

ENVIRONMENTAL STUDIES PROGRAM
DIVISION OF SOCIAL AND BEHAVIORAL SCIENCES
COLLEGE OF ARTS AND SCIENCES
STATE UNIVERSITY OF NEW YORK AT ALBANY

PROPOSAL FOR A BACHELOR OF
ARTS AND BACHELOR OF SCIENCE WITH A
MAJOR IN ENVIRONMENTAL STUDIES

Approved by
CAP 3/11/73 *for*
approved by
CAC 3/20/73

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A. INTRODUCTION

The rapid increase in the body of knowledge on man-environmental relations has triggered a variety of responses at centers of higher learning (1, 2, 3, 4). Programs range from two-year to graduate level, and most are in a state of flux or rapidly developing. Nearly all four-year colleges offer courses dealing directly with environmental subjects and many, if not most, are discussing the manner in which environmental programs should be developed. The response at SUNYA has been fairly typical of multipurpose universities.

At present we offer courses on a range of environmental subjects in departments in many of the colleges and schools. Some courses have been developed specifically to treat environmental subjects while others have developed as part of the particular discipline which offers the course. The degree of environmental subject matter covered in the latter usually depends upon the environmental interest of the instructor.

Attempts to organize this diversity of courses into a cohesive program resulted in the development of a second field program which began in the Fall Semester, 1972 (5). Twelve courses were given cross-listing in environmental studies. At the same time the university introduced a program in "interdisciplinary studies" (6) designed to offer students a major in areas of study which cross several of the present disciplines. Experience in advising students for an interdisciplinary major in environmental studies showed that a "core" environmental program is essential for the cohesiveness of the student's program.

The "core" of environmental courses has been discussed and studied in various ad-hoc committees at SUNYA for the past several years. "Models" of on-going programs from other universities indicate that the most effective and efficient method of organizing programs in environmental studies at multipurpose universities is through such a core program (1, 2, 3). This proposal for a baccalaureate (B.A. and B.S.) with a major in Environmental Studies presents the essential features of a program developed by a "Faculty of Environmental Studies" (see section J) composed of members from eleven different departments. For the most part the program relies on resources already in existence at SUNYA.

B. PHILOSOPHY OF THE PROGRAM

Environmental studies has been described as a "multidiscipline" because it borrows information from many fields but also has its own developing body of knowledge. It stresses an integrated approach and recognizes that the "one problem--one solution" methods of the past are no longer applicable. It borrows the "system" or holocenotic viewpoint from ecology. Most universities recognize that the subject is problem-focused and their programs accordingly are project-oriented (1, 2, 3). Most notable of recent developments are environmental "theme" colleges and experimental programs such as the University of Wisconsin at Green Bay (7), Evergreen State College (Washington) and Hampshire College (3) where a community emphasis is coordinated with regular course offerings in the disciplines.

The proposed major in environmental studies allows the student to select within a broad spectrum of possible fields of emphasis. That is, the student is expected to select a strong second field, or more desirable, a second major in a discipline or specialty area relevant to environmental study. The environmental subjects are intended to instruct the student on the nature and extent of environmental problems, methods by which they can be studied and analyzed, and future alternatives for minimizing environmental disruption. The selected area of emphasis (second field or second major) provides students with "tools" for their own particular goals in the program.

Students can select areas of emphasis from nearly all of the present programs in the university. Those interested in science, mathematics or business will generally select the B.S. program while those interested in social sciences, humanities or fine arts will generally work for the B.A. degree.

C. NATURE AND OBJECTIVES OF THE PROGRAM

The core program contains two elementary courses of three credits each and two full-year courses of six credits each emphasizing projects. To complete the major all students will take a minimum of twelve additional credits in environmental courses (Env or equivalent) as advised. The faculty-advised project courses allow students to participate in study and work on problems related to their goals in the program. Group projects on key problems in the local area or on campus will be stressed.

One of the key elements of the program will be advising students in their area of emphasis. The advising is parallel to the project work. Thus as their projects develop the students are expected to select appropriate coursework to give them the "tools" which fit their goals in environmental studies.

