WRRI Report No. 266

AQUATIC ECOLOGY/TOXICOLOGY AND LAB COURSE DEVELOPMENT

By

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Developed as Disciplinary Elective for:

THE MASTER OF WATER RESOURCES ADMINISTRATION PROGRAM
UNIVERSITY OF NEW MEXICO

TECHNICAL COMPLETION REPORT

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ABSTRACT

This award was to develop and offer a course in "Aquatic Ecology/Toxicology & Lab" through the Department of Biology at the University of New Mexico (UNM). The course was designed as an elective disciplinary course for the Master of Water Resources Administration (MWRA) program at UNM. The MWRA program emphasizes: 1) interdisciplinary breadth in the numerous fields related to water issues; and 2) written and oral skills necessary for effective interdisciplinary communication. The course in Aquatic Ecology/Toxicology (3 credit-hours) was designed to provide non-biology graduates with the basic biological/ecological concepts and principles that control the fate of inorganic and organic chemicals in the environment. The course was designed for current practitioners in water-related fields and students in the MWRA program, but was open to biology majors also. The course could be taken without the associated one-hour laboratory. The lab was designed to provide persons not having laboratory experience with hands-on experience in the methods and associated instrumentation used in biological/ecological investigations of water issues. Eight students completed the course, while three students completed the lab section.

Keywords: Education, Aquatic Environment, Ecology, Natural Waters, Toxicity, Toxins, Water Pollution, Water Quality

TABLE OF CONTENTS

Aquatic Ecology/Toxicology,
Biology 402-502, Section 016
(3 credit-hours)

The course was offered in the Fall semester of 1991 (Biology 402-502, section 016). The class met on Tuesday nights from 6:00 to 8:30. The class was open to undergraduate students majoring in biology and to all graduate students. Three undergraduates (enrolled in 402) and five graduate students (enrolled in 502) successfully completed the course.

The course followed the original subject outline in the proposal. Readings were taken from a variety of sources (complete list of readings in course outlin). Since portions of the class subject matter were covered in other biology classes, biology majors were required to present a lecture and prepare the associated readings on a disciplinary topic. Biology majors were to tailor their presentations for an interested lay audience. Each student was responsible for a one-page summary (typed) of each week's readings. The purpose of the one-page writing was to gain practice at presenting concisely a disciplinary topic to a lay audience. Students were called upon to read their summary at the beginning of class, which served as an introduction to the discussion of the readings.

Each student chose a topic to research in the literature during the semester. Students presented oral and written summaries of their topics to the class. Student topics included:

Plutonium in Aquatic Systems
Mercury: From Sources to Freshwater Fish
Is Liming a Cure for Acidic Lakes?
Cyanide use in Gold Mining: Environmental Impacts, Toxicology, and Remediation Technology
Mercury Bioaccumulation in Salt Water Marshes and Estuaries
Effluent Treatment Processes: a Survey of Nitrogen Removal Methods and Their Effectiveness
The Behavior of Selenium in the Human and Natural Environment
Nitrogen-Related Groundwater Contamination in the South Valley

The student's grade was based upon participation, the weekly written summaries, and the written and oral presentations of their research topics. Most of the students were comfortable with this grading technique, but not everyone.

The University of New Mexico has a standardized Instructor and Course Evaluation System (ICES). Of the eight that completed the course, six students completed the voluntary ICES forms. Based upon the summaries of the evaluations (presented later), the course and instructor were rated very highly by the students. The one aspect that disturbed some students was the perceived failure to explain the grading system. I chose to avoid using letter or numerical grades on the weekly assignments. The hope was that the students would stay focused on the information and feel more free to explore different ways of expressing themselves through their writing. This was successful with some, but not with others.

Aquatic Ecology/Toxicology Course Outline

Weekly Assigned Readings

Week 1.

Introduction: The Scope of Ecology (Chapter 1, Fundamentals of Ecology, pp. 3-8); including sections on:

1. Ecology - Its Relation to Other Sciences and Its Relevance to Human Civilization
2. The Subdivisions of Ecology
3. About Models

Principles and Concepts Pertaining to the Ecosystem (Chapter 2, Fundamentals of Ecology, pp. 8-36); including sections on:

1. Concept of the Ecosystem
2. The Biological Control of the Chemical Environment
3. Production and Decomposition in Nature
4. Homeostasis of the Ecosystem

Week 2.

Principles and Concepts Pertaining to Energy in Ecological Systems (Chapter 3, Fundamentals of Ecology, pp. 37-86); including sections on:

1. Review of Fundamental Concepts Related to Energy
2. The Energy Environment
3. Concept of Productivity
4. Food Chains, Food Webs, and Trophic Levels
5. Metabolism and Size of Individuals
6. Trophic Structure and Ecological Pyramids
7. Summarization: Ecosystem Energetics

Week 3.

Principles Pertaining to Limiting Factors (Chapter 5, Fundamentals of Ecology, pp. 106-140); including sections on:

1. Liebig's "Law" of the Minimum
2. Shelford's "Law" of Tolerance
3. Combined Concept of Limiting Factors
4. Conditions of Existence as Regulatory Factors
5. Brief Review of Physical Factors of Importance as Limiting Factors
6. Ecological Indicators

Week 4.

The Global Carbon Cycle (Chapter 11, Biogeochemistry, pp. 308-322); including sections on:

1. Introduction
2. The Modern Carbon Cycle
3. Temporal Perspectives of the Carbon Cycle
4. Atmospheric Methane
5. Carbon Monoxide
6. Synthesis: Linking the Carbon and Oxygen Cycles
7. Recommended Reading

Week 5.
The Global Cycles of Nitrogen (Chapter 12, Biogeochemistry, pp. 322-331); including sections on:

1. Introduction
2. The Global Nitrogen Cycle
3. Temporal Variations in the Global Nitrogen Cycle
4. Nitrous Oxide: An Unbalanced Global Budget

Handouts and lecture material provided by instructor on factors that limit rates of processes involved in the nitrogen cycle.

Week 6.
The Global Cycles of Phosphorus and Sulfur (Chapter 12 and Chapter 13, Biogeochemistry, pp. 331-347); including sections on:

1. The Global Phosphorus Cycle
2. Linking the Global Cycles of C, N, and P
3. Summary
4. Recommended Reading

and (Chapter 13)

1. Introduction
2. The Global Sulfur Cycle
3. Temporal Perspectives of the Sulfur Cycle
4. The Atmospheric Budget of COS
5. Summary
6. Recommended reading

Week 7.
Aquatic Toxicity Testing: Readings prepared by a graduate student with a biology undergraduate degree for the class requirement. In: Biology of Freshwater Pollution, by C.F. Mason.
Introduction (Chapter 1, pp. 1-13); including sections on:

1. What is pollution?
2. Why need we be concerned about pollution?
3. What are pollutants?
4. Monitoring pollution
5. Why biological surveillance?
6. The complexity of pollution

and Toxic Pollution (Chapter 4, pp. 100-132); including sections on:

1. Introduction
2. Types of toxic pollutants
3. Toxicity
4. Environmental factors affecting toxicity
5. Tolerance
6. Accumulation
7. Field Studies of toxic pollution

