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# Inventory of Course Offerings in Water Resources : the University of Connecticut 1971-1972

William C. Kennard  
*Institute of Water Resources*

Jane S. Fisher  
*Institute of Water Resources*

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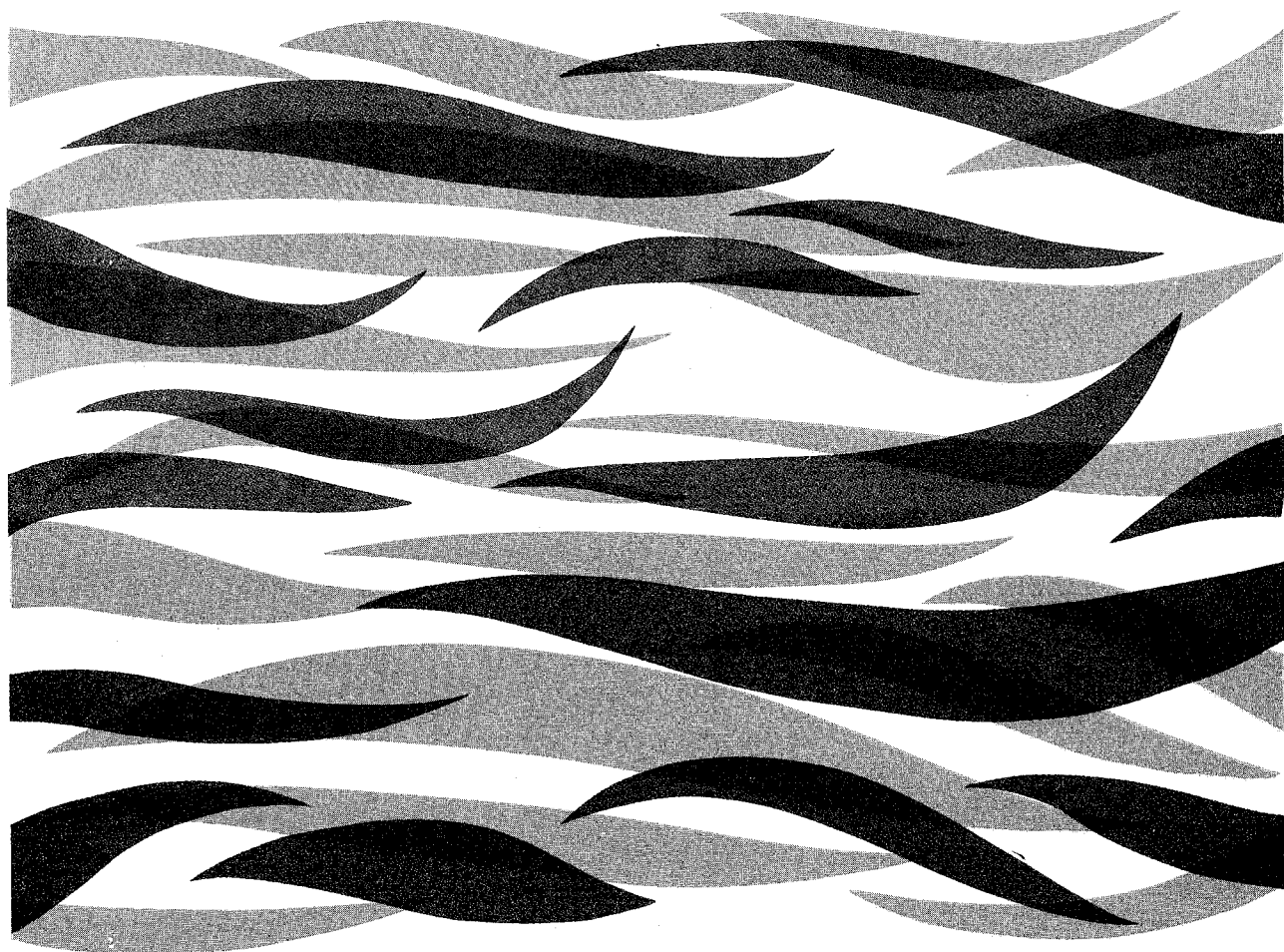
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**INVENTORY OF COURSE OFFERINGS  
IN WATER RESOURCES  
THE UNIVERSITY OF CONNECTICUT  
1971-1972**

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**Report No. 14**

**May 1971**



**INSTITUTE OF WATER RESOURCES**  
**The University of Connecticut**

## **Inventory of Course Offerings in Water Resources The University of Connecticut, 1971-1972**

William C. Kennard, Director  
and  
Jane S. Fisher, Research Assistant

Institute of Water Resources  
The University of Connecticut

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## Table of Contents

	page
Acknowledgements . . . . .	4
Introduction . . . . .	5
Table I. Course Offerings Relating to Water Resources. .	7
Table II. Participating Faculty and Their Courses Relating to Water Resources . . . . .	25
Table III. Distribution of Water Resources Related Courses Within the Separate Colleges and Departments . . . . .	32
Table IV. Distribution of Water Resources Related Courses by General Disciplinary Areas. . . . .	33

## Acknowledgements

We appreciate the cooperation of the Deans, Department Heads and individual faculty members within the University who gave so generously of their time to discuss the subject matter contained within their specific courses and the relationship of each to the broader areas of water resources. Without such personal assistance a compilation such as this could not have been prepared.

