

LSC Use Only No:	LSC Action-Date:	UWUCC USE Only No.	UWUCC Action-Date:	Senate Action Date:
		02-102d	App-4/22/03	App-4/29/03

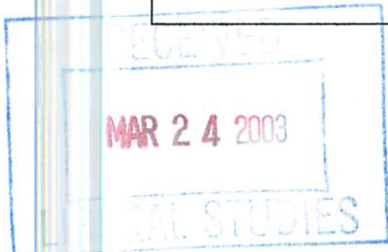
Curriculum Proposal Cover Sheet - University-Wide Undergraduate Curriculum Committee

Contact Person Thomas W. Simmons	Email Address tsimmons@iup.edu
Proposing Department/Unit Department of Biology	Phone (724) 357-4898

Check all appropriate lines and complete information as requested. Use a separate cover sheet for each course proposal and for each program proposal.

1. Course Proposals (check all that apply)		
<input type="checkbox"/> New Course	<input checked="" type="checkbox"/> Course Prefix Change	
<input checked="" type="checkbox"/> Course Revision	<input checked="" type="checkbox"/> Course Number and/or Title Change	
<input type="checkbox"/> Course Deletion	<input type="checkbox"/> Catalog Description Change	
BIOL 321 Environmental Protection I	ENVH 221 Environmental Health & Protection I	
<i>Current Course prefix, number and full title</i>	<i>Proposed course prefix, number and full title, if changing</i>	
2. Additional Course Designations: check if appropriate		
<input type="checkbox"/> This course is also proposed as a Liberal Studies Course.	<input type="checkbox"/> Other: (e.g., Women's Studies, Pan-African)	
<input type="checkbox"/> This course is also proposed as an Honors College Course.		
3. Program Proposals		
<input type="checkbox"/> New Degree Program	<input type="checkbox"/> Program Title Change	
<input type="checkbox"/> New Minor Program	<input type="checkbox"/> New Track	
<input type="checkbox"/> Catalog Description Change	<input type="checkbox"/> Program Revision	
<input type="checkbox"/> Other		
<i>Current program name</i>	<i>Proposed program name, if changing</i>	
4. Approvals		
Department Curriculum Committee Chair(s)	<i>Arth Stahn</i>	3-27-03
Department Chair(s)	<i>[Signature]</i>	3/24/03
College Curriculum Committee Chair	<i>[Signature]</i>	3/24/03
College Dean	<i>[Signature]</i>	3/24/03
Director of Liberal Studies *		
Director of Honors College *		
Provost *		
Additional signatures as appropriate: (include title)		
UWUCC Co-Chairs	<i>Gail Sedquist</i>	4/22/03

* where applicable



Syllabus of Record

I. Catalog Description

ENVH 221 Environmental Health and Protection I

3 credits
2 lecture hours
3 lab hours
(2c-3l-3sh)

Prerequisites: BIOL 104 or BIOL 112, CHEM 102 or CHEM 112

A survey of environmental health hazards as they relate mostly to the outdoor environment. Environmental health hazards are addressed from the standpoint of their source and nature, human and ecological health effects, measurement and control, and management.

II. Course Objectives

Students will be able to

1. Identify the origins of environmental health hazards.
2. Describe the nature and characteristics of these hazards.
3. Explain the human and ecological health effects of these hazards.
3. Describe the control of these hazards.
4. Recognize the regulatory and economic significance of managing these hazards.
5. Assess environmental health hazards, and report their findings, conclusions and recommendations following established guidelines.

III. Course Outline

A. Lecture

[Based on two one-hour lecture periods per week]

1. Introduction and Overview (1 lecture)
2. Water Pollution (4 lectures)
 - a. Source and Nature
 - b. Health Effects
 - c. Measurement and Control
 - d. Management
3. Wastewater (4 lectures)
 - a. Source and Nature
 - b. Health Effects
 - c. Measurement and Control
 - d. Management

