington**

DIVISION OF SCIENCE AND ENGINEERING

1600 Woodland Road  
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### **Brandywine**

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### **DuBois**

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### **Hazleton**

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<http://hazleton.psu.edu/bachelor-science-general-engineering>