ENERGY BUSINESS AND
FINANCE, B.S.

Begin Campus: Any Penn State Campus
End Campus: University Park

Program Description
The major in Energy Business and Finance, offered jointly by the College of Earth and Mineral Sciences and the Smeal College of Business, combines training in business, economics, finance, and the physical sciences with a core of courses focusing on energy and related industries. The major helps students prepare for careers in the energy industry, as well as financial institutions, nonprofit groups, and international organizations dealing with energy issues. The curriculum also provides a strong base for further study in business, economics, law, and social sciences.

General Option
The General option of the Energy Business and Finance major is appropriate for students who want a broad understanding of the earth and environmental sciences in preparation for careers in industry, commerce, and government.

Energy Land Management Option
The Energy Land Management Option in the major of Energy Business and Finance focuses on issues in the acquisition of sub-surface exploration rights. Thus, it is designed to prepare students for a career as a land professional in an energy exploration company. The curriculum, designed in consultation with the American Association of Professional Landmen, requires courses in real estate fundamentals, energy law, geographic information sciences, petroleum engineering, and petroleum geology.

What is Energy Business and Finance?
The solutions to society’s existing and emerging energy challenges require interdisciplinary approaches integrating economics and business with the technical knowledge of energy systems and implications for our environment. That’s where Energy Business and Finance experts come in. Our graduates use their knowledge of energy commodity markets, statistics and risk analysis, and project finance related to energy systems and environmental issues to shape the future of energy production. The major was designed to help students build critical analytical skills in preparation for careers with energy companies, public agencies, and the financial institutions that are investing globally in emerging energy technologies.

You Might Like This Program If...
- You want to work in the energy sector.
- You enjoy analytical thinking and complex problem solving.
- You are passionate about paving the way for a sustainable energy future.

Entrance to Major
To be eligible for entrance into the Energy Business and Finance major, a degree candidate must satisfy requirements for entrance to major. Specific entrance requirements include:

1. The degree candidate must have completed more than 29.1 credits of course work.
2. The degree candidate must have a cumulative grade point average of at least 2.0.
3. Complete the following entrance to major requirements with a grade of C or better: ECON 102, MATH 140.

Degree Requirements
For the Bachelor of Science degree in Energy Business and Finance, a minimum of 120 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>Electives</td>
<td>0-12</td>
</tr>
<tr>
<td>Requirements for the Major</td>
<td>90-102</td>
</tr>
</tbody>
</table>

25-27 of the 45 credits of General Education are included in the Requirements for the Major. This includes: 4-6 credits of GN courses, 9 credits of GWS courses, 6 credits of GQ courses, and 6 credits of GS 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).

Common Requirements for the Major (All Options)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCTG 211</td>
<td>Financial and Managerial Accounting for Decision Making</td>
<td>4</td>
</tr>
<tr>
<td>EBF 473</td>
<td>Risk Management in Energy Industries</td>
<td>3</td>
</tr>
<tr>
<td>ECON 104</td>
<td>Introductory Macroeconomic Analysis and Policy</td>
<td>3</td>
</tr>
<tr>
<td>IB 303</td>
<td>International Business Operations</td>
<td>3</td>
</tr>
</tbody>
</table>

Prescribed Courses: Require a grade of C or better
- EBF 200 Introduction to Energy and Earth Sciences Economics 3
- EBF 301 Global Finance for the Earth, Energy, and Materials Industries 3
- EBF 304W Management for the Energy and Resource Industries 3
- EBF 401 Strategic Corporate Finance for the Earth, Energy, and Materials Industries 3
- ECON 102 Introductory Microeconomic Analysis and Policy 3
- ECON 302 Intermediate Microeconomic Analysis 3
- EME 460 Geo-resource Evaluation and Investment Analysis 3
- MATH 140 Calculus With Analytic Geometry I 4
- MATH 141 Calculus with Analytic Geometry II 4
- RM 302 Risk and Insurance 3

Additional Courses
- CAS 100 Effective Speech 3
- ENGL 15 Rhetoric and Composition 3
- ENGL 30H Honors Rhetoric and Composition 3
- ENGL 202C Effective Writing: Technical Writing 3
or ENGL 202D Effective Writing: Business Writing