4. Examination 1 (1 lecture)
 5. Solid and Hazardous Waste (4 lectures)
 - a. Source and Nature
 - b. Health Effects
 - c. Measurement and Control
 - d. Management
 6. Ambient Air Pollution (4 lectures)
 - a. Source and Nature
 - b. Health Effects
 - c. Measurement and Control
 - d. Management
 7. Examination 2 (1 lecture)
 8. Community Noise (4 lectures)
 - a. Source and Nature
 - b. Health Effects
 - c. Measurement and Control
 - d. Management
 9. Emergency Response & Planning (2 lectures)
 11. Ecological Health (2 lectures)
 12. Global Health (1 lecture)
 13. Examination 3 (during final examination period)
- B. Laboratory**
- [Based on one three-hour laboratory period per week]
1. Introduction (1 laboratory)
 2. Mosquito Monitoring (2 laboratories)
 3. Ground Water Monitoring Well Field Trip (1 laboratory)
 4. Stream Water Chemistry Assessment (1 laboratory)
 5. Stream Habitat Assessment (1 laboratory)
 6. Stream Bioassessment (1 laboratory)
 7. Indiana Sewage Treatment Plant Field Trip (1 laboratory)
 8. Wastewater Analyses (1 laboratory)

9. Municipal Landfill Field Trip (1 laboratory)
10. Environmental Site Assessment for Real Estate (1 laboratory)
11. Coal-fired Utility Power Plant Field Trip (1 laboratory)
12. Community Noise Survey (1 laboratory)
13. Pennsylvania Emergency Management Agency & 911 Center Field Trip (1 laboratory)

IV. Evaluation Methods

The final grade for the course will be determined as follows:

- 75% Tests. Three examinations (25 % each) consisting of fill-in-the blank, short answer and long essay. Examinations will cover all lecture, laboratory, text and supplemental reading materials.
- 20% Four laboratory reports (5% each). A number of environmental health inspection and testing exercises will be performed during the laboratory. Four of these exercises will result in professional reports. For each, students will be working in teams of 3 or 4 throughout all of its stages (e.g., planning, data gathering analyzing and reporting). They will use established government guidelines to complete the project and draft the report. Laboratory grades will be based on the team's overall performance by evaluating the quality (e.g., professionalism, thoroughness and accuracy) of the final reports and supporting materials, and on the students' individual efforts and contributions by evaluating daily logs documenting their activities.
- 5% Class participation will be evaluated on the basis of weekly quizzes.

V. Example Grading Scale

90 – 100 %	A
80 – 89 %	B
70 – 79 %	C
60 – 69 %	D
< 60 %	F

VI. Undergraduate Course Attendance Policy

The attendance policy for this course conforms to the University's Undergraduate Course Attendance Policy; in that all students are expected to attend and participate in class to enhance their learning.

VII. Required Textbooks and Supplemental Reading

Koren, H., Bisesi, M. (2003) Handbook of environmental health: Volume 2; Pollutant Interactions in Air, Water, and Soil. Lewis Publishers, CRC Press, N.Y. 876 pp.

VIII. Special Resource Requirements

None

IX. Bibliography

A. Textbooks

Lave, L.B. (1987) Toxic Chemicals, Health and the Environment. The Johns Hopkins University Press, MD. 304 pp.

Manahan, S.E. (1991) Environmental Chemistry. (5th ed.). Lewis Publishers, N.Y. 583 pp.

Morgan, M.T. (1997) Environmental Health. (2nd ed.). Morton Publishing Co., CO. 317 pp.

Nadakavukaren, A. (2000) Our Global Environment: A Health Perspective (5th ed.) Waveland Press. 697 pp.

Newman, M.C. (1998) Fundamentals of Ecotoxicology. Ann Arbor Press, MI. 402 pp.

Salvato, J.A. (1992) Environmental Engineering and Sanitation. John Wiley & Sons, Inc., N.Y. 1418 pp.

B. Journals and Government Documents

American Society for Testing and Materials (1997) Environmental Site Assessment for Commercial Real Estate. ASTM, PA. 57 pp.

American Journal of Public Health (American Public Health Association)

Commonwealth of Pennsylvania (1991) Pennsylvania Code, Title 25. Environmental Resources, Chapter 240. Radon Certification.

Environmental Health Perspectives (Journal of the National Institute of Environmental Health Sciences)

Environmental Manager (Air & Waste Management Association)

Journal of Environmental Health (National Environmental Health Association)

U.S. Department of Health & Human Services (1991) Health People 2000: National Health Promotion and Disease Prevention Objectives. PHS 91-50212. Washington, D.C. 692 pp.