## Introduction

In addition to its direct sponsorship of research, the Institute of Water Resources has undertaken a number of other activities relating to the broad field of water resources use and development, seminars and special conferences have been conducted, public information programs have been developed and a general interest in the field has been encouraged. Tied very closely to the research mission of the Institute is its training responsibility. The Institute seeks to aid in the development of formal courses at the University relating to water resources and to encourage students to participate in them. Review of the General Catalogs of the University of Connecticut for recent years revealed an ever increasing number of courses relating in whole or in part to water resources. Many of these, in fact, were the direct result of efforts by staff members of the Institute. The review showed also that the courses covered such a wide range of departments, schools and colleges that it was very difficult to determine what was being offered. Short of reading the course listings for a great many of the academic departments in the University, there is no way to find those concerned with water. As a means of providing in a single volume information about water related courses at the University of Connecticut, this publication, "Inventory of Course Offerings in Water Resources, The University of Connecticut, 1971-1972", was prepared.

While the Institute is concerned primarily with graduate instruction since the research projects sponsored often provide thesis and dissertation study topics, it became apparent that courses at the undergraduate level also should be included.

In compiling information for this publication, the listings of every academic administrative unit of the University as given in the 1970-71 General Catalog were reviewed. In many, the courses relating to water could be selected readily. In others where this was not the case, letters were sent to the heads of the units giving them an opportunity to suggest courses for inclusion in the compilation. Additions, corrections and changes were made so that the report shows course offerings for academic year 1971-72. All of the courses included in this report, in part or in their entirety, are concerned directly with water resources. It

should be recognized that there are many basic background courses at the University which would be of interest and value to a student and, indeed, which may be required in order to register for those concerned with water resources. Such courses, which are not listed in this compilation, can be selected readily from the General Catalog, often by checking the prerequisites for the water-related courses.

For convenience in use, the information has been divided into four tables. The first one gives complete course descriptions by department and number. The second section lists alphabetically the staff members and, by department and number, the courses for which they are responsible. Table III gives the distribution of courses among the six schools and colleges concerned with this field. Finally, in Table IV courses are listed by major water interest categories.

The information in this report will be of direct value to students attempting to find courses relating to water resources. It also should be of value to University staff members who serve as student advisors. Too, it may well encourage departments to develop new and/or revised courses in this field. Finally, it will serve to inform people throughout Connecticut of the courses relating to water resources offered at their State University.

This report is a companion publication to Institute Report No. 12, "Water Research Activities and Interests at the University of Connecticut," which was released in September 1970. Between these two volumes it now is possible to obtain information quickly and easily about the research underway, research interests, undergraduate and graduate courses and, of course, the staff members who are responsible for these activities.



## Table I

### Course Offerings Relating to Water Resources

#### AGRICULTURAL ECONOMICS

350. NATURAL RESOURCE ECONOMICS

Either semester. Three credits. Open only with consent of instructor. Economic consequences of public policies influencing the use of natural resources. Attention is focused on environmental protection and the simultaneous and sequential multiple use of land and water.

Mr. Leonard

#### AGRICULTURAL ENGINEERING

227. SOIL AND WATER ENGINEERING

Second semester. Three credits. Two class periods and one 2-hour laboratory period. Not open for credit to students who have passed Agricultural Engineering 211. The study of soil and water control including rainfall and runoff analysis, surface, and subsurface drainage, sprinkler irrigation and pond design.

Mr. Kolega

235. UTILITIES FOR AGRICULTURE AND ENVIRONMENT

First semester. Three credits. Two class periods and one 2-hour laboratory period. Prerequisite: Physics 101 or equivalent. A study of non-municipal water supply and waste disposal systems including treatment, methods, components and electrical requirements.

Mr. Kolega

246. PRINCIPLES OF ENVIRONMENTAL CONTROL

First semester. Three credits. Two class periods and one 2-hour laboratory period. Topics include heat transfer, heating, lighting, moisture control, refrigeration and ventilation as they are related to agriculture.

Mr. Whitaker

#### AGRICULTURE AND NATURAL RESOURCES

130. MAN AND HIS ENVIRONMENT III - NATURAL RESOURCES

Second semester. Three credits. Three class periods. Not open for credit to students who have passed Plant Science 120 or 190. Renewable natural resources and their conservation. Esthetic, social and economic values are discussed. The concept of man as an integral part of the total environment is emphasized.

Mr. McDowell

140. MAN AND HIS ENVIRONMENT IV - PLANTS

First semester. Three credits. Three class periods. Not open for credit to students who have passed Plant Science 110, or 111 or 144. The biological, physical and social factors that influence plant production and utilization. Mr. Lent, Mr. Peters

BIOLOGICAL SCIENCES GROUP

MICROBIOLOGY

233. PUBLIC HEALTH BACTERIOLOGY

Second semester. Four credits. Two class periods and two 2-hour laboratory periods. Prerequisite: Biology 230 or 231; Biology 200 is advised. A detailed study of microbial genera, emphasizing species which are important in diseases of man and animals and which have special public health significance. Diagnostic methods, including some standard serological procedures, are included.