Select 3 credits of the following: 3

CMPSC 101 Introduction to Programming
CMPSC 200 Programming for Engineers with MATLAB
CMPSC 201 Programming for Engineers with C++

Select 3 credits of the following: 3

BA 243 Social, Legal, and Ethical Environment of Business
BLAW 243 Legal Environment of Business
ERM 411 Legal Aspects of Resource Management

Additional Courses: Require a grade of C or better

EBF 483 Introduction to Electricity Markets 3
or EBF 484 Energy Economics

Select 3 credits of the following: 3

EBF 472 Quantitative Analysis in Earth Sciences
STAT 301
STAT 401 Experimental Methods

Requirements for the Option

Select an option 24-36

Requirements for the Option

Energy Land Management Option (25 credits)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBF 402</td>
<td>Energy Law and Contracts</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 363</td>
<td>Geographic Information Systems</td>
<td>3</td>
</tr>
</tbody>
</table>

Prescribed Courses: Require a grade of C or better

GEOG 160 Mapping Our Changing World 3
GEOG 1 Physical Geology 3

Additional Courses

EBF 410 Petroleum and Natural Gas Operations 3
or PNG 405 Rock and Fluid Properties

EBF 411 Petroleum and Natural Gas Geology for Land Professionals 3
or GEOSC 454 Geology of Oil and Gas

Additional Courses: Require a grade of C or better

PHYS 211 General Physics: Mechanics 4
or PHYS 250 Introductory Physics I

Select 3 credits of the following: 3

GEOG 361 Cartography–Maps and Map Construction
GEOG 362 Remote Sensing and Image Analysis
GEOG 364 Spatial Analysis
GEOG 463 Geospatial Information Management

General Option (24-36 credits)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
</table>

Additional Courses

Select 6-7 credits of the following: 6-7

CHEM 110 Chemical Principles I
EARTH 100 Environment Earth
EARTH 101 Natural Disasters: Hollywood vs. Reality
EARTH 103N Earth in the Future: Predicting Climate Change and Its Impacts Over the Next Century
EARTH 111N Water: Science and Society

EARTH 150 Dinosaur Extinctions and Other Controversies
EGEE 101 Energy and the Environment
EGEE 102 Energy Conservation for Environmental Protection
EGEE 120 Oil: International Evolution
GEOG 110 Climates of the World
GEOG 115 Landforms of the World
GEOSC 2 Historical Geology
GEOSC 10 Geology of the National Parks
GEOSC 20 Planet Earth
GEOSC 21 Earth and Life: Origin and Evolution
GEOSC 40 The Sea Around Us
MATSE 81 Materials in Today’s World
METEO 3 Weather Revealed: Introductory Meteorology
METEO 101 Understanding Weather Forecasting
PHYS 211 General Physics: Mechanics
or PHYS 250 Introductory Physics I

Select 3 credits of the following: 3

CED 404 Community, Environment and Development Research Methods
CED 429 Natural Resource Economics
CED 431

EBF 411 Petroleum and Natural Gas Geology for Land Professionals
EBF 483 Introduction to Electricity Markets (if not selected for requirement for the major)

ECON 490

EME 301 Thermodynamics in Energy and Mineral Engineering
GEOG 424 Geography of the Global Economy
GEOG 430 Human Use of Environment
GEOG 431 Geography of Water Resources
GEOG 444 Resource Governance in Africa
GEOG 493 Service Learning
GEOSC 402Y Natural Disasters
GEOSC 454 Geology of Oil and Gas
METEO 473 Application of Computers to Meteorology
PLSC 490 Policy Making and Evaluation

Supporting Courses and Related Areas

Select one of the following: 15-26

Select from one of the following minors: Arabic, Chinese, Civic and Community Engagement, Earth Systems, Energy Engineering, Entrepreneurship and Innovation, Environmental Resource Management, Environmental Systems Engineering, Geographic Information Science, Geosciences, Mathematics, Meteorology, Mining Engineering, Petroleum and Natural Gas Engineering, Russian, Spanish, Statistics, Watersheds and Water Resources or a relevant minor selected in consultation with an adviser

A concurrent major in any subject

A 15 credit semester-long education abroad program approved by the professor in charge of the EBF major

A minor in Asian Studies together with an approved EBF summer term abroad experience
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.

