

THE EARTH INSTITUTE
COLUMBIA UNIVERSITY



Special Concentration in Sustainable Development



COLUMBIA | GS
School of General Studies

> earth.columbia.edu/susdevundergrad

Special Concentration in Sustainable Development

What Is Sustainable Development?

Sustainable development is one of the most pressing challenges facing humanity. How can the world's growing population meet its requirements for food, energy, water and other basic needs without undermining the planet's ecological systems? Major challenges such as poverty alleviation, climate change and food security are so intertwined that none can be viewed apart from the others.

“Sustainable” refers to managing the world's economy in a manner consistent with the continued healthy functioning of Earth's ecosystems, oceans, atmosphere and climate. “Development” refers to continued social, political and economic progress aimed at the improvement of global human well-being, especially for the poorest of the poor.

Achieving sustainable development requires holistic and integrated approaches that consider the complex interplay between the planet's natural and social systems and work at multiple levels of society, from the local to the international.

The Special Concentration

A special concentration in sustainable development is available for undergraduate students at Columbia College and the School of General Studies. The Earth Institute, Columbia University, has collaborated with the departments of Earth and Environmental Sciences; Ecology, Evolution and Environmental Biology; Earth and Environmental Engineering; and the School of International and Public Affairs to offer this new program of study. The special concentration will allow students to draw upon classes in a wide range of disciplines, including political science, anthropology, environmental science and economics. The courses required for the special concentration are designed to provide Columbia students with an understanding of the theory and practice of sustainable development, stimulate a critical examination of the historical and conceptual antecedents, provide experience with complex development challenges through direct engagement, and help students imagine and create alternative futures for our rapidly changing world.

The Columbia Context

Columbia University has long worked at the forefront of sustainable development issues through its research centers and graduate programs. More recently, the University began incorporating this work into its undergraduate degree programs.

In 2007, the Earth Institute helped to launch the special concentration in sustainable development for undergraduate students. The concentration was designed as a cluster of specialized courses to serve as a complement to the expert training inherent in existing disciplinary majors at Columbia. The energy and interest that the special concentration generated from faculty and students foretold the need for a full major in sustainable development, which launched in fall of 2010. The requirements for the special concentration were subsequently revised to more closely follow those of the major.

The undergraduate program in sustainable development benefits from the support of Earth Institute researchers—many of whom have helped design classes in the program—and their pioneering work in the field. Drawing on cutting-edge research and practical work at the Earth Institute, graduates of the program will be uniquely prepared to approach issues of sustainable development from all angles in the public, private and non-profit sectors.

Program of Study

The special concentration in sustainable development is not a standalone concentration; it is intended to serve as a complement to the disciplinary specialization and methodological training inherent in a concentration or major. In order to graduate, a student must complete a concentration or major in addition to the special concentration. Students wishing to complete a special concentration in sustainable development will work with a program adviser to decide upon course selection and sequencing. The program office will provide and keep on record a planning form to track the fulfillment of requirements for the special concentration.

How to Undertake a Special Concentration in Sustainable Development

The first step is to e-mail Natalie Unwin-Kuruneri, program manager, at natalie@ei.columbia.edu to let us know of your interest. We will add you to the program listserv so you can learn about upcoming events and programming. We will also put you in touch with the program director and, when necessary, another adviser from the program's interschool committee, based on your specific interests. Students should always consult with their adviser at Columbia College or the School of General Studies to ensure that they are making satisfactory progress toward general core requirements while pursuing the concentration.

Undergraduate Requirements for a Special Concentration in Sustainable Development (Beginning Fall 2010)

Courses

The academic program is structured to provide students with a foundation in sustainable development, followed by grounding in both the natural and human science systems, and to provide students with the skills, both analytic and practical, to address complex problems. It also teaches skills and synthesis through the team-based Workshop in Sustainable Development. Students gain experience in the practice of sustainable development through the one-point practicum or internship.

Please note: The requirements for the special concentration changed in Spring 2010 to be more in line with those of the newly designed major. Students who declared the special concentration prior to the change have the option to follow either the new or the old requirements. Newly declared special concentrators must follow the new requirements. Students following the old requirements may select classes from the new requirements: Analysis and Solutions to Complex Problems courses will fulfill the Stresses and Solutions requirement and Skills/Actions courses will fulfill Skills requirements.

A minimum of nine courses and a practicum are required for the special concentration. Students will take courses within the following framework:

- I. Sustainable Development Foundation**
- II. Natural Science Systems**
- III. Human Science Systems**
- IV. Analysis and Solutions to Complex Problems**
- V. Skills/Actions**
- VI. Electives**
- VII. Capstone Workshop**

Students wishing to complete the special concentration in sustainable development should work with the program adviser to decide on course selection and sequencing.