As can be seen from the foregoing the objectives of the program are compatible with the goals of a liberal education. Graduates will be prepared in a wide variety of specialties depending upon their own goals, but in common, they will direct their field of emphasis toward the study and solution of environmental problems. They can enter the work force or graduate studies either as environmental specialists or in their area of emphasis.

D. NEED FOR THE PROGRAM

There is good reason to believe that graduates in environmental studies are in greater demand than those trained in the regular disciplines provided the students have a strong emphasis in a discipline or other special environmentally related area. Government agencies such as the New York State Departments of Environmental Conservation and Public Health, and several Federal agencies such as the Environmental Protection Agency (EPA) and Departments of Interior and Commerce hire persons with specific training in a wide variety of environmentally-related programs. Some agencies require re-training to orient recent graduates to their mission (most notable are the EPA short courses), because the baccalaureate program is usually not specific to their mission. These agencies

prefer graduates who already have a broad background of an environmental nature. Many industries are in similar need of graduates with this dual training. Responses from government agencies and industries to our questions about the kind of training they require was one of the main reasons for shaping the broad program described in this proposal.

A second need for this program stems from the fact that a great deal of government- and industry-sponsored research and development is being proposed to minimize environmental deterioration of the present and to plan for future needs. A recent report to the President's Environmental Quality Council (1) emphasizes the multidisciplinary nature of this work. Students with undergraduate preparation in environmental studies will be better prepared to enter the graduate programs which conduct such research, particularly when the research emphasizes multidisciplinary group projects. It has been estimated that professional scientists on multidisciplinary research projects require about 100 hours of communication (seminars, etc.) before they begin to understand mutual inputs to the problem. When the training for the problem begins early the time and expense of this communication will be reduced. When the problem requires input from social sciences, sciences and humanities it is all the more important to begin this communication at an early stage.

A third and somewhat illusory "need" for the program stems from student interest. The environmental concern associated with the first "Earth Day" has gone from passion to a much deeper and more productive urge for study of the issues, problems, and alternatives. First year courses in environmental studies enroll nearly 2000 students per year at some universities and majors in environmental studies programs number as high as 200-300 in some universities (University of Virginia, University of Waterloo, Ontario, see also (3)).

Most students consider their study as part of a career and thus they specialize in some aspect of environmental studies. Many students are interested in an environmental "awareness" or viewpoint associated with an environmental "life style." They are not immediately concerned with a job related to their study. In this respect environmental studies can be compared to some of the arts or humanities where learning for its own sake can be a student's goal.

The need for environmental studies as part of liberal education is evident. Outside of the concept of an environmentally aware public there are specific examples of action-oriented programs where environmental information is necessary. These are organizations such as League of Women Voters, Boy Scouts, (etc.) and a variety of environmental and conservation groups. Misinformation about the environment can often do harm. Leaders in such groups would be more effective if they were exposed to environmental courses or programs. In New York State every local governing body (county, town or municipality) is entitled by law to form an Environmental Council of local citizens (nine per council) as an advisory to the governing officials. There are 57 counties, 62 cities, 931 towns and 556 villages in the State. Very few council members have training in environmental problems except as it may relate to their profession. A great deal of mis-interpretation of the facts could be avoided with an environmentally prepared citizenry.

E. RELATIONSHIP TO THE OVERALL MISSION OF SUNYA AND SUNY

One of the recommendations of the 1972 master plan for SUNY (8) states that: "Baccalaureate degree programs in interdisciplinary or multidisciplinary curricula will be expanded and, in some cases, focused on topics or themes of contemporary social interest." This proposal responds directly to the assumptions upon which this recommendation is based which states that SUNY will offer more varied programs reflecting new fields of knowledge and new social expectations (8). Another assumption of the master plan is that the university must respond to expected changes with fairly limited budget increase. The proposed program will require little change in budgeting due to the availability of the extensive academic and physical facilities of SUNYA.

Other units of SUNY plan to offer programs on aspects of the environment. The two closest to our proposal are at the University Center at Buffalo (SUNYB) and the College at Purchase. The SUNYB program is most like ours and the historical development is almost parallel (3). A major difference is that at SUNYB the program will be administered under a "Collegiate Workshop" concept by the Rachel Carson College. The program at Purchase is science-oriented and administered by the Division of Natural Sciences. Ecological programs at SUNY Stony Brook and at SUC at Oneonta are organized under biological sciences and do not propose a major in environmental studies. Only SUNY Buffalo presently plans a degree program entitled "environmental studies."