Integrated B.S. in Energy Business and Finance and M.S. in Energy and Mineral Engineering
Requirements for the Integrated B.S. in Energy Business and Finance and M.S. in Energy and Mineral Engineering can be found in the Graduate Bulletin (https://bulletins.psu.edu/graduate/programs/majors/energy-mineral-engineering/#integratedundergradgradprogramstext).

Program Learning Objectives
• Demonstrate knowledge of how markets for energy operate.
  • Articulate the factors that drive the supply of energy.
  • Articulate the factors that drive the demand for energy.
  • Explain how markets and government policies may fail.
• Demonstrate knowledge of the process of price formation in markets for energy commodities, specifically:
  • Crude Oil
  • Natural Gas
  • Electric Energy
• Demonstrate knowledge financial skills for the energy industries.
  • Demonstrate a basic understanding of accounting and business law.
  • Calculate the profitability of investment projects.
  • Describe how capital is raised for energy companies.
  • Describe how commodity markets operate, and how they hedge risk.
  • Demonstrate strategies to hedge risk in financial and insurance markets.
• Acquire problem solving ability.
  • Solve numerical problems common in energy commodity trading or analysis.
  • Create investment plans for energy projects.
  • Create strategies for business decisions in the face of market or regulatory uncertainty.
• Acquire the ability to communicate effectively with diverse groups through listening, speaking, and writing.
• Communicate clearly through problem solving exercises.
• Present solutions to business problems.
• Speak with potential employers.
• Use software programs to make presentations to potential employers.

**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 needed to plan the chosen program of study, and referrals to other specialized resources.

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

### University Park

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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 2024-25 academic year. To access previous years’ suggested academic plans, please visit the archive (https://bulletins.psu.edu/undergraduate/archive/) to view the appropriate Undergraduate Bulletin edition.

**General Option With Minor: Energy Business and Finance, B.S. 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.

<table>
<thead>
<tr>
<th>Knowledge Domain</th>
<th>General Education</th>
<th>Major Course</th>
<th>Elective/Minor/Concurrent Major</th>
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<tr>
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<td>Minor/Concurrent Major Course $^3$</td>
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<tr>
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<td>16-17</td>
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**First Year**

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<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ECON 102 (GS)$^*$</td>
<td>3</td>
<td>ECON 302$^*$</td>
<td>3</td>
</tr>
<tr>
<td>BLAW 243, ERM 411, or BA 243</td>
<td>3-4</td>
<td>Minor/Concurrent Major Course $^3$</td>
<td>3</td>
</tr>
<tr>
<td>General Education Health and Wellness (GHW)</td>
<td>1.5</td>
<td>Advanced Level Elective $^4$</td>
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<tr>
<td>General Education Knowledge Domain</td>
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<td>General Education Knowledge Domain</td>
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<td>13.5-14.5</td>
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**Second Year**

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<tr>
<td>ECON 104 (GS)$^*$</td>
<td>4</td>
<td>ACCTG 211</td>
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<td>CMPSC 101, 200, or 201</td>
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**Third Year**

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<tr>
<th>Fall</th>
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<th>Spring</th>
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</thead>
<tbody>
<tr>
<td>RM 302$^*$</td>
<td>3</td>
<td>EME 460$^*$</td>
<td>3</td>
</tr>
<tr>
<td>IB 303 (IL)</td>
<td>3</td>
<td>Minor/Concurrent Major Course $^3$</td>
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</tr>
<tr>
<td>BLAW 243, ERM 411, or BA 243</td>
<td>3-4</td>
<td>Minor/Concurrent Major Course $^3$</td>
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<tr>
<td>General Education Health and Wellness (GHW)</td>
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**Fourth Year**

