

Environmental and Energy Resources Management, B.S.

Degree Offered

- Bachelor of Science

Nature of the Program

The objective of this major is to examine the interdisciplinary relationships involved in the business of energy production and utilization along with associated environmental management, regulatory and policy issues. This major will provide a strong foundation for students interested in pursuing a career in the growing energy and environmental sectors of the economy, whether in private business, government, consulting, or for entrepreneurial ventures of their own design. The program emphasizes the core components of both business and STEM (science, technology, engineering and math) learning in its curriculum.

General Education Foundations

Please use this link to view a list of courses that meet each GEF requirement. (<http://registrar.wvu.edu/gef/>)

NOTE: Some major requirements will fulfill specific GEF requirements. Please see the curriculum requirements listed below for details on which GEFs you will need to select.

Code	Title	Hours
General Education Foundations		
F1 - Composition & Rhetoric		3-6
ENGL 101 & ENGL 102 or ENGL 103	Introduction to Composition and Rhetoric and Composition, Rhetoric, and Research Accelerated Academic Writing	
F2A/F2B - Science & Technology		4-6
F3 - Math & Quantitative Reasoning		3-4
F4 - Society & Connections		3
F5 - Human Inquiry & the Past		3
F6 - The Arts & Creativity		3
F7 - Global Studies & Diversity		3
F8 - Focus (may be satisfied by completion of a minor, double major, or dual degree)		9
Total Hours		31-37

Please note that not all of the GEF courses are offered at all campuses. Students should consult with their advisor or academic department regarding the GEF course offerings available at their campus.

Degree Requirements

Code	Title	Hours
	University Requirements	41
	General Requirements	6
	Environmental and Energy Resources Management Major Requirements	73
Total Hours		120

University Requirements

Code	Title	Hours
	General Education Foundations (GEF) 1, 2, 3, 4, 5, 6, 7, and 8 (31-37 Credits)	
	Outstanding GEF Requirements 1, 5, 6, and 7	15
ANRD 191	First-Year Seminar	1
	General Electives	25
Total Hours		41

General Requirements

Code	Title	Hours
MATH 150	Applied Calculus (GEF 3)	3
ARE 150 or ECON 201	Introductory Agricultural and Agribusiness Economics (GEF 4) Principles of Microeconomics	3
Total Hours		6

Environmental and Energy Resources Management Major Requirements

Code	Title	Hours
ARE 187	Energy Resource Economics (GEF 8)	3
ARE 201	Principles of Resource and Energy	3
ARE 382	Agricultural and Natural Resources Law	3
ARE 488	Career Development	1
ARE 491	Professional Field Experience (Capstone Experience)	3
Select one of the following (GEF 8):		3
ECON 225 or STAT 211	Elementary Business and Economics Statistics Elementary Statistical Inference	
ECON 202	Principles of Macroeconomics (GEF 8)	3
RESM 440 & 440L	Foundations of Applied Geographic Information Systems and Foundations of Applied Geographic Information Systems Laboratory	3
RESM 480	Environmental Regulation	3
Lab Science Requirement		12
Select 12 credits from the following:		
BIOL 101 & 101L	General Biology 1 and General Biology 1 Laboratory	
CHEM 111 & 111L	Survey of General, Organic, and Biological Chemistry 1 and Survey of Chemistry 1 Laboratory	
ESWS 202 & 202L	Principles of Soil Science and Principles of Soil Science Laboratory	
GEOL 101 & 101L	Planet Earth and Planet Earth Laboratory	
SUST 201 & 201L	Earth System Science and Earth System Science Laboratory	
PHYS 101 & 101L	Introductory Physics 1 and Introductory Physics 1 Laboratory	
PLSC 206 & 206L	Principles of Plant Science and Principles of Plant Science Laboratory	
Restricted Electives*		36
Energy. Choose 12 credits. Six credits must be at the 400 level.		
ARE 440	Futures Markets and Commodity Prices	
ARE 445	Energy Economics	
ARE 485	Economics of Water Resources and Energy	
DSGN 340	Design for Energy Efficiency	
DSGN 470	Leadership in Energy and Environmental Design Green Building Systems	
ENGR 310	Energy Engineering	
GEOL 472	Sustainable Energy	
RESM 405	Drones in Resource Management	
RESM 450	Land Use Planning Law	
RESM 460	Energy Project and Program Management	
RESM 475	Solar PV Technology & Policy Fundamentals	
FNRS 445	Bio-based Energy Systems	
Environment. Choose 12 credits. Six credits must be at the 400 level.		
ESWS 455	Reclamation of Disturbed Soils	