Week 8.
Freshwater Ecology (Chapter 11, Fundamentals of Ecology, pp. 295-323); including sections on:

1. The Freshwater Environment: Types and Limiting Factors
2. Ecological Classification of Freshwater Organisms
3. The Freshwater Biota (Flora and Fauna)
4. Lentic Communities
5. Lakes
6. Ponds
7. Lotic (Running Water) Communities
8. Longitudinal Zonation in Streams
9. Springs

Week 9.
Biogeochemistry in Freshwater Wetlands and Lakes (Chapter 7, Biogeochemistry, pp. 195-225); including sections on:

1. Introduction
2. Redox Potential: The Basics
3. Redox Potential in Natural Environments
4. Biogeochemistry of "Terrestrial" Wetlands
5. Primary Production and Nutrient Cycling in Lakes
6. Summary
7. Recommended Reading

Week 10.
New Dimensions in Safe Drinking Water. An Overview of the 1986 SDWA Amendments and Proposed Primary Drinking Water Regulations, pp. 1-29; including sections on:

1. SDWA History and Compliance
2. The 1986 Amendments to the SDWA
3. USEPA's New and Proposed Regulations
4. The VOCs - A Closer Look

Week 11.
Readings prepared by an undergraduate student majoring in biology for the class requirement. Interrelationships Between the Cycles of Elements in Freshwater Ecosystems (Chapter 7 In: Some Perspectives of the Major Biogeochemical Cycles, edited by G.E. Likens, pp. 113-122); including sections on:

1. Introduction
2. The effects of phosphorus on the cycles of other elements
3. The effect of phosphorus on the nitrogen cycle
4. Effects of phosphorus on the carbon cycle
5. Effects of phosphorus on the sulphur cycle
6. Effects of phosphorus on the silicon cycle
7. Effects of sulphur on the carbon cycle
8. Effects of nitrogen and carbon on the cycles of other elements
9. Discussion
10. References

Week 12.
Effects on Individual Organisms (Chapter 5, Ecotoxicology, pp. 97-132).

Week 13.
Readings prepared by an undergraduate student majoring in biology for the class requirement. Fish as "Biological Model" for Experimental Studies in Ecotoxicology (Chapter 2.2, Aquatic Ecotoxicology, pp. 128-162); including sections on:

1. Introduction
2. Basic Methodological Approach: Definition of Experimental Conditions
3. Experimental Study of the Bioaccumulation Processes of Contaminants in Fish
4. Study of the Toxic Effects of Contaminants on Fish
5. Conclusions

Week 14.
Readings prepared by an undergraduate student majoring in biology for the class requirement. MacDonald, D.V. Denitrification by Fluidized Biofilm Reactor. Water Science and Technology 22:451-461.

Handouts and lecture on biological processes utilized in wastewater treatment facilities, including trickling filters, lagoons, activated sludge, septic tanks, Imhoff tanks, and tertiary treatment.

Week 15.
Regulatory Framework for Ecotoxicology, by C.C. Harwell (Chapter 17), and Environmental Decision Making in the Presence of Uncertainty (Chapter 18, Ecotoxicology: Problems and Approaches, pp. 497-540); including sections on:

1. Toxic Substances Control Act (TSCA)
2. Clean Water Act (CWA)
3. Clean Air Act (CAA)
4. Resource Conservation and Recovery Act (RCRA)
5. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or Superfund
6. Safe Drinking Water Act (SDWA)
7. Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

Week 16.
Student Oral Presentations

Week 17.
Student Oral Presentations

Instructor and Course Evaluation System (ICES):
Summary for Aquatic Ecology/Toxicology,
Biology 402-502, Section 016, Fall 1991.

The Department of Biology accommodates the offering of Special Topics courses through the 402-502 designation. Courses with these numbers are offered upon demand. The 402 designation is for upperclass undergraduate students, while the 502 is for graduate students. The following is the summary of the responses to the Instructor and Course Evaluation System (ICES), a campus-wide confidential evaluation system. The evaluations for each designation (402 and 502) are provided on following pages. The responses to the section on the IDES Instructor Report titled "Global Core Item Results" are summarized below by the number corresponding to each Item. The number of responses in each column are indicated (zeros are omitted). Please refer to the individual Instructor Reports for specific questions for each Item and interpretation of the indicated response (generally, column 6 indicates the most favorable response).

	Column # (by weights)						
ITEM	6	5	4	3	2	1	OMIT
1.	6						
2.	5	1					
3.	5	1					
4.	4	2					
5.	4	2					
6.	3	3					
7.	3	2	1				
8.	5						1
9.	3	1	1				1
10.	1	2	3				
11.	5		1				
12.	5		1				
13.	6						
14.	5	1					
15.	5	1					
16.	6						
17.	6						
18.	4	2					
19.		2	4				
20.	2				1	3	
21.	1	1	3				1
22.		2	4				

1.2 Cont.

INSTRUCTOR AND COURSE EVALUATION SYSTEM

INSTRUCTOR REPORT

FOR: C. WHITE DEPT BIOLO COURSE 402 SECTION 016 DEPT CODE 01050 SEMESTER: FALL YEAR: 1991

DEMOGRAPHIC DATA IN PERCENTS
NO. OF FORMS COMPLETED: 2

1. PRE-COURSE OPINION TOWARD

	POS	NO OP	NEG	OMIT
INSTRUCTOR	50	50	0	0
COURSE	50	50	0	0

2. COURSE IN:

MAJOR	MINOR	OTHER	OMIT
100	0	0	0

3. SEX.

MALE	FEMALE	OMIT
100	0	0

4. THIS COURSE WAS:

SPECIFICALLY REQUIRED	REQUIRED BUT A CHOICE	ELECTIVE	OMIT
0	50	50	0

5. CLASS STATUS:

FRESH	SOPH	JUNIOR	SENIOR	GRAD	OTHER	OMIT
0	0	0	100	0	0	0

6. EXPECTED GRADE:

A	B	C	D	F	OMIT	*EXP GRADE MEAN*
100	0	0	0	0	0	* 4.0 *

GLOBAL CORE ITEM RESULTS

ITEM	WEIGHTS	RESPONSE LABELS, PERCENTS & FREQUENCIES( ) 6 EXCELLENT	5 --	4 --	3 --	2 --	1 VERY POOR	OMIT	* SUMMARY STATISTICS MEAN / MDN	SD / CONS	*RELATIVE COMPARISON OF CLASS MEAN GROUP 1: NORM UNAVAILABLE GROUP 2: NORM UNAVAILABLE LOW | AVG | AVG | HIGH AVG | HI
1 RATE THE COURSE CONTENT		100	0	0	0	0	0	0	* 6.0	0.00	* 1
		(2)	(0)	(0)	(0)	(0)	(0)	(0)	* 6.0	HIGH	* 2
2 RATE THE INSTRUCTOR		100	0	0	0	0	0	0	* 6.0	0.00	* 1
		(2)	(0)	(0)	(0)	(0)	(0)	(0)	* 6.0	HIGH	* 2
3 RATE THE COURSE IN GENERAL		100	0	0	0	0	0	0	* 6.0	0.00	* 1
		(2)	(0)	(0)	(0)	(0)	(0)	(0)	* 6.0	HIGH	* 2

INTERPRETATION GUIDE

THE UPPER PORTION OF THIS PAGE OF THE COMPUTER PRINTOUT CONTAINS PERCENTAGES OF STUDENTS WHO MARKED EACH RESPONSE OPTION FOR THE DEMOGRAPHIC ITEMS. FOR DEMOGRAPHIC #6 THE EXPECTED GRADE MEAN IS CALCULATED USING A WEIGHT OF 4 FOR AN 'A', ETC.

