

Sustainability Studies Certificate Program, Duke University

Definition

Nobel Prize winning economist Robert Solow defines sustainability as the assurance that future generations will have the opportunity to be at least as well off as the current generation¹. The concept asks the question, can current rates and patterns of human activity continue unchecked, or would such activity affect irreversible and ultimately unacceptable detrimental results? The concept of sustainability bridges all traditional disciplines and includes ideas of economic, ecological, and human understanding within a culturally responsible framework.

Objective

The **Sustainability Studies Certificate Program** addresses the needs of students planning careers in the sphere of sustainability studies, as the need for a more sustainable path of development and management become progressively more important in an increasingly interdependent world. This program will allow students to focus their work towards developing an interdisciplinary approach and an enhanced understanding of the concept and importance of a sustainable perspective.

This program will be available to students both at the undergraduate as well as the graduate levels. This will be achieved with the means of two separate but parallel certificate programs that meet the needs of the different student bodies, graduate and undergraduate.

Courses in the **Sustainability Studies Certificate Program** address 4 primary goals; (1) to gain a better understanding of the interdisciplinary nature of the concept of sustainability; (2) to develop a more global perspective on the nexus between human activity and the environment; (3) to provide students with a historical context to better understand the development of environmental thinking; and (4) to explore the cultural and ideological forces that helped shape modern conceptions of sustainability.

The **Sustainability Studies Certificate Program** focuses primarily on established research in the fields of biology, economics, environmental science, political science, public policy and law. However, it does also recognize the equally important contributions in the fields of business, history, philosophy, and engineering, among others.

The **Sustainability Studies Certificate Program** is open to all degree-seeking students of the Duke University community. The program culminates in a mandatory capstone course for both graduates as well as undergraduates. The Program website will list the most complete and current list of courses offerings each semester.

¹ Solow, Robert M. 2000. "Sustainability: An Economist's Perspective." *Economics of the Environment: Selected Readings*. 4th Edition. Robert N. Stavins (Ed.). New York: Norton.

Benefits to students

This program offers the students interested in the idea of sustainability an opportunity to gain an intensive, interdisciplinary focus that would provide a competitive edge to students seeking employment or further education in this field. It also has the added benefit of developing a more sentient and sensitive individual with a greater awareness of their ecological footprint. The **Sustainability Studies Certificate Program** pushes students to better understand the increasingly precarious state of the natural and human environments as resources become more and more scarce. This program aims to expose students to the analytic framework of research into sustainability from a multiplicity of perspectives. It challenges students, both graduate and undergraduate to make novel and imaginative contributions to the debate over the state of the world, and to explore potential future paths of human activity from both a theoretical and practical standpoint. Furthermore, this program will enhance the offerings of Duke University further, augmenting its reputation as a leader in developing responsible and socially aware individuals.

The Undergraduate Program

Current Undergraduate Certificate Program Offerings

A certificate program is a course of study that affords a distinctive, usually interdisciplinary, approach to a subject that is not available within any single academic unit. All certificate programs consist of at least six courses, four of which are at the 100-level or above, including an introductory and a capstone course.²

Undergraduate Certificate programs are available in: Applied Science; Documentary Studies; Early Childhood Education Studies; Film/Video/Digital; Health Policy; Human Development; Information Science and Information Studies; Judaic Studies; Latin American Studies; Markets and Management Studies; Neurosciences; Perspectives on Marxism and Society; Primatology; Science, Technology, and Human Values; and Study of Sexualities.³

Undergraduate Sustainability Studies Certificate Program

Successful candidates in the undergraduate **Sustainability Studies Certificate Program** must complete the prescribed combination of *six* courses: one introductory course, two core courses, two elective courses, and the capstone course. Appropriate coursework may be chosen from the course listing provided, or may include other courses (such as new courses, special topics courses, independent studies courses, and, when applicable, courses offered at UNC and NC State) as approved by the director on an individual basis.