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<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBF 473</td>
<td>3</td>
<td>EBF 304W (Writing Across the Curriculum)$^*$</td>
<td>3</td>
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<tr>
<td>EBF 484 or 483$^*$</td>
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<td>EBF 401$^*$</td>
<td>3</td>
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<tr>
<td>ENGL 202C or 202D (GWS)$^{1\dagger}$</td>
<td>3</td>
<td>Elective/Minor/Concurrent Major Course $^3$</td>
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</tr>
<tr>
<td>Minor/Concurrent Major Course $^3$</td>
<td>3</td>
<td>Elective/Minor/Concurrent Major Course $^3$</td>
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<tr>
<td>Elective/Minor/Concurrent Major Course $^3$</td>
<td>3</td>
<td>General Education Health and Wellness (GHW)</td>
<td>1.5</td>
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<tr>
<td>15</td>
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</table>

**Total Credits 120-122**

* 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 Cultural Diversity 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.

General Education includes Foundations (GWS and GQ), Knowledge Domains (GHW, GN, GA, GH, GS) and Integrative Studies (Inter-domain) requirements. N or Q (Honors) is the suffix at the end of a course number used to help identify an Inter-domain course, but the inter-domain attribute is used to fill audit requirements. Foundations courses (GWS and GQ) require a grade of ‘C’ or better.

All incoming Schreyer Honors College first-year students at University Park will take ENGL 137H/CAS 137H in the fall semester and ENGL 138T/CAS 138T in the spring semester. These courses carry the GWS designation and satisfy a portion of that General Education requirement. If the student’s program prescribes GWS these courses will replace both ENGL 15/ENGL 30H and CAS 100A/CAS 100B/CAS 100C. Each course is 3 credits.

1 Students who begin their studies at non-UP locations and/or join the college after their first year should substitute CAS 100, CAS 100A, CAS 100B, or CAS 100C (GWS) for EMSC 100 (GWS). EMSC 100S Earth and Mineral Sciences First year Seminar (3) is a required course only for students who begin their studies at UP in the College of Earth and Mineral Sciences.

2 Select 6-7 credits from: CHEM 110 GN(3), EARTH 100 GN(3), EARTH 101 GN;US(3), EARTH 103N GN(3), EARTH 111 GN;US(3), EARTH 150 GN(3), EGEE 101 GN(3), EGEE 102 GN(3), EGEE 120 GS;US;IL(3), GEOG 110 GN(3), GEOG 115 GN(3), GEOSC 2 GN(3), GEOSC 10 GN(3), GEOSC 20 GN(3), GEOSC 21 GN(3), GEOSC 40 GN(3), MATSE 81 GN;IL(3), METEO 101 GN(3), PHYS 211 GN(4) or PHYS 250 GN(4). Most courses can also count toward the General Education Knowledge Domain Natural Science (GN) requirement. If a GN course is not selected for this requirement, students will need to add a GN to their plan. Some selections may have additional prerequisites.

3 Some minors require beginning coursework in a student’s first year; other minors require coursework to begin later. Please check prerequisites for minor courses. Please work closely with your adviser to select and plan for a minor, see list of approved minors in the advising notes section.

4 Select 3 credits from: CED 404(3), CED 429(3), CED 431(3), EBF 411(3), EBF 483(3)[if not selected for requirement above], ECON 490(3), EME 301(3), GEOG 424 US;IL(3), GEOG 430(3), GEOG 431(3), GEOG 444(3), GEOG 493(3), GEOSC 402Y IL(3), GEOSC 454(3), METEO 473(3), PL SC 490(3)

Advising Notes:

Entrance to Major requirements: To enter EBF, students must have a cumulative GPA of 2.8 or higher, complete the entrance to major courses (MATH 140, MATH 141, ECON 102) with a C or better, and apply to the major within 40-70 cumulative credits. Only students who are enrolled in EMSC or DUS are eligible to apply to EBF.

