

GEOGRAPHY, ENVIRONMENT AND PLANNING

DEPARTMENT OFFICE

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Programs Offered

Bachelor of Arts in Geography and Environment

Society, Environment, and Development

Environmental Systems

Geospatial Analysis and Technology

Sustainable Communities,

Planning for Sustainable Communities

Minor In Geography and Environment

Bachelor of Science in Environmental Studies

Energy Management and Design

The Geography, Environment, and Planning (GEP) Department's mission is to promote excellence in teaching and research across five areas of focus:

- 1) human-environment conflict and collaboration;
- 2) building resilience with environmental systems;
- 3) the application of geospatial and quantitative analyses to solving complex environmental and societal problems;
- 4) management and planning for sustainable communities; and
- 5) urban planning. For students, those goals are met through two degrees.

The Bachelor of Arts in Geography and Environment bridges the natural and social sciences in order to provide a more holistic and systematic analysis of the world. All students take a common set of foundational and intermediate courses that establish a strong

background in the natural, social and quantitative sciences. They then take more specialized courses in their area of concentration. Five concentrations are offered, mirroring the five areas of focus identified above. Students also take two-semester capstone courses that pull their educational experience together.

The Bachelor of Science in Energy Management and Design prepares students to become professionals in the energy field. The curriculum is interdisciplinary, with foundational courses in math, physics, chemistry, computer science and economics. A set of upper division concentration courses within the department pulls those skills together as they apply to energy management.

Both degrees strengthen students' writing, critical thinking and oral presentation skills, which are important for any successful career. The degrees also encourage students to take on internships and engage in other practical experiences that help prepare for the working world.

Careers in Geography, Environment, and Planning

Each concentration within the Geography, Environment, and Planning curriculum provides students with strong interdisciplinary backgrounds in the social and physical sciences, planning, and energy management. This combination of breadth and in-depth instruction allows students to develop the intellectual foundations, skills, and flexibility needed to deal with the specific environmental and social issues of today and the future. Through the interdisciplinary nature of the degree program and concentrations, GEP graduates become prepared for careers in both the public and private sectors including environmental management and restoration, city and regional planning, education and environmental outreach, and residential and commercial energy fields. Graduates from the department often pursue advanced degree programs in a variety of fields (e.g. geography, ecology, planning, environmental law, education).

Admission Requirements

When applying to Sonoma State University and declaring a major, a student may declare a B.A. in Geography and Environment or a B.S. in Environmental Studies, Energy Management and Design. There are no admissions requirements for the B.A. in Geography and Environment degree. The B.S. in Environmental Studies degree requires students attain a minimum GPA of 2.75. A student considering this degree should make an appointment to see a faculty member for academic advising.

Financial Aid and Scholarships

Students seeking financial aid to assist them in their studies should contact the financial aid office. Several scholarships are provided

specifically for GEP students through the University scholarship program. Please refer to the Scholarships section of this catalog.

Department Resources

Geospatial Technology Instructional Laboratory (GISL)

The Geography, Environment, and Planning Department has a well-equipped computer laboratory that supports advanced instruction in geographic information systems (GIS), satellite image processing, digital cartography, and laboratory and field methods' data analysis. The GTIL includes 17 workstations, ArcGIS Desktop, ERDAS Imagine, IDRISI, Adobe Illustrator, and geobrowsers.

Map Library

The Map Library houses an extensive collection of digital and paper maps, and aerial photography.

The Center for Interdisciplinary Geospatial Analysis (CIGA)

The Center for Interdisciplinary Geospatial Analysis promotes the application of geospatial technology to social and environmental problems through research, education, and community service. The lab seeks interdisciplinary collaboration among campus and external researchers, students, and other organizations in projects that involve geographic information and spatial analysis at local to global scales. The CIGA provides computer, software and data resources, Geographic Information System (GIS) and remote sensing expertise, consulting services, educational courses, and community outreach. Students are given a unique opportunity to broaden and refine their education by working on real-world problems in CIGA research projects and service contracts.

The Climate Research Center (CRC)

The Climate Research Center conducts research on climate science phenomena (e.g. hurricanes, droughts, and floods) with a special focus on their connections with climate variability, climate change and human activities. The CRC promotes the application of statistical methods and geographic information systems (GIS) to address climate science problems. The CRC aims to collaborate in multidisciplinary climate research with members of the SSU community, organizations or individuals in the Sonoma area and with researchers globally. The CRC houses state-of-the-art computers and cutting-edge software. Students working in the CRC can experience climate science in action and will gain essential data analysis skills

Sonoma Quaternary Laboratory (SQUAL)

The Sonoma Quaternary Laboratory specializes in reconstructing ecological, climate and landscape change caused by environmental and climate forces as well as human impacts over the past several thousand years. These paleoenvironmental reconstructions provide an important context for evaluating current and future environmental and climate change. The SQUAL houses state-of-the-art equipment for micro- and macro-botanical analysis as well as other sedimentary analyses. Students working in SQUAL have the opportunity to gain unique field and laboratory research skills.