Mr. Cameron

236. MARINE MICROBIOLOGY

First semester. Three credits. Two lecture-discussion class periods and one 2-hour laboratory period for which field trips may be substituted. Prerequisite: Biology 230 or 231 and consent of instructor. A general survey of the taxonomy, physiology and ecology of marine micro-organisms.

Mr. Buck

396. INVESTIGATION OF SPECIAL TOPICS

Either or both semesters. Credits and hours by arrangement, open only with consent of instructor. In recent years the following special topic has been investigated: Marine microbiology. Mr. Buck

REGULATORY BIOLOGY

409. MINERAL NUTRITION OF PLANTS

Second semester. Four credits. Two class periods and two 2-hour laboratory periods. Prerequisite: Biology 259 and either Chemistry 232 or 234. Alternate years; to be given in 1971-72. Essentiality, function, absorption and translocation of mineral elements. Laboratory work includes theory and application of current research techniques.

Mr. Koontz

413. APPLICATIONS OF ISOTOPIC TRACERS TO BIOLOGICAL RESEARCH

First semester. Three credits. Two class periods and one 3-hour laboratory period. Prerequisite: Physics 122, either Chemistry 232 (or Pharmacy 239) or Chemistry 234; Chemistry 244 or Chemistry 140 and Biology 200, and consent of instructor. Techniques in handling and assaying radioactive materials, with emphasis on liquid scintillation spectrometry.

Mr. Koontz

420. ENVIRONMENTAL ANIMAL PHYSIOLOGY

First semester. Two credits. Two class periods. Open only with consent of instructor. Alternate years; to be given in 1972-73. The evolutionary, integrative and functional processes involved in organismal and molecular adaptation to environmental phenomena.

Mr. Brush

SYSTEMATIC AND EVOLUTIONARY BIOLOGY; ECOLOGY

270. EVOLUTION AND THE ENVIRONMENT

Either semester. Five credits. Five class periods. Prerequisite: Chemistry 128 or 130; Biology 100-101, Biology 110 or 121. Students who have passed Biology 203 or 226 will receive only three credits. An introduction to evolution, biogeography and ecology emphasizing the interrelationship of these disciplines to biological diversity, past and present.

Departmental Staff

275. INVERTEBRATE ZOOLOGY

Second semester. Four credits. Two class periods and two 2-hour laboratory periods. Prerequisite: Biology 121. A comparative study of the general morphology, systematics and physiology of common invertebrate animals. Field trips are required.

Mr. Franz

290. INTRODUCTORY PHYCOLOGY

Second semester. Four credits. Two class periods and two 2-hour laboratory periods. Open only with consent of instructor. A survey of the major groups of algae.

Mr. Trainor, Mrs. Page

442. MALACOLOGY

First semester. Three credits. Two class periods and one 3-hour laboratory period. Alternate years; to be given in 1971-72. The functional morphology, ecology, systematics and evolution of mollusks; emphasis on the molluscan fauna of New England. Field trips required.

Mr. Franz

443. MARINE ECOLOGY

First semester. Three credits. Two class periods and one 4-hour laboratory. Prerequisite: Biology 270, 275 and consent of instructor. The ocean as an environment, with special reference to shallow and estuarine regions; distribution of biota in relation to the physical and chemical environment. Field trips are required.

Mr. Franz

444. MARINE ICHTHYOLOGY

First semester. Three credits. Two class periods and one 2-hour laboratory. Prerequisite: Consent of instructor. Taxonomy and ecology of marine fishes. Field trips are required.

Mr. Lund

450. POPULATION AND COMMUNITY ECOLOGY  
Second semester. Three credits. Two class periods and one 2-hour laboratory period. Prerequisite: Biology 270 and consent of the instructor. Alternate years; to be given in 1971-72. Mr. Streams
451. BIOLOGICAL CONTROL  
Second semester. Three credits. Three class periods. Prerequisite: Biology 286 or consent of instructor. Alternate years; to be given in 1972-73. Biological control of insects and weeds as a problem in applied ecology. Identification, special features of the biology, and host and prey relations of the major groups of entomophagous insects are covered. Mr. Streams
459. AQUATIC INSECTS  
First semester. Three credits. One class period and two 2-hour laboratory periods. Prerequisite: Biology 286 or 289 and consent of instructor. Alternate years; to be given in 1972-73. Taxonomic, habitat, and life history studies of aquatic insects. Mr. Slater
460. ADVANCED PHYCOLOGY  
First semester. Three credits. Two class periods and one 2-hour laboratory for which field trips may be substituted. Prerequisite: Biology 290 and consent of instructor. This course may be repeated once for credit. Mr. Trainor, Mrs. Page
461. PATHOBIOLOGY OF INVERTEBRATES  
First semester. Three credits. One class period and two 3-hour laboratory periods. To be given at Marine Research Laboratory, Noank. Open only with consent of instructor. A study of the invertebrate host response elicited by natural and experimental infections. Marine invertebrates will be used as experimental hosts in laboratory studies. Mr. Feng
463. PLANT ECOLOGY  
First semester. Four credits. Two lectures and one 4-hour laboratory period for which field trips may be substituted. Prerequisite: Ecology (Biology 270) or consent of instructor. An advanced course in plant ecology with emphasis on the effects of environment on development of vegetation, metabolism of the ecosystem, cycling of nutrients, growth and succession. Principles of vegetation dynamics, classification and their ecological interpretation will be discussed. Mr. Damman
465. HERPETOLOGY  
Second semester. Three credits. Two class periods and one 3-hour laboratory. Field trips are required. Open only with consent of instructor. Alternate years; to be given 1972-73. Evolution and biology of reptiles and amphibians with emphasis on living groups. Mr. N. Scott

