PETROLEUM AND NATURAL GAS ENGINEERING, B.S.

Begin Campus: Any Penn State Campus

End Campus: University Park

Degree Requirements

For the Bachelor of Science degree in Petroleum and Natural Gas Engineering, a minimum of 129 credits is required:

<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>114</td>
</tr>
</tbody>
</table>

30 of the 45 credits for General Education are included in the Requirements for the Major. This includes: 3 credits of GH courses; 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 (https://senate.psu.edu/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#82-44).

Select 9 credits: one course from categories A, B, and C:

A. ENGL 15 Rhetoric and Composition
   or ENGL 30H Honors Rhetoric and Composition

B. PHIL 103 Ethics
   PHIL 106 Business Ethics
   PHIL 107 Philosophy of Technology
   PHIL 233 Ethics and the Design of Technology

C. CMPSC 201 Programming for Engineers with C++
   or CMPSC 202

Supporting Courses and Related Areas

Select 6 credits in consultation with adviser (students may apply 6 credits of ROTC)

1. The following substitutions are allowed for students attending campuses where the indicated course is not offered: CAS 100 can be substituted for EMSC 100S.
2. Students at commonwealth campuses and/or transfer students can substitute the combination of EMCH 211 and EMCH 213.

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.

<table>
<thead>
<tr>
<th>Prescribed Courses</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 110 Chemical Principles I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 112 Chemical Principles II</td>
<td>3</td>
</tr>
<tr>
<td>EME 301 Thermodynamics in Energy and Mineral Engineering</td>
<td>3</td>
</tr>
<tr>
<td>EME 303 Fluid Mechanics in Energy and Mineral Engineering</td>
<td>3</td>
</tr>
<tr>
<td>MATH 140 Calculus With Analytic Geometry I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 141 Calculus with Analytic Geometry II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 140 Calculus With Analytic Geometry I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 141 Calculus with Analytic Geometry II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 211 General Physics: Mechanics</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 212 General Physics: Electricity and Magnetism</td>
<td>4</td>
</tr>
<tr>
<td>PNG 405 Rock and Fluid Properties</td>
<td>3</td>
</tr>
<tr>
<td>PNG 406 Rock and Fluid Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>PNG 410 Applied Reservoir Engineering</td>
<td>3</td>
</tr>
<tr>
<td>PNG 450 Drilling Engineering</td>
<td>3</td>
</tr>
<tr>
<td>PNG 451 Drilling Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>PNG 475 Production and Completions Engineering</td>
<td>3</td>
</tr>
</tbody>
</table>

Prescribed Courses: Require a grade of C or better
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