

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

This program currently has administrative enrollment controls. Administrative Enrollment Controls are initiated when limitations of space, faculty, or other resources in a major prevent accommodating all students who request them. Students must follow the administrative

enrollment controls that are in effect for the semester that they enter the university.

First-Year Students Entering Summer 2023, Fall 2023, Spring 2024

In order to be eligible for entrance to this major, students must satisfy the following requirements:

- be enrolled in the College of Earth and Mineral Sciences or the Division of Undergraduate Studies
- 29.1-70 graded Penn State credits (excludes transfer and AP credits)
- completed with a grade of C or better: ECON 102, MATH 140
- earned a minimum cumulative grade-point average (GPA) of 2.60

Students Who Entered Prior to Summer 2023

Students who entered the University from Summer 2018 through Spring 2023 should view the administrative enrollment controls in the appropriate Undergraduate Bulletin archive (<https://bulletins.psu.edu/undergraduate/archive/>). Students who entered the University prior to the summer 2018 semester should consult with their academic adviser about the administrative enrollment controls in effect for the semester they entered the university.

Degree Requirements

For the Bachelor of Science degree in Energy Business and Finance, a minimum of 120 credits is required:

Requirement	Credits
General Education	45
Electives	0-12
Requirements for the Major	90-102

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)

Code	Title	Credits
Prescribed Courses		
ACCTG 211	Financial and Managerial Accounting for Decision Making	4
EBF 473	Risk Management in Energy Industries	3
ECON 104	Introductory Macroeconomic Analysis and Policy	3
IB 303	International Business Operations	3
<i>Prescribed Courses: Require a grade of C or better</i>		
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
or EMSC 100S	Earth and Mineral Sciences First-Year Seminar	
ENGL 15	Rhetoric and Composition	3
or ENGL 30H	Honors Rhetoric and Composition	
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++	
CMPSC 202		
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)**

Code	Title	Credits
Prescribed Courses		
EBF 402	Energy Law and Contracts	3
GEOG 363	Geographic Information Systems	3
<i>Prescribed Courses: Require a grade of C or better</i>		
GEOG 160	Mapping Our Changing World	3
GEOSC 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	
<i>Additional Courses: Require a grade of C or better</i>		
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	Image Analysis
GEOG 364	Spatial Analysis
GEOG 463	Geospatial Information Management

General Option (24-36 credits)

Code	Title	Credits
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 2023-24 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 (*Note: the archive only contains suggested*

academic plans beginning with the 2018-19 edition of the Undergraduate Bulletin).

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.

First Year

Fall	Credits Spring	Credits
MATH 140 or 140G (GQ) ^{*†#†}	4 MATH 141 or 141G (GQ) ^{*†#†}	4
ECON 102 (GS) ^{*#††}	3 ENGL 15, 30H, or ESL 15 (GWS) ^{††}	3
EMSC 100S, 100, CAS 100A, CAS 100B, or CAS 100C (GWS) ^{††1}	3 EBF 200 [*]	3
General Education Knowledge Domain	3 Introductory Level Elective ²	3-4
Introductory Level Elective ²	3 Minor/Concurrent Major Course ³	3
16		16-17

Second Year

Fall	Credits Spring	Credits
ECON 104 (GS) [†]	3 ACCTG 211	4
ECON 302 [*]	3 EME 210 or STAT 401 [*]	3
EBF 301 [*]	3 General Education Knowledge Domain	3
CMPSC 101, 200, or 201	3 General Education Knowledge Domain	3
Minor/Concurrent Major Course ³	3 Minor/Concurrent Major Course ³	3
15		16

Third Year

Fall	Credits Spring	Credits
RM 302 [*]	3 EME 460 [*]	3
IB 303 (IL)	3 Minor/Concurrent Major Course ³	3
BLAW 243, ERM 411, or BA 243	3-4 Minor/Concurrent Major Course ³	3
ENGL 202C or 202D (GWS) ^{††}	3 Advanced Level Elective ⁴	3
General Education Health and Wellness (GHW)	1.5 General Education Knowledge Domain	3
13.5-14.5		15

Fourth Year

Fall	Credits Spring	Credits
EBF 304W (Writing Across the Curriculum) [*]	3 EBF 401 [*]	3
EBF 473	3 Elective/Minor/Concurrent Major Course ³	3
EBF 484 or 483 [*]	3 Elective/Minor/Concurrent Major Course ³	3

Minor/Concurrent Major Course ³	3 General Education Knowledge Domain	3
Elective/Minor/Concurrent Major Course ³	3 General Education Health and Wellness (GHW)	1.5
	15	13.5

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 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), 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 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.

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

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.