469. SEMINAR - MARINE BIOLOGY

Study and discussion of current researches, books and periodicals in the field of marine biology. Mr. Franz

CHEMICAL ENGINEERING

280. INTRODUCTION TO ENVIRONMENTAL RATE PROCESSES.

First semester. Three credits. Three class periods. Prerequisite: Chemistry 128, Mechanical Engineering 232 or Chemical Engineering 212. An introductory study of thermodynamics, chemical kinetics, and transfer operations for environmental problems. Open only to students not majoring in chemical engineering.

Mr. Klei, Mr. Sundstrom

281. ENVIRONMENTAL CHEMICAL ENGINEERING

Second semester. Three credits. Three class periods. Prerequisite: Chemical Engineering 224. Application of chemical engineering principles to the analysis of environmental problems.

Mr. Klei, Mr. Sundstrom

381. TRANSFER PROCESSES IN ENVIRONMENTAL SYSTEMS.

Semester by arrangement. Three credits. Three class periods. Prerequisite: Chemical Engineering 281 or consent of instructor. An advanced study of rate processes for disposal and recovery of industrial and municipal wastes. Control and instrumentation.

Mr. Klei, Mr. Sundstrom

320. INVESTIGATION OF SPECIAL TOPICS

Semester by arrangement. Credit and hours by arrangement. This course is designed for special topics, or for individual students who desire to pursue investigations in a specialized field. In recent years the following special topic has been investigated: Industrial Wastes.

Mr. Sundstrom, Mr. Helfgott

CHEMISTRY

355-356. CHEMICAL THERMODYNAMICS

Both semesters. Three credits each semester. Three class periods. Prerequisite: Chemistry 255 or 259. An understanding of partial differentiation is essential. Advanced calculus is desirable. Chemistry 356 is offered in alternate years; to be given in 1971-72. Classical thermodynamics of pure substances and solutions.

Mr. Masterton

## CIVIL ENGINEERING

### 260. WATER AND WASTEWATER TREATMENT

First semester. Three credits. Three class periods. Prerequisite: Civil Engineering 297 which may be taken concurrently, and Chemistry 128. Physical, chemical, and biological principles of the treatment of water, sewage and industrial wastes; design, layout, and operation of purification and treatment works; state and federal regulatory standards.

Mr. Helfgott, Mr. Widmer

### 263. ENVIRONMENTAL ENGINEERING FUNDAMENTALS

First semester. Three credits. Three class periods. The fundamentals of environmental engineering, problems concerning public health, air and water pollution abatement, water and wastewater treatment, solid waste disposal, ecological principles, and engineering methods for protection of the environment.

Mr. Helfgott, Mr. Laak, Mr. Widmer

### 264. SANITARY ENGINEERING LABORATORY

First semester. Two credits. One class period. One 2-hour laboratory. Prerequisite: Civil Engineering 260, which may be taken concurrently. Laboratory analyses of water, sewage, and industrial wastes; interpretation of analytical results; quality criteria; experimental studies and design of basic treatment processes.

Mr. Helfgott, Mr. Laak, Mr. Widmer

### 265. ENVIRONMENTAL ENGINEERING HYDRAULICS

Second semester. Three credits. Three class periods. Prerequisite: Civil Engineering 297. Introduction to hydrology; population and water demand projections; design of water and wastewater transport systems. Analysis of typical hydraulic problems such as pipe grids, sewer systems and pumping stations.

Mr. Helfgott, Mr. Laak, Mr. Widmer

### 267. WATER RESOURCES ENGINEERING

Second semester. Three credits. Three class periods. Prerequisite: Civil Engineering 297. Elements of the hydrologic cycle including analysis of precipitation and stream flow data; ground water flow; flood flows; river improvement and storage. Techniques of single and multipurpose water resources planning.

Mr. Bock, Mr. Posey

### 268. LIMNOLOGY

Second Semester. Three credits. Two class periods and one 3-hour laboratory. Prerequisite: Introductory course in Chemistry, Physics, and invertebrate Biology are advised. Open to students outside of Engineering with consent of instructor. The interrelationships and biotic influences of physical, chemical and biological factors in freshwater environments. Laboratory and field studies.