² Duke University Undergraduate Course Bulletin, p. 28

³ Ibid

Undergraduate Course Listing

INTRODUCTORY COURSE (Any 1 course)

BIOLOGY 110L. Ecology.
BIOLOGY 292. Population Ecology

CORE COURSES (Any 2 courses)

BIOLOGY 268/268L/ENVIRON 231. Ecological Theory and Data
CE 124L. Environmental Engineering
CE 193. Integrated Environmental Design
COMPAREA 125/CULANTH 125/HISTORY 137/POLSCI 125/RELIGION 183/
SOCIOL 125. Comparative Approaches to Global Issues
CULANTH 191ES/ISIS. Global Environmentalism and the Politics of Nature
DPC 196S. Human Population Growth and Global Change
ECON 163. Economics of the Environment
ECON 238. History of Globalization in the Twentieth Century
EGR 176S. Global Climate Change
HISTORY 132/COMPAREA. Modern World Environmental History
HISTORY 204S. Technology, Economic Development, and Social Change
PHIL 115. Applied and Environmental Ethics
POLSCI 148D/ PUBPOL 143D/COMPAREA. Environmental Politics Beyond Borders
PUBPOL 261/ECON 261/ENVIRON 272. Evaluation of Public Expenditures
PUBPOL 267S/ POLSCI 267S. Policy-Making in International Organizations
OLDTEST 145. To Work and Watch: Towards a Biblical Ecology/Theology of Land
SOCIOL 111/WOMENST. Social Inequality: An International Perspective
SOCIOL 142/COMPAREA/MMS. Organizations and Global Competitiveness

ELECTIVE COURSES (Any 2 courses)

BIOLOGY 46. AIDS and Other Emerging Diseases
BIOLOGY 217. Ecology and Global Change
COMPAREA 110. Global Human Geography
CE 240/ENVIRON 240. Chemical Fate of Organic Compounds
CE 244. Biological Processes in Environmental Engineering
CE 270. Environmental and Engineering Geophysics
CULANTH 117/COMPAREA/MARXISM&SOCIETY. Global Culture
EOS 51S. Global Change
ECON 209S. Global Issues in Population and Development
ECON 270/ENVIRON 270/PUBPOL 272. Resource and Environmental Economics
ENVIRON 216. Applied Population Ecology
ENVIRON 298.XX Special Topics in Environmental Studies
(as applicable, with approval from the Director)
HISTORY 121A/PUBPOL 133/POLSCI 160AD. Globalizing Protest
HISTORY 203S. Topics in Modern World Environmental History

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LAW 235 or ENVIRON 281. Environmental Law
LAW 277. Introduction to International Development
POLSCI 107/PUBPOL 107/COMPAREA. Environmental Politics and Policies in the Industrial World
POLSCI 155/COMPAREA. Political Economy of Development
POLSCI 205S. Collective Action, Property Rights and the Environment
POLSCI 234S/ CULANTH 234S/SOCIO 234S. Political Economy of Development: Theories of Change in the Third World
POLSCI 237S/ECON 237S. Understanding and Managing Global Capital Markets Crises
PUBPOL 185D/POLSCI 149D/COMPAREA. Globalization and Public Policy
SOCIO 114/ISIS/MMS. Cybernetworks and the Global Village

Undergraduate Capstone Course

This capstone class is designed as a research seminar where each time the course is taught, it has a different focus. This class culminates in a collaborative research project focused on the topic of the seminar. For instance, one year, the topic might be tropical deforestation. Research would be conducted from a multi and interdisciplinary perspective, where students pick their perspective on the issue and research the issue from that perspective. Class meetings would be either two one-hour meetings each week, or one two hour meeting each week, as determined by the instructor and class preference.

Week 1 would include an introduction to the issue, and an introduction to each student's particular perspective, be it natural science, policy, social science, or any other. The next two weeks would include basic research, and identification of student perspective and identification of individual student project, with discussion of assigned readings. The following six weeks would include research and updates on individual project sub-components. The final three weeks would be used for compilation of the project from all individual projects, and a class presentation, open to the university community.

The Graduate Program

Successful candidates in the graduate **Sustainability Studies Certificate Program** must complete the prescribed combination of *five* courses: two core courses, two elective courses, and the capstone course. Appropriate coursework may be chosen from the course listing provided, or may include other courses (such as new courses, special topics courses, independent studies courses, and, when applicable, courses offered at UNC and NC State) as approved by the director on an individual basis.