One aspect of the change in SUNY which favors development of environmental studies is the trend toward sharing of resources between universities. Freedom to select course offerings from local universities such as Rensselaer Polytechnic Institute and Union College in addition to other units of the State University would increase the number of specialties offered in environmental studies and add considerable breadth to our program.

F. REFERENCES

- (1) Steinhart, John C. and Stacie Cherniack, 1969. The universities and environmental quality--commitment to problem focused education. Office of Science and Technology, Executive Office of the President (Sup. of Documents, Washington, D. C. (20402).
- (2) Francis, G. R. 1972. Man-Environment Studies: one approach to undergraduate education. Paper presented at 27th National Conference on Higher Education, Chicago, Ill., March 7, 1972.
- (3) Aldrich, J. L. and E. J. Kormondy, 1972. Environmental education: academia's response. Publication No. 35, Commission for Undergraduate Education in the Biological Sciences. American Institute of Biological Science. 3900 Wisconsin Ave., N.W., Washington, D. C. 20016.
- (4) Ragland, K. W. and T. W. Smith, 1971. Environmental Studies at CIC universities--a survey. Committee on Institutional Cooperation. Staff Offices Suite 970, 1603 Orrington Ave., Evanston, Ill. 60201.

- (5) Ad Hoc Committee for Environmental Studies, SUNY at Albany, March 22, 1972. Memorandum: Environmental Studies Second Field Advisory Statement.
- (6) College of Arts and Sciences, SUNYA (1972). Announcement of an Undergraduate Inter-Disciplinary Major.
- (7) Weidner, E. W. 1971. The University of Wisconsin-Green Bay: an academic plan of person, society, and future. Submitted to International Year Book of Education, 1972.
- (8) State University of New York. 1972. The Master Plan of 1972: Building a Comprehensive University for the '70's.

G. REQUIREMENTS FOR THE DEGREE

1. Requirements for Admission. The requirements for admission to the program are the same as those for SUNYA.

2. General Requirements. General requirements for the Bachelor of Arts and Bachelor of Science programs are the same as described on pages 16-17 in Part I of the 1972-73 SUNYA Undergraduate Bulletin except that Part (3a) will be altered to include "environmental studies" in both programs.

✓ 3. Course Requirements. General Program (B.A. or B.S. Degree): Either Env 100 or 230, either Env 150 or 201, plus Env 250 a & b, 350 a & b, plus 18 credits of Env courses (including Env cross-listed courses) as advised. Those whose program is scientific or technical should register for the B.S. degree while those whose program will emphasize social sciences, humanities or the fine arts should register for the B.A. degree.

Typical Course Sequences:

a. Example of a major in Environmental Studies with a second field in Economics (B.A. degree):*

Semester 1

Env 100	3
Eco 100a	3
Electives	9
	<u>15</u>

Semester 2

Env 150	3
Eco 100b	3
Electives	9
	<u>15</u>

Semester 3

Env 250a	3
Eco 220	3
Electives	9
	<u>15</u>

Semester 4

Env 250b	3
Eco 300	3
Electives	9
	<u>15</u>

Semester 5

Env 350a	3
Eco-Env 3EE**	3
Electives	9
	<u>15</u>

Semester 6

Env 350b	3
Env 302	3
Eco 330	3
Electives	6
	<u>15</u>

Semester 7

Env 450a	3
Env 301	3
Eco 442	3
Electives	6
	<u>15</u>

Semester 8

Art-Env 352**	3
Law 350-Env 320	3
Electives	9
	<u>15</u>

*Programs with second fields in Afro-American Studies, American Studies, Anthropology, Art, Geography, Sociology and Urban Studies also provide logical sequences. It is also desirable to undertake a double major program for the B.A. degree. For example, a second major in Economics is fulfilled by adding three more Eco courses in place of electives. A good example would be the addition of Eco-Env 182, Eco 341 and Eco 442 but many others will be suitable and the selection depends upon the goals of the student.