Students must complete an approved minor, a concurrent major in any subject, a 15-credit semester-long education abroad program approved by the professor in charge of EBF, or a minor in Asian Studies with an approved summer education abroad experience. Approved minors include Arabic, Chinese, Civic and Community Engagement, Earth Systems, Energy Engineering, Entrepreneurship and Innovation, Environmental Resource Management, Environmental Systems Engineering, Geographic Information Science, Geosciences, Mathematics, Meteorology, Mining Engineering, Petroleum and Natural Gas Engineering, Russian, Spanish, Statistics, Watersheds and Water Resources, or a relevant minor selected in consultation with the professor in charge of EBF.

Courses required for the major may be offered fall semester only, spring semester only, or both fall and spring semesters. Consult with your adviser and department to discuss your academic progress and course sequencing.
General Option with Semester Study Abroad: Energy Business and Finance, B.S. at University Park Campus

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<tr>
<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 140 or 140G (GQ)*†‡</td>
<td>4</td>
<td>MATH 141 or 141G (GQ)*†‡</td>
<td>4</td>
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<tr>
<td>ECON 102 (GS)*†‡</td>
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<td>ENGL 15, 30H, or ESL 15 (GWS)*†</td>
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</tr>
<tr>
<td>EMSC 100S, CAS 100A, CAS 100B, or CAS 100C (GWS)*†</td>
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<td>EBF 200*</td>
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<td>3 Introductory Level Elective</td>
<td>3-4</td>
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</tr>
<tr>
<td>Introductory Level Elective</td>
<td>3 General Education Knowledge Domain</td>
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### Second Year

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<th>Spring</th>
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<tr>
<td>ECON 104 (GS)*†</td>
<td>3</td>
<td>ACCTG 211</td>
<td>4</td>
</tr>
<tr>
<td>ECON 302*</td>
<td>3</td>
<td>EME 210 or STAT 401*</td>
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<tr>
<td>EBF 301*</td>
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<tr>
<td>CMPS 101, 200, 201, or 202</td>
<td>3 Elective</td>
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<tr>
<td>General Education Knowledge Domain</td>
<td>3 Elective</td>
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### Third Year

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<tr>
<th>Fall</th>
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<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>RM 302*</td>
<td>3</td>
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<td>EME 460*</td>
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<td>BLAW 243, ERM 411, or BA 243</td>
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<tr>
<td>ENGL 202C or 202D (GWS)*†</td>
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### Fourth Year

<table>
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<tr>
<th>Fall</th>
<th>Credits</th>
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<tbody>
<tr>
<td>EBF 473</td>
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<td>EBF 304W (Writing Across the Curriculum)*</td>
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<tr>
<td>EBF 483 or 484*</td>
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<td>EBF 401*</td>
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<tr>
<td>Elective</td>
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<td>Advanced Level Elective*</td>
<td>3</td>
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<tr>
<td>Elective</td>
<td>3</td>
<td>General Education Knowledge Domain</td>
<td>3</td>
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<tr>
<td>General Education Health and Wellness (GHW)</td>
<td>1.5</td>
<td>General Education Health and Wellness (GHW)</td>
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</tr>
</tbody>
</table>

### Total Credits 120-122

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* 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 Cultural Diversity 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.

General Education includes Foundations (GWS and GQ), Knowledge Domains (GHW, GN, GA, GH, GS) and Integrative Studies (Inter-domain) requirements. N or Q (Honors) is the suffix at the end of a course number used to help identify an Inter-domain course, but the inter-domain attribute is used to fill audit requirements. Foundations courses (GWS and GQ) require a grade of 'C' or better.

All incoming Schreyer Honors College first-year students at University Park will take ENGL 137H/CAS 137H in the fall semester and ENGL 138T/CAS 138T in the spring semester. These courses carry the GWS designation and satisfy a portion of that General Education requirement. If the student’s program prescribes GWS these courses will replace both ENGL 15/ENGL 30H and CAS 100A/CAS 100B/CAS 100C. Each course is 3 credits.

1. Students who begin their studies at non-UP locations and/or join the college after their first year should substitute CAS 100, CAS 100A, CAS 100B, or CAS 100C (GWS) for EMSC 100S (GWS). EMSC 100S Earth and Mineral Sciences.

