Admission to the Electrical Engineering major also requires that the applicant have a cumulative GPA of 2.6 or higher by the end of the semester during which the admission to major process is carried out.

1 In the event that the major is under enrollment control, a higher minimum cumulative grade-point average is likely to be needed and students must be enrolled in the College of Engineering or Division of Undergraduate Studies at the time of confirming their major choice.
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). For more information, check the Suggested Academic Plan for your intended program.

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

Code | Title | Credits
--- | --- | ---
EDSGN 100 | Introduction to Engineering Design | 3
EE 200 | Design Tools | 3
EE 300 | Design Process | 3
EE 403 | Capstone Design | 3
ENGL 202C | Effective Writing: Technical Writing | 3
MATH 220 | Matrices | 2-3
PHYS 214 | General Physics: Wave Motion and Quantum Physics | 2

Prescribed Courses: Require a grade of C or better
CHEM 110 | Chemical Principles I | 3
EE 210 | Circuits and Devices | 4
EE 310 | Electronic Circuit Design I | 4
EE 330 | Engineering Electromagnetics | 4
EE 340 | Introduction to Nanoelectronics | 4
EE 350 | Continuous-Time Linear Systems | 4
MATH 140 | Calculus With Analytic Geometry I | 4
MATH 141 | Calculus With Analytic Geometry II | 4
PHYS 211 | General Physics: Mechanics | 4
PHYS 212 | General Physics: Electricity and Magnetism | 4

Additional Courses
- Select 1 credit of First-Year Seminar
- CAS 100A or CAS 100B or ENGL 138
- CMPSC 121 or CMPSC 131
- CMPSC 122 or CMPSC 132
- ECON 102 or ECON 104
- ENGL 15 or ENGL 30 or ENGL 137
- MATH 231 & MATH 232 or MATH 230
- Select 3-4 credits of the following:
  - IE 424
  - PHYS 410
  - STAT 401
  - STAT 414
  - STAT 418
- Additional Courses: Require a grade of C or better
  - CMPEN 271
  - CMPEN 275 & CMPEN 270
  - MATH 250 & MATH 251
- Select 6 credits from program-approved list of 300-level courses
- Select 3 credits from program-approved lists of 300-level or 400-level courses
- Select 6 credits from program-approved list of 400-level courses
- Select 6 additional credits, which may include up to 6 credits of ROTC, up to 6 co-op credits, and others from a program-approved list

Supporting Courses and Related Areas
- Select 6 credits from program-approved list of 300-level courses
- Select 3 credits from program-approved lists of 300-level or 400-level courses
- Select 6 credits from program-approved list of 400-level courses
- Select 6 additional credits, which may include up to 6 credits of ROTC, up to 6 co-op credits, and others from a program-approved list

1. CMPEN 275 does not require a grade of C or better.

Program Educational Objectives
The BSEE Program provides undergraduates with a broad technical education important for employment in the private or public sector, and it teaches them the fundamentals, current issues, and creative problem solving skills essential for future years of learning. At three to five years after graduation, we foresee our graduates able to accomplish the following:
1. Electrical engineering practice in technical assignments such as design, product development, research, manufacturing, consulting, testing, sales, and management;
2. Participation and leadership on teams comprised of individuals with diverse professional and cultural backgrounds;
3. Continued learning and professional development through such activities as graduate school, distance education, professional training, and membership in professional societies.

**Student Outcomes**

Student outcomes describe what students are expected to know and be able to do by the time of graduation. The Electrical 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 advising relationship. 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 advising relationship.

**University Park**

David Salvia  
Director of Academic Affairs  
114 EE East  
University Park, PA 16802  
814-865-7227  
dsalvia@psu.edu

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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 2019-20 academic year. To access previous years' suggested academic plans, please visit the archive (http://bulletins.psu.edu/undergraduate/archive) to view the appropriate Undergraduate Bulletin edition (Note: the archive only contain suggested academic plans beginning with the 2018-19 edition of the Undergraduate Bulletin).

**Ending at University Park 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**

<table>
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<tr>
<th>Course</th>
<th>Credits Spring</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHEM 110 (GN)</td>
<td>3</td>
<td>CMPSC 121 or 131</td>
</tr>
<tr>
<td>EE 8 or 9 (or First Year Seminar)</td>
<td>3</td>
<td>ECON 102 or 104 (GS)</td>
</tr>
<tr>
<td>ENGL 15, 30, or ESL 15 (GWS)</td>
<td>3</td>
<td>EDSSG 100</td>
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<tr>
<td>MATH 140 or 140E (GQ)</td>
<td>4</td>
<td>MATH 141 or 141E (GQ)</td>
</tr>
<tr>
<td>PHYS 211 (PHYS 211L and PHYS 211R (GN))</td>
<td>4</td>
<td>PHYS 212 (PHYS 212L and PHYS 212R (GN))</td>
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| Credits | 15 |

**Second Year**

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<td>CAS 100A or 100B (GWS)</td>
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<tr>
<td>CMPSC 122 or 132</td>
<td>3</td>
<td>EE 200</td>
</tr>
<tr>
<td>EE 210*</td>
<td>4</td>
<td>EE 310*</td>
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<td>MATH 220</td>
<td>2</td>
<td>MATH 230</td>
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<tr>
<td>MATH 250*#†</td>
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<td>MATH 214</td>
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| Credits | 16-17 |