Mr. Laak, Mr. Widmer

294. PROBLEMS IN CIVIL ENGINEERING  
Semester by arrangement. Three credits. Studies of selected environmental problems. Mr. Widmer
320. INVESTIGATION OF SPECIAL TOPICS  
Semester by arrangement. Credit and hours by arrangement. Open only to seniors and graduate students with consent of instructor. In recent years the following special topics have been investigated:
- |                                    |                             |
|------------------------------------|-----------------------------|
| Aquatic Engineering Chemistry      | Mr. Helfgott                |
| Hydrologic Analyses                | Mr. Bock                    |
| Industrial Wastes                  | Mr. Sundstrom, Mr. Helfgott |
| Introduction to Physical Hydrology | Mr. Bock                    |
| Rainfall - Runoff Relationships    | Mr. Bock                    |
| Water Resources Planning           | Mr. Bock                    |
338. HYDRAULICS OF OPEN CHANNELS  
First semester. Three credits. Three class periods. Prerequisite: Civil Engineering 297. Varied or non-uniform flow in open channels, surface and backwater curves, the hydraulic jump, surges and waves, applied mathematical theory. Mr. Posey, Mr. Scottron
346. GROUND WATER FLOW AND DRAINAGE DESIGN  
Semester by arrangement. Three credits. Prerequisite: Civil Engineering 341. Principles of permeability, flow nets and ground water flow; application to excavation dewatering, foundation drains, slope stabilization, highway drainage. Mr. Healy
383. ENGINEERING HYDROLOGY  
Semester by arrangement. Three credits. Three class periods. Open only with consent of instructor. Hours by arrangement. Study of the occurrence of rainfall and its relationship to stream and ground water flow; dimensionless hydrograph; storage requirements and flow regulation; water rights. Mr. Bock, Mr. Posey
384. HYDRAULIC MACHINERY AND TRANSIENTS  
First semester. Three credits. Three class periods. Prerequisite: Civil Engineering 297. Theory and selection of pumps and turbines; study of related phenomena such as surging, water hammer and cavitation; applications of hydraulic machinery to hydroelectric plants, water supply irrigation, and river navigation. Mr. Scottron
385. HYDRAULIC STRUCTURES  
Second semester. Three credits. Three class periods. Prerequisite: Civil Engineering 384. Design of hydraulic structures; hydro-electric plants, storage and turbines; design of canals, locks, and penstocks; study of dams and regulation for power, flood control, navigation, and irrigation. Mr. Posey, Mr. Scottron

386. THE FLOOD PROBLEM

Second semester. Hours by arrangement. Three credits. Three class periods. Flood hazards: methods of preventing or alleviating damages; relationship to water resources development and urban planning; multiple purpose projects. Mr. Posey

391. ADVANCED SANITARY ENGINEERING LABORATORY

Second semester. Three credits. One class period and two 2-hour laboratory periods. Prerequisites: Civil Engineering 260 and 261. Hours by arrangement. Analysis of water and wastewater; experimental laboratory and plant investigations of water, sewage, and industrial waste treatment processes. Mr. Helfgott, Mr. Laak, Mr. Widmer

392. INDUSTRIAL WASTES

First semester. Three credits. Three class periods. Prerequisite: Civil Engineering 260. Hours by arrangement. Origin and characteristics of industrial wastes; methods for solving industrial waste problems. Mr. Laak, Mr. Widmer

393. PUBLIC HEALTH ENGINEERING

First semester. Three credits. Three class periods. Hours by arrangement. Open only with consent of instructor. Engineering aspects of communicable disease control, food handling, refuse disposal, rural water supplies and waste disposal, air pollution, and radiological health. Mr. Laak, Mr. Widmer

394. WATER POLLUTION I

Second semester. Three credits. Two class periods and one 3-hour field or laboratory period. Open only with consent of instructor. Hours by arrangement. The nature and causes of pollution; effects of pollution on the biological, chemical and physical characteristics of inland waters; survey methods, rationale of control legislation. Mr. Laak, Mr. Widmer

395. WATER POLLUTION II

First semester. Three credits. Two class periods and one 3-hour laboratory or field period. Prerequisite: Civil Engineering 394. A continuation of course C.E. 394 dealing with estuarine, marine, and groundwaters. Mr. Laak, Mr. Widmer

396-397. ADVANCED WATER AND WASTEWATER TREATMENT

Both semesters. Three credits each semester. Three class periods. Prerequisite: Civil Engineering 260. Theory and design of chemical, physical and biological processes used in water and wastewater treatment. Mr. Helfgott, Mr. Laak, Mr. Widmer



401. OCEAN ENGINEERING I

Semester by arrangement. Three credits. Three class periods.  
Prerequisite: Civil Engineering 297. Dynamics of the ocean, including waves, tides and currents; shore processes and protection works; chemical and physical characteristics of seawater; estuarine flushing, mixing and diffusion; sedimentation; engineering applications.  
Mr. Widmer

ECONOMICS

294. GOVERNMENT AND INDUSTRY

Second semester. Three credits. Three class periods. Prerequisite: Economics 112. Public policies of enforcing, supplementing, or replacing competition in particular segments of the economy, with studies of selected industries and legal cases. Examination of factors relevant to the appropriate relation of government to business in a free enterprise economy, and the legal problems created for businessmen by government regulations.  
Mr. Weiner

332. STATE AND LOCAL FINANCE

Second semester. Three credits. Open only with consent of instructor.  
Departmental Staff