CORE COURSES (Any 2 courses)

BIOLOGY 268/268L/ENVIRON 231. Ecological Theory and Data
ECON 238. History of Globalization in the Twentieth Century
ECON 219S. Economic Problems of Underdeveloped Areas
ENVIRON 216. Applied Population Ecology

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ENVIRON 239. Human Health and Ecological Risk Assessment
LAW 235 or ENVIRON 281. Environmental Law
LAW 277. Introduction to International Development
LAW 355. Land Use Planning
POLSCI 213S. Theories of International Political Economy
POLSCI 271S/PUBPOL 258S/COMPAREA. International Environmental Regimes
PUBPOL 261/ECON 261/ENVIRON 272. Evaluation of Public Expenditures
MGRECON 301. Global Economic Environment of the Firm
FINANCE 456. Emerging Markets
MANAGEMENT 438. Global Interdependence

ELECTIVE COURSES (Any 2 courses)

ECON 268S/CANADIAN. Current Issues in International and Development Economics
ECON 363. Economics of Natural Resource Damage Assessment
ECON 372. Advanced Theory of Environmental and Natural Resource Economics
ECON 373. Topics in Environmental and Natural Resource Economics
ENVIRON 247. Survey of Environmental Health and Safety
ENVIRON 275S/LATAMER. Protected Areas, Tourism, and Local Development
ENVIRON 298.XX Special Topics in Environmental Studies
(as applicable, with approval from the Director)
ENVIRON 317. Topics in Tropical Ecology and Conservation
HISTORY 203S. Topics in Modern World Environmental History
HISTORY 204S. Technology, Economic Development, and Social Change
LAW 275. Public International Law
LAW 318. The Non-Profit Sector
LAW 373. Origins of Environmental Legislation
LAW 512. Comparative Public Law and Policy: Ethnic Group Relations
LAW 555. International Environmental Law
LAW 562. International Dispute Settlement
LAW 567. Global Capital Markets
LAW 737. Environmental Litigation
LIT 295. Representation in Global Perspective
LIT 302. Seminar in Emergent Literatures (as applicable, with approval from the
Director.)
POLSCI 205S. Collective Action, Property Rights and the Environment
POLSCI 227S/ISIS 232S. Issues in International Communications
POLSCI 234S/ CULANTH 234S/SOCIO 234S. Political Economy of Development:
Theories of Change in the Third World
POLSCI 237S/ECON 237S. Understanding and Managing Global Capital Markets Crises
POLSCI 248. International Politics and International Law
PUBPOL 267S/ POLSCI 267S. Policy-Making in International Organizations
PUBPOL 320. Globalization and Governance
PUBPOL 329. Special Topics in International Development Policy (as applicable, with
approval from the Director.)
CE 240/ENVIRON 240. Chemical Fate of Organic Compounds

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CE 244. Biological Processes in Environmental Engineering
CE 270. Environmental and Engineering Geophysics
(Fuqua School of Business)
MANAGEMENT 435. Corporate Environmental Management and Strategy
MANAGEMENT 436. Management and Organizational Design of Global Corporations
MGMTCOM 397. Effective Advocacy
(School of Medicine)
INTERDIS 310B. 20th Century Epidemics
INTERDIS 302C. Exploring Medicine: Cross-Cultural Challenges to Medicine in the 21st
Century
INTERDIS 304C. Healing in the Developing World and Care of the Underserved

Graduate Capstone Course

This capstone class is designed as a research seminar. This class culminates in a research project focused on the topic of the choosing of the graduate student, and may be completed in groups of up to two individuals. Research would be conducted from a multi and interdisciplinary perspective, where students pick their issue and research said issue from all perspectives, natural science, policy, social science, or any other. Class meetings would be either two one-hour meetings each week, or one two hour meeting each week, as determined by the instructor and class preference, and would serve primarily as research and direction meetings.

Week 1 would include an introduction to sustainability, and initial research and identification of student research projects. Each week following for the next eight weeks would include a discussion of a different issue, presented by the student/s researching said issue. The final three weeks would be used for compilation and refining of individual projects, and a class presentation, open to the university community.

PROPOSED OPERATING BUDGET*

	FY 2003-2004
BUDGET	\$ 57,503
Personnel	\$ 56,028
Salaries	\$ 41,251
Teaching	\$ 22,451
Capstone Course (Undergraduate)**	\$ 12,785
Capstone Course (Graduate)**	\$ 9,666
Administration	\$ 18,800
Certificate Program Director***	\$ 16,000
Administrative Support****	\$ 2,800
Fringe Benefits*****	\$ 14,777
Non-Personnel	\$ 1,475
Photocopying	\$ 100
Office Supplies	\$ 125
Postage	\$ 75
Publicity	
Advertising	\$ 300
Brochure Publication	\$ 700
Miscellaneous	\$ 175

* Based primarily on Health Policy Certificate Program Operating Budget, non-inclusive of initial sunk costs (capital expenditures) of buying computer equipment, office furniture et al.