U.S. Environmental Protection Agency (1999) Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers. EPA 841-B-99-002. Washington, D.C.

U.S. Department of Housing and Urban Development (1985) The Noise Guidebook. HUD-953-CPD. Washington, D.C.

Water Environment & Technology (Water Environment Federation)

Summary of Proposed Revision

The names and course listings of BIOL 321 Environmental Protection I and BIOL 322 Environmental Protection II have been changed to ENVH 221 Environmental Health and Protection I and ENVH 222 Environmental Health and Protection II, respectively. The coverage of subjects in BIOL 321 Environmental Protection I and BIOL 322 Environmental Protection II has been redistributed in ENVH 221 Environmental Health and Protection I and ENVH 222 Environmental Health and Protection II. These topics have been divided so that ENVH 221 Environmental Health and Protection I deals mostly with the outdoor environment, whereas ENVH 222 Environmental Health and Protection II deals mostly with the indoor environment.

Justification/Rationale for Revision

ENVH 221 Environmental Health and Protection I and ENVH 222 Environmental Health and Protection II are core requirements for environmental health majors. The former course is also a controlled elective for environmental geoscience majors. The prefix, number and title changes reflect that the courses are for environmental health major credit only (not biology major credit), should be taken during the sophomore year, and have a significant health component. According to the present catalog description, physical hazards and epidemiological concepts are covered in BIOL 321 Environmental Protection I, while all other topics including occupational health are covered in BIOL 322 Environmental Protection II. Because environmental health majors are required to take SAFE 101 Introduction to Occupational Safety, and the proposed ENVH 477 Fundamentals in Environmental Epidemiology; coverage of epidemiology and occupational health in ENVH 221 and ENVH 222 is no longer necessary. As a result, the remaining topics covered in ENVH 221 Environmental Health and Protection I and ENVH 222 Environmental Health and Protection II are expanded. The content of the courses also changes in that topics in BIOL 321 Environmental Protection I and BIOL 322 Environmental Protection II are redistributed between ENVH 221 Environmental Protection and Health I and ENVH 222 Environmental Protection and Health II so that they cover outdoor and indoor environmental hazards, respectively. As a result, outdoor laboratories take place during the fall semester when the weather is better. In addition, ENVH 221 Environmental Health and Protection I is now more suitable to Environmental Geoscience majors as a controlled elective.

Old Syllabus of Record

See attached.

Biology Department
Indiana University of Pennsylvania

Course Syllabus
for

Environmental Protection I -- Bio 321

INDIANA UNIVERSITY OF PENNSYLVANIA
BIOLOGY DEPARTMENT

Course Syllabus
BI 321 Environmental Protection I

Catalog Information:

Bio 321, Environmental Protection I. The aspects of air, noise, water, metal, and agricultural pollutants will be considered along with the laws that deal with these pollutants. Some consideration of the methods used in analysis of these pollutants will also be considered. 3 credit hours. Prerequisites: BI 105, CH 112 & permission of instructor.

Syllabus Content:

I. Summary of Objectives:

- A. The student will become familiar with the aspects of the environment that have become polluted:
 1. Air; the pollutants, their effects, and the law.
 2. Noise; the effect, and the law.
 3. Water; the pollutants, their effects, and the law.
 4. Metals; the effects, and the law.
 5. Agriculture; the pollutants, their effects, and the law.
- B. The student will select an aspect of the environment and do a report on instrumentation to analyze specific pollutants. Selection is made in E.P.I. & the report will be given in EP.II.
- C. The student will write reports on assigned field experiences.

II. Evaluation Methods:

- A. Three essay exams will be given, i.e., one/wk. A grade of 25 points will be assigned to each exam for a total of 75 points or 75% of the grade.
- B. Three to five written field reports will be graded. Each report getting between 5 and 8 points for approximately 25% of the grade. Additionally, the student report should get 5 to 8 points in the total 25% lab grade.

III. Special Features:

- A. Selected speakers in the field of enviprotection will be invited to present the "state of the art" and what qualifications a specialist needs in the field, e.g., DER-sanitation, Penn Elec. Env. affairs, Soil Conservation, etc.
- B. Trips to selected areas showing pollution will be taken, e.g., strip mines, sewage disposal plants, water treatment, etc.

