

INTERDISCIPLINARY MINOR IN SUSTAINABLE ENERGY



**ENERGY
INSTITUTE**
COLORADO STATE UNIVERSITY

In partnership with



**SCHOOL OF GLOBAL
ENVIRONMENTAL SUSTAINABILITY**
COLORADO STATE UNIVERSITY

The Energy Institute and the School of Global Environmental Sustainability are proud to offer this new Minor in Sustainable Energy for students who recognize the need to break down the traditional barriers that separate the science and engineering of energy from the social, economic and political dimensions of energy. The Minor in Sustainable Energy offers undergraduate students, regardless of their major, an opportunity to gain a deeper knowledge of the many dimensions of sustainable energy.

THE FUNDAMENTAL CONCEPTS OF ENERGY

Citizens in all walks of life make choices about energy that have profound implications for society and for the planet. And yet, the basic concepts and vocabulary of energy remain out of reach for most citizens. Students in this new minor will gain a common language of energy basics that will enable the kind of interdisciplinary teamwork and problem solving that are needed in the transition to a sustainable energy future.

ENERGY RESOURCES—WHAT ARE OUR OPTIONS?

Fossil energy has allowed our technological society to innovate and grow at a spectacular pace. But, what is the future of fossil energy as a resource? How do we understand the limits, benefits and trade-offs of fossil versus other forms of energy such as nuclear, wind, solar and biomass? How do we assess these questions while avoiding the polarizing hyperbole that often surrounds them? These are questions that students in this new minor will be able to tackle.

RETHINKING ENERGY— WHAT IT MEANS TO BE SUSTAINABLE

The transition to sustainable energy involves much more than shifting from fossil to renewable resources. Sustainability requires understanding energy as a human-directed system—from extraction and production to consumption—that operates within the constraints of human society and Earth's ecosystems. In the capstone course for the minor, students will develop skills and use tools for systems thinking such as life cycle assessment, techno-economic analysis and system dynamics modeling as part of their own efforts to analyze options for sustainable energy.

[The School of Global Environmental Sustainability](#), [Student Sustainability Center](#), and the [Energy Club](#) have even more ways for you to connect. See more information regarding the minor at the [SoGES Focused Minors webpage](#) or by contacting Ryan Deming, Minor Advisor, at Ryan.Deming@colostate.edu or [schedule an advising appointment](#).

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ENERGY INSTITUTE AND THE SCHOOL OF GLOBAL ENVIRONMENTAL SUSTAINABILITY INTERDISCIPLINARY MINOR IN SUSTAINABLE ENERGY CHECKSHEET



The Energy Institute and the School of Global Environmental Sustainability are proud to offer a minor in Sustainable Energy providing students with a background in sustainable energy in all its dimensions — the social, economic, physical and biological, and technological.

REQUIRED COURSES 9 CREDITS REQUIRED, KEY - F: FALL, S: SPRING, (E)/(O) EVEN/ODD YEARS, SS: SUMMER SESSION, O: AVAILABLE ONLINE

Course Code	Course Name	Offered	Credits	Prerequisites
<input type="checkbox"/> GES 101	Foundations of Env. Sustainability	F,S,O	3	
<input type="checkbox"/> GES 141	Introduction to Sustainable Energy	F	3	
<input type="checkbox"/> GES 441	Analysis of Sustainable Energy Solutions	S	3	GES 141

GROUP A. SOCIETY AND ECONOMIC ASPECTS (CHOOSE 2) 6 CREDITS MINIMUM, 3-6 CREDITS MUST BE UPPER DIVISION *

KEY - F: FALL, S: SPRING, (E)/(O) EVEN/ODD YEARS, SS: SUMMER SESSION, O: AVAILABLE ONLINE

Course Code	Course Name	Offered	Credit	Prerequisites
<input type="checkbox"/> AREC202 or ECON 202	Principles of Microeconomics (AUCC 3C)	F,S,SS	3	MATH 117, 118, 141, 155 or 160
<input type="checkbox"/> AREC/ECON 240	Issues in Environ. Economics (AUCC 3C)	F,S,SS	3	
<input type="checkbox"/> AREC/ECON 444	Economics of Energy Resources	S,(O)	3	AREC/ECON 202
<input type="checkbox"/> ESS 542	Greenhouse Gas Policies	S	2	ESS 524
<input type="checkbox"/> NR 320	Natural Resources History and Policy	F,S	3	
<input type="checkbox"/> POLS 101	American Gov't and Politics (AUCC 3C)	F,S,SS	3	
<input type="checkbox"/> POLS 364	U.S. Energy Policy Analysis		3	POLS 101

GROUP B. SCIENTIFIC AND TECHNOLOGICAL ASPECTS 6 CREDITS MINIMUM, 3-6 CREDITS MUST BE UPPER DIVISION *

KEY - F: FALL, S: SPRING, (E)/(O) EVEN/ODD YEARS, SS: SUMMER SESSION, O: AVAILABLE ONLINE

Course Code	Course Name	Offered	Credits	Prerequisites
<input type="checkbox"/> ATS 150	Science of Global Climate Change	S	3	MATH 117, 118, 141, 155 or 160
<input type="checkbox"/> ATS 350 and ATS 351	Intro. to Weather and Climate\ Intro. to Weather and Climate Lab	F	2 1	
<input type="checkbox"/> ATS 555	Air Pollution	S(O)	3	CHEM 113 & (MATH 261 OR 340) & (PH 122 OR 142)

May select from one of the following:

<input type="checkbox"/> BZ 104 and BZ 105	Basic Concepts of Plant Life (AUCC 3A)	F,S,SS	3	
<input type="checkbox"/> BZ 120	Principles of Plant Biology (AUCC 3A)	F,S	4	
<input type="checkbox"/> Life 102	Attributes of Living Systems	F,S	3	
<input type="checkbox"/> BZ 332	Introduction Phycology	F(E)	4	BZ 120 OR LIFE 102 & BZ 220
<input type="checkbox"/> BZ/NR 353	Global Change Ecology, Impacts and Mitigation	S	3	LIFE 320 OR 220 OR LAND 220
<input type="checkbox"/> BZ 440	Plant Physiology	S	3	BZ 120 or LIFE 103
<input type="checkbox"/> CBE 210	Thermodynamic Process Analysis	S	3	CBE 201 & MATH 261
<input type="checkbox"/> CHEM 103	Chemistry in Context (AUCC 3A)	F,S,SS	3	

May select from one of the following:

<input type="checkbox"/> CHEM 107	Fundamental of Chemistry (AUCC 3A)	F,S, SS	4	MATH 117 or 141, or concurrently with MATH 155, 160, 161, 229, or 261
<input type="checkbox"/> CHEM 111	General Chemistry I, (AUCC 3A)	F,S, SS	4	MATH 118, 141, 155, 160, 161, 229 or MATH 261 & CHEM 105
<input type="checkbox"/> CHEM 117	General Chemistry I for Chemistry Majors	F	3	MATH 118, 141, 155, 160, 161, 229 or 261

GROUP B. (CONT.) 6 CREDITS MINIMUM, 3-6 CREDITS MUST BE UPPER DIVISION *

KEY - F: FALL, S: SPRING, (E)/(O) EVEN/ODD YEARS, SS: SUMMER SESSION, O: AVAILABLE ONLINE

	Course Code	Course Name	Offered	Credits	Prerequisites
<input type="checkbox"/>	CON 476	Sustainable Practices-Design & Const.	F	3	
<input type="checkbox"/>	ECE 465	Electrical Energy Generation Technologies	S	3	ECE 202 with a min grade of C
<input type="checkbox"/>	ESS/GR 210	Physical Geography	F,S	3	
<input type="checkbox"/>	ESS 311	Ecosystem Ecology	F	3	ESS 211
<input type="checkbox"/>	ESS 524	Foundations for Carbon/Greenhouse Gas Management	F	3	BZ 300 to 499 or ECOL 300 to 499 or CHEM 300 to 499
May select from one of the following:					
<input type="checkbox"/>	GEOL 120	Exploring Earth: Physical Geology (AUCC 3A)	F,S,SS	3	
<input type="checkbox"/>	GEOL 122	Geology of Our Environment (AUCC 3A)	F,S,SS	3	
<input type="checkbox"/>	GEOL 150	Physical Geology for Scientists & Engineers	F	4	
<input type="checkbox"/>	GEOL/CIVE 424	Modern Gas and Oil	S	3	
<input type="checkbox"/>	LIFE 320	Ecology	F,S	3	BZ 101 or BZ 104 or BZ 110 or BZ 120 or LIFE 102; MATH 141 or MATH 155 or MATH 160
<input type="checkbox"/>	MECH 303	Energy Engineering	F	3	CBE 310 or ECE 341 or MECH 237 or MECH 337 or PH 361
<input type="checkbox"/>	MECH 337	Thermodynamics	F,S	4	MATH 261 and PH 141
<input type="checkbox"/>	MECH 463	Building Energy Systems	S	3	MECH 344
<input type="checkbox"/>	MECH 575	Solar and Alternative Energies	F	3	MECH 337 & 342 & 344
May select from one of the following:					
<input type="checkbox"/>	PH 110	Descriptive Physics (AUCC 3A)	F,S	3	
<input type="checkbox"/>	PH 121	General Physics I (AUCC 3A)	F,S,SS	5	MATH 125 or 155 or 157 or 160 (may be taken concurrently)
<input type="checkbox"/>	PH 141	Physics for Scientists and Engineers (AUCC 3C)			MATH 126 & (MATH 155, 159 or 160)
<input type="checkbox"/>	PH 361	Physical Thermodynamics	S	3	MATH 261 and PH 142
<input type="checkbox"/>	SYSE 530	Overview of Systems Engineering Processes	F,S	3	ECE 303 or STAT 303 or STAT 315
<input type="checkbox"/>	SYSE/ECE 532	Dynamics of Complex Engineering Systems	F	3	ECE 501 or ENGR 501 or SYSE 501

*To complete the minor, a total of at least 12 credits must be upper division coursework (300 or above).

ABOUT THE ENERGY INSTITUTE

The Energy Institute is a cross-campus, interdisciplinary collaboration administered by the Office of the Vice President for Research that spans all eight colleges and extends off campus to a global network of public and private partners. It serves as a convening and collaboration hub for faculty, staff, students, donors, sponsors, alumni, and other stakeholders and is under-pinned by over 160 faculty involved in all aspects of energy research, education, outreach, and entrepreneurship.

ABOUT THE SCHOOL OF GLOBAL ENVIRONMENTAL SUSTAINABILITY

The School of Global Environmental Sustainability was established in 2008 under the direction of Professor Diana Wall. The School is now a successful model for the modern, interdisciplinary 21st century university. The School is an "umbrella" institution that focuses the education and research capabilities of eight colleges within CSU ranging from the Warner College of Natural Resources to the College of Business. This wide range of expertise allows the School to address a comprehensive set of sustainable development issues such as food security, poverty, inequality, water management, industrial ecology, sustainable engineering, and urbanization.

CONTACT INFORMATION

For more information on the education programs and courses offered by the School of Global Environmental Sustainability, please contact Dale Lockwood, SoGES Academic Coordinator, at GESAdvising@colostate.edu or by calling (970) 492-4070.



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