GLOBAL ITEM RESULTS (ITEM 1, 2, AND 3) ARE PRESENTED NEXT.

LABELS, PERCENTS AND FREQUENCIES: TOP ROWS CONTAIN PERCENTAGES; BOTTOM ROWS CONTAIN NUMBERS OF STUDENTS MARKING EACH OPTION. THE SUMMARY STATISTICS ARE CALCULATED USING WEIGHTS INDICATED ABOVE EACH RESPONSE OPTION. FOR GLOBAL ITEMS THE RANGE IS 1-6 WITH 6 MOST FAVORABLE. FOR MOST OTHER ITEMS THE RANGE IS 1-5 WITH 5 MOST FAVORABLE.

CONS (CONSENSUS): POSSIBLE VALUES ARE HIGH, AVG OR LOW. HIGH INDICATES CONSIDERABLE STUDENT AGREEMENT.

RELATIVE COMPARISON: CLASS MEAN RATING IS COMPARED WITH ONE OR TWO GROUPS. GROUP 1 IS CAMPUS-WIDE BASED ON REQUIRED/ELECTIVE NATURE OF COURSE AND CLASS SIZE. GROUP 2 IS COLLEGE OR DEPARTMENT-WIDE. THE RELATIVE POSITION OF THE CLASS MEAN IS DENOTED UNDER ONE OF THE FOLLOWING FIVE NORM CATEGORIES:

HI--TOP 10%; HIGH AVG--NEXT 20%; AVG--MIDDLE 40%; LOW AVG--NEXT 20%; OR LOW--BOTTOM 10%

THE ROWS CONTAINING AN X AND O'S SHOW THE CLASS AVERAGE RATING IN COMPARISON TO GROUPS 1 AND 2. X INDICATES THE RELATIVE PLACEMENT OF THE MEAN. O'S INDICATE THE RANGE OF UNCERTAINTY. THE RATINGS SHOULD BE READ, FOR EXAMPLE, AS LOW-AVERAGE TO AVERAGE OR HIGH-AVERAGE TO HIGH TO TAKE INTO ACCOUNT THE RANGE OF UNCERTAINTY.

STUDENT RESPONSES TO DEPARTMENTAL CORE ITEMS, INSTRUCTOR SELECTED ITEMS OR COMPLETE FORM ITEMS ARE PRESENTED NEXT. THE RESULTS ARE TO BE INTERPRETED IN THE SAME WAY. HOWEVER, NORMATIVE DATA MAY NOT BE AVAILABLE.

SEE NEWSLETTER #--ICES INTERPRETIVE GUIDE--FOR A MORE COMPLETE DESCRIPTION. CALL 277-5345 FOR QUESTIONS AND MORE INFORMATION.

DEPARTMENTAL CORE ITEM RESULTS

	RESPONSE LABELS, PERCENTS & FREQUENCIES						SUMMARY STATISTICS		RELATIVE COMPARISON OF CLASS MEAN				
							MEAN	SD	NORM	UNAVAILABLE			
							MDN	CONS	LOW	LOW AVG	AVG	AVG HI	HI
CATALOG ITEM 1													
4 THE COURSE OBJECTIVES WERE:	VERY CLEAR	--	--	--	VERY UNCLEAR	OMIT							
WEIGHTING SCHEME 54321	50	50	0	0	0	0	4.5	0.50					
	(1)	(1)	(0)	(0)	(0)	(0)	4.5	HIGH					
CATALOG ITEM 2													
5 THE INSTRUCTOR STATED CLEARLY WHAT WAS EXPECTED OF STUDENTS.	ALMOST ALWAYS	--	--	--	ALMOST NEVER	OMIT	MEAN MDN	SD CONS	LOW	LOW AVG	AVG	AVG HI	HI
WEIGHTING SCHEME 54321	100	0	0	0	0	0	5.0	0.00					
	(2)	(0)	(0)	(0)	(0)	(0)	5.0	HIGH					
CATALOG ITEM 3													
6 THE COURSE WAS:	ORGANIZED	--	--	--	DIS-ORGANIZED	OMIT	MEAN MDN	SD CONS	LOW	LOW AVG	AVG	AVG HI	HI
WEIGHTING SCHEME 54321	50	50	0	0	0	0	4.5	0.50					
	(1)	(1)	(0)	(0)	(0)	(0)	4.5	HIGH					
CATALOG ITEM 45													
7 RATE THE TEXT(S) USED IN THIS COURSE.	EXCELLENT	--	--	--	POOR	OMIT	MEAN MDN	SD CONS	LOW	LOW AVG	AVG	AVG HI	HI
WEIGHTING SCHEME 54321	50	50	0	0	0	0	4.5	0.50					
	(1)	(1)	(0)	(0)	(0)	(0)	4.5	HIGH					
CATALOG ITEM 102													
8 HOW WOULD YOU RATE THE INSTRUCTOR'S EXAMINATION QUESTIONS?	EXCELLENT	--	--	--	POOR	OMIT	MEAN MDN	SD CONS	LOW	LOW AVG	AVG	AVG HI	HI
WEIGHTING SCHEME 54321	50	0	0	0	0	50	5.0	0.00					
	(1)	(0)	(0)	(0)	(0)	(1)	5.0	HIGH					
CATALOG ITEM 103													
9 HOW WELL DID EXAMINATION QUESTIONS REFLECT CONTENT AND EMPHASIS OF THE COURSE?	WELL RELATED	--	--	--	POORLY RELATED	OMIT	MEAN MDN	SD CONS	LOW	LOW AVG	AVG	AVG HI	HI
WEIGHTING SCHEME 54321	0	50	0	0	0	50	4.0	0.00					
	(0)	(1)	(0)	(0)	(0)	(1)	4.0	HIGH					
CATALOG ITEM 130													
10 HOW MUCH WORK DID THIS COURSE REQUIRE?	EXCESSIVE AMOUNT	--	--	--	NOT ENOUGH	OMIT	MEAN MDN	SD CONS	LOW	LOW AVG	AVG	AVG HI	HI
WEIGHTING SCHEME 210-1-2	0	50	50	0	0	0	0.5	0.50					
	(0)	(1)	(1)	(0)	(0)	(0)	0.5	AVG					
CATALOG ITEM 165													
11 WOULD YOU RECOMMEND THIS COURSE TO OTHER STUDENTS?	HIGHLY RECOMMEND	--	--	--	NOT RECOMMEND	OMIT	MEAN MDN	SD CONS	LOW	LOW AVG	AVG	AVG HI	HI
WEIGHTING SCHEME 54321	100	0	0	0	0	0	5.0	0.00					
	(2)	(0)	(0)	(0)	(0)	(0)	5.0	HIGH					
CATALOG ITEM 191													
12 DID THIS COURSE INCREASE YOUR INTEREST IN THE SUBJECT MATTER?	YES, GREATLY	--	--	--	NO, NOT MUCH	OMIT	MEAN MDN	SD CONS	LOW	LOW AVG	AVG	AVG HI	HI
WEIGHTING SCHEME 54321	100	0	0	0	0	0	5.0	0.00					
	(2)	(0)	(0)	(0)	(0)	(0)	5.0	HIGH					

