ENVIRONMENT & SUSTAINABILITY (BS)

College of Agriculture and Life Sciences

Program Website (https://cals.cornell.edu/education/degrees-programs/environment-sustainability-major-and-minor/)

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Program Description

The Environment & Sustainability (E&S) major is available in the College of Agriculture and Life Sciences and the College of Arts and Sciences. The E&S major spans perspectives needed to build a world with more socially just and sustainable conditions for biodiversity and human prosperity. E&S provides students with a basis for understanding the structure and functioning of the earth's environment, and critically analyzing the sustainability of social-ecological systems. How do we as humans value, use, benefit from, and protect the environment? What is sustainability and how should it be measured? Students take courses in environmental natural sciences, social sciences, humanities, and examine how sustainability challenges are multidisciplinary and require integrative solutions.

The E&S curriculum relies upon a core foundation in biology, physical and social science, humanities, economics, and statistics, supplemented by coursework and experiences integrating these topics of study. In addition, E&S focused electives allow students to pursue greater depth in specific disciplines encompassing environment and sustainability issues, taking advantage of a diverse range of courses in two colleges.

Requirements for the E&S major are the same in both colleges, but distinct college requirements will result in students taking different overall courses to complete their degrees. All students complete a set of foundation courses (core curriculum (https://cals.cornell.edu/environment-sustainability/education/core-curriculum/)) after which students tailor their upper-division courses by selecting one of six focused electives: Environmental Biology and Applied Ecology (EBAE), Environmental Humanities (EH), Environmental Policy and Governance (EPG), Land, Air and Water Resources (LAWR), Sustainable Business and Environmental Economics (SBEE), or a Student-Designed Focused Elective (SD).

E&S requirements leave room for students to study abroad, engage in research and pursue other opportunities offered by Cornell. More information on the E&S Research Honors Program (https://cals.cornell.edu/environment-sustainability/research-opportunities/honors-program/) can be found on the E&S program page (https://cals.cornell.edu/environment-sustainability/research-opportunities/). Prospective students are encouraged to explore the learning outcomes, curriculum requirements, and career paths pursued by recent graduates.

The E&S Program Office is located in 117 Kennedy Hall on the Cornell Ithaca campus. Instruction mode is in-person for courses in the E&S curriculum unless otherwise noted. For any questions, please email environment@cornell.edu.

Program Information

- Instruction Mode: In Person
- Location: Ithaca, NY
- Minimum Credits for Degree: 120

Program Requirements

- Students declaring or adding the E&S major must complete at least three Core Curriculum courses beforehand. This does not apply to first-year CALS students who are admitted directly into the E&S major.
- Once matriculated, one class in the Core Curriculum may be taken S/U. All other requirements must be taken for a letter grade unless the course is offered S/U only.
- A grade of C- or higher must be earned to meet major requirements.
- 10 courses with a minimum of 28 total credits are required for the Core.
- 7-9 courses with a minimum of 21 credits are required for the focused elective requirements.

In addition to the major requirements outlined below, all students must meet their college graduation requirements:

- Agriculture and Life Sciences Graduation Requirements

Foundation Course

Code	Title	Hours
NTRES 1101	Understanding Environment and Sustainability (crosslisted)	3

Social Science

Code	Title	Hours
NTRES 2201	Society and Natural Resources (crosslisted)	3

Biology

Choose one course:

Code	Title	Hours
Ecology		
BIOEE 1610	Introductory Biology: Ecology and the Environment	3-4
BIOSM 1610	Ecology and the Marine Environment	3
Evolution/Diversity		
BIOEE 1780	An Introduction to Evolutionary Biology and Diversity	4-5
BIOEE 1781	Introduction to Evolution and Diversity	4
BIOSM 1780	Evolution and Marine Diversity	4

Note:

- BIOSM designates summer courses at Shoals Marine Laboratory (https://www.shoalsmarinelaboratory.org/).
- The EBAE and LAWR focused electives require more than one biology course. See focused elective descriptions (https://cals.cornell.edu/environment-sustainability/education/concentrations/) for details.
- Advanced placement (AP) biology credits are not accepted for substitution or placement out of any introductory biology course.

Chemistry/Physics

Choose one course:

Code	Title	Hours
CHEM 1560 & CHEM 1561	Introduction to General Chemistry and Introduction to General Chemistry Laboratory	4
CHEM 2070 & CHEM 2071	General Chemistry I and General Chemistry I Laboratory	4
EAS 1600	Environmental Physics	3

Note:

- The EBAE and LAWR focused electives require students to complete at least one physics and one chemistry course.
- AP/IB/Case Credit for Chemistry and Physics accepted to fulfill this requirement.

Statistics

Choose one course:

Code	Title	Hours
AEM 2100	Introductory Statistics	4
BIOEE 1760	Biostatistics with R programming language	3
BTRY 3010	Statistics I (crosslisted)	4
MATH 1710	Statistical Theory and Application in the Real World	4
PUBPOL 2100	Introduction to Statistics	4
PSYCH 2500	Statistics and Research Design	3
SOC 3010	Statistics for Sociological Research	4
STSCI 2100	Introductory Statistics and Data Science (crosslisted)	4
STSCI 2150	Introductory Statistics for Biology	4

Note:

- AP/IB Statistics credit accepted to fulfill this requirement.

Humanities

Choose one course:

Code	Title	Hours
ANTHR 2201	Early Agriculture (crosslisted)	3
ANTHR 2420	Nature-Culture: Ethnographic Approaches to Human Environment Relations (crosslisted)	4
ANTHR 2482	Anthropology of Climate Change (crosslisted)	3
ASIAN 2273	Religion and Ecological Sustainability (crosslisted)	3
BSOC 2061	Ethics and the Environment (crosslisted)	4
COML 2036	Literature and the Elements of Nature	3
ENGL 3795	Communicating Climate Change	3
ENGL 4675	The Environmental Imagination in American Literature (crosslisted)	4
HIST 2581	Environmental History (crosslisted)	4
NTRES 3330	Ways of Knowing: Indigenous and Place-Based Ecological Knowledge (crosslisted)	3
PHIL 1440	Ethics of Eating	3

Economics

Choose one course:

Code	Title	Hours
AEM 1500	An Introduction to the Economics of Environmental and Natural Resources (crosslisted)	3
AEM 2500	Environmental and Resource Economics (crosslisted)	3

Note:

- The SBEE focused elective requires AEM 2500 Environmental and Resource Economics. ECON 1110 Introductory Microeconomics is a prerequisite for AEM 2500.
- AP/IB credit accepted for ECON 1110 and ECON 1120.

Field/Engaged Experience

Choose one course:

Code	Title	Hours
BIOEE 2525 & BIOEE 2526 & BIOEE 2527	Ecology and Conservation of Wildlife in the Neotropics and Ecology and Conservation of Wildlife in the Neotropics II and Neotropical Wildlife Biology	4
BIOEE 3611	Field Ecology	3
BIOEE 4570 & BIOEE 4571	Limnology: Ecology of Lakes, Lectures and Limnology: Ecology of Lakes, Laboratory	5
ENTOM 2120	Insect Biology	4
NTRES 2100	Introductory Field Biology (crosslisted)	4
NTRES 2400	Field Methods in Avian Ecology (crosslisted)	3
NTRES 2600	Field Research in the Ecological Arts (crosslisted)	3
NTRES 3020	Earth Projects (crosslisted)	3
NTRES 3150 & NTRES 3151 & NTRES 3152	Introduction to Conservation Bioacoustics and Conservation Bioacoustics Field Course Preparation and Field Methods in Conservation Bioacoustics: Hawai'i Experience	5.5
NTRES 4560	Stream Ecology (crosslisted)	4
BIOSM 2500	Coastal Habitat Field Research Methods	3
BIOSM 3330	Marine Parasitology and Disease	3
BIOSM 3340	Marine Invasive Species: Ecology, Evolution and Management	3
BIOSM 3450	Marine Mammal Biology	3
BIOSM 3650	Underwater Research	3

Note:

- BIOSM designates summer course at Shoals Marine Laboratory (https://www.shoalsmarinelaboratory.org/) (SML).

Sustainability Science Colloquium

Choose one course:

Code	Title	Hours
ENVS 2000	Environment and Sustainability Colloquium (crosslisted)	1
ENVS 2010	Discussions of Environment and Sustainability (crosslisted)	3

BEE 2000	Perspectives on the Climate Change Challenge (crosslisted)	1.5
BEE 2010		3

Capstone Course

NOTE: Only juniors and seniors are eligible for capstone requirement fulfillment.

Choose one from the following courses:

Code	Title	Hours
BIOSM 3750	Marine Ecosystem Research and Management	3
COML 4103	Nabokov, Naturally (crosslisted)	3
ENGL 4795	Climate Communications Capstone	3
ENVS 4940	Capstone Special Topics Course in Environment and Sustainability	3-4
HIST 4262	Environmental Justice: Past, Present, Future (crosslisted)	4
NTRES 4400	Nature-Based Climate Solutions?	3
NTRES 4500	Climate Solutions Capstone (crosslisted)	3
NTRES 4600	Planning for Environmental Conservation and Sustainability (crosslisted)	3
NTRES 4700	Art and Science of the Mohawk River Watershed (crosslisted)	3
NTRES 4800	Wildlife Corridor Conservation & Crossing Design (crosslisted)	3

Note:

- BIOSM designates summer course at Shoals Marine Laboratory (https://www.shoalsmarinelaboratory.org/) (SML).

Focused Electives

The E&S major comprises an interdisciplinary core curriculum coupled with the completion of courses in a thematic focused elective of your choice. All students must select one of six focused electives, consisting of seven to nine additional courses beyond the core. All students should familiarize themselves with the requirements of focused electives in which they may be interested. Several focused electives require students to complete specific courses as part of their core requirements.