The Center for Sustainable Communities:

The Center for Sustainable Communities (CSC) works with cities and counties, special districts, and regional and state government agencies to develop planning policies and implementation strategies related to climate change and greenhouse gas emissions, planning for healthy communities, the relationship between land use and water resources, and other sustainability and resiliency topics. The CSC utilizes faculty, students, and "encore career" professionals (recently retired leaders from the environmental professions), providing mentoring and professional development opportunities for students and assistance to our government partners in addressing a wide array of environmental, economic, and social challenges.

The Environmental Technology Center:

A model for sustainable building techniques and technologies, this center includes energy and water-efficient landscaping, "smart building" control technologies, environmentally-sensitive materials, passive solar heating and cooling, and more. It serves as a training facility for building professionals and teachers and as an educational and research site.

The Classroom Garden:

The garden adjacent to the Environmental Technology Center teaches SSU students and members of the public about sustainable landscape practices and how these contribute to biodiversity and environmental health. Through internships, volunteering, and classroom experiences, students gain a sense of place, community, purpose, and an enriched academic experience.

The SSU Botanical and Kenneth M. Stocking Native Plant Garden:

A showcase of diverse California plant communities and a quiet place for education and relaxation. Located near the campus lakes, the garden includes a guided trail through woodland, marsh, and riparian ecosystems.

The Fairfield Osborn Preserve and Galbreath Wildlands Preserve:

Managed by the Center for Environmental Inquiry (CEI), SSU features two valuable off-campus learning environments. The Fairfield Osborn Preserve is 411-acre field station atop Sonoma Mountain that provides environmental education programs and opportunities for scientific research. The Preserve is a fifteen-minute drive from campus. Galbreath Wildlands Preserve is a 3,670 acre preserve nestled in the Coast Range of northern California. The mission of the preserves is to promote environmental education and research, as well as the effective stewardship of this diverse landscape.

Bachelor of Arts in Geography and Environment

Degree Requirements

(See page 150 for a sample four-year program.)

Degree Requirements	Units
General education (48 total, 7-20 units in major)	28-41
Units remaining in GE	
Major Courses	54-67

General Electives	23-40
Total units needed for graduation	120

Note: Courses required for the major must be taken for a traditional letter grade, except for courses that are offered CR/NC only. Students must earn a C- or better in any course applied to the major.

Core Requirement for Major: 31-32 Units

Foundational Courses Lower Division Courses (12 units)

GEP 203 Human Geography	3
OR	
GEP 206 Society, Environment, and Sustainable Development	3
GEP 201 Global Environmental Systems	4
GEP 215 Environmental Forum	1
GEP 202 Quantitative Methods	4
OR	
MATH 165 Introductory Statistics	4

Intermediate Upper Division Courses (14-15 units)

Society, Environment and Development

GEP 320 Geopolitics	4
OR	
GEP 330 Environmental History	4

Environmental Systems

GEP 340 Applied Ecology	3-4
OR	
GEP 351 Natural Hazards	3-4

Sustainable Communities

GEP 360 Planning – required for PSC concentration	3
OR	
GEP 371 Social Geography	3

Geospatial and Applied Quantitative Analysis (Choose One)

GEP 387 Intro to GIS	4
OR	
GEP 390 Environ. Data Analysis	4

Capstone (5 units)

Choose one course in consultation with your advisor after GEP 310.

GEP 310 Professional Preparation	1-2
GEP 490b Human-Environment Capstone Seminar	4
GEP 491b Environmental Systems Capstone Seminar	4
GEP 492b Global Issues Capstone Seminar	4
GEP 493b Planning Workshop	4

Practical Experience (4-5 units minimum)

GEP 312 Professional Conferences	1-2
GEP 313 Field Experience	1-2
GEP 314 Field Experience Abroad	2-3
GEP 317 Internship	1-3
GEP 418 Lab Assistant in GEP	2
GEP 419 Teaching Assistant in GEP	2

Concentrations total units: 19-30

Geospatial Science and Technology

This concentration is designed for students interested in geographic information science and its application in resource management, land-use planning, and land-change science.

Concentration courses 14-16

Take all courses in Group I and additional courses in Group II to meet a 14 unit minimum in the Concentration beyond Foundation and Upper Division courses taken.