381. INDUSTRY AND GOVERNMENT

First semester. Three credits. Three class periods. Open only with consent of instructor.  
Mr. Weiner

382. TOPICS IN PUBLIC POLICY TOWARD INDUSTRY

Second semester. Three credits. Three class periods. Open only with consent of instructor. This course may be repeated for credit. Topics are varied from year to year.  
Mr. Weiner

EDUCATION

311EN. WORKSHOP IN EDUCATION: ENVIRONMENTAL EDUCATION

Three credits. Prerequisite: at least 12 credits in education or consent of instructor. July 5--August 13, 1971. A problem-oriented workshop concerned with all aspects of an environmental education curriculum for those individuals interested in developing such a program, or integrating environmental education into existing programs at the elementary or secondary level.  
Mr. Roberts

325. FOUNDATIONS OF CURRICULUM DEVELOPMENT

Three credits. Semester and hour by arrangement. Open only with consent of instructor. Issues in program development in schools; factors involved in curriculum change.  
Mr. Roberts

326EE. CURRICULUM LABORATORY: ECONOMIC EDUCATION WORKSHOP ON ECONOMICS  
AND ENVIRONMENTAL QUALITY

Three credits. EDUCATION 300-SPECIAL TOPIC. One credit. Pre-requisite: at least 12 credits in education or consent of instructor. Students must register for both courses. August 16-27, 1971. The program draws from the science of human ecology, and from economics and other social sciences, the basic concepts needed by all teachers for understanding and teaching about environmental problems. Study of a variety of instructional materials, field trips, and discussion of methods will give the workshop a direct classroom application.

Mr. Wass

367. PROBLEMS IN THE TEACHING OF NATURAL SCIENCES

Three credits, semester and hours by arrangement. Prerequisite: at least 21 credits in Science, Education 257, and consent of instructor. Theories of teaching the natural sciences with emphasis on studies of research in science teaching related to current problems.

Mr. Blick

464. MATERIALS AND MEETINGS IN THE TEACHING OF ELEMENTARY SCHOOL SCIENCE

Both semesters. Three credits. Prerequisite: 12 hours in education or consent of instructor. Selection and organization of content, principles and methods, and research applications. Consideration will be given of new laboratory centered programs for elementary schools.

Mr. Dyrli

FINANCE

230. PRINCIPLES OF REAL ESTATE

Either semester. Three credits. Three class periods. Prerequisite: Economics 111-112, or Agricultural Economics 280, or consent of instructor. A study of the economic and legal environment within which real estate is transferred and used. Special emphasis is placed on the principles and institutions designed to foster efficient land use.

Mr. Boyce, Mr. Kinnard, Mr. Messner

235. INTRODUCTION TO REGIONAL SCIENCE

First semester. Three credits. Prerequisite: Finance 230. This course surveys the application of quantitative analytic techniques to problems of the allocation of urban space within geographic regions. Topics covered include location analysis, optimization of urban space allocations, input-output analysis, development of regional accounts, market area measurements.

Mr. Messner

331. REGIONAL SCIENCE AND URBAN ECONOMIC STUDIES

Semester and hours by arrangement. Three credits. Prerequisite: Consent of instructor. This course applies and incorporates the tools and analytical techniques of economic theory to sub-national problems. Major study areas will include the theory of urban growth and development, location theory, economic base analysis, input-output analysis, and various urban and regional growth models.

Mr. Messner

GEOLOGY AND GEOGRAPHY

GEOLOGY

209. FIELD AND STRUCTURAL GEOLOGY

First semester. Four credits. Two class periods and two 2-hour laboratory periods, for which field work will be substituted frequently. Prerequisite: Geology 104. Field and laboratory techniques for preparation and interpretation of data from maps, cross-sections, air photos and statistical diagrams, with emphasis on structural interpretation of these data.

Miss Aitken

217. SEDIMENTATION

Second semester. Three credits. Two class periods and one 3-hour laboratory period; occasional field trips. Prerequisite: Geology 103 and consent of instructor. Origin, transport, deposition and diagenesis of terrestrial, transitional, and marine sediments.

Mr. Thomas

220. PRINCIPLES OF GEOMORPHOLOGY

Second semester. Three credits. Two class periods and one 2-hour laboratory period or occasional field trips. Prerequisite: Geology 104. The study of land forms with emphasis on their origin. Laboratory involves use of air photographs, topographic maps, and geologic maps.

Mr. Black

221. PLEISTOCENE AND GLACIAL GEOLOGY

Second semester. Three credits. Prerequisite: Geology 104 or consent of instructor. The characteristics and work of glaciers and the historical events of the Pleistocene epoch.

Mr. Black

229. ENGINEERING GEOLOGY

Second semester. Three credits. Prerequisite: Geology 103 or consent of instructor. Introduction to the relationship between geologic processes and principles, and engineering problems. Topics include mass wasting, earthquakes, subsidence, and engineering properties of geologic materials.