Students must declare their focused elective by pre-enroll in Spring of their sophomore year. External/internal transfers and Arts & Sciences students declaring their major in sophomore year will be required to submit a focused elective plan before pre-enroll in their first semester of junior year.

- Students may not use the same course to fulfill both a core and focused elective requirement
- Students may not use the same course within a focused elective to fulfill more than one requirement.
- (*) marks courses common to both a core requirement and the focused elective.

Focused Electives (Acronyms)

- Environmental Biology & Applied Ecology (EBAE)
- Environmental Humanities (EH)
- Environmental Policy & Governance (EPG)
- Land, Air & Water Resources (LAWR)
- Sustainable Business & Environmental Economics (SBEE)
- Student-Designed Focused Elective (SD)

Environmental Biology & Applied Ecology Focused Elective

The Environmental Biology and Applied Ecology (EBAE) focused elective provides students with the scientific basis for understanding the sustainability of various ecological systems. Students will learn advanced principles of biology and ecology and their application to problems of environmental management. Students with interests in many topics may undertake this focused elective, for example, wildlife and fisheries management; forest, wetland and aquatic ecology; environmental microbiology; conservation science; endangered and invasive species management; biological and ecological consequences of pollutants in the environment.

Required Courses from Core Curriculum

Code	Title	Hours
BIOEE 1610	Introductory Biology: Ecology and the Environment	3-4
EAS 1600	Environmental Physics	3

Additional Required Courses:

Biological Science (Choose One)

Code	Title	Hours
BIOEE 1780	An Introduction to Evolutionary Biology and Diversity	4-5
or BIOEE 1781	Introduction to Evolution and Diversity	
BIOSM 1780	Evolution and Marine Diversity	4

Chemistry (Choose One)

Recommended:

Code	Title	Hours
CHEM 1560 & CHEM 1561	Introduction to General Chemistry and Introduction to General Chemistry Laboratory	4

Other chemistry options include:

Code	Title	Hours
CHEM 1570	Introduction to Organic and Biological Chemistry	3
CHEM 2070 & CHEM 2071	General Chemistry I and General Chemistry I Laboratory	4
CHEM 2080 & CHEM 2081	General Chemistry II and General Chemistry II Laboratory	4

- AP/IB/CASE Chemistry credit accepted to fulfill this requirement.

Calculus (Choose One)

Code	Title	Hours
MATH 1106	Modeling with Calculus for the Life Sciences	4
MATH 1110	Calculus I	4

- AP/IB/CASE Calculus credit accepted to fulfill this requirement.

Note: It is recommended (but not required) that students take a second semester of calculus, MATH 1120 Calculus II.

Quantitative (Choose One)

Choose from any quantitative field that aligns with your career goals. Some fields/courses from which to choose are an additional calculus or statistics beyond the core and concentration requirements, population modeling (BIOEE or NTRES) and/or applied analytical courses, computer programming, or Geographical Information Systems (GIS). See EBAE

webpage for suggestions. Additional courses may be considered with approval from the E&S Program.

Code	Title	Hours
AEM 2770	Excursions in Computational Sustainability	3
BIOEE 3550	Data Analysis and Visualization in Ecology and Environmental Science	3
BTRY 3020	Statistics II	4
CS 1110	Introduction to Computing: A Design and Development Perspective	4
EAS 2900	Introduction to Programming for Meteorology and Climate Science	3
ENTOM 3030	Applied Statistics: Biological Experiments in Practice	4
GDEV 4295	Data Science Workshop with R	3
MATH 1120	Calculus II	4
NTRES 4100	Advanced Conservation Biology	4
PLSCI 2200	Introduction to Mapping and Spatial Analysis with GIS	3
STSCI 3110	Applied Probability and Statistics	4

Introductory Genetics (Choose One)

Code	Title	Hours
NTRES 2830	DNA, Genes and Genetic Diversity	4
BIOMG 2800 & BIOMG 2801	Lectures in Genetics and Genomics and Laboratory in Genetics and Genomics	5

Advanced Ecology (Choose One)

Code	Title	Hours
BIOEE 3610	Advanced Ecology	4
NTRES 3100	Applied Population Ecology	3

Elective Courses

Three additional courses from EBAE elective lists: Choose one course from **List 1**, one course from **List 2** and one more course from either list that must be at the 4000 level or above.

List 1 - Ecosystems: The Physical and Biological Environment

Code	Title	Hours
BIOEE 3610	Advanced Ecology	4
BIOEE 3690	Chemical Ecology	3
BIOEE 4570	Limnology: Ecology of Lakes, Lectures	3
BIOEE 4690	Food, Agriculture, and Society	3
BIOEE 4780	Ecosystem Biology and Global Change	4
EAS 3030	Introduction to Biogeochemistry	4
NTRES 3150	Introduction to Conservation Bioacoustics	3
NTRES 3240	Sustainable, Ecologically Based Management of Water Resources	3
NTRES 3250	Forest Management and Maple Syrup Production	3
NTRES 4560	Stream Ecology (crosslisted)	4
PLSCI 3210	Soil and Crop Management for Sustainability	3
PLSCI 4730	Ecology of Agricultural Systems	4.5
PLSCI 4660	Soil Ecology	3-4

List 2 - Organisms: Plants, Animals, Microbes

Code	Title	Hours
BIOEE 2740	The Vertebrates: Comparative Anatomy, Function, Paleontology, and Evolution	4
BIOEE 3610	Advanced Ecology	4
BIOEE 3611	Field Ecology	3
BIOEE 3730	Biodiversity and Biology of the Marine Invertebrates	3
BIOEE 4460	Plant Behavior and Biotic Interactions, Lecture	3
BIOEE 4500		3
BIOEE 4660	Physiological Ecology, Lectures	3
BIOEE 4700 & BIOEE 4701	Herpetology, Lectures and	3
BIOEE 4750	Ornithology, Lectures	3
BIOEE 4760	Ichthyology: Biology of Fishes, Lectures	3
BIOEE 4800	Ecological Genetics	4
BIOMI 2900	General Microbiology Lectures	3-4
BIOMI 3500	Marine Microbes and Disease in a Changing Ocean (crosslisted)	3
BIOMI 6300	Computational Approaches for Microbial Systems	3
BIOSM 3290	Field Animal Behavior	3
BIOSM 3330	Marine Parasitology and Disease	3
BIOSM 3450	Marine Mammal Biology	3
BIOSM 3740	Field Ornithology	3
BIOSM 4650	Shark Biology and Conservation	3
ENTOM 2120	Insect Biology	4
ENTOM 3150	Spider Biology	3
ENTOM 3440	Insect Conservation Biology (crosslisted)	3
ENTOM 3630	Bugs in Bugs– Insect Pathology and Immunity	3
ENTOM 3755	Social Animal Behavior: Arthropods to Apes	3
ENTOM 4440	(crosslisted)	4
ENTOM 4550	Insect Ecology (crosslisted)	4
NTRES 3100	Applied Population Ecology	3
NTRES 3110	Fish Ecology, Conservation, and Management	3
NTRES 3150	Introduction to Conservation Bioacoustics	3
NTRES 3260	Applied Conservation Ecology (crosslisted)	3
NTRES 3400	Molecular Tools for Ecology, Conservation, and Natural Resource Management	3
NTRES 4100	Advanced Conservation Biology	4
NTRES 4120	Wildlife Population Analysis: Techniques and Models	3
NTRES 4280	Principles and Practices of Applied Wildlife Science	3
PLSCI 2410	Introductory Plant Diversity and Evolution	4
PLSCI 3010	Biology and Management of Plant Diseases	4
PLSCI 3150	Weed Biology and Management	4
PLSCI 3420	Plant Physiology, Lectures	3
PLSCI 4300	Mycology	3

Environmental Humanities

The Environmental Humanities (EH) focused elective emphasizes the important role the humanities, arts, and interpretive social sciences can play not just in producing solutions to environmental problems but in understanding how those problems arose and reframing them to improve environmental outcomes. All humans, including environmental scientists, engage in the arts of imagination, narration, reflection, and persuasion that lie at the core of humanistic fields of study. The environmental humanities explore how the environment is constructed and represented in relation to humans, and how these divergent visions impact both

knowledge and action. Courses exploring subjects such as art, culture, ethics, history, and literature can help students appreciate the underlying values and belief systems that drive much of human behavior vis-à-vis the biological and geo-physical systems that we inhabit and transform.

The Environmental Humanities focused elective is designed for students who wonder why so many innovative, promising scientific and technical solutions to environmental problems have foundered in particular social, cultural, and political contexts—and are interested in learning how to mobilize humanistic knowledges and skills to ensure more sustainable and livable futures.

Career options available to students who complete the EH course of study include policy, media, corporate sustainability, education, law, and the non-profit sector.