Group I (all required; 9 units)

GEP 202 Quantitative Methods	4
GEP 387 Intro to GIS	4
GEP 491a Pre-seminar	1

Group II (Choose 2-3 for minimum 5 additional units)

GEP 440 Field Methods	2
GEP 380 Environmental Remote Sensing	4
GEP 385 Cartographic Visualization	3-4
GEP 388 Environmental GIS	3-4
GEP 389 Advanced GIS	3
GEP 390 Environmental Data Analysis	4

Supporting courses 12-14

Take CS 115 and 2-3 additional courses to meet a minimum of 12 units. Substitutions possible in consultation with an advisor

CS 115 Programming I	4
CS 210 Intro to UNIX	1
CS 215 Programming II	4
CS 355 Database Management	4
CS 370 Software Design & Dev.	4
CS 386 Selected Topics in CS with Lab	3
ANTH 326 Topics in Archaeology	4
ES 314 Advanced Programming, Simulation and Modeling	4
BIOL 485 Biometry	4

Environmental Systems

This concentration is designed for students who would like to focus on the natural environment, including the nature of biophysical patterns and processes, as well as applied, science-based conservation, restoration, conservation planning, land management, and preservation.

Concentration: 12-15

Choose three or four courses to meet the 12 unit minimum; no more than 6 units in GEP 440-444; no more than 8 units in GEP 380-389; GEP 491 Required

GEP 340 Applied Ecology	3-4
GEP 341 Conservation Biology	3-4
GEP 343 Biogeography	4
GEP 350 Geomorphology	4
GEP 351 Natural Hazards	3-4
GEP 352 Soil Science	3-4
GEP 354 Watershed Hydrology and Management	4
GEP 355 Weather and Climate	4
GEP 356 Global Climate Change: Past, Present, Future	4
GEP 359 Special topics in Environmental Systems	2-4
GEP 387 Intro to GIS	4
GEP 380 Environmental Remote Sensing	4

GEP 388 Environmental GIS	3-4
GEP 389 Advanced GIS	3-4
GEP 390 Environmental Data Analysis	4
GEP 440 Field Methods	2
GEP 441 Lab Methods	2-3
GEP 442 Conservation Research Methods	3
GEP 443a/b Agroecology	1-2
GEP 444a/b Native Plant Propagation	1-2
GEP 445 Restoration Ecology	5
GEP 491a Pre-seminar (Required)	1

Supporting Courses: 12-13

Choose one of two pathways to meet the 12 unit minimum. Group I: Take BIO 130, 131 and one additional course from the list; Group II; Take BIO 131 and two additional courses from the list, with GEOL 303&304 considered as single combined-course option

Group I

BIOL 130 Intro Cell Biology and Genetics	4
BIOL 131 Biological Diversity and Ecology	4
BIOL(322;323;324;327;329;330;332;333;335;337;341;346)	4

Group II

BIOL 131 Biological Diversity and Ecology(required)	4
CS 115 Programming I	4
GEOL 303/304 Adv Principles of Geology/Mapping & Report Writing	5
GEOL 323 Hydrology	4
GEOL 306 Environmental Geology	4
GEOL 310 Geophysics	4
GEOL 311 Sedimentary Geology	4

Society, Environment, and Development

This concentration is designed for students interested in human-environment relations, sustainable development, natural resource policy and management and the human dimensions of environmental restoration.

Concentration: 15-17

Choose at least four courses to meet the 15 unit minimum; but no more than one area studies course; GEP 492 Required

GEP 320 Geopolitics	4
GEP 322 Globalization and Environments	4
GEP 323 Resource Mgt & Development in Global Persp.	4
GEP 324 Climate Change & Society	4
GEP 325 Global Food Systems: Scarcity & Sustainability	3-4
GEP 327 Latin America and the Caribbean	4
GEP 328 Africa South of the Sahara	4
GEP 330 Environmental History	4
GEP 331 Restoration and Society	4
GEP 332 Environmental Literature	3
GEP 335 US Environmental Policy	4
GEP 336 US Environmental Law	3
GEP 337 Landscape History of the American West	4
GEP 339 Special Topics in Society, Environment and Develmt	3-4
GEP 341 Conservation Biology	3-4
GEP 364 Environmental Planning	4
GEP 445 Restoration Ecology	5
GEP 490a Pre-seminar (Required)	1

Supporting Courses: 6-8 Units

Choose any two; substitutions possible in consultation with an advisor; Peace Corp Prep must take UNIV 238 and 200-level language

ANTH 352 Global Issues	4
BIO 131 Biological Diversity & Ecology	4
ECON 205 Microeconomics	4
ECON 381 Natural Resources & Environmental Economics	4
HIST 471 The American West	4
LANGUAGE (200 level course)	4
POLS 314 Environmental Political Theory	4
POLS 452 Politics of the Developing World	4
SOCI 482 Sociology of the Environment	4
SSCI 299 Sophomore Seminar: How to Think Like a Social Scientist	3
UNIV 238 Found. of Leadership	3
WGS 385 Globalization and Gender	4

Sustainable Communities

This concentration is designed for students interested in social relations and environmental sustainability within urban and rural communities.