**New cross-listed courses being proposed in Economics (3EE), Business Law (350), Art (352). The program does not depend upon approval of these courses.

Summary of example (a):

Core of Environmental Courses	18	} (30-36 required)
Environmental Electives	15	
Second field (Economics)	21	(18-24 required)
Electives	66	
	<u>120</u>	

A total of 90 credits must be in Arts and Sciences.

b. Example of a major in Environmental Studies with a second field in Biology (B.S. degree):*

Semester 1

Env 100	3
Bio 101a	4
Electives	8
	<u>15</u>

Semester 2

Env 150	3
Bio 101b	4
Electives	8
	<u>15</u>

Semester 3

Env 250a	3
Bio 202, 203	4
Electives	8
	<u>15</u>

Semester 4

Env 250b	3
Bio 219	3
Env 201	3
Electives	6
	<u>15</u>

Semester 5

Env 350a	3
Env 301	3
Bio-Env 230	3
Electives	6
	<u>15</u>

Semester 6

Env 350b	3
Env 302	3
Bio 316	3
Electives	6
	<u>15</u>

Semester 7

Env 450a	3
Bio 420 or 530	3
Electives	9
	<u>15</u>

Semester 8

Art-Env 352**	3
Env 450b	3
Electives	9
	<u>15</u>

*Programs with second fields or second majors in Atmospheric Science, Chemistry, Geology, Mathematics, Computer Science, Medical Technology, Business Administration, and Social Welfare are logical sequences. Such programs are fully in accord with the philosophy of the Environmental Studies major especially for those students desiring post graduate study. Using the above example for the B.S. degree the second major in Biology is obtained by adding the following courses in place of electives: Bio 201, 301 and 402, Chm 121, 122, 345, 346, 347, 348, Phy 105, 106, six credits in Astronomy and Space Science, Geological Science or Atmospheric Science as advised, two courses in Mathematics exclusive of Mat 100, 102, 105 and 326.

**New courses being proposed in Economics (3EE), Business Law (350) and Art (352), (see course list). The program does not depend upon approval of these courses.

Summary of example (b):

Core of Environmental Courses	18	} (30-42 required)
Environmental Electives	18	
Second field (Biology)	21	} (18-24 required)
Electives	6	
	<u>63</u>	
	120	

A total of 60 credits must be in Arts and Sciences.

c. Example of Transfer Student:

When students transfer from two year colleges, other universities or from a different program, it is possible to complete the major field requirements in two years. The example assumes that 60 transfer credits are allowed but that none are applicable to the Environmental Studies major. It also assumes that transfer credits and electives can be used to develop a second field sequence.

Semester 5

Env 100	3
Env 250a	3
Env 350a	3
Electives	6
	<u>15</u>

Semester 6

Env 150	3
Env 250b	3
Env 350b	3
Electives	6
	<u>15</u>

Semester 7

Env 303	3
Env 302	3
Env 3EE	3
Electives	6
	<u>15</u>

Semester 8

Env 402	3
Env 320	3
Electives	9
	<u>15</u>

H. LIST OF COURSES

1. Courses with Env listing only. All except Env 250 a & b are new. The latter is now given as A and S 201.

- Env 100 Human Environments and Natural Systems (3). An introduction to the study of man's relation to the ecosphere. Three class periods each week. Several field trips required.
- Env 201 Environmental Technics (3). Social, environmental, economic, and political goals and consequences of the generation and utilization of science and technology. Environmental and social technology for closing the gap between physical technology and human progress. Three class periods each week.
- Env 250 a & b Environmental Forum (3, 6). A study of environmental issues which a crowded and industrialized society must face. Lectures by specialists in a variety of environmental fields with large and small group discussion. Individual and group projects on environmental problems. Fall and Spring terms.
- Env 303 Environmental Information (3). Environmental information and literature. Statistical analysis and written presentation of environmental data. Decision models and environmental quality assurance. Preparation of public service, legislative position, or technical papers. Prerequisite: consent of the instructor.

Env 350 a & b Environmental Study Project (3, 6). Performance of a year-long project suited to the student's needs or goals. Prerequisite or corequisite: 2 semesters of Env 250 a & b. Fall and Spring terms.