- **Minimum of 24 credits** (8 courses) selected from the following categories.
- With approval from the E&S Program, additional courses may be considered, including the Society for the Humanities (SHUM) and other one-time course offerings.
- (*) marks courses common to both the humanities core requirement and the concentration. **The same course may not fill both requirements.**

Anthropology

Code	Title	Hours
ANTHR 2201	Early Agriculture	3
ANTHR 2420	Nature-Culture: Ethnographic Approaches to Human Environment Relations (crosslisted) *	4
ANTHR 2482	Anthropology of Climate Change (crosslisted)	4
ANTHR 3152		3
ANTHR 3230	Humans and Animals (crosslisted)	4
ANTHR 3248	Finger Lakes and Beyond: Archaeology of the Native Northeast (crosslisted)	3
ANTHR 3325	Food and Work	3
ANTHR 3422	Culture, Politics, and Environment in the Circumpolar North (crosslisted)	3
ANTHR 4101	The Entangled Lives of Humans and Animals (crosslisted)	4
ANTHR 4442	Toxicity (crosslisted)	3

Africana Studies

Code	Title	Hours
ASRC 3565	Black Ecoliterature (crosslisted)	3

Asian Studies

Code	Title	Hours
ASIAN 2273	Religion and Ecological Sustainability (crosslisted)	3

Biology & Society

Code	Title	Hours
BSOC 2061	Ethics and the Environment (crosslisted) *	4

Classics

Code	Title	Hours
CLASS 2010	Discussions of Environment and Sustainability (crosslisted)	3
CLASS 2729	Climate, Archaeology and History (crosslisted)	3
CLASS 3750	Introduction to Dendrochronology (crosslisted)	4

Comparative Literature

Code	Title	Hours
COML 2036	Literature and the Elements of Nature *	3
COML 3111	Literature, Art and Environment	3
COML 3264	Poetics, Economies, Ecologies	3
COML 3336	Border Environments (crosslisted)	3
COML 3435	Art, Nature, and Empire in Russian and Soviet Culture (crosslisted)	3
COML 4902	Environmental Humanities: Theories and Methods (crosslisted)	3

English

Code	Title	Hours
ENGL 3795	Communicating Climate Change *	3
ENGL 4675	The Environmental Imagination in American Literature	4
ENGL 4795	Climate Communications Capstone (crosslisted) *	3

French

Code	Title	Hours
FREN 4250	(crosslisted)	3

History

Code	Title	Hours
HIST 2371	US Climate Catastrophes: Rethinking US History through the Climate	4
HIST 2581	Environmental History (crosslisted) *	4
HIST 4262	Environmental Justice: Past, Present, Future (crosslisted)	4

History of Art and Visual Studies

Code	Title	Hours
ARTH 2255	Ecocriticism and Visual Culture	4
ARTH 3620	After Nature: Art and Environmental Imagination	4

Natural Resources

Code	Title	Hours
NTRES 3330	Ways of Knowing: Indigenous and Place-Based Ecological Knowledge (crosslisted) *	3

Philosophy

Code	Title	Hours
PHIL 1440	Ethics of Eating *	3

Science & Technology Studies

Code	Title	Hours
STS 3181	Living in an Uncertain World: Science, Technology, and Risk (crosslisted)	4
STS 4131	Comparative Environmental History (crosslisted)	3
STS 4460	Lightscapes (crosslisted)	4

Society for the Humanities

Code	Title	Hours
SHUM 4697		3

Spanish

Code	Title	Hours
SPAN 4690	Latin American and Latinx Environmentalisms	3

Environmental Policy & Governance Focused Elective

E&S students with a focused elective area in Environmental Policy and Governance (EPG) will study policy and broader social dimensions of environmental issues. Foundational courses in several realms of the environmental social sciences will acquaint students with different approaches to studying human-environment relationships. Students will also learn about the design, construction, implementation and evaluation of environmental policy and management. Whether a student is interested in a policy career or social-environmental analysis, this focused elective area provides a foundation for understanding human-environmental relationships holistically.

- Students may not use the same course to fulfill both a core and focused elective requirement.
- (*) denotes courses that may be used to fulfill core requirements.

Seven courses beyond the E&S core requirements consisting of the following:

Foundational Themes (4 Courses)

The **four foundational themes** provide a grounding in key concepts of environmental action and management. **Environment and Law** introduces legal tools relevant to environmental issues. **Environment and Human Behavior** gives students approaches to understanding varying ways that people and human communities create, understand, struggle over, and resolve environmental concerns. **Environment and Institutions** acquaints students with key institutions through which people use or interact with environmental resources and equips students to analyze variation and change in environmental management. **Environment and Policy** provides insight about how people construct and implement policies and regulations concerning natural resources and the environment.

Environment and Law (Choose One)

Code	Title	Hours
CRP 4590	Land Use Law	3
LAW 4131	The Nature, Functions, and Limits of Law (crosslisted)	4
LAW 4330	Environmental Law and Policy (crosslisted)	3
LAW 4443	International Environmental Law and Policy	3
LAW 6361	Environmental Law	3
LAW 7358	International Environmental Law	3
PUBPOL 5132	Legal Aspects of Public Agency Decision-Making	3

Environment and Human Behavior (Choose One)

Code	Title	Hours
ANTHR 2420	Nature-Culture: Ethnographic Approaches to Human Environment Relations (crosslisted) *	4
BSOC 2061	Ethics and the Environment (crosslisted) *	4
DEA 1500	Introduction to Environmental Psychology (crosslisted)	3
GDEV 3240	Environmental Sociology (crosslisted)	3
NTRES 3330	Ways of Knowing: Indigenous and Place-Based Ecological Knowledge (crosslisted) *	3

Environment and Institutions (Choose One)

Code	Title	Hours
AEM 4500	Resource Economics (crosslisted)	3
AEM 4510	Environmental Economics (crosslisted)	3
CRP 3860	Planning for Sustainable Transportation	3
GOVT 1817	Making Sense of World Politics	4
GOVT 3613 & GOVT 3614 & GOVT 3623	Politics of Sustainable Development in Latin America I and Politics of Sustainable Development in Latin America II and Politics of Sustainable Development in Latin America III (crosslisted)	4
HIST 2581	Environmental History (crosslisted) *	4
NTRES 3311	Environmental Governance (crosslisted)	3
NTRES 4600	Planning for Environmental Conservation and Sustainability (crosslisted) *	3

Environment and Policy (Choose One)

Code	Title	Hours
BME 4440	Science Policy Bootcamp: Concept to Conclusion	3
GOVT 3032	Politics of Public Policy in the U.S. (crosslisted)	4
GOVT 3583	Comparative Public Policy: Political Pathways to Equality (crosslisted)	4
PUBPOL 3590	Environmental Justice and Policy	3
PUBPOL 3670	Economics and Environmental Policy (crosslisted)	3
PUBPOL 3730	Comparative Environmental Policy ((crosslisted))	3
PUBPOL 3910 & PUBPOL 5441	Federal Policy Making in Action and Effective Writing for Public Policy	2.5

Methods/Tools Course

Choose one of the following methods/tools courses to acquire tools that will enhance your ability to do research and analysis on the social dimensions of environments. Students may not use the same course to fulfill both a core and focused elective requirement. (*) denotes courses that may be used to fulfill core requirements.

Code	Title	Hours
AEM 2770	Excursions in Computational Sustainability (crosslisted)	3
CRP 3555	Environmental Planning and Practice	3
CRP 4080	Introduction to Geographic Information Systems (GIS)	4
EAS 2400	Observing the Earth: Remote Sensing and GIS	3
GDEV 2130	Introduction to Social Science Research Methods	3
GDEV 3140	Mapping Our Worlds: Cartography and Analysis in GIS	4
GDEV 3680	Environmental Decision Making	3
NTRES 4600	Planning for Environmental Conservation and Sustainability (crosslisted) *	3
PLSCI 2200	Introduction to Mapping and Spatial Analysis with GIS	3
PLSCI 4200	Geographic Information Systems (GIS): Concepts and Application	3

Additional Environmental Courses (Choose Two)

Students may not use the same course to fulfill both a core and focused elective requirement. For example, if you took HIST 2581 Environmental History to fulfill the Humanities core requirement, you

could not also count it toward this requirement, but you could additionally take NTRES 3330 Ways of Knowing: Indigenous and Place-Based Ecological Knowledge for this requirement. Courses not in this list that are relevant to social and policy dimensions of environmental issues can be considered for this requirement with approval of the E&S Program. (*) denotes courses that may be used to fulfill core requirements.

Code	Title	Hours
AEM 2000	Contemporary Controversies in the Global Economy	3
AEM 4500	Resource Economics (crosslisted)	3
AEM 4510	Environmental Economics	3
AEM 4880	Global Food, Energy, and Water Nexus – Engage the US, China, and India for Sustainable Future	3-4
ANTHR 2420	Nature-Culture: Ethnographic Approaches to Human Environment Relations (crosslisted) *	4
ANTHR 3422	Culture, Politics, and Environment in the Circumpolar North (crosslisted)	3
ANTHR 4410		3
BIOEE 4690	Food, Agriculture, and Society (crosslisted)	3
BSOC 2061	Ethics and the Environment (crosslisted) *	4
CEE 5970	Risk Analysis and Management	3
COML 2036	Literature and the Elements of Nature	3
COMM 2850	Communication, Environment, Science, and Health (crosslisted)	3
COMM 3210	Communication and the Environment	3
COMM 4860	Risk Communication	3
CRP 3840	Green Cities	3
CRP 4080	Introduction to Geographic Information Systems (GIS)	4
CRP 5080	Introduction to GIS for Planners	4
DEA 1500	Introduction to Environmental Psychology (crosslisted)	3
DEA 4220	Ecological Literacy and Design (crosslisted)	3
FSAD 3200	Global Textile and Apparel Sustainability	3
GDEV 2010	Population and Social Change (crosslisted)	3
GDEV 2065	Environment and Development	3
GDEV 3010	Theories of Society and Development	3
GDEV 3020	Political Ecologies of Health	3
GDEV 3031		3
GDEV 3150	Climate Change and Global Development: Living in the Anthropocene	3
GDEV 3400	Agriculture, Food, Sustainability and Social Justice	3
GOVT 3781	Human Rights in Law and Culture	3
HIST 2581	Environmental History (crosslisted) *	4
NS 4450	Toward a Sustainable Global Food System: Food Policy for Developing Countries (crosslisted)	3
NTRES 3330	Ways of Knowing: Indigenous and Place-Based Ecological Knowledge (crosslisted) *	3
NTRES 4320		
SOC 3650	Sociology of Disasters	3
STS 3181	Living in an Uncertain World: Science, Technology, and Risk (crosslisted)	4
STS 4131	Comparative Environmental History	3

Land, Air & Water Resources Focused Elective

The Land, Air, and Water Resources (LAWR) focused elective is especially good for students interested in climate change, soil, air, and water pollution, and environmental consequences of food production. The focused elective in LAWR provides a sound foundation in the diversity and integration of Earth's environments, as well as data science needed for environmental studies. Coursework includes atmospheric sciences, ecosystem ecology, soil science, water systems, and ways to compare among each.