Concentration: 12-15 Units

Choose 3-4 courses to meet 12 unit minimum; GEP 493 required

GEP 360 Introduction to Planning	3
GEP 361 Planning Theory and Methodology	3-4
GEP 362 Environmental Impact Assessment	2-3
GEP 363 Land Use Law	3
GEP 364 Environmental Planning	4
GEP 365 Healthy Communities Planning	3-4
GEP 366 Planning for Sustainable Communities	3
GEP 367 Transportation Planning	3
GEP 368 Urban Design I: The Urban Form	3
GEP 369 Urban Design II: Placemaking	3
GEP 370 Globalization and the City	4
GEP 371 Social Geography	3
GEP 373 Energy Technology & Society	4
GEP 473 Thermal Energy Management	3-4
GEP 474 Electrical Energy Management	3-4
GEP 475 Passive Solar Design	3-4
GEP 476 Small-scale Energy Sources	3-4
GEP 477 Computer Applications in Energy Mngt Lab	2-3
GEP 379 Selected Topics in Sustainable Communities	3-4
GEP 493 Required	3-4
GEP 490a Pre-seminar (Required)	1

Supporting Courses 7-8 Units

Choose any two; substitutions possible in consultation with an advisor

ECON 204 Macroeconomics	4
ECON 205 Microeconomics	4
ECON 381 Natural Res & Environ Econ	4
POLS 314 Environmental Political Theory	4
POLS 452 Politics of the Developing World	4
WGS 385 Globalization and Gender	4
SOCI 482 Sociology of the Environment	4

SSCI 299 Sophomore Seminar	3
ANTH 352 Global Issues	4

Planning for Sustainable Communities

This concentration is designed for students who would like to follow a pre-professional curriculum in planning.

Concentration: 18-21

Group I (required)

GEP 361 Planning Theory and Methodology	3-4
GEP 362 Environmental Impact Assessment	2
GEP 363 Land Use Law	3
GEP 493a Pre-seminar	4

Group II (choose two)

GEP 364 Environmental Planning	4
GEP 365 Healthy Communities Planning	3-4
GEP 366 Planning for Sustainable Communities	3
GEP 367 Transportation Planning	3
GEP 368 Urban Design I: The Urban Form	3
GEP 369 Urban Design II: Placemaking	3

Supporting Courses (Choose any two)

(choose any two; substitutions possible in consultation with an advisor)

ANTH 352 Global Issues	4
ECON 204 Macroeconomics	4
ECON 205 Microeconomics	4
ECON 381 Ntrl Res & Environ Econ	4
HIST 471 The American West	4
POLS 314 Environmental Political Theory	4
POLS 452 Politics of the Developing World	4
SOCI 482 Sociology of the Environment	4
SSCI 299 Sophomore Seminar	3
UNIV 238 Found. of Leadership	3
WGS 385 Globalization and Gender	4

Minor in Geography and Environment

Students take the required GEP Foundational courses Society, Environment, and Development (choose one)

GEP 203 Human Geography	3
OR	
GEP 205 World Regional Geography	3
OR	
GEP 206 Society, Environ, and Sust Development	3

Environmental Systems

GEP 201 Global Environmental Systems	4
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Sustainable Communities

GEP 215 Environmental Forum	1
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Upper-division courses chosen in consultation with advisor;
no more than 3 units in the 310-319 practical experience category

Total units in the minor 20

Note: Courses required for the minor must be taken for a traditional letter grade, except for courses that are offered CR/NC only. Students must earn a C- or better in any course applied to the minor.

Bachelor of Science in Environmental Studies

This program is designed to prepare students for careers or for graduate studies in the fields of residential and commercial energy management, energy-efficient architecture and design, energy planning in industry and government, renewable energy applications, and other energy-related businesses

(See page 157 for a sample four-year programs in the degree)

Degree Requirements	Units
General education (50, 9 in major)	41
Science Support Courses	29-31
Major Requirements	27-29
General Electives	29-33
Total units needed for graduation	120

The following natural science support courses are required for the B.S. degree, in addition to the specific requirements for Energy Management and Design..