DEPARTMENTAL CORE ITEM RESULTS

	RESPONSE LABELS, PERCENTS & FREQUENCIES						SUMMARY STATISTICS		RELATIVE COMPARISON OF CLASS MEAN				
							MEAN MDN	SD CONS	NORM LOW	UNAVAILABLE LOW AVG	AVG	AVG	HI HI
13 THE INSTRUCTOR'S KNOWLEDGE OF SUBJECT WAS: CATALOG ITEM 242	EXCELLENT	--	--	--	POOR	OMIT	5.0	0.00					
WEIGHTING SCHEME 54321	100 (2)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	5.0	HIGH					
14 HOW WOULD YOU CHARACTERIZE THE INSTRUCTOR'S ABILITY TO EXPLAIN? CATALOG ITEM 244	EXCELLENT	--	--	--	VERY POOR	OMIT	MEAN MDN 5.0	SD CONS 0.00					
WEIGHTING SCHEME 54321	100 (2)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	5.0	HIGH					
15 DID THE INSTRUCTOR SEEM TO ENJOY TEACHING? CATALOG ITEM 246	YES, VERY MUCH	--	--	--	NO, ENJOYED IT LITTLE	OMIT	MEAN MDN 5.0	SD CONS 0.00					
WEIGHTING SCHEME 54321	100 (2)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	5.0	HIGH					
16 THE INSTRUCTOR SEEMED WELL PREPARED FOR CLASSES. CATALOG ITEM 248	YES, ALWAYS	--	--	--	NO, SELDOM	OMIT	MEAN MDN 5.0	SD CONS 0.00					
WEIGHTING SCHEME 54321	100 (2)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	5.0	HIGH					
17 THE INSTRUCTOR WAS ABLE TO ANSWER QUESTIONS CLEARLY AND CONCISELY. CATALOG ITEM 295	ALMOST ALWAYS	--	--	--	ALMOST NEVER	OMIT	MEAN MDN 5.0	SD CONS 0.00					
WEIGHTING SCHEME 54321	100 (2)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	5.0	HIGH					
18 DESCRIBE YOUR INSTRUCTOR'S ATTITUDE TOWARD STUDENTS. CATALOG ITEM 393	FRIENDLY	--	--	--	UNFRIENDLY	OMIT	MEAN MDN 4.5	SD CONS 0.50					
WEIGHTING SCHEME 54321	50 (1)	50 (1)	0 (0)	0 (0)	0 (0)	0 (0)	4.5	HIGH					
19 THE COURSE CONTENT WAS: CATALOG ITEM 19	TOO ADVANCED	--	--	--	TOO ELEMENTARY	OMIT	MEAN MDN 0.5	SD CONS 0.50					
WEIGHTING SCHEME 210-1-2	0 (0)	50 (1)	50 (1)	0 (0)	0 (0)	0 (0)	0.5	AVG					
20 WAS THE GRADING SYSTEM FOR THE COURSE EXPLAINED? CATALOG ITEM 104	YES, VERY WELL	--	--	--	NO, NOT AT ALL	OMIT	MEAN MDN 3.5	SD CONS 1.50					
WEIGHTING SCHEME 54321	50 (1)	0 (0)	0 (0)	50 (1)	0 (0)	0 (0)	3.5	LOW					
21 DID THE INSTRUCTOR SET TOO HIGH/LOW GRADING STANDARDS FOR STUDENTS? CATALOG ITEM 106	TOO HIGH	--	--	--	TOO LOW	OMIT	MEAN MDN 2.0	SD CONS 0.00					
WEIGHTING SCHEME 210-1-2	50 (1)	0 (0)	0 (0)	0 (0)	0 (0)	50 (1)	2.0	HIGH					

DEPARTMENTAL CORE ITEM RESULTS

CATALOG ITEM 144
22 DESCRIBE THE PACE OF THE COURSE.

WEIGHTING SCHEME 210-1-2

RESPONSE LABELS, PERCENTS & FREQUENCIES						SUMMARY STATISTICS		RELATIVE COMPARISON OF CLASS MEAN				
TOO FAST	--	--	--	TOO SLOW	OMIT	MEAN MDN	SD CONS	NORM LOW	UNAVAILABLE LOW	AVG	AVG	HI AVG HI
0	50	50	0	0	0	0.5	0.50					
(0)	(1)	(1)	(0)	(0)	(0)	0.5	AVG					

INSTRUCTOR REPORT

FOR: C. WHITE DEPT BIOLO COURSE 502 SECTION 016 DEPT CODE 01050 SEMESTER: FALL YEAR: 1991

DEMOGRAPHIC DATA IN PERCENTS
NO. OF FORMS COMPLETED: 4

1. PRE-COURSE OPINION TOWARD

	POS	NO OP	NEG	OMIT
INSTRUCTOR	50	25	0	25
COURSE	50	25	0	25

2. COURSE IN:

MAJOR	MINOR	OTHER	OMIT
50	0	50	0

3. SEX.

MALE	FEMALE	OMIT
25	50	25

4. THIS COURSE WAS:

SPECIFICALLY REQUIRED	REQUIRED BUT A CHOICE	ELECTIVE	OMIT
25	0	50	25

5. CLASS STATUS:

FRESH	SOPH	JUNIOR	SENIOR	GRAD	OTHER	OMIT
0	0	0	0	50	25	25

6. EXPECTED GRADE:

A	B	C	D	F	OMIT	*EXP GRADE MEAN*
25	50	0	0	0	25	3.3

GLOBAL CORE ITEM RESULTS

ITEM	WEIGHTS	RESPONSE LABELS, PERCENTS & FREQUENCIES( ) 6 EXCELLENT	5 --	4 --	3 --	2 --	1 VERY POOR	OMIT	SUMMARY STATISTICS MEAN / MDN	SD / CONS	*RELATIVE COMPARISON OF CLASS MEAN GROUP 1: NORM UNAVAILABLE GROUP 2: NORM UNAVAILABLE | LOW | LOW AVG | AVG | HIGH AVG | HI
1 RATE THE COURSE CONTENT		100	0	0	0	0	0	0	6.0	0.00	1
		(4)	(0)	(0)	(0)	(0)	(0)	(0)	6.0	HIGH	2
2 RATE THE INSTRUCTOR		75	25	0	0	0	0	0	5.8	0.43	1
		(3)	(1)	(0)	(0)	(0)	(0)	(0)	5.7	HIGH	2
3 RATE THE COURSE IN GENERAL		75	25	0	0	0	0	0	5.8	0.43	1
		(3)	(1)	(0)	(0)	(0)	(0)	(0)	5.7	HIGH	2

INTERPRETATION GUIDE

THE UPPER PORTION OF THIS PAGE OF THE COMPUTER PRINTOUT CONTAINS PERCENTAGES OF STUDENTS WHO MARKED EACH RESPONSE OPTION FOR THE DEMOGRAPHIC ITEMS. FOR DEMOGRAPHIC #6 THE EXPECTED GRADE MEAN IS CALCULATED USING A WEIGHT OF 4 FOR AN 'A', ETC.