IV. Lecture Topical Outline:

- A. Introduction
 - 1. Pollutants
 - 2. Effects of Pollution
 - 3. Technological Hazards
 - 4. The "Spirit" & "Letter" of the Law.

- B. Population & People - The Cause of Pollution
 - 1. Population Growth
 - a. World
 - 2. Living Standards
 - a. U.S.
 - b. World
 - 3. Natural Resource Consumption

- C. Air Pollution
 - 1. Introduction
 - a. The atmosphere
 - b. The sources & emissions
 - c. Particulate matter
 - d. Sulfur oxides
 - e. Carbon monoxide
 - f. Hydrocarbons
 - g. Nitrogen oxides
 - h. Other air pollutants
 - i. Costs
 - j. Legislation
 - 2. Meteorology & Climatology
 - a. Temp. distribution in the atmosphere
 - b. Radiation balance of the earth
 - c. Temperature inversions
 - d. Pollution effects on climate
 - (1) Localized
 - (2) Global
 - 3. Industrial Emissions
 - a. History
 - b. Industrial emissions
 - c. Control techniques
 - 4. Motor Vehicle Emissions
 - a. Photochemical smog
 - b. Sources & controls
 - c. Alternative engines
 - d. Aircraft emissions

- D. Noise
 - 1. Sound & Hearing
 - 2. Occupational Noise
 - 3. Public Noise
 - 4. Sonic Booms
 - 5. Noise Control Legislation

E. Water Pollution

1. Introduction
 - a. Earth's water balance
 - b. Water pollutants
 - c. Sources
 - d. Legislation
 - e. Costs
2. Municipal
 - a. Drinking water supplies
 - b. Sewers & sewage
 - c. Waste water treatment
 - (1) Primary
 - (2) Secondary
 - (3) Tertiary
3. Industrial & Commercial
 - a. Shipping
 - b. Industrial waste water
 - c. Fish kills
 - d. Treat & disposal

F. Metal Pollution

1. Lead
2. Mercury
3. Cadmium
4. Beryllium
5. Other metals

G. Agricultural Pollution

1. Farm & Animal Waste
2. Soil Erosion
3. Plant Residues
4. Agricultural Chemicals
 - a. Fertilizers
 - b. Pesticides
 - (1) History
 - (2) Classes
 - (3) Effects
 - (4) Alternates
 - (5) Legislation

V. Laboratory and/or Field Experiences

The laboratory should deal with trips into the field and the major stress of the lab should be field experiences. A list of possible field trips is as follows for E.P.I and/or E.P.II.

- A. Strip mining - this is an on-site inspection that shows the laws & practices that are trying to protect the environment.
- B. Water Treatment - a municipal water supply treatment plant tour. This deals with the laws and practices to ensure a safe water for human consumption.

- C. Sewage Treatment - a municipal sewage treatment plant tour. This deals with the laws & practices to decrease the liquid waste pollutant due to human activities.
 - D. Flood Control Project - an on-site visit to a wat dam designed to protect a major drainage basin from flood. The Connemaugh Dam at Tunnelton is recommended.
 - E. Nuclear Power Station - an on-site visit to a nuclear facility producing electric power. The safeguards, the cost/benefit ratio & legislation should be discussed.
 - F. Heavy Industry - a trip to a steel mill with a discussion of legislation on emission control, water treatment, etc. Also a discussion on how Env. Spec. might fit into the industry as an employee. Bethlehem Steel, Johnstown is recommended.
 - G. Electric Power Generating Facility - a discussion of the effects of electric power production to people and the effects of pollution plus the ways of combating pollution and how they are meeting federal standards. Penna. Elec. Homer City Plant is recommended.
 - H. Coal Gasification - an experimental project to convert coal to methane gas as clean burning fuel. This plant is located in Homer City, Pa. and is a federally funded project.
 - I. Package Sewage Systems - Yellow Creek State Park - a facility 15 miles from Indiana. A tour of and an explanation of a package plant designed to handle small quantities of sewage for a small population as opposed to a municipal works.
 - J. Sanitary Land Fill - an on-site visit to a sanitary land fill designed to receive solid wastes. A discussion on the problem, the benefits & alternatives.
- VI. Additional Laboratory and/or Field Experiences With Consideration of the Background of the Students.
- A. Discussion on the use of topographic maps. A useful guide is the publication "Topographic Maps", Supt. of Documents, U.S. Govt. P.O., Washington, D.C. 20402; stock number 024-001-02793-3.
 - B. Student reports on instruments & monitoring devices for pollution analysis.
 - 1. Water pollutant analysis
 - 2. Air pollutant analysis
 - 3. Soil pollutant analysis