Env 402 Environmental Impact (3). Technology assessment and environmental forecasting for government and corporate planning. Systems and information theory approaches to environmental impact statements and quality control policies. Prerequisite: consent of the instructor.

Env 450 a & b Advanced Environmental Study Project (3, 6). Performance of a year-long project leading to a senior thesis on an environmental theme. Prerequisite: Env 350 a & b. Fall and Spring terms.

2. Env courses cross-listed with other departments (revised December 1972).

Env 150 (Paf 150) Man Against His Environment (3). An introductory analysis of major environmental issues, the social and political forces that generate and aggravate them, the limits and prospects of collective action and alternatives from which we must choose environmental policy. Live lectures plus TV presentations and critique twice a week. Discussion sessions once a week.

Env 182 (Eco 182) Economics and Environmental Policy (3). The economics of public policies which aim at environmental control. Emphasis is given to the concepts of resource scarcity, externalities, and common property, as they affect the role of the public sector in environmental control.

— Env 202 (Bio 202) Ecology (3). Introduction to the study of organisms, populations, and communities in relation to their environments. The course stresses an integrated approach at all levels of biological organization. Topics considered include: the niche concept, species diversity, nutrient cycling, energy flow, population dynamics and control, biological rhythms, and other physiological mechanism influenced by the environment. Prerequisite: Bio 101. Students are encouraged to register for Bio 203 concurrently. Three class periods each week. May be taken either semester.

Env 230 (Bio 230) People and Resources in Ecological Perspective (3). Introduction to ecosystems, soils science, and the distribution of natural communities. The study of man as a global population and its social implications for resource exploitation. A historical perspective on resource-oriented behavior. Does not yield credit toward the major in biological sciences. Three class periods each week. Given second semester only.

- Env 300 a & b (Paf 300 a & b) Environmental Legislative Workshop (3, 3). Intensive study of current New York State legislative proposals involving environmental topics. Preparation of factual analyses of these proposals for information of the legislators and the general public.
- Env 301 (Chm 301) Chemistry in Society (3). Designed to provide the non-science student with an appreciation of chemistry as a human pursuit and the nature of chemical knowledge and how it is obtained. (Closed to students with credit in Chm 121 b or Chm 131 b.) Three class meetings each week.
- Env 302 (Phy 302) Urban and Environmental Physics Problems (3). A physicist's approach to the collection, evaluation, and interpretation of data and opinions on selected urban and environmental problems. Topics will include mass transportation systems, comparison of various energy sources such as nuclear and fossil fuel, and effective utilization of natural resources. Prerequisite: Algebra. Three class periods each week. May be taken either semester. This course will be S/U graded.
- **Env 3EE (Eco 3---) Course on Economics and the Environment to be proposed by the Economics Department.
- **Env 320 (Law 320) Environmental Law (3). An overview of legal problems in environmental management with emphasis on principles of effective resource management in an industrial society. Prerequisites: Law 200 or Law 220 or permission of instructor.
- **Env 352 (Art 352) The Environment as Art (3). The understanding of art as environment as well as environment as art; the artist and the conditions of his obligation to society; a continuing analysis of what is, what could be, and what must be. The idea of art made for posterity; the question of recycling and re-use of art.

**Courses being developed in Economics (3EE), Business Law (350), and Art (352) to be cross-listed in the Environmental Studies Program.

3. Related Courses in Departments and Schools. These are supportive courses and may apply toward a student's major field program in special cases where they are central to the student's environmental interest (as advised).

<u>School</u>	<u>Department/ Course Number</u>	<u>Title</u>
A & S	Art 460	Human Ecology
	Art 410	Architectural Design
	Art 474	Contemporary Architecture
	Art 475	History of City Planning
	Atm 103	Climatology
	Atm 207	The Oceans

<u>School</u>	<u>Department/ Course Number</u>	<u>Title</u>
	Bio 219	Field Biology
	Bio 316	Biogeography
	Chm 407	Atmospheric Chemistry
	Gog 101	Introduction to Physical Geography
	Gog 330	Geography of Population and Settlement
	Gog 416	Geographical Aspects of Land Use Planning
	Geo 105	Physical Geology
	Geo 106	Environmental Geology
	Law 427	Business Law Seminar
	Soc 436	Urban Sociology

I. FACILITIES

1. General Facilities. The program will not require major additions of facilities since it borrows from resources of existing departments, field stations and research centers. Classroom and lecture hall space for the new courses will be required. The program now has an office and half-time secretary. The small faculty proposed for the five-year projection should be housed in conterminous office space.