GLOBAL ITEM RESULTS (ITEM 1, 2, AND 3) ARE PRESENTED NEXT.

LABELS, PERCENTS AND FREQUENCIES: TOP ROWS CONTAIN PERCENTAGES; BOTTOM ROWS CONTAIN NUMBERS OF STUDENTS MARKING EACH OPTION. THE SUMMARY STATISTICS ARE CALCULATED USING WEIGHTS INDICATED ABOVE EACH RESPONSE OPTION. FOR GLOBAL ITEMS THE RANGE IS 1-6 WITH 6 MOST FAVORABLE. FOR MOST OTHER ITEMS THE RANGE IS 1-5 WITH 5 MOST FAVORABLE.

CONS (CONSENSUS): POSSIBLE VALUES ARE HIGH, AVG OR LOW. HIGH INDICATES CONSIDERABLE STUDENT AGREEMENT.

RELATIVE COMPARISON: CLASS MEAN RATING IS COMPARED WITH ONE OR TWO GROUPS. GROUP 1 IS CAMPUS-WIDE BASED ON REQUIRED/ELECTIVE NATURE OF COURSE AND CLASS SIZE. GROUP 2 IS COLLEGE OR DEPARTMENT-WIDE. THE RELATIVE POSITION OF THE CLASS MEAN IS DENOTED UNDER ONE OF THE FOLLOWING FIVE NORM CATEGORIES:

HI--TOP 10%; HIGH AVG--NEXT 20%; AVG--MIDDLE 40%; LOW AVG--NEXT 20%; OR LOW--BOTTOM 10%

THE ROWS CONTAINING AN X AND O'S SHOW THE CLASS AVERAGE RATING IN COMPARISON TO GROUPS 1 AND 2. X INDICATES THE RELATIVE PLACEMENT OF THE MEAN. O'S INDICATE THE RANGE OF UNCERTAINTY. THE RATINGS SHOULD BE READ, FOR EXAMPLE, AS LOW-AVERAGE TO AVERAGE OR HIGH-AVERAGE TO HIGH TO TAKE INTO ACCOUNT THE RANGE OF UNCERTAINTY.

STUDENT RESPONSES TO DEPARTMENTAL CORE ITEMS, INSTRUCTOR SELECTED ITEMS OR COMPLETE FORM ITEMS ARE PRESENTED NEXT. THE RESULTS ARE TO BE INTERPRETED IN THE SAME WAY. HOWEVER, NORMATIVE DATA MAY NOT BE AVAILABLE.

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DEPARTMENTAL CORE ITEM RESULTS

	RESPONSE LABELS, PERCENTS & FREQUENCIES						SUMMARY STATISTICS			RELATIVE COMPARISON OF CLASS MEAN					
										NORM	UNAVAILABLE				
							MEAN	SD		LOW	LOW	AVG	AVG	AVG	HI
4 CATALOG ITEM 1 THE COURSE OBJECTIVES WERE: WEIGHTING SCHEME 54321	VERY CLEAR	--	--	--	VERY UNCLEAR	OMIT	MDN	CONS		LOW	AVG	AVG	AVG	AVG	HI
	75	25	0	0	0	0	4.8	0.43							
	(3)	(1)	(0)	(0)	(0)	(0)	4.7	HIGH							
5 CATALOG ITEM 2 THE INSTRUCTOR'STATED CLEARLY WHAT WAS EXPECTED OF STUDENTS. WEIGHTING SCHEME 54321	ALMOST ALWAYS	--	--	--	ALMOST NEVER	OMIT	MEAN MDN	SD CONS		LOW	AVG	AVG	AVG	AVG	HI
	50	50	0	0	0	0	4.5	0.50							
	(2)	(2)	(0)	(0)	(0)	(0)	4.5	HIGH							
6 CATALOG ITEM 3 THE COURSE WAS: WEIGHTING SCHEME 54321	ORGANIZED	--	--	--	DIS-ORGANIZED	OMIT	MEAN MDN	SD CONS		LOW	AVG	AVG	AVG	AVG	HI
	50	50	0	0	0	0	4.5	0.50							
	(2)	(2)	(0)	(0)	(0)	(0)	4.5	HIGH							
7 CATALOG ITEM 45 RATE THE TEXT(S) USED IN THIS COURSE. WEIGHTING SCHEME 54321	EXCELLENT	--	--	--	POOR	OMIT	MEAN MDN	SD CONS		LOW	AVG	AVG	AVG	AVG	HI
	50	25	25	0	0	0	4.3	0.82							
	(2)	(1)	(1)	(0)	(0)	(0)	4.5	AVG							
8 CATALOG ITEM 102 HOW WOULD YOU RATE THE INSTRUCTOR'S EXAMINATION QUESTIONS? WEIGHTING SCHEME 54321	EXCELLENT	--	--	--	POOR	OMIT	MEAN MDN	SD CONS		LOW	AVG	AVG	AVG	AVG	HI
	100	0	0	0	0	0	5.0	0.00							
	(4)	(0)	(0)	(0)	(0)	(0)	5.0	HIGH							
9 CATALOG ITEM 103 HOW WELL DID EXAMINATION QUESTIONS REFLECT CONTENT AND EMPHASIS OF THE COURSE? WEIGHTING SCHEME 54321	WELL RELATED	--	--	--	POORLY RELATED	OMIT	MEAN MDN	SD CONS		LOW	AVG	AVG	AVG	AVG	HI
	75	0	25	0	0	0	4.5	0.86							
	(3)	(0)	(1)	(0)	(0)	(0)	4.7	AVG							
10 CATALOG ITEM 130 HOW MUCH WORK DID THIS COURSE REQUIRE? WEIGHTING SCHEME 210-1-2	EXCESSIVE AMOUNT	--	--	--	NOT ENOUGH	OMIT	MEAN MDN	SD CONS		LOW	AVG	AVG	AVG	AVG	HI
	25	25	50	0	0	0	0.8	0.82							
	(1)	(1)	(2)	(0)	(0)	(0)	0.5	LOW							
11 CATALOG ITEM 165 WOULD YOU RECOMMEND THIS COURSE TO OTHER STUDENTS? WEIGHTING SCHEME 54321	HIGHLY RECOMMEND	--	--	--	NOT RECOMMEND	OMIT	MEAN MDN	SD CONS		LOW	AVG	AVG	AVG	AVG	HI
	75	0	25	0	0	0	4.5	0.86							
	(3)	(0)	(1)	(0)	(0)	(0)	4.7	AVG							
12 CATALOG ITEM 191 DID THIS COURSE INCREASE YOUR INTEREST IN THE SUBJECT MATTER? WEIGHTING SCHEME 54321	YES, GREATLY	--	--	--	NO, NOT MUCH	OMIT	MEAN MDN	SD CONS		LOW	AVG	AVG	AVG	AVG	HI
	75	0	25	0	0	0	4.5	0.86							
	(3)	(0)	(1)	(0)	(0)	(0)	4.7	AVG							