Required Courses from Core Curriculum

Code	Title	Hours
BIOEE 1610	Introductory Biology: Ecology and the Environment	3-4
EAS 1600	Environmental Physics	3

Additional Required Courses (Choose Four)

Choose four courses beyond the E&S core requirements consisting of the following:

Biological Science (Choose One)

Code	Title	Hours
BIOG 1440	Introductory Biology: Comparative Physiology	3
BIOEE 1780	An Introduction to Evolutionary Biology and Diversity	4-5
or BIOEE 1781	Introduction to Evolution and Diversity	
or BIOSM 1780	Evolution and Marine Diversity	
BIOMG 1350	Introductory Biology: Cell and Developmental Biology	3

Chemistry

Code	Title	Hours
CHEM 1560 & CHEM 1561	Introduction to General Chemistry and Introduction to General Chemistry Laboratory	4
CHEM 2070 & CHEM 2071	General Chemistry I and General Chemistry I Laboratory	4

- AP/IB/Case Exam accepted to fulfill this requirement.

Quantitative (Choose One)

Code	Title	Hours
MATH 1106	Modeling with Calculus for the Life Sciences	4
MATH 1110	Calculus I	4

- AP/IB/Case credit accepted to fulfill this requirement.

Biogeochemistry (Choose One)

Code	Title	Hours
EAS 3030	Introduction to Biogeochemistry	4
PLSCI 3650	Environmental Chemistry: Soil, Air, and Water	3

LAWR Elective Courses

Choose five additional courses from the LAWR elective lists:

- One course from LAWR List 1: Chemical/Physical environmental science
- One course from LAWR List 2: Environmental informatics
- One course from LAWR List 3: Integrated ecosystems/ecology
- One additional elective from LAWR List 1, 2, or 3
- One additional elective from LAWR List 1, 2, or 3

Other Cornell University courses similar in content and level (3000-level or above), but not on these lists, may be chosen in consultation with your advisor.

LAWR List 1 – Chemical/Physical Environmental Science Atmosphere/Climate

Code	Title	Hours
EAS 1310	Basic Principles of Meteorology	3
EAS 2680	Climate and Global Warming	3
EAS 3050	Climate Dynamics	3
EAS 3340	Microclimatology	3
EAS 3420	Atmospheric Dynamics	3
BEE 4800	Atmospheric Chemistry: From Air Pollution to Global Change (crosslisted)	3

Terrestrial/Soil Science/Geology

Code	Title	Hours
EAS 2250	The Earth System	4
EAS 3010	Evolution of the Earth System	4
EAS 3030	Introduction to Biogeochemistry	4
PLSCI 2600	Soil Science	4
PLSCI 3210	Soil and Crop Management for Sustainability	3
PLSCI 3630	Soil Genesis, Classification, and Survey	4
PLSCI 3650	Environmental Chemistry: Soil, Air, and Water	3

Water Management/Hydrology

Code	Title	Hours
BEE 3500	Heat and Mass Transfer in Biological Engineering	4
BEE 3710	Physical Hydrology for Ecosystems	3
BEE 4110		
BEE 4270	Water Measurement and Analysis Methods	3
BEE 4710	Introduction to Groundwater (crosslisted)	3
CEE 3310	Fluid Mechanics	4
EAS 3530	Physical Oceanography	3
NTRES 3240	Sustainable, Ecologically Based Management of Water Resources	3

LAWR List 2 – Environmental Informatics

Code	Title	Hours
BIOEE 3550	Data Analysis and Visualization in Ecology and Environmental Science	3
CRP 4080	Introduction to Geographic Information Systems (GIS)	4
EAS 2400	Observing the Earth: Remote Sensing and GIS	3
EAS 2900	Introduction to Programming for Meteorology and Climate Science	3
PLSCI 2200	Introduction to Mapping and Spatial Analysis with GIS	3
PLSCI 4200	Geographic Information Systems (GIS): Concepts and Application	3

LAWR List 3 – Integrated Ecosystems/Ecology

Code	Title	Hours
BIOEE 4570	Limnology: Ecology of Lakes, Lectures	3
BIOEE 4620		3
BIOEE 4780	Ecosystem Biology and Global Change	4
NTRES 3220	Global Biodiversity	3
NTRES 4560	Stream Ecology (crosslisted)	4
PLSCI 4730	Ecology of Agricultural Systems	4.5
PLSCI 4660	Soil Ecology	3-4
PLSCI 4720	Nutrient and Carbon Cycling and Management in Ecosystems	3

Sustainable Business & Environmental Economics Focused Elective

E&S students with a focused elective in Sustainable Business and Environmental Economics will use economic principles to understand the interrelation between society and the environment and study how environmental policies should be structured to address the environmental challenges by understanding behavioral responses of economic agents to these policies. Total credits required: 21.5 credits.

Required Courses from Core Curriculum:

Code	Title	Hours
AEM 2500	Environmental and Resource Economics	3

Additional Required Courses:

Code	Title	Hours
ECON 1110	Introductory Microeconomics	3
ECON 1120	Introductory Macroeconomics	3
ECON 3030	Intermediate Microeconomic Theory	4
or AEM 2600	Managerial Economics	
MATH 1110	Calculus I	4

- AP/IB/Case credit accepted where applicable

Resource/Environmental Economics (Choose a Minimum of 5.5 Credits, 2-3 Courses)

Code	Title	Hours
AEM 3115	Evaluation of Green Energy Strategies and Markets	3
AEM 4090	Environmental Finance and Markets	3
AEM 4490	Financial Markets and Sustainability	3
AEM 4500	Resource Economics	3
AEM 4510	Environmental Economics (crosslisted)	3
or ECON 3850	Economics and Environmental Policy	
AEM 4515		3
AEM 4585	Sustainable Business	3
AEM 4940	Undergraduate Special Topics in Applied Economics and Management [1]	1-4
NBA 6030	Strategies for Sustainability	1.5
NBA 6380	Finance and Sustainable Global Enterprise Colloquium (crosslisted)	1

[1] Topic approved by advisor.

Data Analysis/Econometrics (Choose One)

Code	Title	Hours
AEM 2770	Excursions in Computational Sustainability (crosslisted)	3
AEM 2840	Python Programming for Data Analysis and Business Modeling	3
AEM 2850	R Programming for Business Analytics and Data Visualization	3
AEM 3100	Business Statistics	3

AEM 4110	Introduction to Econometrics	3
CRP 4080	Introduction to Geographic Information Systems (GIS)	4
ECON 3120	Applied Econometrics	4
ECON 3140	Econometrics	4
ILRST 2110	Statistical Methods for the Social Sciences II	4
PLSCI 2200	Introduction to Mapping and Spatial Analysis with GIS	3
STSCI 4060	Python Programming and its Applications in Statistics	4

Student-Designed Focused Elective

The Student-Designed (SD) Focused Elective within the E&S major allows students to pursue a specific intellectual/professional goal not encompassed by the structured focused elective (EBAE, EH, EPG, LAWR and SBEE). These structured concentrations were carefully designed by E&S faculty to serve the breadth of interests for most students in the major, and they are organized around learning goals that position students to develop expertise and professional success in core environmental fields.

If a student finds that the 5 existing structured focused elective do not match their educational objectives, they can work with their advisor and a faculty mentor to propose an alternative course of study comprised of a minimum of 8 courses (24 credits) focused around a specified intellectual/professional goal.

Course Requirements

- Minimum of eight courses (24 credits) beyond the E&S core requirements.
- At least 18 credits (six of the eight courses) must be 3000-level or above.
- A course may only be used once to meet either a core or focused elective requirement.
- Courses should reflect an environment or sustainability theme.
- Independent study courses, internship credits, TA credit and research credits are not eligible for the SD focused elective.

Student-Designed Focused Elective proposals will only be considered if the student follows the submission timeline and eligibility requirements. Proposals will be carefully evaluated, and only those that feature clear and compelling objectives, justifications, and planning will be accepted.

Eligibility

To be eligible to submit a SD proposal, students must have completed or be enrolled in

- Core Foundation class (NTRES 1101/ENVS 1101 **AND**
- 3 Additional Disciplinary Core Requirements from the following:
  - Social Science (NTRES 2201)
  - Biology (BIOEE 1610 or BIOEE 1780)
  - Chemistry/Physics (CHEM 1560/CHEM 1561 or CHEM 2070/CHEM 2071 or EAS 1600)
  - Environmental Humanities (see Core list)
  - Environmental Economics (AEM 1500 or AEM 2500)

Objectives and Rationale

Approval of a student-designed focused elective is contingent upon a proposal explaining in detail the educational and career goals that motivate your plan and why these goals are better met by a student-designed focused elective than by any of the E&S structured focused electives.

The ~500-word, double-spaced proposal should include:

- Student Name
- Title /Theme for the plan of study
- Identify your educational and career goals that motivate the proposed plan of study, and why these goals are better met by a student-designed plan over any of the structured focused electives.
- How each proposed course contributes to a coherent curriculum that advances your educational AND professional goals in the Environment and Sustainability major. This should be done by consulting course learning outcomes in the Catalog and providing links to each proposed course. Emphasize how the classes build your depth of understanding and relate to each other rather than reiterating course descriptions.