**Third Year**

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<td>EE 300 (Writing Intensive)</td>
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<tr>
<td>EE 340*</td>
<td>4</td>
<td>ENGL 202C (GWS)</td>
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<td>EE 350*</td>
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<td>General Education Course†</td>
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<tr>
<td>General Education Course (GHW)†</td>
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<td>General Education Course†</td>
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</table>

| Credits | 16.5 |

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‡††

*‡#†
Fourth Year

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<th>Fall</th>
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<th>Spring</th>
<th>Credits</th>
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<tr>
<td>EE 403</td>
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<td>EE/CMPEN 400-Level Elective</td>
<td>3</td>
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<tr>
<td>EE/CMPEN 300/400-Level Elective</td>
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<td>EE/CMPEN 400-Level Elective</td>
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<td>Related Elective</td>
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<td>Related Elective</td>
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<td>Statistics Elective</td>
<td>3</td>
<td>General Education Course†</td>
<td>3</td>
</tr>
<tr>
<td>General Education Course†</td>
<td>3</td>
<td>General Education Course†</td>
<td></td>
</tr>
<tr>
<td>General Education Course‡</td>
<td></td>
<td>General Education Course (GHW)‡</td>
<td>1.5</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td>15</td>
<td><strong>Total Credits</strong></td>
<td>16.5</td>
</tr>
</tbody>
</table>

* 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.

All incoming Schreyer Honors College first-year students at University Park will take ENGL/CAS 137 in the fall semester and ENGL/CAS 138 in the spring semester. These courses carry the GWS designation and replace both ENGL 30 and CAS 100. Each course is 3 credits.

College Note

**E E/CMPEN 300-Level Elective:** Select from department list.

**E E/CMPEN 300/400-Level Elective:** Select from department list.

**E E/CMPEN 400-Level Elective:** Select from department list.

Health and Physical Activity Elective: Students who complete the ROTC Program may substitute 3 ROTC credits for the GHW requirement and 3 ROTC credits for a Related Elective.

Related Elective: Students who complete the ROTC Program may substitute 3 ROTC credits for the GHW requirement and 3 ROTC credits for a Related Elective. Students who complete the Cooperative Education Program may substitute up to 6 co-op credits for the Related Electives.

Statistics Elective: Select from department list.

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Career Paths

**CAREERS**

An electrical engineer is responsible for designing and integrating electronic/electrical systems in diverse industries such as defense, communications, transportation, manufacturing, healthcare, construction, power/energy, and entertainment. Some graduates work as design engineers in research labs where they help design state-of-the-art electronic circuits, devices, and systems. Others work in a manufacturing environment where they help improve the manufacturing of existing products. Still others may work in post-production jobs where they deal with technical sales, field testing, or trouble shooting. Some graduates even serve as consultants who are hired by companies to help solve their technical problems.

Some examples of career opportunities include: circuit design for consumer electronics; design of power systems and industrial automation for manufacturing; design of communications systems; signal processing software and hardware development for audio and video applications; image processing and computer vision for medical imaging; software design and algorithm development for artificial intelligence, cyber security, and other big data analytics.

The average entry-level salary for electrical engineers is $73,000.

MORE INFORMATION ABOUT POTENTIAL CAREER OPTIONS FOR GRADUATES OF THE ELECTRICAL ENGINEERING PROGRAM (http://www.eecs.psu.edu/students/undergraduate/EECS-Students-Undergrad-EE-Specialization.aspx)

Opportunities for Graduate Studies

A graduate degree can broaden your educational credentials and improve your marketability in the global workplace. Students who graduate with a Bachelor of Science Degree in Electrical Engineering are well-prepared to continue their technical education with a Master's or PhD degree in electrical engineering or related fields such as physics or computer science and engineering. These technical graduate degrees prepare students for employment in research labs or higher education.

Penn State offers M.S. and Ph.D. degrees in Electrical Engineering and in Computer Science and Engineering. All of these graduate programs are highly recognized for producing graduates with strong academic credentials who can perform both theoretical and experimental research. In addition to traditional technical degrees, some of our graduates opt to get professional degrees in medicine, law or business administration so that they can pursue careers in fields such as medical imaging, patent law, and engineering management.

MORE INFORMATION ABOUT OPPORTUNITIES FOR GRADUATE STUDIES (http://www.eecs.psu.edu/students/graduate/EECS-How-to-apply-EE.aspx)

Professional Resources

- Penn State IEEE (http://sites.psu.edu/psuieee)
- Eta Kappa Nu (http://sites.psu.edu/hkneecs)
- Association of Women in Computing (http://awc.cse.psu.edu)
- Penn State SPIE/OSA (http://spie.ee.psu.edu/about.html)
- Association of Computing Machinery (https://acm.psu.edu)
Accreditation
The baccalaureate program in Electrical Engineering is accredited by the Engineering Accreditation Commission of ABET, www.abet.org (http://www.abet.org).

MORE INFORMATION ABOUT ABET ACCREDITATION (http://www.abet.org)

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