DEPARTMENTAL CORE ITEM RESULTS

	RESPONSE LABELS, PERCENTS & FREQUENCIES						SUMMARY STATISTICS		RELATIVE COMPARISON OF CLASS MEAN				
							MEAN MDN	SD CONS	NORM LOW	UNAVAILABLE LOW AVG	AVG	AVG	HI HI
13 THE INSTRUCTOR'S KNOWLEDGE OF SUBJECT WAS: CATALOG ITEM 242 WEIGHTING SCHEME 54321	EXCELLENT	--	--	--	POOR	OMIT	5.0	0.00					
	100 (4)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	5.0	HIGH					
14 HOW WOULD YOU CHARACTERIZE THE INSTRUCTOR'S ABILITY TO EXPLAIN? CATALOG ITEM 244 WEIGHTING SCHEME 54321	EXCELLENT	--	--	--	VERY POOR	OMIT	MEAN MDN 4.8	SD CONS 0.43					
	75 (3)	25 (1)	0 (0)	0 (0)	0 (0)	0 (0)	4.7	HIGH					
15 DID THE INSTRUCTOR SEEM TO ENJOY TEACHING? CATALOG ITEM 246 WEIGHTING SCHEME 54321	YES, VERY MUCH	--	--	--	NO, ENJOYED IT LITTLE	OMIT	MEAN MDN 4.8	SD CONS 0.43					
	75 (3)	25 (1)	0 (0)	0 (0)	0 (0)	0 (0)	4.7	HIGH					
16 THE INSTRUCTOR SEEMED WELL PREPARED FOR CLASSES. CATALOG ITEM 248 WEIGHTING SCHEME 54321	YES, ALWAYS	--	--	--	NO, SELDOM	OMIT	MEAN MDN 5.0	SD CONS 0.00					
	100 (4)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	5.0	HIGH					
17 THE INSTRUCTOR WAS ABLE TO ANSWER QUESTIONS CLEARLY AND CONCISELY. CATALOG ITEM 295 WEIGHTING SCHEME 54321	ALMOST ALWAYS	--	--	--	ALMOST NEVER	OMIT	MEAN MDN 5.0	SD CONS 0.00					
	100 (4)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	5.0	HIGH					
18 DESCRIBE YOUR INSTRUCTOR'S ATTITUDE TOWARD STUDENTS. CATALOG ITEM 393 WEIGHTING SCHEME 54321	FRIENDLY	--	--	--	UNFRIENDLY	OMIT	MEAN MDN 4.8	SD CONS 0.43					
	75 (3)	25 (1)	0 (0)	0 (0)	0 (0)	0 (0)	4.7	HIGH					
19 THE COURSE CONTENT WAS: CATALOG ITEM 19 WEIGHTING SCHEME 210-1-2	TOO ADVANCED	--	--	--	TOO ELEMENTARY	OMIT	MEAN MDN 0.3	SD CONS 0.43					
	0 (0)	25 (1)	75 (3)	0 (0)	0 (0)	0 (0)	0.2	AVG					
20 WAS THE GRADING SYSTEM FOR THE COURSE EXPLAINED? CATALOG ITEM 104 WEIGHTING SCHEME 54321	YES, VERY WELL	--	--	--	NO, NOT AT ALL	OMIT	MEAN MDN 2.0	SD CONS 1.73					
	25 (1)	0 (0)	0 (0)	0 (0)	75 (3)	0 (0)	1.3	LOW					
21 DID THE INSTRUCTOR SET TOO HIGH/LOW GRADING STANDARDS FOR STUDENTS? CATALOG ITEM 106 WEIGHTING SCHEME 210-1-2	TOO HIGH	--	--	--	TOO LOW	OMIT	MEAN MDN 0.3	SD CONS 0.43					
	0 (0)	25 (1)	75 (3)	0 (0)	0 (0)	0 (0)	0.2	AVG					

DEPARTMENTAL CORE ITEM RESULTS

CATALOG ITEM 144
22 DESCRIBE THE PACE OF THE COURSE.

WEIGHTING SCHEME 210-1-2

RESPONSE LABELS, PERCENTS & FREQUENCIES						SUMMARY STATISTICS			RELATIVE COMPARISON OF CLASS MEAN				
TOO FAST	--	--	--	TOO SLOW	OMIT	MEAN MDN	SD CONS		NORM LOW	UNAVAILABLE LOW AVG	AVG	AVG HI	HI
0	25	75	0	0	0	0.3	0.43						
(0)	(1)	(3)	(0)	(0)	(0)	0.2	AVG						

Aquatic Ecology/Toxicology Lab,
Biology 402-502, Section 017, Fall 1991
(1 credit)

Enrollment in the Lab section was by permission of instructor only. The lab was designed for people who receive reports on laboratory analyses of water samples. Through the lab exercises, the student should gain a better understanding of what the analyses mean and limitations to interpreting the results.

The Lab session (Biology 402-502, section 017) met for one hour after the class. Three students successfully completed the lab section (one graduate and two undergraduate students). The Lab was designed for persons without laboratory experience. The laboratory session gave hands-on experience with the techniques used for biological/ecological investigations of water issues. The Lab evaluated each technique with respect to its application, interpretation, and **limitations** (emphasis added because this aspect is often ignored). The primary reference for the laboratory methods was Standard Methods . One method for analysis was provided each week (list of analyses in next section). The students were required to find another method for the same analysis and a recent article from the aquatic literature that utilized the analysis. Each student was responsible for a written summary of the method, comparison with the method they found, and a discussion of interferences and limitations. The student's grade was based upon participation and the weekly written summaries.

Of the three, only one student returned the ICES form (response included later). I believe the responses of the other two students would have been favorable. With such a small group, the concerns of each student could be addressed.

Weekly Methods for Aquatic Ecology/Toxicology Lab
Biology 402-502, Sec 017

Analytical Parameter Schedule

Parameter	Date due
Alkalinity	9-10
BOD-COD	9-17
Coliform	9-24
Redox	10-1
NO_2^--NO_3^-	10-8
TKN	10-15
Phosphorus	10-22
Fe by flame	10-29
Pb	11-5
Hg	11-12
Ar-Se	11-19 (Ar-Se combined with Hg)
CN^-	11-26
Volatile organic hydrocarbons	12-3
TDS-Conductivity or volatile organic carbon	12-10

Assignments: A method from *Standard Methods* (16th edition) was handed out for primary reference. Students were required to write a one to two-page review that included: (1) brief summary of standard method; (2) brief summary of alternate method, including citation of method; (3) compare and contrast methods; (4) citation and summary of one article from current literature journal that measured the specific parameter; and (5) list of methods' interferences and limitations.