** Dependent mostly on host department and potential cost sharing, estimate

*** Based on 1/4th of a nine-month salary, equivalent to a course load reduction.

**** Could be managed with comparable work-study research assistance, however, would still require some staff support with confidential tasks dealing with grades, printing of certificates, managing roster of students, increasing continuity, among others. Based on full academic assistantship available to students. Could account for 10%-25% of the time of an administrative assistant for either a research center, or assigned to another department and shared.

***** Health benefits, among others

PROJECTED NEEDS OF THE PROGRAM

Traditionally, certificate programs at Duke University have been developed from established academic departments, as an alternative to major or minor courses of study, or from research centers expanding to incorporate an academic component. These certificate programs allow for a concentration in a particular course of study, and completion of such a certificate recognizes a student's intensive concentration in said field of study.

Fiscal

Projections for the 2003-2004 fiscal year are provided earlier. This is assumed to increase approximately 2.5% each year. Operating costs begin at approximately \$57,503⁴. Capital costs to set up the program would depend on whether this program was part of a larger research center, or whether any academic program would adopt this program. The difference between the two would be the need for a greater output of capital for the establishment of an entirely new center. However, the center would provide an excellent opportunity for students to avail of exciting new research and faculty resources, and would ensure greater longevity of the program.

Advisory Committee

The education committee for this program is responsible for managing the program, ensuring the long-term goals and plans of the program, establishing assessment criteria, and assisting in the visibility of the program. Essentially, the Education committee is established to secure the stability and direction of the program. The Education Committee would consist of six or seven members of the Duke University Faculty. **Please Note** that none of these faculty members have yet been approached, as funding must be secured prior to gaining the commitments of faculty members. Potential members of the Education committee would include:

Dr. Robert N. Brandon

Professor of Philosophy and Professor of Biology
Philosophy of Science, Philosophy of Biology, Logic

Dr. James Clark

H.L. Blomquist Professor of Biology and Faculty Director of the Center for Global Change, NSEES
How global change affects forests and grasslands

Dr. Norman L. Christensen, Jr.

Professor of Biology and Professor of Environmental Studies
Professor of Ecology and Founding Dean of the Nicholas School of the Environment and Earth Sciences

Dr. Robert G. Healy

Professor of the Environment, and Professor of Public Policy Studies
Management of protected areas in developed and developing countries, especially as related to human populations living near (or within) the area; tourism and regional development; agriculture and forestry; land use in the U.S., particularly in rapidly growing urban and exurban areas. Has special interest in Mexico and Canada. Serves as director of Duke University Center for North American Studies

⁴ Based primarily on Health Policy Certificate Program Operating Budget, non-inclusive of initial sunk costs (capital expenditures) of buying computer equipment, office furniture et al

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Dr. Robert B. Jackson

Professor of Biology and Director of Duke University's Program in Ecology

Examines feedbacks between global change and the biosphere. Current projects in his lab include studies of the global carbon and water cycles, biosphere/atmosphere interactions, and vegetation change. He leads research projects for two core projects of the International Geosphere Biosphere Programme, Global Change and Terrestrial Ecosystems (GCTE) and Biosphere Aspects of the Hydrological Cycle (BAHC).

Dr. Gabriel G. Katul

Associate Professor of the Environment and Associate Professor of Civil and Environmental Engineering

Micrometeorology and surface hydrology. Carbon and water cycling. Fluid Dynamics. Co-Director, Center for Hydrologic Science

Dr. Robert O. Keohane

James B. Duke Professor of Political Science

The role of international institutions, including international environmental regimes.