Proposal Submission Timeline

A student-designed plan will not be accepted after the focused elective declaration deadline.

To apply to the SD focused elective, visit the E&S Student-Designed web page (https://cals.cornell.edu/environment-sustainability/education/concentrations/student-designed-concentration/) for more information and the application link.

University Graduation Requirements Requirements for All Students

In order to receive a Cornell degree, a student must satisfy academic and non-academic requirements.

Academic Requirements

A student's college determines degree requirements such as residency, number of credits, distribution of credits, and grade averages. It is the student's responsibility to be aware of the specific major, degree, distribution, college, and graduation requirements for completing their chosen program of study. See the individual requirements listed by each college or school or contact the college registrar's office (https://registrar.cornell.edu/service-resources/college-registrar-directory/) for more information.

Non-academic Requirements

Conduct Matters. Students must satisfy any outstanding sanctions, penalties or remedies imposed or agreed to under the Student Code of Conduct (Code) or Policy 6.4. Where a formal complaint under the Code or Policy 6.4 is pending, the University will withhold awarding a degree otherwise earned until the adjudication process set forth in those procedures is complete, including the satisfaction of any sanctions, penalties or remedies imposed.

Financial Obligations. Outstanding financial obligations will not impact the awarding of a degree otherwise earned or a student's ability to access their official transcript. However, the University may withhold issuing a diploma until any outstanding financial obligations owing to the University are satisfied.

Additional Requirements for Undergraduate Students

The University has two requirements for graduation that must be fulfilled by all undergraduate students: the swim requirement, and completion of two physical education courses. For additional information about fulfilling University Graduation Requirements, see the Physical Education website (https://scl.cornell.edu/pe/).

Physical Education

All incoming undergraduate students are required to take two credits (two courses) of Physical Education prior to graduation. It is recommended they complete the two courses during their first year at Cornell. Credit in Physical Education may be earned by participating in courses offered by the Department of Athletics and Physical Education (https://courses.cornell.edu/preview_program.php?catoid=60&poid=30232) and Cornell Outdoor Education, by being a registered participant on a varsity athletic team, or performing in the marching band.

Students with medical concerns should contact the Office of Student Disability Services (http://sds.cornell.edu/).

Swim Requirement

The Faculty Advisory Committee on Athletics and Physical Education has established a basic swimming and water safety competency requirement for all undergraduate students. Normally, the requirement is taken during the Fall Orientation process at Helen Newman Hall or Teagle Hall pools. The requirement consists of the following: jump or step feet-first into the deep end of the pool, float or tread for one minute, turn around in a full circle, swim 25 yards using any stroke(s) of choice without touching the bottom or holding on to the sides (there is no time limit) and exit from the water. Students who do not complete the swim requirement during their first year, during a PE swim class or during orientation subsequent years, will have to pay a $100 fee. Any student who cannot meet this requirement must register for PE 1100 Beginning Swimming as their physical education course before electives can be chosen.

If a student does not pass the swim requirement in their first Beginning Swimming PE class, then the student must take a second Beginning Swimming PE class (PE 1100 or PE 1101). Successful completion of two Beginning Swimming classes (based on attendance requirements) with the instructor's recommendation will fulfill the University's swim requirement.

Students unable to meet the swim requirement because of medical reasons should contact the Office of Student Disability Services (http://sds.cornell.edu/). When a waiver is granted by the Faculty Committee on Physical Education, an alternate requirement is imposed. The alternate requirement substitute is set by the Director of Physical Education.

CALS Graduation Requirements for the Bachelor of Science

Students are responsible for understanding and fulfilling all the requirements necessary for graduation. Additionally, students must promptly notify the college of any discrepancies or issues with their academic records.

CALS undergraduate students follow college distribution requirements corresponding to their matriculation/entry term and class standing. Students matriculating/entering before Fall 2025 will complete the existing CALS distribution requirements. First-year students matriculating/entering Fall 2025 or later will be subject to the new CALS 2025+ distribution requirements. However, sophomore and junior transfer students matriculating/entering in Fall 2025 will follow the existing CALS distribution requirement to align with students in their corresponding cohort year. All students must adhere to the requirements designated for their matriculation/entry term and class standing. *There are no exceptions to this policy.*

Although specific requirements vary between the curriculums, all students must complete the following Graduation Requirements to earn the Bachelor of Science degree:

1. University Graduation Requirements
2. Credit Requirements
3. Distribution Requirements
4. Residency Requirement
5. GPA Requirement
6. Major Requirements
7. Application to Graduate

Credit Requirement Policies

1. Minimum total credits: 120 academic credits are required for graduation.
   - Important Exceptions:
     - Repeated Cornell courses that do not allow repeat for credit will not count towards the number of credits required for graduation. These credits do count toward the minimum twelve (12) credits required for full-time status and good academic standing.
     - Forbidden Overlaps will not count towards credits required for graduation. These credits do count toward the minimum twelve (12) credits required for full-time status and good academic standing. More information can be found under the Course Enrollment and Credits page.
     - Review or supplemental courses (e.g., 1000- to 1099-level) do not count towards the number of credits required for graduation. These credits do not count toward the minimum twelve (12) credits required for full-time status or good academic standing.
     - Physical Education courses do not count toward the required 120 credits for graduation. They also do not count toward the minimum twelve (12) credits required for full-time status or good academic standing.
2. Minimum Credits at Cornell: Sixty (60) academic credits must be completed at Cornell (includes Cornell in Rome, Capital Semester, and Brooks School Cornell in Washington DC Connect Program, and Shoals Marine Laboratory).
3. Maximum Non-Cornell Credits: Sixty (60) non-Cornell credits (AP, CASE, IB, GCE, French Baccalauréat, Cambridge Pre-University, and external transfer coursework) can be applied toward degree requirements. A student can transfer in a maximum of fifteen (15) academic credits earned before matriculation as a first-year student at any accredited college/university (AP, CASE, IB, GCE, French Baccalauréat, and external transfer credits). Refer to Non-Cornell (Transfer) Credit under Policies and Procedures for additional information.
4. All CALS students are required to fulfill a minimum number of CALS Credits, structured credits, and letter-graded credits. Specific policies are in the curriculum sections below.

Residency Requirements

- Eight (8) semesters of full-time study are expected. External transfer students are credited with one (1) semester in residence for each full-time semester (or equivalent) completed at another accredited institution prior to matriculation at Cornell.
- Internal transfer students must complete two (2) semesters in residence in CALS.
- The final semester before graduation must be completed in a Cornell program as a full-time student. Summer or winter semesters cannot be counted as a final semester. (The School of Continuing Education does not count towards a final semester in residency.)
- Students in the ninth (9^{th}) (or equivalent) and final semester may be eligible to apply for prorated tuition. The eligibility criteria are listed online (https://cals.cornell.edu/undergraduate-students/cals-student-services/degree-advising/cals-graduation-requirements-for-bachelor-of-science/).
- The following programs are in residency: Cornell in Washington DC Connect Program (Fall or Spring only), Capital Semester, Shoals Summer Semester.

Grade Point Average (GPA) Requirements

Minimum cumulative GPA: 2.00 or above must be maintained. Students must earn a minimum cumulative GPA of 2.00 or better to graduate. The cumulative GPA includes all letter grades earned at Cornell.

CALS Degree Requirements Prior to 2025 (applies to Transfers entering Fall 2025)

These requirements apply to: First-year students who matriculated before Fall 2025, sophomore transfers who matriculate prior to Fall 2026, and junior transfers who matriculate before Fall 2027. All students must follow the requirements based on their matriculation and expected graduation dates. *There are no exceptions to this policy.*

Students are required to fulfill:

1. University Graduation Requirements:
   a. Physical Education.
   b. Swim Requirement.
2. Credit Requirements: 120 academic credits, of which a minimum of fifty-five (55) must be taken from the College of Agriculture and Life Sciences at Cornell. A minimum of one hundred (100) credits must be in courses for which a letter grade was received. PE and supplemental courses do not count as academic credit.
   a. Fifty-five (55) CALS Credits are required for graduation. CALS Credits consist of courses offered within CALS and in Applied Economics and Management, Biological Sciences, Biology & Society, Earth and Atmospheric Sciences, Environment and Sustainability, Information Science, Nutritional Science, and the Department of Statistics and Data Science. CALS Credits include all courses with the following subjects: AGSCI, AIISP, ALS, AEM, ANSC, BEE, BIOG, BIOAP, BIOCB, BIOEE, BIOMG, BIOMI, BIOMS, BIONB, BIOSM, BSOC, BTRY, COMM, DSOC, EAS, EDUC, ENTOM, ENVS, FDSC, GDEV, IARD, INFO, LA, LEAD, NS, NTRES, PLBIO, PLBRG, PLHRT, PLPPM, PLSCI, PLSCS , STSCI, VIEN.
   b. Minimum Letter-Graded Credits: One hundred (100) credits. Proration of letter-graded credits may be applicable to students that transfer non-Cornell credits (see Proration Chart for non-Cornell credit (https://experience.cornell.edu/sites/default/files/resource-files/Proration%20Chart%20for%20Students%20with%20Non%20Cornell%20Credit.pdf)).
   c. Maximum Credits earned through Special Studies (Independent Study, Research, Teaching Assistantships, and/or Internships): Fifteen (15) credits of "unstructured" coursework can be applied towards graduation requirements. Proration of structured credits may be applicable to students that transfer non-Cornell credits (see Proration Chart for non-Cornell credit (https://experience.cornell.edu/sites/default/files/resource-files/Proration%20Chart%20for%20Students%20with%20Non%20Cornell%20Credit.pdf)).
3. Residency: Eight (8) semesters of full-time study are expected. External transfer students are credited with one (1) semester of residence for each full-time semester (or equivalent) completed at another accredited institution prior to matriculating at Cornell.
4. GPA: Students must earn a minimum cumulative GPA of 2.00 or better to graduate. The cumulative GPA includes all letter grades earned at Cornell.
5. Physical and Life Sciences: Eighteen (18) credits, of which six (6) credits must be Introductory Life Sciences/Biology and three (3) credits must be Chemistry or Physics.
6. Quantitative Literacy: Faculty legislation requires minimum competency in quantitative literacy. This requirement can be satisfied by taking an approved calculus or statistics class.
7. Social Science and Humanities: Students must complete four (4) courses within the seven (7) categories of Humanities and Social Sciences. The courses MUST span at least three (3) different categories. Human Diversity (D) is a required category. Humanities courses must be a minimum of three (3) credits.
8. Written and Oral Expression: Nine (9) credits total, of which at least six (6) must be in Written Expression. Oral Expression is not required by the college but may be required for some majors. If Oral Expression is not required by the major, all nine credits may be in Written Expression.
9. Major: See individual department listings for major requirements.
10. Application to Graduate: See Graduation Resources (https://cals.cornell.edu/undergraduate-students/cals-student-services/graduation-resources/).