- C. Guest speakers - These should be experts in the field from both governmental agencies & industrial corporations. A partial list follows:
1. Dept. of Envir. Resources, e.g., sanitation, water management, etc.
 2. Federal Mine Inspectors, U.S. Dept. of the Interior, Mining Enforcement and Safety Admin.
 3. U.S. Soil Conservation Serv.
 4. Rodent Control - DER.
 5. Municipal water & sewage - Local
 6. Environmental Affairs Dept. of a large corporation, e.g., Penna. Elec., Bethlehem Steel.
 7. Scientific Companies - demonstration of selected pollution analysis of monitoring equipment and lists of available instrumentation.

VII. Bibliography

- A. Mason, William H. and Folkerts George W., "Environmental Problems: principles, readings and comments". Wm. C. Brown Publishers, 1973. required reading.
- B. Chanlett, Emil T., Environmental Protection, McGraw-Hill Book Company, 1973.
- C. Owen, Oliver S., Natural Resource Conservation. The MacMillan Publishing Company. 1973.
- D. Mausner, Judith S. and Bahn, Anita K. Epidemiology, and introductory text. W.B. Saunders Company, 1974. Chaps 1-5.
- E. The "legislation". Personal copies of these may be obtained by writing the individual congressmen are on file in the library of congress.
Ex: The Clean Air Act of 1972.
The Clean Air Act of 1973 as amended, etc.
- F. Econotes - published by the Penna. Dept. of Env. Resources.
- G. Conservation News - published by the National Wildlife Federation.

<u>Date</u>	<u>Topic</u>	<u>Text</u>
Sept. 5	Introduction, History of Pollution	Chapter 1
10	Ecological Perspectives-Terrestrial Systems	Reading
12	Ecological Perspectives-Aquatic Systems	Reading
17	Human Population Control	Chapter 2
19	Water Pollution-Sources	Chapter 8
24	Water Pollution-Effects	Chapter 8
26	Water Treatment Methods	186-192
Oct. 1	Waterborne Diseases	Reading
3	<u>EXAM I</u>	
8	Strip Mining/Acid Mine Drainage	Reading
10	Wastewater-Municipal	Chapter 9
15	Wastewater-Industrial and non-point sources	Chapter 10
17	Sludge Treatment and Use	Reading
22	Water Pollution Laws	177-180
24	How Environmental Law & Regulation Develop	Conway
29	Water Resources	Reading
31	Water Resource Management	Reading
Nov. 5	<u>EXAM II</u>	
7	Solid Waste Management	Chapter 13
12	Landfills	Reading
14	Hazardous Wastes	Reading
19	Radioactive Wastes	Chapter 15
21	Toxic Substances	Reading
26	Heavy Metals in the Environment	Chapter 18
Dec. 3	Nutrition: Fact & Fable	Reading
5	Malnutrition and Hunger	Reading
10	The Food Additives Controversy	Reading
12	Summary of Course	

ENVIRONMENTAL HEALTH

Laboratory

<u>Date</u>	<u>Topic</u>
Sept. 6	Environmental Sampling/Statistics
Sept. 13	* Stream Sampling - Bacteriological/Physical
Sept. 20	* Stream Sampling - Chemical/Diversity
Sept. 27	Water Treatment Plant
Oct. 4	Water Quality Mgt./Hazardous Wastes (Steve Pederson)
Oct. 11	Sewage Treatment Plant
Oct. 18	Strip Mine/Acid Mine Drainage
Oct. 25	Environmental Law and the D.E.R. (Terry Fabian)
Nov. 1	Wallops Is. (Friday Noon to Sunday Afternoon)
Nov. 8	Solid Waste Management (Chuck Duritza)
Nov. 15	Hazardous Waste Site
Nov. 22	* Toxic Substances Experiment
Dec. 6	* Toxic Substances Experiment - Conclusion
Dec. 13	Presentation of Reports

* LAB REPORT REQUIRED