2.2 ICES Summary

INSTRUCTOR AND COURSE EVALUATION SYSTEM PAGE 1

INSTRUCTOR REPORT

FOR: C. WHITE DEPT BIOLO COURSE 502 SECTION 017 DEPT CODE 01050 SEMESTER: FALL YEAR: 1991

DEMOGRAPHIC DATA IN PERCENTS
NO. OF FORMS COMPLETED: 1

1. PRE-COURSE OPINION TOWARD

	POS	NO OP	NEG	OMIT
INSTRUCTOR	100	0	0	0
COURSE	100	0	0	0

2. COURSE IN:

MAJOR	MINOR	OTHER	OMIT
0	0	100	0

3. SEX.

MALE	FEMALE	OMIT
0	100	0

4. THIS COURSE WAS:

SPECIFICALLY REQUIRED	REQUIRED BUT A CHOICE	ELECTIVE	OMIT
0	0	100	0

5. CLASS STATUS:

FRESH	SOPH	JUNIOR	SENIOR	GRAD	OTHER	OMIT
0	0	0	0	0	100	0

6. EXPECTED GRADE:

A	B	C	D	F	OMIT	*EXP GRADE MEAN*
100	0	0	0	0	0	* 4.0 *

GLOBAL CORE ITEM RESULTS

ITEM	WEIGHTS	6 EXCELLENT	5 --	4 --	3 --	2 --	1 VERY POOR	OMIT	SUMMARY STATISTICS MEAN MDN	SD CONS	RELATIVE COMPARISON OF CLASS MEAN GROUP 1: NORM UNAVAILABLE GROUP 2: NORM UNAVAILABLE | LOW | AVG | AVG | HIGH | HI
1 RATE THE COURSE CONTENT		100	0	0	0	0	0	0	6.0	0.00	1
		(1)	(0)	(0)	(0)	(0)	(0)	(0)	6.0	HIGH	2
2 RATE THE INSTRUCTOR		100	0	0	0	0	0	0	6.0	0.00	1
		(1)	(0)	(0)	(0)	(0)	(0)	(0)	6.0	HIGH	2
3 RATE THE COURSE IN GENERAL		100	0	0	0	0	0	0	6.0	0.00	1
		(1)	(0)	(0)	(0)	(0)	(0)	(0)	6.0	HIGH	2

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HI--TOP 10%; HIGH AVG--NEXT 20%; AVG--MIDDLE 40%; LOW AVG--NEXT 20%; OR LOW--BOTTOM 10%

THE ROWS CONTAINING AN X AND O'S SHOW THE CLASS AVERAGE RATING IN COMPARISON TO GROUPS 1 AND 2. X INDICATES THE RELATIVE PLACEMENT OF THE MEAN. O'S INDICATE THE RANGE OF UNCERTAINTY. THE RATINGS SHOULD BE READ, FOR EXAMPLE, AS LOW-AVERAGE TO AVERAGE OR HIGH-AVERAGE TO HIGH TO TAKE INTO ACCOUNT THE RANGE OF UNCERTAINTY.

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									NORM	UNAVAILABLE			
							MEAN MDN	SD CONS	LOW	LOW AVG	AVG	HI AVG	HI
CATALOG ITEM 1													
4 THE COURSE OBJECTIVES WERE:	VERY CLEAR	--	--	--	VERY UNCLEAR	OMIT							
WEIGHTING SCHEME 54321	100	0	0	0	0	0	5.0	0.00					
	(1)	(0)	(0)	(0)	(0)	(0)	5.0	HIGH					
CATALOG ITEM 2													
5 THE INSTRUCTOR STATED CLEARLY WHAT WAS EXPECTED OF STUDENTS.	ALMOST ALWAYS	--	--	--	ALMOST NEVER	OMIT	MEAN MDN	SD CONS	LOW	LOW AVG	AVG	HI AVG	HI
WEIGHTING SCHEME 54321	100	0	0	0	0	0	5.0	0.00					
	(1)	(0)	(0)	(0)	(0)	(0)	5.0	HIGH					
CATALOG ITEM 3													
6 THE COURSE WAS:	ORGANIZED	--	--	--	DIS-ORGANIZED	OMIT	MEAN MDN	SD CONS	LOW	LOW AVG	AVG	HI AVG	HI
WEIGHTING SCHEME 54321	100	0	0	0	0	0	5.0	0.00					
	(1)	(0)	(0)	(0)	(0)	(0)	5.0	HIGH					
CATALOG ITEM 45													
7 RATE THE TEXT(S) USED IN THIS COURSE.	EXCELLENT	--	--	--	POOR	OMIT	MEAN MDN	SD CONS	LOW	LOW AVG	AVG	HI AVG	HI
WEIGHTING SCHEME 54321	100	0	0	0	0	0	5.0	0.00					
	(1)	(0)	(0)	(0)	(0)	(0)	5.0	HIGH					
CATALOG ITEM 102													
8 HOW WOULD YOU RATE THE INSTRUCTOR'S EXAMINATION QUESTIONS?	EXCELLENT	--	--	--	POOR	OMIT	MEAN MDN	SD CONS	LOW	LOW AVG	AVG	HI AVG	HI
WEIGHTING SCHEME 54321	100	0	0	0	0	0	5.0	0.00					
	(1)	(0)	(0)	(0)	(0)	(0)	5.0	HIGH					
CATALOG ITEM 103													
9 HOW WELL DID EXAMINATION QUESTIONS REFLECT CONTENT AND EMPHASIS OF THE COURSE?	WELL RELATED	--	--	--	POORLY RELATED	OMIT	MEAN MDN	SD CONS	LOW	LOW AVG	AVG	HI AVG	HI
WEIGHTING SCHEME 54321	100	0	0	0	0	0	5.0	0.00					
	(1)	(0)	(0)	(0)	(0)	(0)	5.0	HIGH					
CATALOG ITEM 130													
10 HOW MUCH WORK DID THIS COURSE REQUIRE?	EXCESSIVE AMOUNT	--	--	--	NOT ENOUGH	OMIT	MEAN MDN	SD CONS	LOW	LOW AVG	AVG	HI AVG	HI
WEIGHTING SCHEME 210-1-2	0	0	100	0	0	0	0.0	0.00					
	(0)	(0)	(1)	(0)	(0)	(0)	0.0	HIGH					
CATALOG ITEM 165													
11 WOULD YOU RECOMMEND THIS COURSE TO OTHER STUDENTS?	HIGHLY RECOMMEND	--	--	--	NOT RECOMMEND	OMIT	MEAN MDN	SD CONS	LOW	LOW AVG	AVG	HI AVG	HI
WEIGHTING SCHEME 54321	100	0	0	0	0	0	5.0	0.00					
	(1)	(0)	(0)	(0)	(0)	(0)	5.0	HIGH					
CATALOG ITEM 191													
12 DID THIS COURSE INCREASE YOUR INTEREST IN THE SUBJECT MATTER?	YES, GREATLY	--	--	--	NO, NOT MUCH	OMIT	MEAN MDN	SD CONS	LOW	LOW AVG	AVG	HI AVG	HI
WEIGHTING SCHEME 54321	100	0	0	0	0	0	5.0	0.00					
	(1)	(0)	(0)	(0)	(0)	(0)	5.0	HIGH					

