Special Concentration in Sustainable Development

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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:

1. **Sustainable Development Foundation**
2. **Natural Science Systems**
3. **Human Science Systems**
4. **Analysis and Solutions to Complex Problems**
5. **Skills/Actions**
6. **Electives**
7. **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
- EAEE E1100 A Better Planet by Design
- EEEB W1001 Biodiversity
- EEEB 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:
    - EAEE E1100 A Better Planet by Design
    - EEEB W1001 Biodiversity
    - EEEB 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
  - 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):
  - 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 Development of China
  - ANTH V3973 Environment and Development
  - ECON W4527 Economic Organization and ANTH V3924 Anthropology and Disaster
  - ECON W2257 The Global Economy
  - ANTH V3950 Anthropology of Consumption
  - ECON W4370 Political Economy
  - CIEN E4163 Environmental Engineering: Wastewater
  - EEEB W3087 Conservation Biology
  - CIEE E4252 Environmental Engineering
  - EEEB W4700 Race: The Tangled History of a Biological Concept
  - CIEE E3250 Hydro systems Engineering
  - EEEB W4122 Fundamentals of Ecology and Evolution
  - CIEE 3255 Environmental Control and Pollution
  - EEEB W4086 Ethnobotany: The Study of People and Resources
  - ECON W4200 Alternative Energy
  - EEEB G4325 Hydrology (alternate years)
  - EAEA E2002/INAF W4200 Alternative Energy
  - EEEB BC3033 Hydrology (alternate years)
  - EAEA E3103 Energy, Minerals, Materials Systems
  - EEEB BC3032 Agriculture and Urban Land Use
  - EAEA E3901 Environmental Microbiology
  - EEEC BC3032 Agriculture and Urban Land Use
  - EAEA E4001 Industrial Ecology: Earth Resources
  - EEEC BC3034 Environmental Law (alternate years)
  - EAEA E4350 Planning/Management of Urban Systems
  - EESC BC3000/EEEB W4200 Ecotoxicology
  - Hydrologic Systems
  - EESC BC3032 Agriculture and Urban Land Use
  - EAEE E4150 Air Pollution Prevention and Control (alternate years)
  - EESC BC3040 Environmental Law
  - EAEE 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
  - ECON BC3014 United States in the World
  - ECON V4080 Globalization, Incomes and Inequality
  - EESC BC3040 Environmental Law
  - ECON G4301 Economic Growth and Development
  - EESC W4917 The Earth/Human Interactions
  - ECON 4321 Economic Development
  - HIST BC3414 United States in the World
  - ECON G4421 Topics on Problems of Emerging Market Economies Seminar **
  - ECON W3665 Economic History of Latin America
  - ECON W4480 Gender and Applied Economics
  - HIST W3760 Main Currents in African History
  - ECON W4480 Gender and Applied Economics
  - HIST W4400 Americans and the Natural World: 1800-Present

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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 4609 Introduction to International Planning
PLAN 4620 Public Financing of Urban Development
PLAN 4008 History and Theory of Planning

- **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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