Dr. Elizabeth Kiss

Associate Professor of the Practice of Political Science and Associate Professor of the Practice of Philosophy

Moral and Political Philosophy, Applied Ethics

Dr. Robert R. Korstad

Associate Professor of Public Policy Studies and Associate Professor of History

Social Policy from an historical perspective

Dr. Randall A. Kramer

Professor of Environmental Economics

The role of economics in environmental policy and management, focusing on improving our understanding of how human and business behavior is shaped by policies intended to protect the environment, especially in the areas of water quality, wetlands, biodiversity

Dr. Fredrick W. Mayer

Associate Professor of Public Policy Studies and Political Science, Director of Graduate Studies, PPS

Research: International trade; globalization and governance; international negotiations; political analysis

Dr. Margaret A. McKean

Associate Professor of Political Science

Japanese politics and environmental and resource politics

Dr. Walter D. Mignolo

William H. Wannamaker Professor of Romance Studies, Professor of Literature, and Professor of Cultural Anthropology

His current research focuses on global coloniality and the History of Capitalism

Dr. Marie Lynn Miranda

Dan and Bunny Gable Associate Professor of the Practice of Environmental Ethics and Sustainable Environmental Management

Children's environmental health; environmental justice, spatial modeling and GIS (Global Information Systems). Director, Children's Environmental Health Initiative.

Dr. Stuart Pimm

Doris Duke Professor of Conservation Ecology

Species extinctions and what can be done to prevent them. The loss of tropical forests and its consequences to biodiversity.

Dr. Chantal Reid

Instructor, Department of Biology

Research centers on plant responses to global change, including atmospheric carbon dioxide and tropospheric ozone

Dr. John F. Richards

Professor of History

Dr. Richards specializes in the history of South Asia. He has published extensively on the history of Mughal India. His other interests include environmental history and the history of opium. He also

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contributes to the expanding field of world history. See his statement of academic interests, curriculum vitae and texts of recently delivered public lectures for further information

Dr. William H. Schlesinger

James B. Duke Professor of Biology, Professor of Earth and Ocean Sciences, and Dean of the NSEES
Global environmental change, focusing on chemical changes in the environment, especially soils, that relate to changes in global climate and desertification.

Dr. Martin Smith

Assistant Professor of Environmental Economics
Natural resource economics. Modeling linkages between economic behavior and biophysical processes. Statistical analysis of discrete decisions

Dr. John Terbourgh

James B. Duke Professor of Environmental Science and Biology
Tropical ecology and conservation

Webspace

The **Sustainability Studies Certificate Program** must have its own web space with consistent management and updates, specifically managing the current course offerings, and providing greater visibility for the program. This could be delegated to either the staff assistant or the student assistant.

Approval Process

The approval process for the Sustainability Studies Certificate Program would be necessary to be handled separately for the undergraduate and graduate levels. Please see attached checklist for needs to be submitted for approval for the undergraduate certificate program. Written consent from each faculty member teaching each identified course will also be required. **Please Note:** Deadline for approval in time for inclusion in the **2004-05 Undergraduate Bulletin: MONDAY, SEPTEMBER 29, 2003**. Proposals for undergraduate certificate programs must be sent to Dean Ellen Wittig's office at 04 Allen Building, while proposals for graduate certificate programs must be sent to Dean Leigh DeNeef's office at 127 Allen Building.

Administrative Needs

The administrative needs of the program could be handled with a work-study student handling the daily copying, website management, filing, and other simple administrative tasks. However, a permanent staff member would be needed to maintain student rosters, grade management, and printing out certificates, some of the tasks that cannot be assigned to students by University policy.

Academic Needs

Duke University currently offers a great many courses that relate in some way to the concept of sustainability from a variety of perspectives. However, there are areas, specifically in the humanities that are quite restricted in terms of literature offerings of environmental writers, or environmental writing, for instance. Business Sustainability,

while available through a few courses at the Fuqua School of Business, is available in greater depth to students through the UNC Keenan Flagler School of Business.

Recommendations for Faculty Program Directors

Dr. Norman Christensen. One other possibility that might need to be considered is the adoption of this program by the newly developed Center for Global Change at the NSEES, with Dr. James Clark as Director. The Center does not necessarily focus of Global Climate Change, and this sustainability certificate might well fall under the umbrella of global change, or perhaps even globalization. The existence of said research center might speed up the approval process further, and may need to be considered as a viable option.

Recommendations for Location of the Program

The most natural home for this program would be in the Nicholas School of the Environment and Earth Sciences. The Nicholas School already has the facilities established, and this program would add both visibility and greater marketability for the evolving curriculum at the School of the Environment.