DEPARTMENTAL CORE ITEM RESULTS

	RESPONSE LABELS, PERCENTS & FREQUENCIES						SUMMARY STATISTICS		RELATIVE COMPARISON OF CLASS MEAN				
							MEAN	SD	NORM	UNAVAILABLE			
							MDN	CONS	LOW	LOW AVG	AVG	AVG HI	HI
CATALOG ITEM 242													
13 THE INSTRUCTOR'S KNOWLEDGE OF SUBJECT WAS:	EXCELLENT	--	--	--	POOR	OMIT	5.0	0.00					
WEIGHTING SCHEME 54321	100	0	0	0	0	0	5.0	HIGH					
	(1)	(0)	(0)	(0)	(0)	(0)							
CATALOG ITEM 244													
14 HOW WOULD YOU CHARACTERIZE THE INSTRUCTOR'S ABILITY TO EXPLAIN?	EXCELLENT	--	--	--	VERY POOR	OMIT	MEAN MDN 5.0	SD CONS 0.00					
WEIGHTING SCHEME 54321	100	0	0	0	0	0	5.0	HIGH					
	(1)	(0)	(0)	(0)	(0)	(0)							
CATALOG ITEM 246													
15 DID THE INSTRUCTOR SEEM TO ENJOY TEACHING?	YES, VERY MUCH	--	--	--	NO, ENJOYED IT LITTLE	OMIT	MEAN MDN 5.0	SD CONS 0.00					
WEIGHTING SCHEME 54321	100	0	0	0	0	0	5.0	HIGH					
	(1)	(0)	(0)	(0)	(0)	(0)							
CATALOG ITEM 248													
16 THE INSTRUCTOR SEEMED WELL PREPARED FOR CLASSES.	YES, ALWAYS	--	--	--	NO, SELDOM	OMIT	MEAN MDN 5.0	SD CONS 0.00					
WEIGHTING SCHEME 54321	100	0	0	0	0	0	5.0	HIGH					
	(1)	(0)	(0)	(0)	(0)	(0)							
CATALOG ITEM 295													
17 THE INSTRUCTOR WAS ABLE TO ANSWER QUESTIONS CLEARLY AND CONCISELY.	ALMOST ALWAYS	--	--	--	ALMOST NEVER	OMIT	MEAN MDN 5.0	SD CONS 0.00					
WEIGHTING SCHEME 54321	100	0	0	0	0	0	5.0	HIGH					
	(1)	(0)	(0)	(0)	(0)	(0)							
CATALOG ITEM 393													
18 DESCRIBE YOUR INSTRUCTOR'S ATTITUDE TOWARD STUDENTS.	FRIENDLY	--	--	--	UNFRIENDLY	OMIT	MEAN MDN 5.0	SD CONS 0.00					
WEIGHTING SCHEME 54321	100	0	0	0	0	0	5.0	HIGH					
	(1)	(0)	(0)	(0)	(0)	(0)							
CATALOG ITEM 19													
19 THE COURSE CONTENT WAS:	TOO ADVANCED	--	--	--	TOO ELEMENTARY	OMIT	MEAN MDN 0.0	SD CONS 0.00					
WEIGHTING SCHEME 210-1-2	0	0	100	0	0	0	0.0	HIGH					
	(0)	(0)	(1)	(0)	(0)	(0)							
CATALOG ITEM 104													
20 WAS THE GRADING SYSTEM FOR THE COURSE EXPLAINED?	YES, VERY WELL	--	--	--	NO, NOT AT ALL	OMIT	MEAN MDN 5.0	SD CONS 0.00					
WEIGHTING SCHEME 54321	100	0	0	0	0	0	5.0	HIGH					
	(1)	(0)	(0)	(0)	(0)	(0)							
CATALOG ITEM 106													
21 DID THE INSTRUCTOR SET TOO HIGH/LOW GRADING STANDARDS FOR STUDENTS?	TOO HIGH	--	--	--	TOO LOW	OMIT	MEAN MDN 0.0	SD CONS 0.00					
WEIGHTING SCHEME 210-1-2	0	0	100	0	0	0	0.0	HIGH					
	(0)	(0)	(1)	(0)	(0)	(0)							

DEPARTMENTAL CORE ITEM RESULTS

CATALOG ITEM 144

22 DESCRIBE THE PACE OF THE COURSE.

WEIGHTING SCHEME 210-1-2

RESPONSE LABELS, PERCENTS & FREQUENCIES						
TOO FAST	--	--	--	TOO SLOW	OMIT	SUMMARY STATISTICS
0	0	100	0	0	0	MEAN MDN 0.0
(0)	(0)	(1)	(0)	(0)	(0)	SD CONS 0.00
						HIGH 0.0

RELATIVE COMPARISON OF CLASS MEAN

NORM	UNAVAILABLE				
LOW	LOW	AVG	AVG	AVG	HI

Summary

This 3-credit hour course is designed to provide non-biology graduates who work in water-related professions the basic biological/ecological concepts and principles that control the fate of chemicals in aquatic environments. The associated one-hour Lab is for persons without laboratory experience and focuses on laboratory methods used in biological/ecological investigations of water issues. The course is listed as an elective course for the Master of Water Resources Administration (MWRA) program, an interdisciplinary program established at the University of New Mexico in 1990. As such, a major focus of the course and lab is communication of this disciplinary topic to others with different disciplinary backgrounds.

The first offering of the course was in the Fall semester of 1991. The 3-credit hour course met Tuesday evenings (6:00 to 8:30 pm) followed by the associated 1-credit hour lab (9:00 to 10:00 pm). It was offered through the Department of Biology as a 402-502 Special Topics for undergraduate and graduate students, respectively. Biology majors were allowed to take either section. Since portions of the class subject matter were covered in other biology classes, biology majors were required to present a lecture and prepare the associated readings on a disciplinary topic. They were to tailor their presentations for an interested lay audience.

There was no text for the course. Readings were taken from a variety of sources and were handed out weekly prior to discussion in class. All students prepared a one-page summary written for a lay audience on each week's readings. One or more person was called upon to read their summary in class at the beginning of each class period. This served as an "abstract" to lead into the evening's discussions and lectures.

All students performed a library-literature research project. At the end of the semester, the students' projects were presented orally to the class and a written copy was distributed to each class member. Consistent with all other exercises, the students were to tailor their written and oral presentations for an interested lay audience. Titles for the projects included:

Plutonium in Aquatic Systems;
Mercury: From Sources to Freshwater Fish;
Is Liming a Cure for Acidic Lakes?;
Cyanide Use in Gold Mining: Environmental Impacts, Toxicology, and Remediation Technology;
Mercury Bioaccumulation in Salt Water Marshes and Estuaries;
Effluent Treatment Processes: a Survey of Nitrogen Removal Methods and their Effectiveness;
The Behavior of Selenium in the Human and Natural Environment; and
Nitrogen-Related Groundwater Contamination in the South Valley.

Twelve students enrolled in the course, with 8 students (3 undergraduate and 5 graduate students) successfully completing the course. The grades were based upon the student's participation, written weekly summaries, and the written and oral projects. Biology majors were also graded on their prepared lecture and reading materials. Three students completed the laboratory section of the course.

Confidential reviews of the class were returned by 6 of the 8 students. The students were unanimous in their responses on four items: (1) course content was rated as excellent; (2) the instructors knowledge of subject was excellent; (3) the instructor was always well prepared; and (4) the instructor almost always was able to answer questions clearly and concisely. Their responses to the question "Was the grading system for the course explained?" differed widely.

BIBLIOGRAPHY

Readings for the class (including the lab) were taken from the following texts. The texts are listed in alphabetical order, with the library call numbers immediately following to aid in retrieval from the library.

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