Field sampling equipment is presently borrowed, but if the projected enrollments are realized the program will be required to obtain certain equipment items and vehicles. A five-year budget estimate for these items is \$6,000.00.

2. The library facilities are excellent for the program. Much relevant environmental literature is purchased for other departments and our most immediate problem is determining what necessary materials have not been ordered. Many environmentally related journals applicable to the undergraduate program are available. Several periodicals should be purchased but back ordering costs are minimal since these journals are of recent origin.

3. Communications Center and Computer. A particular strength of SUNYA for an environmental studies program is the communications center. The program would utilize these facilities to a great extent in the future. The computer facilities will be brought into the program via future planned coursework in environmental systems analysis.

4. Field Stations and Capital District Agencies. The Environmental Studies program plans to make extensive use of the facilities at several field research stations including the facilities at Lake George, Cranberry Lake, Whiteface Mountain and the Five Rivers Field Station. These facilities are well-suited for field trips but are particularly useful for summer programs.

J. FACULTY

The "Environmental Studies Faculty" submitting this proposal is a group of interested persons from various departments of SUNYA. Of the thirteen members, four will be asked to formally commit time to running the program. The others will participate on a volunteer basis as time from their present duties permits.

The proposed direct participants are the program director (presently J. T. Scott of Atmospheric Sciences is the Interim Director), L. F. Ismay (Art), R. Stewart (ASRC), and J. Bulloff (History of Science). They will be responsible for teaching the courses listed under the program (listed as Env under H.1) and in coordinating the other environmentally related courses (cross-listed etc.) into a cohesive degree program. They will also advise students and help with the general administration of the program.

The indirect participants will act as advisors to the program and become directly involved as their time permits. Most of these faculty are teaching environmental courses including the cross-listed courses (section H.2). This faculty is composed of E. Cowley (Art), E. Hanna (Sociology), J. Heikoff (GSPA), R. Kalish (Economics), D. McNaught (Biology), B. Marsh (Physics), R. Nichols (Bus. Law), E. Renshaw (Economics) and R. Rienow (GSPA).

K. PROJECTIONS FOR FIVE YEARS

The table below summarizes our estimates of the needs of the program and number of majors it should attract.

	<u>72-73</u>	<u>73-74</u>	<u>74-75</u>	<u>75-76</u>	<u>76-77</u>
Env Majors	35	50	100	125	150
Faculty FTE	1.5	2.8	4.0	4.5	4.5
Grad Assistants	0	1	3	5	5
Steno (for 7 or more participating faculty)	$\frac{1}{2}$	1	1	1	1
Support Costs*	3	7	7	6	6

*Thousands of dollars in equipment and supplies.

The present number of 35 students listed as majors represents the number who responded to a call for a meeting on the interdisciplinary major and stated that they would like to major in environmental studies. The projections for number of majors may be conservative since student interest in a formal program on this campus has been high.

The proposal calls for additions to the faculty for two fairly general areas. These are in environmental management (preferably a social scientist) and in systems analysis (natural or social scientist). We expect that graduate assistants will be needed for instruction in the projects and other courses. Since there is no graduate program in Environmental Studies we propose that these graduate assistants should come from relevant programs in the disciplines. For budgeting purposes the lines would be assigned to the particular department in which the interested graduate student is enrolled.

I. SUMMARY

The proposed program provides a wide range of opportunities for a major in Environmental Studies. Its primary function is to form a cohesive program within a university in where a wide range of environmental interest and facilities already exists but in a rather undefined manner. The main technique used is the formation of a "core" of environmental courses within a more loosely defined major program. Present faculty interest in the program is sufficient for 1973-74 but a permanent program faculty is recommended for the future.