Distribution Requirements

The purpose of the distribution requirement is to have all students achieve common learning outcomes. It is expected that through college and major course requirements graduates will be able to:

- Explain, evaluate, and effectively interpret factual claims, theories, and assumptions in the student's discipline(s) (especially in one or more of the college's priority areas of Food & Energy Systems, Social Sciences, Life Sciences, and Environmental Sciences) and more broadly in the sciences and humanities.
- Find, access, critically evaluate, and ethically use information.
- Integrate quantitative and qualitative information to reach defensible and creative conclusions.
- Communicate effectively through writing, speech, and visual information.
- Articulate the views of people with diverse perspectives.
- Demonstrate the capability to work both independently and in cooperation with others.

Through the study of Physical and Life Sciences, students develop their understanding and appreciation of the physical sciences, enhance their quantitative reasoning skills, and gain an appreciation of the variability of living organisms. Social Sciences and Humanities gives students

perspective on the structure and values of the society in which we live and prepares them to make decisions on ethical issues that will affect their work and role in society. Written and Oral Expression is designed to help students become competent and confident in the use of oral and written communication to express themselves and their ideas.

Important Notes:

- Credits received for independent study, fieldwork, teaching, research, work experience, and internships cannot be used to fulfill the distribution requirements
- Review or supplemental courses, such as 1000- to 1099-level courses, will not be counted in the distribution areas.
- First-Year Writing Seminars (FWS) cannot be used to satisfy the Physical and Life Sciences distribution area.
- Courses that fulfill distributions are approved by the CALS Curriculum Committee. Distributions cannot be applied to a course retroactively, and individual student petitions for Cornell courses to fulfill distributions will not be accepted. Students may request a review of external transfer courses for fulfilling distribution requirements.

Physical and Life Sciences:

Eighteen (18) credits, of which six (6) credits must be Introductory Life Sciences/Biology and three (3) credits in Chemistry or Physics. Courses that count for Introductory Life Sciences/ Biology, Chemistry/Physics, Quantitative Literacy, and Other Physical and Life Sciences count towards the eighteen (18) credits for this requirement

Introductory Life Sciences/Biology Requirement (BIO-AG):
Students must complete at least six (6) academic credits of Introductory Life Sciences/Biology. Courses that count towards this requirement have the BIO-AG distribution attribute. Note: CALS does NOT accept BIO-AS for BIO-AG.

Offerings in the area provide a foundation in the field of biology. Courses must include: an evolutionary component, instruction on applying the process of science and a significant student-centered teaching component.

Chemistry/Physics (CHPH-AG):
Students must complete a minimum of three (3) credits of Chemistry or Physics. Includes all Cornell courses with the CHEM or PHYS prefix (excluding courses that are supplemental, independent study, research, TA, internship, and First-Year Writing Seminar). Courses that count towards this requirement have a CHPH-AG distribution attribute. Additionally, courses with the prefix CHEM or PHYS of at least 11xx numbering and a minimum of three (3) credits are accepted as fulfilling CHPH-AG.

Courses that meet the CALS Chemistry or Physics (CHPH) requirement provide students with a foundational understanding of key scientific principles. These courses delve into the study of chemistry (focusing on the composition, properties, and transformations of substances) or physics (exploring the principles of matter, energy, and their interactions). Fulfilling this requirement equips students with essential scientific knowledge that supports practical and innovative applications in fields like agriculture, environmental science, and food science, thereby fostering their ability to address and solve critical challenges within these domains.

Quantitative Literacy (MQL-AG):
Students must complete one (1) Quantitative Literacy course. Courses that count towards these requirements have an MQL-AG distribution attribute. Additionally, courses of at least 11xx numbering with the MATH prefix may fulfill this category. Calculus courses and Introductory Statistics courses may also fulfill MQL-AG.

Faculty legislation requires minimum competency in quantitative literacy. Courses that fulfill the Mathematics and Quantitative Literacy distribution in CALS enhance students' problem-solving skills by teaching them to understand abstract, logical relationships. These classes focus on the mathematical analysis of data, modeling natural and man-made systems, and developing algorithms critical for computation. Students will learn various quantitative methods and how to apply quantitative reasoning across different fields.

This requirement can also be satisfied by earning a score of four (4) or five (5) on the AP Calculus exam or a score of five (5) on the AP Statistics exam, or transfer of an approved calculus or statistics course with a minimum letter grade of "C" or better.

Other Physical Life Sciences (OPHLS-AG):
Other Physical Life Sciences courses count towards the eighteen (18) credit total for the Physical and Life Sciences requirement. Courses that count towards this requirement have the OPHLS-AG distribution attribute. The number of OPHLS-AG courses taken will vary by student. Courses with the following distributions are also accepted for the CALS OPHLS-AG distribution: PBS-HE, BIO-AS, PHS,AS, SDS-AS. Additionally, any course with BIO-AG, CHPH-AG or MQL-AG may alternatively fulfill OPHLS-AG.

Offerings in this area explore additional physical and life science subjects as well as quantitative literacy (math) courses. Courses satisfying this requirement help students understand and appreciate the physical sciences, enhance quantitative reasoning skills, or explore the variability of living organisms.

Social Sciences and Humanities:

Students must complete four (4) courses within the seven (7) categories of Humanities and Social Sciences. The courses MUST span at least three (3) different categories. Human Diversity (D) is a required category. Humanities courses must be a minimum of three (3) credits.

No more than two (2) courses in the same department will be counted toward the distribution requirement. Social Sciences & Humanities Categories:

(Also refer to Distribution Requirement Codes (https://catalog.cornell.edu/general-information/distribution-codes/))

Cultural Analysis (CA-AG)
These courses study human life in particular cultural contexts through interpretive analysis of individual behavior, discourse, and social practice. Topics include belief systems (science, medicine, religion), expressive arts and symbolic behavior (visual arts, performance, poetry, myth, narrative, ritual), identity (nationality, race, ethnicity, gender, sexuality), social groups and institutions (family, market, community), and power and politics (states, colonialism, inequality).

CALS also accepts courses of at least three (3) credits with the following distributions as fulfilling CA-AG: ALC-AS, ALC-HA, ALC-AAP, CA-HE, CA-AAP, GLC-AS

Foreign Language (FL-AG)
Foreign Language courses available for CALS students at Cornell are offered by several departments, including Africana Studies and Research Center (AS&RC – language courses only), Asian Studies with languages such as Bangla-Bengali, Burmese, Chinese, Hindi, Indonesian, Japanese, Khmer, Korean, Sanskrit, Tagalog, Thai, and Vietnamese, and Classics (CLASS – language courses only). Additional offerings are

provided by German Studies, which includes German, Dutch, and Swedish (language courses only), Linguistics (LING – language courses only), Near Eastern Studies (NES - language courses only), Romance Studies with languages like Catalan, French, Italian, Portuguese, Quechua, and Spanish, and Russian Studies, covering Russian, Hungarian, Polish, Serbian/Croatian, and Ukrainian. CALS will recognize these Foreign Language (FL) classifications by any college at Cornell, provided the class is taken for three (3) or more credits. Transfer students may have non-Cornell courses that meet SUNY World Languages requirements and are a minimum of three (3) credits reviewed as fulfilling FL-AG.

Human Diversity (D-AG)
These courses analyze historical or contemporary marginalized communities and the culturally specific contexts that produce unequal power relations in terms of race, nationality, ethnicity, indigeneity, sexuality, disability, religion, gender, or economic status.

Definition of "marginalize": Any groups with reduced access to social status, political influence, economic advancement, educational advancement, healthcare, information, or any of the goods, services, and powers of a society can be considered "marginalized." Causes of marginalization may be related to ethnic status, religion, country of origin, sexual orientation, geography, economics, and government policies. Those who exist on the furthest margins of a society are frequently subject to several of these forces.

CALS also accepts courses of at least three (3) credits with the following distributions as fulfilling D-AG: SCD-AS, SCD-HA, D-HE.

Non-equated external transfer courses will only be considered for junior transfer students who have taken an appropriate course at their prior institution and whose schedule does not allow space to take a Human Diversity (D-AG) course at Cornell. These situations will be reviewed individually after a required appointment with CALS Student Services.

Historical Analysis (HA-AG)
These courses interpret continuities and changes—political, social, economic, diplomatic, religious, intellectual, artistic, scientific—through time. The focus may be on groups of people, dominant or subordinate, a specific country or region, an event, a process, or a time period.