Natural Science Support Courses: 29-31 Units

CHEM 115A, B General Chemistry	(GE-B1) 5,5
MATH 161 Calculus 1	(GE-B4) 4
MATH 211-S Calculus II 2	
MATH 165 Elementary Statistics	(GE-B4) 4
Physics: either sequence	
PHYS 210A,B General Physics	(GE-B1) 3,3
PHYS 114, 214 Introduction to Physics I, II	(GE-B1) 4,4

ENSP and EMD Core Courses (27-29 units)

GEP 416 GEP Forum	1
GEP 373 Energy, Technology and Society	4
GEP 473 Thermal Energy Management	4
GEP 474 Electrical Energy Management	4
GEP 416 Energy Forum (taken twice)	2,2
GEP 494/317 Internship in EMD	4
At least two of the following:	
GEP 475 Passive Solar Design	4
GEP 476 Small-Scale Energy	4
GEP 477 Computer Applications in EMD	2

Note: You may need to take upper division courses (300-400 level) in addition to those listed above (and in your upper division GE selection) in order to meet the required number of upper division units for graduation (40).

Recommended Courses

CS 101 Intro to Computing 3

Architectural drafting course at community/junior college

Sample Four-Year Program for Bachelor of Science in ENSP-Energy Management and Design

FRESHMAN YEAR: 31 Units

<i>Fall Semester (15 Units)</i>	<i>Spring Semester (16 Units)</i>
CHEM 115A (5)	CHEM 115B (4)
GE A1 (3)	MATH 161 (4)
GE A2 (3)	GE (C) (4)
GE A3 (4)	GE (D1) (3)

SOPHOMORE YEAR: 30 Units

<i>Fall Semester (14 Units)</i>	<i>Spring Semester (16 Units)</i>
MATH 211S (2)	PHYS 214 (4)
PHYS 114 (4)	GE (D2) (3)
GE (B2) (4)	GE (D3) (3)
GE/Elective (3-4)	GE (D4) (3)
GE (C) (4)	GE (D5) (3)

JUNIOR YEAR: 31 Units

<i>Fall Semester (16 Units)</i>	<i>Spring Semester (15 Units)</i>
ENSP 201 (1)	ENSP 430 (2)
ENSP 330 (4)	ENSP 438 (4)
ENSP 338 (4)	GE (E) (3)
GE (C) (4)	Elective (3)
Elective (3)	Elective (3)

SENIOR YEAR: 28 Units

<i>Fall Semester (15 Units)</i>	<i>Spring Semester (13 Units)</i>
MATH 165 (4)	ENSP 430 (2)
ENSP 337 (4)	ENSP 437 (4)
ENSP 499-internship (4)	Elective (4)
Elective (3)	Elective (4)

TOTAL UNITS: 120

Sample Four-year Program for Bachelor of Arts in Geography and Environment

This is just an example of how one might plan four years as a GEP student. Most GE classes can be taken in any order or sequence. Consult with your advisor for suggestions on when to take particular courses..

FRESHMAN YEAR: 30 Units

<i>Fall Semester (14 Units)</i>	<i>Spring Semester (15-16 Units)</i>
Core Course: GEP 203 or 206 / GE (3)	Core Course: GEP 201 / GE (B1) (4)
GE English 100a/101 (3)	GE/Elective (3-4)
Core Course: Quantitative Reasoning (4)	GE/Elective (4)
GE/Elective (4)	GE/Elective (4)

SOPHOMORE YEAR: 30 Units

<i>Fall Semester (15 Units)</i>	<i>Spring Semester (15 Units)</i>
Core course GEP 215 (1)	Disciplinary Breadth (4)
Disciplinary Breadth (4)	GE/Elective (3)
GE/Elective (3)	GE/Elective (4)
GE/Elective (3)	Supporting Course (4)
Supporting Course (4)	

JUNIOR YEAR: 30 Units

<i>Fall Semester (15 Units)</i>	<i>Spring Semester (15 Units)</i>
Upper Division GE (3)	Disciplinary Breadth (4)
Upper Division GE (3)	Disciplinary Breadth (4)
Concentration (3)	Disciplinary Breadth (3)
Disciplinary Breadth (3)	Concentration (3)
University Elective (3)	GEP 310 Professional Development (1)

SENIOR YEAR: 30 Units

<i>Fall Semester (16 Units)</i>	<i>Spring Semester (14 Units)</i>
Concentration (3)	Concentration (4)
Concentration (3)	Concentration (3)
Supporting Course (3-4)	Upper Division GE (3)
Pre-seminar (1-4)	Capstone (4)
University Electives (2)	

TOTAL UNITS: 120