Mr. Holzer

234. INTRODUCTION TO GROUND WATER HYDROLOGY

First semester. Three credits. Two class periods and one 2-hour laboratory for which occasional field trips will be substituted. Prerequisite: open only with consent of instructor. Not open for credit to students who have passed Geology 233. Basic hydrologic principles with emphasis on hydrologic and geologic relationships, use of quantitative techniques. Mr. Holzer

344. ENVIRONMENTAL GEOLOGY

Second semester. Three credits. Two class periods and one 3-hour laboratory period. Open only with consent of instructor. Application of geology to environmental needs and problems. Includes investigations into the utilization of natural resources for land use planning, development, and management. Mr. Thomas

355. ADVANCED HYDROGEOLOGY

Second semester. Three credits. Two class periods and one 2-hour laboratory period. Prerequisite: Geology 209, 220 and 234. Utilization of pumping test flow nets and hydraulic principles; ground water in selected environments. Mr. Holzer

357. FIELD PROBLEMS IN HYDROGEOLOGY

Semester by arrangement. Hours and credits by arrangement. May be repeated once for credit. Prerequisite: Geology 355. Theoretical and practical problems associated with the occurrence and utilization of ground water. Mr. Holzer

GEOFYSICS

265. INTRODUCTION TO GEOPHYSICAL METHODS

Second semester. Three credits. Three class periods. Prerequisite: Physics 122 or Physics 134, and Mathematics 122; or consent of instructor. Application of seismic, gravity, magnetic, thermal and electrical methods for determining subsurface structures on land and at sea; interpretation of measurements. Mr. Dowling

OCEANOGRAPHY

272. MARINE SCIENCES I

First semester. Three credits. Prerequisite: Mathematics 122, Physics 122 or 134, Chemistry 128, or equivalent. Offered on the Storrs Campus. Properties of sea water; waves, tides, currents; advective and convective processes; instruments used in physical oceanography; world ocean circulation; structure and origin of the sea floor. Departmental Staff

273. MARINE SCIENCES II

Second semester. Three credits. Prerequisite: Oceanography 272 or consent of instructor. A continuation of Marine Sciences I. Chemical properties, processes, and instrumentations; life in the sea; environmental modification and control. Departmental Staff

370. PHYSICAL OCEANOGRAPHY

Second semester. Three credits. Prerequisite: Oceanography 272 and Mathematics 272 or consent of instructor. Offered at the Southeastern Branch Campus (Avery Point). Mechanics of fluids; boundary-layer phenomena, turbulence and mixing; wave motion and generation; heat budget; tides; ocean currents. Mr. Garvine

371. CHEMICAL OCEANOGRAPHY

Second semester. Three credits. Prerequisite: Oceanography 273 and Chemistry 264 or consent of instructor. Offered at the Southeastern Branch Campus (Avery Point). Composition of sea water; chlorinity, salinity, density, temperature, and acoustic velocity relationships; dissolved gases in sea water; carbon dioxide and nutrient systems; energy transfer among oceans, the atmosphere, and biota; instruments used in chemical oceanography. Mr. Fitzgerald

373. COASTAL ZONE PROCESSES

Second semester. Three credits. Prerequisite: Oceanography 273 or consent of instructor. Offered at the Southeastern Branch Campus (Avery Point). Nearshore dynamics: surface and internal waves in a shoaling regime; sediment erosion, transport and deposition; long-shore and rip currents; salt-wedge dynamics; estuarine mechanics. Mr. Bohlen

374. GEOPHYSICAL FLUID DYNAMICS

First semester. Three credits. Prerequisite: Applied Mechanics 334 or consent of instructor. Offered at the Southeastern Branch Campus (Avery Point). Theoretical aspects of fluid motion in a rotating frame with application to problems in physical oceanography and dynamic meteorology. Geostrophic flows; Ekman layers; Rossby waves; effects of fluid stratification. Mr. Garvine

375. THEORIES OF OCEAN CIRCULATION

First semester. Three credits. Prerequisite: Oceanography 370 or consent of instructor. Offered at the Southeastern Branch Campus (Avery Point). Wind driven circulation theories; frictional and inertial boundary regions; energy and vorticity considerations; stratification and bathymetry; thermohaline circulation; numerical models. Mr. Paskausky

GEOGRAPHY

151. INTRODUCTION TO PHYSICAL GEOGRAPHY

Either semester. Three credits. Three class periods. The physical elements in geography are considered systematically and regionally in their relation to one another and with respect to their significance to man and his activities. Departmental Staff

152. INTRODUCTION TO CULTURAL GEOGRAPHY

Either semester. Three credits. Three class periods. The cultural elements in geography are considered systematically and regionally in relation to habitat.

Departmental Staff

261. CLIMATOLOGY

First semester. Three credits. Two class periods and one 2-hour laboratory period. Atmospheric processes giving rise to climate. The regional climatology of the world is emphasized. One all-day field trip is required.

Mr. Rumney

271. POLITICAL GEOGRAPHY

First semester. Three credits. Three class periods. Prerequisite: Geography 151 or 152, or consent of instructor. Physical and cultural geographic factors considered in their interrelationship with political processes in the division and control of territory. Survey of contemporary geopolitical problems.

Mr. Langley

289. ADVANCED POLITICAL GEOGRAPHY

Second semester. Three credits. Three class periods. Prerequisite: Geography 271 and Political Science 121 or 131 or 132, or consent of instructor. Major concepts in political-geographical theory, such as regional characteristics of political behaviour, political problems of resource management, electoral geography, and urban political geography.