CALS also accepts courses of at least three (3) credits with the following distributions as fulfilling HA-AG: HA-AAP, HST-AAP, HST-AS, HST-HA, HA-HE

Knowledge, Cognition, and Moral Reasoning (KCM-AG)
These courses investigate the bases of human knowledge in its broadest sense, ranging from cognitive faculties shared by humans and animals such as perception, to abstract reasoning, to the ability to form and justify moral judgments. Courses investigating the sources, structure, and limits of cognition may use the methodologies of science, cognitive psychology, linguistics, or philosophy. Courses focusing on moral reasoning explore ways of reflecting on ethical questions that concern the nature of justice, the good life, or human values in general.

CALS also accepts courses of at least three (3) credits with the following distributions as fulfilling KCM-AG: ETM-AAP, ETM-AS, ETM-HA, KCM-AAP, KCM-HE

Literature and the Arts (LA-AG)
These courses explore literature and the arts in two different but related ways. Some courses focus on the critical study of artworks and on their history, aesthetics, and theory. These courses develop skills of reading, observing, and hearing and encourage reflection on such experiences; many investigate the interplay among individual achievement, artistic tradition, and historical context. Other courses are devoted to the production and performance of artworks (in creative writing, performing arts, and media such as film and video). These courses emphasize the interaction among technical mastery, cognitive knowledge, and creative imagination.

CALS also accepts courses of at least three (3) credits with the following distributions as fulfilling LA-AG, ALC-AS, ALC-HA, ALC-AAP, LA-AAP

Social and Behavioral Analysis (SBA-AG)
These courses examine human life in its social context through the use of social scientific methods, often including hypothesis testing, scientific sampling techniques, and statistical analysis. Topics studied range from the thoughts, feelings, beliefs, and attitudes of individuals to interpersonal relations between individuals (e.g., in friendship, love, conflict) to larger social organizations (e.g., the family, society, religious or educational or civic institutions, the economy, government) to the relationships and conflicts among groups or individuals (e.g., discrimination, inequality, prejudice, stigmas, conflict resolution).

CALS also accepts courses of at least three (3) credits with the following distributions as fulfilling SBA-AG: SSC-AS, SBA-HE, SBA-AAP, SSC-AAP

Written and Oral Expression:

Nine (9) credits total, of which at least six (6) must be in Written Expression. Oral Expression is not required by the college but may be required for some majors. If Oral Expression is not required by the major, all nine (9) credits may be in Written Expression. Writing in the Majors (WIM) courses do not count towards Written Expression.

Written Expression (WRT-AG)
All students are required to take at least six (6) credits of Written Expression and may take nine (9) credits to fulfill the Written and Oral Expression requirement. Courses that fulfill the Written Expression requirement in CALS focus on enhancing students' writing skills. Courses meeting this requirement devote at least 50% of class time to writing proficiency, involve at least five (5) writing assignments with detailed feedback, and emphasize revision and development. These courses ensure personalized attention and help students articulate ideas clearly, argue effectively, and engage with evidence critically. This structure supports students in improving both their writing mechanics and their ability to communicate persuasively across contexts.

CALS also accepts FWS courses as fulfilling WRT-AG. Transfer students may have courses that meet the SUNY Writing Requirement considered to fulfill this requirement.

Oral Expression (ORL-AG)
Students may take one (1) Oral Expression course towards the nine (9) required credits for Written and Oral Expression. Courses that fulfill the CALS Oral Expression requirement enhance students' public speaking and communication skills. Courses meeting this requirement center on improving oral proficiency, dedicating over 50% of class time to the principles of effective communication. Each course involves at least five (5) formal oral presentations, with four (4) undergoing detailed revisions based on structured feedback that focuses on speech organization, clarity, evidence use, and delivery. These courses offer personalized guidance and encourage students to apply feedback to subsequent presentations. The aim is to refine students' abilities to articulate ideas persuasively and adapt messages for different contexts, ensuring they can communicate effectively on any topic.

CALS 2025+ Degree Requirements (applies to first-year students who start Fall 2025 or after)

The 2025+ CALS Curriculum applies to first-year students who enter CALS starting Fall 2025 and all semesters after. Transfer students entering Fall 2025 and all continuing students will follow the Prior to Fall 2025 Requirements. There are no exceptions to this policy.

All students are required to complete:

1. University Graduation Requirements
2. Credit Requirements
3. 120 Credits are required to graduate, of the 120:
   - A minimum seventy-five (75) must be CALS Credits (fifty-five (55) for transfer students).
   - A minimum of 105 must be structured academic credits (transfer courses can count towards this requirement).
   - A minimum of one hundred (100) letter-graded academic credits (transfer courses can count towards this requirement).
   - The following courses do not count towards the 120: PE course, courses numbered 1000-1099, forbidden overlap courses, and repeated courses (that do not allow repeats).
4. Residency Requirement
5. GPA Requirement
6. Distribution Requirements
7. E3 Learning Milestone
8. Major Requirements: See individual department listings for major requirements.
9. Application to Graduate: Information can be found on graduation webpage.

75 CALS Credits

Students are required to take seventy-five (75) CALS Credits. The following counts as CALS Credit:

- Any course with the following prefixes: AGSCI, AIIS, ALS, ANSC, BEE, BIOG, BIOAP, BIOCB, BIOEE, BIOMG, BIOMI, BIOMS, BIONB, BIOSM, BSOC, BTRY, COMM, EAS, EDUC, ENTOM, ENVS, FDSC, GDEV, INFO, LA, LEAD, NS, NTRES, PLSCI, STSCI, VIEN
- Courses with the FWS attribute (two (2) courses maximum)
- For BSBU students only: prefix AEM
  - AEM courses will not count towards the required seventy-five (75) CALS Credits, except for students who have officially been accepted to the AEM major. CALS students who choose to complete an AEM minor cannot count AEM courses towards their seventy-five (75) required CALS courses.

Students with matriculation status of Transfer will have a requirement of fifty-five (55) CALS Credits.

Distribution Requirements

The College of Agriculture and Life Sciences (CALS) college distribution requirements are the cornerstone of a diverse and comprehensive education.

These requirements encourage our students to venture beyond familiar subjects, develop a deeper understanding of others, uncover insights that can spark new interests, and pave the way toward meaningful careers that can shape a just and sustainable future.

The CALS distribution requirements consist of:

- A minimum of thirty-nine (39) credit hours of coursework.
- A single course may not fulfill more than one college distribution requirement. However, a single course can simultaneously fulfill college and major requirements.
- Students in CALS have the option to take some of these courses either for a grade or using S/U grading. However, letter grades may be required for some majors.
- Non-academic credit courses (numbered 1000-1099 and PE) do not fulfill distribution requirements. Special Topics Courses (numbered 4940) do not fulfill distribution requirements.
- Courses that fulfill distributions are approved by the CALS Curriculum Committee. Distributions cannot be applied to a course retroactively, and individual student petitions for Cornell courses to fulfill distributions will not be accepted. Students may request a review of external transfer courses for fulfilling distribution requirements.

Students must complete all of the following:

Agriculture, Food Systems & Human Nutrition (AFS-AG)

- Take one (1) Agriculture, Food Systems & Human Nutrition (AFS-AG) course.

The Agriculture, Food Systems & Human Nutrition distribution requirement at CALS emphasizes a comprehensive understanding of the food system, including production, processing, distribution, consumption, and waste, with a focus on the integration of these multiple components. Students must learn to describe, analyze, and understand the interdependent nature and the environmental and nutritional impacts of the food system. To fulfill the requirement, a course must cover at least two components of the food system, analyze their interactions, and dedicate at least half of its content to this holistic view, potentially including topics like agricultural history, food sustainability, and nutrition access.

Biological Sciences (BSC-AG)

- Take one (1) Biological Sciences (BSC-AG) course. Note: the following are NOT accepted as fulfilling BSC-AG: BIO-AG, BIO-AS.

Courses that meet the Biological Sciences requirement for CALS dedicate most of their content (at least 75%) to exploring one or more of the following biological concepts: evolution, structure and function, the flow, exchange and storage of information, pathways and transformations of energy and matter, or living systems. These courses include an evolutionary component, teach students how to apply scientific methods, and include at least one of the following competencies: quantitative reasoning, modeling and simulation, interdisciplinary thinking, interdisciplinary collaboration and communication, or science and society relational understanding. Courses also emphasize student-centered learning activities such as labs, problem solving, case studies, research projects, or collaborative projects. Some courses within this distribution are identified as suitable for non-life sciences majors— these courses have no prerequisites and require only high school-level science knowledge.

Physical Sciences (PSC-AG)

- Take one (1) Physical Sciences (PSC-AG) course.

CALS Physical Sciences courses cover at least 75% of their content in fields such as chemistry, physics, earth science, atmospheric science, or astronomy, connecting theoretical knowledge to practical applications. Courses also emphasize student-centered learning activities such as labs, problem solving, case studies, research projects, or collaborative

projects. Some courses within this distribution are identified as suitable for non-sciences majors - these courses have no prerequisites and require only high school-level science knowledge.

Sustainability Challenges (SCH-AG)

- Take one (1) Sustainability Challenges (SCH-AG) course.

Courses that satisfy the sustainability distribution requirement in CALS must allocate at least 30% of content or learning outcomes to examining the intricate interplay between economic, socio-political, and environmental aspects of sustainability issues or their solutions or to exploring the connections among three or more UN Sustainable Development Goals in relation to the main class topic. Additionally, the course must incorporate a learning outcome focused on one of three key proficiencies: systems thinking, decision-making amidst uncertainty, or understanding the factors that constrain sustainability, thereby ensuring students gain a comprehensive and interdisciplinary perspective on sustainability challenges.

Data Literacy (DLG-AG and DLS-AG)

Two required courses:

- Take one (1) course with attribute Data Literacy Statistics (DLS-AG).
- Take one (1) course with attribute Data Literacy General (DLG-AG) OR one (1) course with attribute Data Literacy Statistics (DLS-AG).