ARE 485	Economics of Water Resources and Energy
ESWS 355	Environmental Sampling and Analysis
ENVP 415 & 415L	Hazardous Waste Training and Hazardous Waste Training Laboratory
ESWS 460 & 460L	Environmental Impact Assessment and Environmental Impact Assessment Laboratory
GEOG 205	Climate and Sustainability
GEOG 415	Global Environmental Change
RESM 405	Drones in Resource Management
RESM 444	Advanced GIS for Natural Resource Management
WMAN 200	Restoration Ecology
Economics and Entrepreneurship. Choose 12 credits. Six credits must be at the 400 level.	
AGEE 421	Agricultural and Natural Resource Communications
ARE 204	Agribusiness Management
ARE 220	Introductory Environmental and Resource Economics
ARE 380	Agribusiness Sales and Management
ARE 401 or ECON 301	Applied Demand Analysis Intermediate Micro-Economic Theory
ARE 410	Environmental and Resource Economics (fulfills Writing and Communication skills requirement)
ARE 422	New Venture Creation
ARE 431	Marketing Agricultural Products
ARE 445	Energy Economics
ARE 450	Agriculture, Environmental and Resource Policy
ARE 461	Agribusiness Finance
ARE 482	Enterprise Operation Law
ARE 484	Agribusiness Strategic Management
ECON 302	Intermediate Macro-Economic Theory

Total Hours

73

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Selected and approved in consultation with advisor. Must include at least four courses from each of the three restricted elective categories: Energy, Environment, and Economics and Entrepreneurship.

SUGGESTED PLAN OF STUDY

First Year

Fall	Hours	Spring	Hours
ANRD 191		1 ARE 187 (GEF 8)	3
ARE 150 (GEF 4)		3 GEOL 101 & 101L	4
ARE 201		3 MATH 150 (GEF 3)	3
ENGL 101 (GEF 1)		3 GEF 5, 6, or 7	3
BIOL 101 & 101L (GEF 2B)		4 Free Elective	3
		14	16

Second Year

Fall	Hours	Spring	Hours
ARE 204 (Entrepreneurship/ Economics)		3 ESWS 202 & 202L	4
ENGL 102 (GEF 1)		3 ECON 202 (GEF 8)	3
GEOG 205 (Environment)		3 STAT 211 (GEF 8)	3
GEF 5, 6, or 7		3 GEF 5, 6, or 7	3

Free Elective		3 Free Electives		3	
		15		16	
Third Year					
Fall	Hours	Spring	Hours	Summer	Hours
ARE 220 (Entrepreneurship/ Economics)		3 ARE 482 (Economics and Entrepreneurship)		3 ARE 491	3
ARE 488		1 ENVP 415 (Environment)		3	
ENGR 310 (Energy)		3 RESM 450 (Energy)		3	
RESM 440 & 440L		3 RESM 480		3	
Free Elective		3 Free Elective		3	
		13		15	3
Fourth Year					
Fall	Hours	Spring	Hours		
ARE 382		3 ESWS 455 (Environment)		3	
DSGN 340 (Energy)		3 ARE 431 (Entrepreneurship/ Economics)		3	
Environment		3 RESM 460 (Energy)		3	
Free Electives		6 Free Electives		4	
		15		13	

Total credit hours: 120

Major Learning Outcomes

ENVIRONMENTAL AND ENERGY RESOURCE MANAGEMENT

After completing this major students will be able to:

1. Demonstrate an understanding of major concepts in energy and environmental resource economics, legal issues related to natural resource and environmental management, and enterprise creation and demonstrate critical thinking skills and problem solving abilities related to these areas.
2. Utilize relevant software for data analysis in energy and environmental applications and general business settings.
3. Communicate effectively in a business or professional setting (written and oral).
4. Work cooperatively within a business or professional setting.