2. Select 6-7 credits from: CHEM 110 GN(3), EARTH 100 GN(3), EARTH 101 GN(3), EARTH 103 GN(3), EARTH 105 GN(3), EGE 101 GN(3), EGE 102 GN(3), EGE 120 GS;US;IL(3);GEOG 110 GN(3), GEOG 115 GN(3), GEOSC 2 GN(3), GEOSC 20 GN(3), GEOSC 21 GN(3), GEOSC 40 GN(3), MATSE 81 GN;IL(3), METEO 3 GN(3), METEO 101 GN(3), PHYS 211 GN(4) or PHYS 250 GN(4). Most courses can also count toward the General Education Knowledge Domain Natural Science (GN) requirement. If a GN course is not selected for this requirement, students will need to add a GN to their plan. Some selections may have additional prerequisites.


4. Students can study abroad in any semester. For a study abroad to be approved for EBF, students need to follow the course plan in the EBF Study Abroad Guide (https://www.ems.psu.edu/undergraduate/undergraduate-programs/energy-business-and-finance/) and get pre-approval for their study abroad course selections from the EBF program chair.

**Advising Notes:**

Entrance to Major requirements: To enter EBF, students must have a cumulative GPA of 2.8 or higher, complete the entrance to major courses
(MATH 140, MATH 141, ECON 102) with a C or better, and apply to the major within 40-70 cumulative credits. Only students who are enrolled in EMSC or DUS are eligible to apply to EBF.

Students must complete an approved minor, a concurrent major in any subject, a 15-credit semester-long education abroad program approved by the professor in charge of EBF, or a minor in Asian Studies with an approved summer education abroad experience.

Courses required for the major may be offered fall semester only, spring semester only, or both fall and spring semesters. Consult with your adviser and department to discuss your academic progress and course sequencing.
General Option with Minor: Energy Business and Finance, B.S. at Commonwealth Campuses

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.

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<thead>
<tr>
<th>First Year</th>
<th>Credits</th>
<th>Spring</th>
<th>Fall</th>
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<tbody>
<tr>
<td>MATH 140 (GQ)**†</td>
<td>4</td>
<td>MATH 141 (GQ)**†</td>
<td>4</td>
</tr>
<tr>
<td>ECON 102 (GS)**‡</td>
<td>3</td>
<td>CAS 100A, 100B, or 100C (GWS)**†</td>
<td>3</td>
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<tr>
<td>ENGL 15, 30H, or ESL 15 (GWS)**†</td>
<td>3</td>
<td>Introductory Level Elective ²</td>
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<td>General Education Knowledge Domain</td>
<td>3</td>
<td>Minor/Concurrent Major Course ²</td>
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<tr>
<td>Introductory Level Elective ²</td>
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<td><strong>15</strong></td>
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<th>Second Year</th>
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<tr>
<td>ECON 104 (GS)‡</td>
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<td>ECON 302 ²</td>
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<td>ENGL 202C or 202D (GWS)**†</td>
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<td>CMPSC 101, 200, or 201</td>
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<td>General Education Knowledge Domain</td>
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<td>Minor/Concurrent Major Course ³</td>
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<tr>
<td><strong>Total Credits: 15</strong></td>
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<td><strong>15</strong></td>
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<th>Spring</th>
<th>Fall</th>
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<tr>
<td>EBF 200 ²</td>
<td>3</td>
<td>Minor/Concurrent Major Course ³</td>
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<td>EBF 301 ²</td>
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<td>RM 302 ²</td>
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<td>EME 210 or STAT 401 ²</td>
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<td>General Education Knowledge Domain</td>
<td>3</td>
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<tr>
<td>EME 460 ²</td>
<td>3</td>
<td>General Education Health and Wellness (GHW)</td>
<td>1.5</td>
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<td><strong>Total Credits: 15</strong></td>
<td><strong>16-17</strong></td>
<td><strong>15</strong></td>
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<table>
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<th>Fourth Year</th>
<th>Credits</th>
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<tbody>
<tr>
<td>EBF 473</td>
<td>3</td>
<td>EBF 304W (Writing Across the Curriculum) ³</td>
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</tr>
<tr>
<td>EBF 484 or 483 ³</td>
<td>3</td>
<td>EBF 401 ³</td>
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<tr>
<td>IB 303 (IL)</td>
<td>3</td>
<td>Elective/Minor/Concurrent Major Course ³</td>
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<tr>
<td>Minor/Concurrent Major Course ³</td>
<td>3</td>
<td>Minor/Concurrent Major Course ³</td>
<td>3</td>
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<tr>
<td><strong>Total Credits: 15</strong></td>
<td><strong>16-17</strong></td>
<td><strong>15</strong></td>
<td><strong>13.5</strong></td>
</tr>
</tbody>
</table>