- I. Sustainable Development Foundation (three courses):**
 - SDEV W1900 Introduction to Sustainable Development
 - SDEV W2300 Challenges of Sustainable Development
 - EESC W2330 Science for Sustainable Development
- II. Natural Science Systems (one course):**
 - PHYS V1201 General Physics I
 - CHEM C1403 Chemistry I
 - EAAE E1100 A Better Planet by Design
 - EEEE W1001 Biodiversity
 - EEEE W2002 Environmental Biology II
 - EESC V1201 Environment Risks and Disasters
 - EESC V2100 Earth's Environment Systems: Climate
 - EESC 1011/1411 Earth: Origin, Evolution, Processes, Future
 - EESC V1003 Climate and Society: Case Studies
 - SCNC W1800 Energy and Energy Conservation
- III. Human Science Systems (one course):**
 - ECON W1105 Principles of Economics
 - SDEV W3400 Demography of Human Populations
 - POLS V1501 Introduction to Comparative Politics
 - POLS V1601 International Politics
 - SOCI W1000 The Social World
 - ANTH V1002 The Interpretation of Culture

- IV. Analysis and Solutions to Complex Problems (two courses):**
EAIA W4200 Alternative Energy Resources
SDEV W3330 Ecological and Social Systems for Sustainable Development
PUBH W3100 Fundamentals of Global Health
SDEV W3200 Global Food Systems
SDEV W3360 Disasters and Development
SDEV W3410 Urbanization and Sustainable Development
ECIA W4100 Management and Development of Water Resources
The Summer Ecosystem Experiences for Undergraduates (SEE-U) Program
- V. Skills/Actions (one course):**
SDEV W3390 GIS for Sustainable Development
SCNC W3010 Science, Technology and Society
SDEV W3450 Spatial Analysis and Modeling for Sustainable Development
EESC W4050 Global Assessment Remote Sensing
SDEV W3320 Economic and Financial Methods for Sustainable Development
SDEV W3355 Climate Change and Law
SUMA K4100 Sustainability Management
- VI. Practicum (one course):**
SUMA K4734 Earth Institute Practicum
INAF U4420 Oil, Rights and Development
- VII. Capstone Workshop (one course):**
SDEV W3280 Workshop in Sustainable Development

Undergraduate Requirements for a Special Concentration in Sustainable Development (Prior to Fall 2010)

Courses: A total of nine courses plus one practicum are required:

- **Five Courses Focusing on Systems (each course for 3-4.5 points):**

- EESC W2330 Science for Sustainable Development
- **One Course in Science Systems:**
 - EAAE E1100 A Better Planet by Design
 - EEEE W1001 Biodiversity
 - EEEE W2002 Environmental Biology II
 - EESC V1201 Environment Risks and Disasters
 - EESC V2100 Earth's Environment Systems: Climate
 - Summer Ecosystem Experiences for Undergraduates (SEE-U)
- **One Course in Economic Systems:**
 - ECON W1105 Principles of Economics
 - ECON W3211 Intermediate Microeconomics
- SDEV W2300 Challenges of Sustainable Development
- **One Systems Elective (choose either a second science systems course or one of the following):**
 - EESC 1011/1411 Earth: Origin, Evolution, Processes, Future
 - EESC V1003 Climate and Society: Case Studies
 - SOCI V2225 Globalization: Empirical and Theoretical Elements
 - ANTH V3004 Introduction to Environmental Anthropology
 - SOCI W3290 Environmental Sociology
 - HIST 3424 The Politics of the American Environment 1865-Present

- **Two Courses Focusing on Stresses and Solutions (each course for three points):**

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| ANTH V3660 Gender, Culture and Human Rights | ECON W4500 International Trade |
| ANTH V3971 Environment and Cultural Behavior: The Production of Nature | ECON W4625 Economics of the Environment |
| ANTH V3973 Environment and Development | ECON G4527 Economic Organization and Development of China |
| ANTH V3924 Anthropology and Disaster | ECON W2257 The Global Economy |
| ANTH V3950 Anthropology of Consumption | ECON W4370 Political Economy |
| CIEE E4163 Environmental Engineering: Wastewater | EEEE W3087 Conservation Biology |
| CIEE E4252 Environmental Engineering | EEEE W4700 Race: The Tangled History of a Biological Concept |
| CIEE E3250 Hydrosystems Engineering | EEEE W4122 Fundamentals of Ecology and Evolution |
| CIEE 3255 Environmental Control and Pollution Reduction Systems | EEEE G4086 Ethnobotany: The Study of People and Plants |
| EAAE E2002/INAF W4200 Alternative Energy Resources | EEEE G4136 Tropical Agriculture and Sustainable Development |
| EAAE E3103 Energy, Minerals, Materials Systems | EEEE G4130 Restoration and Urban Ecology ** |
| EAAE E3901 Environmental Microbiology | EESC BC 3200/EEEE W4200 Ecotoxicology |
| EAAE E4001 Industrial Ecology: Earth Resources | EESC BC3033 Waste Management |
| EAAE E4350 Planning/Management of Urban Hydrologic Systems | EESC BC3025 Hydrology (alternate years) |
| ECIA W4100 Management & Development of Water Systems | EESC BC3032 Agriculture and Urban Land Use (alternate years) |
| EAAE E4150 Air Pollution Prevention and Control | EESC BC3040 Environmental Law (alternate years) |
| EAAE E4160 Solid and Hazardous Waste Management | EESC W4008 Introduction to Atmospheric Science |
| ECON BC 3011 Inequality and Poverty | EESC W4400 Dynamics of Climate Variability and Climate Change |
| ECON BC3029 Development Economics | EESC W4917 The Earth/Human Interactions |
| ECON V4080 Globalization, Incomes and Inequality | HIST BC3414 United States in the World |
| ECON G4301 Economic Growth and Development | HIST W3665 Economic History of Latin America |
| ECON 4321 Economic Development | HIST W3760 Main Currents in African History |
| ECON G4421 Topics on Problems of Emerging Market Economies Seminar ** | HIST W4400 Americans and the Natural World: 1800-Present |
| ECON W4480 Gender and Applied Economics | |