CALS courses fulfilling the Data Literacy General (DLG-AG) requirement are designed to teach students how to interpret and articulate insights from both quantitative and qualitative data, with an emphasis on various competencies such as data analysis, acquisition methods, curation, and security. Students will be expected to understand the types of data, their applications, and the ethical implications of data misuse upon completion of these courses. The courses must dedicate a significant portion of content to at least three (3) specific data literacy competencies and include at least one of these competencies as a main learning outcome.

Courses that fulfill Data Literacy Statistics (DLS-AG) additionally provide explicit instruction on mathematical approaches to collection, description, analysis, and inference of conclusions from quantitative data. Course content focuses on the Data Manipulating & Analysis competency: Ability to draw conclusions from data with quantitative and/or qualitative methods, which may include statistical or computational methods and may include tools like R, Python, Stata, Tableau, Unix, NVivo, QGIS, Excel, SPSS, etc.

Ethics (ETH-AG)

- Take one (1) course with attribute Ethics (ETH-AG). Note the following are NOT accepted as fulfilling ETH-AG: KCM-AG, ETM-AAP, ETM-AS, ETM-HA, KCM-AAP, KCM-HE.

Courses that fulfill the CALS Ethics requirement are designed to immerse students in the study of ethical principles impacting various facets of life, including personal, social, and global spheres, as well as in research and professional practices. These courses aim for students to critically engage with their values, understand diverse ethical perspectives, and articulate reasoned ethical positions. To satisfy the Ethics requirement, a course must devote over half of its content to ethical issues relevant to its main topic, incorporate historical or modern ethical debates, foster personal ethical reflection, and include specific learning outcomes focused on ethics.

Human Diversity (D-AG)

- Take one (1) course with attribute Human Diversity (D-AG).

CALS Human Diversity courses foster a comprehensive understanding of the complexities surrounding historically or contemporarily marginalized communities, emphasizing the critical analysis of unequal power dynamics shaped by factors such as race, nationality, ethnicity, indigeneity, sexuality, disability, religion, gender, or economic status. To meet this requirement, a course must allocate at least 50% of its content to examining these issues, be a minimum of three (3) credits, and achieve specific learning outcomes. These outcomes include demonstrating knowledge of diverse cultural practices, understanding systemic oppression, and assessing personal cultural perspectives to identify potential biases.

CALS also accepts courses of at least three (3) credits with the following distributions as fulfilling D-AG: SCD-AS, SCD-HA, D-HE.

Non-equated external transfer courses will only be considered for junior transfer students who have taken an appropriate course at their prior institution and whose schedule does not allow space to take a Human Diversity (D-AG) course at Cornell. These situations will be reviewed individually after a required appointment with CALS Student Services.

Cultural, Social & Historical Understanding

Take two (2) courses of the below distributions, with a maximum of one (1) course in each category: CA-AG, FL-AG, HA-AG, LA-AG, SBA-AG.

Cultural Analysis (CA-AG)

These courses study human life in particular cultural contexts through interpretive analysis of individual behavior, discourse, and social practice. Topics include belief systems (science, medicine, religion), expressive arts and symbolic behavior (visual arts, performance, poetry, myth, narrative, ritual), identity (nationality, race, ethnicity, gender, sexuality), social groups and institutions (family, market, community), and power and politics (states, colonialism, inequality).

CALS also accepts courses of at least three (3) credits with the following distributions as fulfilling CA-AG: ALC-AS, ALC-HA, ALC-AAP, CA-HE, CA-AAP, GLC-AS.

Foreign Language (FL-AG)

Foreign Language - Foreign Language courses available for CALS students at Cornell are offered by several departments, including Africana Studies and Research Center (AS&RC – language courses only), Asian Studies with languages such as Bangla-Bengali, Burmese, Chinese, Hindi, Indonesian, Japanese, Khmer, Korean, Sanskrit, Tagalog, Thai, and Vietnamese, and Classics (CLASS – language courses only). Additional offerings are provided by German Studies, which includes German, Dutch, and Swedish (language courses only), Linguistics (LING – language courses only), Near Eastern Studies (NES - language courses only), Romance Studies with languages like Catalan, French, Italian, Portuguese, Quechua, and Spanish, and Russian Studies, covering Russian, Hungarian, Polish, Serbian/Croatian, and Ukrainian. CALS will recognize these Foreign Language (FL) classifications by any college at Cornell, provided the class is taken for three (3) or more credits. Transfer students may have non-Cornell courses that meet SUNY World Languages and are a minimum of three (3) credits reviewed as fulfilling FL-AG.

Historical Analysis (HA-AG)

These courses interpret continuities and changes - political, social, economic, diplomatic, religious, intellectual, artistic, scientific - through

time. The focus may be on groups of people, dominant or subordinate, a specific country or region, an event, a process, or a time period.

CALS also accepts courses of at least three (3) credits with the following distributions as fulfilling HA-AG: HA-AAP, HST-AAP, HST-AS, HST-HA, HA-HE.

Literature and the Arts (LA-AG)
These courses explore literature and the arts in two different but related ways. Some courses focus on the critical study of artworks and on their history, aesthetics, and theory. These courses develop skills of reading, observing, and hearing and encourage reflection on such experiences; many investigate the interplay among individual achievement, artistic tradition, and historical context. Other courses are devoted to the production and performance of artworks (in creative writing, performing arts, and media such as film and video). These courses emphasize the interaction among technical mastery, cognitive knowledge, and creative imagination.

CALS also accepts courses of at least three (3) credits with the following distributions as fulfilling LA-AG: ALC-AS, ALC-HA, ALC-AAP, LA-AAP.

Social and Behavioral Analysis (SBA-AG)
These courses examine human life in its social context through the use of social scientific methods, often including hypothesis testing, scientific sampling techniques, and statistical analysis. Topics studied range from the thoughts, feelings, beliefs, and attitudes of individuals to interpersonal relations between individuals (e.g., in friendship, love, conflict) to larger social organizations (e.g., the family, society, religious or educational or civic institutions, the economy, government) to the relationships and conflicts among groups or individuals (e.g., discrimination, inequality, prejudice, stigmas, conflict resolution).

CALS also accepts courses of at least three (3) credits with the following distributions as fulfilling SBA-AG: SSC-AS, SBA-HE, SBA-AAP, SSC-AAP.

Written and Oral Expression

Nine (9) credits total, of which at least six (6) must be in Written Expression. Oral Expression is not required by the college but may be required for some majors. If Oral Expression is not required by the major, all nine (9) credits may be in Written Expression. Writing in the Majors (WIM) courses do not count towards Written Expression.

Written Expression (WRT-AG)
All students are required to take at least six (6) credits of Written Expression and may take nine (9) credits to fulfill the Written and Oral Expression requirement. Courses that fulfill the Written Expression requirement in CALS focus on enhancing students' writing skills. Courses meeting this requirement devote at least 50% of class time to writing proficiency, involve at least five (5) writing assignments with detailed feedback, and emphasize revision and development. These courses ensure personalized attention and help students articulate ideas clearly, argue effectively, and engage with evidence critically. This structure supports students in improving both their writing mechanics and their ability to communicate persuasively across contexts.

CALS also accepts FWS courses as fulfilling WRT-AG. Transfer students may have courses that meet the SUNY Writing Requirement considered to fulfill this requirement.

Oral Expression (ORL-AG)
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Engaged, Experiential, Entrepreneurial (E3) Learning Milestone

The E3 Learning Milestone allows students to blend experiential learning with academics, apply theory to practice, and deepen their community and professional engagement. This milestone emphasizes learning through experience, engagement, and/or entrepreneurship, encouraging students to apply their academic knowledge in real-world settings in collaboration with diverse groups and community partners. By completing an E3-designated course or experience, students are able to link their classroom learning with practical application, understand how their experiences align with their academic goals at Cornell, and recognize their contributions to a broader community. Eligible E3 experiences include community-engaged courses, undergraduate research, internships, study-abroad programs, and more—each designed to foster these outcomes and enhance the student's role in their field and community.

Learning Outcomes
Upon completion of a course or experience that fulfills the E3 Learning Milestone requirement, students should be able to:

- Make connections between their disciplinary and scholarly learning and the practice or application of that knowledge.
- Explain how their course/experience contributes to and is informed by their learning goals at Cornell (i.e. in their major or course of study, as they define it).
- Explain how they engaged with and contributed to, or served, a community or cause greater than themselves.

The E3 Learning Milestone can be fulfilled by courses or non-course-based experiences. Courses cannot apply to another distribution requirement if used for E3.

The following courses are accepted as fulfilling E3:

- Any course with CU-CEL attribute.
- Any course with EEE-AG distribution.
- CALS E3 Research and Teaching courses with EEE-AG. With advisor approval some Independent Study (4970) and Internship academic components (4960) may fulfill this requirement.

Courses and experiences that fulfill the E3 Learning Milestone must meet the following requirements:

1. Involve practice and application of knowledge in a real context.
2. Provide learning outcomes at the outset of the course or experience, including but not limited to the learning outcomes articulated above.
3. Include an assignment or activity that promotes student reflection on their experience.

Learning Outcomes

Students will be able to:

- Compare and contrast multiple perspectives on the sustainability of social-ecological relationships, including implications for food, land, air, water, energy, climate, and biodiversity.
- Evaluate claims about sustainability using approaches and perspectives from the natural sciences, humanities, and social sciences.
- Apply diverse scholarly approaches to critically evaluate information and build deeper disciplinary knowledge in one of six focused electives.
- Work collaboratively and across disciplines to formulate approaches to environmental challenges that could help build sustainable human-ecological systems.
- Communicate across disciplines, and demonstrate the capacity to enter the public dialogue regarding complex environmental issues using a variety of communication strategies.