NUCLEAR ENGINEERING, B.S.

Begin Campus: Any Penn State Campus

End Campus: University Park

Degree Requirements

For the Bachelor of Science degree in Nuclear Engineering, a minimum of 129 credits is required:

- **General Education**: 45 credits
- **Requirements for the Major**: 111 credits

27 of the 45 credits for General Education are included in the Requirements for the Major. This includes: 9 credits of GN courses; 6 credits of GQ courses; 3 credits of GS courses; 9 credits of GWS 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 (http://senate.psu.edu/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#82-44).

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Education</td>
<td>45</td>
</tr>
<tr>
<td>Requirements for the Major</td>
<td>111</td>
</tr>
</tbody>
</table>

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

- **NUCE 450**: Radiation Detection and Measurement 3
- **PHYS 211**: General Physics: Mechanics 4
- **PHYS 212**: General Physics: Electricity and Magnetism 4

Select one of the following:

- **ECON 102**: Introductory Microeconomic Analysis and Policy 3
- **ECON 104**: Introductory Macroeconomic Analysis and Policy 3
- **EBF 200**: Introduction to Energy and Earth Sciences Economics 3

Select 6 credits, of which 3 credits must be designated as design, from the following:

- **BME 406**: Medical Imaging 1
- **NUCE 405**: Radiation Shielding 1
- **NUCE 409**: Nuclear Materials 1
- **NUCE 420**: Radiological Safety 1
- **NUCE 428**: Radioactive Waste Control 1
- **NUCE 470**: Power Plant Simulation 1
- **NUCE 490**: Introduction to Plasmas 1
- **NUCE 496**: Independent studies 1
- **NUCE 497**: Special Topics 1
- **500-level NUCE courses with approval of adviser** 1

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

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 111</td>
<td>Experimental Chemistry I</td>
<td>1</td>
</tr>
<tr>
<td>EE 212</td>
<td>Introduction to Electronic Measuring Systems</td>
<td>3</td>
</tr>
<tr>
<td>EMCH 211</td>
<td>Statics</td>
<td>3</td>
</tr>
<tr>
<td>EMCH 212</td>
<td>Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>EMCH 213</td>
<td>Strength of Materials</td>
<td>3</td>
</tr>
<tr>
<td>EMCH 315</td>
<td>Mechanical Response of Engineering Materials</td>
<td>2</td>
</tr>
<tr>
<td>EMCH 316</td>
<td>Experimental Determination of Mechanical</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Response of Materials</td>
<td></td>
</tr>
<tr>
<td>MATH 230</td>
<td>Calculus and Vector Analysis</td>
<td>4</td>
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<tr>
<td>ME 300</td>
<td>Engineering Thermodynamics I</td>
<td>3</td>
</tr>
<tr>
<td>ME 320</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>ME 410</td>
<td>Heat Transfer</td>
<td>3</td>
</tr>
<tr>
<td>NUCE 310W</td>
<td>Issues in Nuclear Engineering</td>
<td>2</td>
</tr>
<tr>
<td>NUCE 403</td>
<td>Advanced Reactor Design</td>
<td>3</td>
</tr>
<tr>
<td>NUCE 451</td>
<td>Experiments in Reactor Physics</td>
<td>3</td>
</tr>
<tr>
<td>NUCE 431W</td>
<td>Nuclear Reactor Core Design Synthesis</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 214</td>
<td>General Physics: Wave Motion and Quantum</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Physics</td>
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</tbody>
</table>

### Supporting Courses and Related Areas

Select 3 credits in General Technical Elective (GTE) courses from department list

- **CAS 100A**: Effective Speech 3
- or **CAS 100B**: Effective Speech 3
- **ENGL 15**: Rhetoric and Composition 3
- or **ENGL 30H**: Honors Rhetoric and Composition 3

1. These courses may have to be chosen so that the engineering design or engineering science requirements for the major are met.

2. Students who complete Basic ROTC may substitute 6 of the ROTC credits for 3 credits of GTE and 3 credits of GHW.

**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.)
- 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

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.