**University Requirements and General Education Notes:**

US and IL are abbreviations used to designate courses that satisfy Cultural Diversity 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.

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1. Students who begin their studies at non-UP locations and/or join the college after their first year should substitute CAS 100, CAS 100A, CAS 100B, or CAS 100C (GWS) for EMSC 100S (GWS). EMSC 100S Earth and Mineral Sciences First year Seminar (3) is a required course only for students who begin their studies at UP in the College of Earth and Mineral Sciences.

2. Select 6-7 credits from: CHEM 110 GN(3), EARTH 100 GN(3), EARTH 101 GN(3), EARTH 103N GN(3), EARTH 111 GN(3), EARTH 150 GN(3), EEE 101 GN(3), EEE 102 GN(3), EEE 120 GS;US;IL(3), EEE 110 GN(3), EEOG 115 GN(3), GEOG 2 GN(3), GEOG 20 GN(3), GEOG 21 GN(3), GEOG 40 GN(3), MATSE 81 GN;IL(3), METEO 3 GN(3), METEO 101 GN(3), PHYS 211 GN;4) or PHYS 250 GN(4). Most courses can also count toward the General Education Knowledge Domain Natural Science (GN) requirement. If a GN course is not selected for this requirement, students will need to add a GN to their plan. Some selections may have additional prerequisites.

3. Some minors require beginning coursework in a student’s first year; other minors require coursework to begin later. Please check prerequisites for minor courses. Please work closely with your adviser to select and plan for a minor, see list of approved minors in the advising notes section.


**Advising Notes:**

Entrance to Major requirements: To enter EBF, students must have a cumulative GPA of 2.8 or higher, complete the entrance to major courses (MATH 140, MATH 141, ECON 102) with a C or better, and apply to the major within 40-70 cumulative credits. Only students who are enrolled in EMSC or DUS are eligible to apply to EBF.
Students must complete an approved minor, a concurrent major in any subject, a 15-credit semester-long education abroad program approved by the professor in charge of EBF, or a minor in Asian Studies with an approved summer education abroad experience. Approved minors include Arabic, Chinese, Civic and Community Engagement, Earth Systems, Energy Engineering, Entrepreneurship and Innovation, Environmental Resource Management, Environmental Systems Engineering, Geographic Information Science, Geosciences, Mathematics, Meteorology, Mining Engineering, Petroleum and Natural Gas Engineering, Russian, Spanish, Statistics, Watersheds and Water Resources, or a relevant minor selected in consultation with the professor in charge of EBF.

Courses required for the major may be offered fall semester only, spring semester only, or both fall and spring semesters. Consult with your adviser and department to discuss your academic progress and course sequencing.
General Option with Semester Study Abroad: Energy Business and Finance, B.S. at Commonwealth Campuses

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First Year

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<tr>
<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
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<tbody>
<tr>
<td>MATH 140 (GQ)</td>
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<td>MATH 141 (GQ)</td>
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</tr>
<tr>
<td>ECON 102 (GS)</td>
<td>3</td>
<td>CAS 100A, 100B, or 100C (GWS)</td>
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<tr>
<td>ENGL 15, 30H, or ESL 15 (GWS)</td>
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General Education Knowledge Domain

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<tr>
<td>EBF 200*</td>
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<td>RM 302*</td>
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<tr>
<td>EME 210 or STAT 401*</td>
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<td>EME 460*</td>
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General Education Knowledge Domain