First Year

Fall	Credits Spring	Credits
MATH 140 or 140G (GQ) ^{*†#†}	4 MATH 141 or 141G (GQ) ^{*†#†}	4
ECON 102 (GS) ^{*#†}	3 ENGL 15, 30H, or ESL 15 (GWS) ^{††}	3
EMSC 100S, 100, CAS 100A, CAS 100B, or CAS 100C (GWS) ^{††}	3 EBF 200 [*]	3
General Education Knowledge Domain	3 Introductory Level Elective ²	3-4
Introductory Level Elective ²	3 General Education Knowledge Domain	3
16		16-17

Second Year

Fall	Credits Spring	Credits
ECON 104 (GS) [†]	3 ACCTG 211	4
ECON 302 [*]	3 EME 210 or STAT 401 [*]	3
EBF 301 [*]	3 General Education Knowledge Domain	3
CMPSC 101, 200, 201, or 202	3 Elective	3
General Education Knowledge Domain	3 Elective	3
15		16

Third Year

Fall	Credits Spring	Credits
RM 302 [*]	3 Approved Study Abroad Program ⁴	15
IB 303 (IL)	3	
EME 460 [*]	3	
EBF 304W (Writing Across the Curriculum) [*]	3	
BLAW 243, ERM 411, or BA 243	3-4	
15-16		15

Fourth Year

Fall	Credits Spring	Credits
EBF 473	3 EBF 401 [*]	3
EBF 483 or 484 [*]	3 Advanced Level Elective ³	3
Elective	3 ENGL 202C or 202D (GWS) ^{††}	3
Elective	3 General Education Knowledge Domain	3

General Education Health and Wellness (GHW)	1.5 General Education Health and Wellness (GHW)	1.5
13.5		13.5

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 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), 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 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 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)

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.emc.psu.edu/undergraduate/academics/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.

First Year

Fall	Credits Spring	Credits
MATH 140 (GQ) ^{*†#†}	4 MATH 141 (GQ) ^{*†#†}	4
ECON 102 (GS) ^{*#†}	3 CAS 100, CAS 100A, CAS 100B, or CAS 100C (GWS) ^{††1}	3
ENGL 15, 30H, or ESL 15 (GWS) ^{††}	3 Introductory Level Elective ²	3-4
General Education Knowledge Domain	3 Minor/Concurrent Major Course ³	3
Introductory Level Elective ²	3 Elective/Minor/Concurrent Major Course ³	3
	16	16-17

Second Year

Fall	Credits Spring	Credits
ECON 104 (GS) [†]	3 ACCTG 211	4
ECON 302 [*]	3 ENGL 202C or 202D (GWS) ^{††}	3
CMPSC 101, 200, or 201	3 BLAW 243, ERM 411, or BA 243	3-4
Minor/Concurrent Major Course ³	3 General Education Knowledge Domain	3
General Education Knowledge Domain	3 Minor/Concurrent Major Course ³	3
	15	16-17

Third Year

Fall	Credits Spring	Credits
EBF 200 [*]	3 Minor/Concurrent Major Course ³	3
EBF 301 [*]	3 Minor/Concurrent Major Course ³	3
RM 302 [*]	3 Advanced Level Elective ⁴	3
EME 210 or STAT 401 [*]	3 General Education Knowledge Domain	3
EME 460 [*]	3 General Education Health and Wellness (GHW)	1.5
	15	13.5

Fourth Year

Fall	Credits Spring	Credits
EBF 304W (Writing Across the Curriculum) [*]	3 EBF 401 [*]	3
EBF 473	3 Elective/Minor/Concurrent Major Course ³	3
EBF 484 or 483 [*]	3 Elective/Minor/Concurrent Major Course ³	3
IB 303 (IL)	3 General Education Knowledge Domain	3

Minor/Concurrent Major Course ³	3 General Education Health and Wellness (GHW)	1.5
	15	13.5

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.

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), 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 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.

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 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.

First Year

Fall	Credits Spring	Credits
MATH 140 (GQ) ^{*†#†}	4 MATH 141 (GQ) ^{*†#†}	4
ECON 102 (GS) ^{*#†}	3 CAS 100, CAS 100A, CAS 100B, or CAS 100C (GWS) ^{††1}	3
ENGL 15, 30H, or ESL 15 (GWS) ^{††}	3 Introductory Level Elective ²	3-4
General Education Knowledge Domain	3 General Education Knowledge Domain	3
Introductory Level Elective ²	3 General Education Knowledge Domain	3
16		16-17

Second Year

Fall	Credits Spring	Credits
ECON 104 (GS) [†]	3 ACCTG 211	4
ECON 302 [*]	3 ENGL 202C or 202D (GWS) ^{††}	3
CMPSC 101, 200, or 201	3 BLAW 243, ERM 411, or BA 243	3-4
General Education Knowledge Domain	3 Elective	3
Elective	3 Elective	3
15		16-17

Third Year

Fall	Credits Spring	Credits
EBF 200 [*]	3 Approved Study Abroad ⁴	15
EBF 301 [*]	3	
RM 302 [*]	3	
EME 210 or STAT 401 [*]	3	
EME 460 [*]	3	
15		15

Fourth Year

Fall	Credits Spring	Credits
EBF 304W (Writing Across the Curriculum) [*]	3 EBF 401 [*]	3
EBF 473	3 Advanced Level Elective ³	3
EBF 483 or 484 [*]	3 General Education Knowledge Domain	3
IB 303 (IL)	3 Elective	3
General Education Health and Wellness (GHW)	1.5 General Education Health and Wellness (GHW)	1.5
13.5		13.5

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

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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), 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 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), 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)

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.

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.

<https://www.eme.psu.edu>

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.

MORE INFORMATION ABOUT POTENTIAL CAREER OPTIONS FOR GRADUATES OF THE ENERGY BUSINESS AND FINANCE PROGRAM (<https://www.eme.psu.edu/undergraduate/academics/undergraduate-programs/energy-business-and-finance/career-options/>)

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.

MORE INFORMATION ABOUT OPPORTUNITIES FOR GRADUATE STUDIES (<https://www.eme.psu.edu/graduate/>)

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

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