HIST W4584 History of African-American Health and Health Movements
 HIST W4663 Gender and Sexualities in early Latin America
 HIST W3441 Making of the Modern American Landscape
 HRTS W3001 Introduction to Human Rights
 INAF U4545 Contemporary Diplomacy*
 INAF U4710 Extractive Industry: Rights and Development*
 INAF U6243 International Relations of the Environment*
 INAF U4763 Policy Analysis of Development*
 INAF U6060 International Energy Systems and Business Structures**
 INAF U6242 Energy Policy**
 INAF U6760 Managing Risks: Natural and Other Disasters**
 PH P6300 Environment Health Sciences
 PLAN 4151 Foundations of Urban Economic Analysis
 PLAN A4208 Planning Techniques
 PLAN 4304 Introduction to Housing
 PLAN 4329 Disaster Planning
 PLAN 4579 Environmental Planning
 PLAN 4501 Local Economic Development Planning
 PLAN 4540 Interdisciplinary Planning for Health
 PLAN 4609 Introduction to International Planning
 PLAN 4620 Public Financing of Urban Development
 PLAN 4008 History and Theory of Planning

PLAN A4319 Introduction to Environmental Planning
 PLAN 4518 New Patterns of Metropolitan Development
 PLAN 4392 Politics of Planning
 POLS G4415 Political Economy and Sociology of Global Capitalism
 POLS V3615 Globalization and International Politics
 POLS BC3414 Colloquium on Women, Gender, and the Third World
 POLS V3619 Nationalism and Contemporary World Politics
 POLS BC3805 International Organizations **
 POLS G4626 Global Justice and Democracy
 Policy U8778 Urban Energy Systems and Policy**
 SCNC W3010 Science, Technology and Society
 SOCI V2230 Food and the Social Order
 SOCI W3235 Social Movements
 SOCI W3945 Seminar: Inequality and Public Policy
 SOCI W3960 Law, Science and Society
 URBS V3310 Science and Technology in the Urban Environment
 URBS V3550 Community Building and Economic Development***
 URBS V3565 Cities in Developing Countries: Problems and Prospects
Approved upper level courses focusing on issues such as poverty, health, population, transportation, resources

- **One Skills Course (three-point course):**
 EAEE E4009 GIS for Resource, Environmental, and Infrastructure Management
 EAEE E4257 Environmental Data Analysis & Modeling
 EESC BC3017 Environmental Data Analysis
 SOCI V3020 Statistics for Social Research
 SOCI V3210 Methods for Social Research
 URBS V3200 GIS Methods and Case Studies
 Summer Ecosystem Experiences for Undergraduates (SEE-U)
- **Practicum (One required, one-point course) or Practice (Please see Internship Substitution Application Form.):**
 INAF U4738 Earth Institute Practicum
 INAF U4420 Oil, Rights and Development**
 INAF U4728 Practicum in International Energy Management and Policy**
 SDEV W3500 EI-Lamont Sustainable Development Practicum
 SUMA K4734 Practicum on Environment and Sustainable Development
 Summer Ecosystem Experiences for Undergraduates (if applicable)
- **One Required Synthesis Course: Sustainable Development Workshop SDEV 3500 (four-points; This course should be taken in the third or fourth year of study)**

NOTE: Approved science classes taken for the special concentration may be used to fulfill General Studies and Columbia College requirements. Under certain circumstances, up to three additional courses counted toward the special concentration may also be counted toward the student's major or another concentration. You will need to get the approval of your advisor and the program director for any course you would like to count toward another major or concentration. Students may petition to count as related courses those not listed.

*Seniors only

** Students must petition for entry to course

Beyond the Classroom

In addition to coursework, students are encouraged to take advantage of the many resources available at Columbia. By attending lectures and career panels, becoming active in student organizations, and pursuing internship opportunities, students will gain broad perspectives on sustainable development and gather ideas on shaping their future goals. The Earth Institute's Office of Academic and Research Programs offers research assistant positions and special events for undergraduates throughout the year.

Online Resources

Visit earth.columbia.edu/susdevundergrad for the following forms and information:

- Course Planning Form
- Course Approval Form
- Internship Substitution Form
- Special Concentration Declaration Form
- Opportunities for Students Outside the Classroom
- Information on How to Study Abroad
- Research Assistant Program

For more information on the major or the special concentration in sustainable development, please contact:

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