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<th>Credits</th>
<th>Spring</th>
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<tbody>
<tr>
<td>EBF 473</td>
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<td>EBF 304W (Writing Across the Curriculum)</td>
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<tr>
<td>EBF 483 or 484*</td>
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<td>IB 303 (IL)</td>
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General Education Health and Wellness (GHW)

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<tbody>
<tr>
<td>1.5 Elective</td>
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</table>

Total Credits 120-122

* Course requires a grade of C or better for the major
† Course requires a grade of C or better for General Education

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1 Students who begin their studies at non-UP locations and/or join the college after their first year should substitute CAS 100, CAS 100A, CAS 100B, or CAS 100C (GWS) for EMSC 100S (GWS). EMSC 100S Earth and Mineral Sciences First year Seminar (3) is a required course only for students who begin their studies at UP in the College of Earth and Mineral Sciences.

2 Select 6-7 credits from: CHEM 110 GN(3), EARTH 100 GN(3), EARTH 101 GN;US(3), EARTH 103N GN(3), EARTH 111 GN;US(3), EARTH 150 GN(3), EGE 101 GN(3), EGE 102 GN(3), EGE 120 GS;US;IL(3), GEC 110 GN(3), GEOG 115 GN(3), GEOSC 2 GN(3), GEOSC 10 GN(3), GEOSC 20 GN(3), GEOSC 021 GN(3), GEOSC 40 GN(3), MATSE 81 GN;IL(3), METEO 03 GN(3), METEO 101 GN(3), PHYS 211 GN(4) or PHYS 250 GN(4). Most courses can also count toward the General Education Knowledge Domain Natural Science (GN) requirement. If a GN course is not selected for this requirement, students will need to add a GN to their plan. Some selections may have additional prerequisites.

3 Select 3 credits from: CED 404(3), CED 429(3), CED 431(3), EBF 411(3), EBF 483(3)[if not selected for requirement above], ECON 490(3), EME 301(3), EGE 424 US;IL(3), EGE 430(3), EGE 431(3), EGE 444(3), EGO 493(3), GEOSC 420 Y IL(3), GEOSC 454(3), METEO 473(3), PL SC 490(3)

4 Students can study abroad in any semester. For a study abroad to be approved for EBF, students need to follow the course plan in the EBF Study Abroad Guide (https://bulletins.psu.edu/undergraduate/colleges/earth-mineral-sciences/energy-business-finance-bs/) and get pre-approval for their study abroad course selections from the EBF program chair.

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Courses required for the major may be offered fall semester only, spring semester only, or both fall and spring semesters. Consult with your adviser and department to discuss your academic progress and course sequencing.

Career Paths

Energy Business and Finance provides equally good preparation for a career or for further graduate study. EBF graduates pursue a wide variety of career options, most of which are in the energy or environmental sector. Many also pursue graduate study, especially when the EBF major is paired with a quantitative minor or concurrent major at Penn State.

Careers

There are hundreds of EBF alumni now working for oil and gas firms; electric utilities or power generation companies; consulting firms, banks, and insurance companies; or in the public and nonprofit sector. Common career roles for Energy Business and Finance majors include analyst positions, commodities trading and marketing, energy delivery scheduling, and project finance analysts. Energy Business and Finance students are also competitive for rotational programs with major energy firms.

Opportunities for Graduate Studies

Graduates from the Energy Business and Finance program are well positioned for professional graduate study in economics, business, finance, and law. Students with strong research interests should consider the M.S. or Ph.D. programs in Energy and Mineral Engineering or Energy, Environmental and Food Economics.

Professional Resources

• Society for Energy Business and Finance (https://www.eme.psu.edu/undergraduate/undergraduate-resources/student-organizations/)
• Penn State Energy Marketing Association (https://orgcentral.psu.edu/organization/energy-marketing-association/)
• Positive Energy (https://sites.psu.edu/spepennstate/positive-energy/)

Contact

University Park

JOHN AND WILLIE LEONE FAMILY DEPARTMENT OF ENERGY AND MINERAL ENGINEERING
113 Hosler Building
University Park, PA 16802
814-865-3437
eme@ems.psu.edu