Mr. Langley

LAW, SCHOOL OF

659 or 660. LAND USE PLANNING AND CONTROL

Second semester. Two credits. Seminar, enrollment limited to 15. Prerequisite: Property II. A critical examination of the feasibility, wisdom, constitutionality, and efficacy of governmental activity with respect to the ownership and use of private or public land. Reference will be made to private attempts to control land use, but major emphasis will be upon public control. Investigation will be made of common law principles of public and private controls, such as the law of nuisance, and restrictive covenants; statutory regulation of land use such as subdivision control, zoning, official map regulation.

Mr. Walsh

LEGAL CONTROL OF THE ENVIRONMENT (No formal number designated as yet)  
Seminar. Second semester. Two credits. An interdisciplinary study of our environment exploring the ecological, social and economic relationships and the means by which the environment can be controlled. Topics will include and over-view of the interrelationships; an examination of current attacks on the environment from an institutional view-

point; a survey of specific environmental problems such as population (size and distribution), scarce resources (use, consumption, pollution of biosphere), human health and safety (food and water adulteration, product safety), and quality of life (privacy, aesthetics); legal and extra-legal methods of control; and inter-governmental problems of control. There may be opportunities for interested students to participate, under clinical supervision, in actual litigation, or other legal activity aimed at improving the environment.

Mr. Tait

### MECHANICAL ENGINEERING

#### 328-329. SALINE WATER CONVERSION

Both semesters. Three credits each semester. Three class periods. Prerequisite: Mechanical Engineering 321 and 323, which may be taken concurrently. Physical principles and mathematical analysis of various methods of desalination including distillation, freezing, and other physical and chemical processes which separate salts. Design considerations and economic analysis of the various methods. Current status of applications.

Departmental Staff

### METALLURGY

#### 343. CORROSION

First semester. Three credits. Three class periods. Mechanisms, characteristics and types of corrosion. Test methods and evaluation of corrosion resistance. Suitability of metals, ceramics, and organic materials in corrosive environments. Oxidation and other high temperature gas-metal reactions.

Mr. Greene

#### 345. THEORY OF ELECTROCHEMICAL PROCESSES

Second semester. Three credits. Three class periods. Theory and measurement of irreversible electrochemical processes at metal-electrolyte interfaces. Mixed potential theory. Mass transport phenomena. Apparatus, techniques, and interpretation of experimental measurements. Applications to metallographic etching, phase extraction and electroanalytical techniques. Scientific development of corrosion-resistant alloys.

Mr. Greene

#### 347. ADVANCED TOPICS IN ELECTROCHEMICAL PROCESSES

Either semester. Credits and hours by arrangement. Prerequisites: Metallurgy 345 or equivalent and consent of instructor. Current development of topics fundamental to specialized work in this field. Typical subjects treated are: double layer theory, thermodynamics and kinetics of electrochemical reactions, dynamic electrochemical measurements, mechanism of metallic passivity and electrochemical machining.

Mr. Greene

## PLANT SCIENCE

### AGRONOMY

#### 351. CROP ECOLOGY

Second semester. Three credits. Two class periods and one 2-hour laboratory period. Prerequisite: Plant Science 250, 254 and Biology 259. Alternate years; to be given in 1972-73. A study of environmental factors as they affect crop growth. Consideration is also given to the interactions between plant populations, both crop plants and weeds under field conditions. Mr. Peters

#### 375. SOIL PHYSICS

Second semester. Three credits. Two class periods and one 3-hour laboratory period. Open only with consent of instructor. Alternate years; to be given in 1972-73. The physical properties of soils and their relation to texture and structure; water movement, aeration, and temperature in soils with emphasis on their influence on plant growth. Mr. Wengel

#### 377. SOIL ANALYSIS

First semester. Three credits. One class period and two 3-hour laboratory periods. Prerequisite: Open only with consent of instructor. Alternate years; to be given in 1971-72. A study of the theory and practice of analytical methods used in the determination of nutrient and related elements of soil. Mr. Griffin

### CONSERVATION AND RESOURCE MANAGEMENT

#### 201. OPEN SPACE ECOLOGY

Second semester. Three credits. Two class periods and one 2-hour laboratory or discussion period. This course is designed primarily for in-service school teachers. Given at the Bartlett Arboretum, Stamford, Connecticut. Floral and faunal ecology and its application to instruction utilizing open space land areas. Mr. Duda

#### 220. FOREST RECREATION

First semester. Three credits. Three class periods. Introduction to the principles of land management for recreational purposes. Mr. Gratzner



223. FOREST RECREATION PLANNING

First semester. Three credits. One class period and one 4-hour laboratory period. Prerequisite: Agricultural Engineering 200, 219, Plant Science 220 or consent of instructor. Principles involving selection of forest recreational sites; planning, design, construction, and maintenance of structures and facilities. Field trips are required.

Mr. Gratzner

228. LAND AND WATER POLICY

First semester. Two credits. Two class periods. Public and private policies in land and water management.

Departmental Staff

FISHERIES MANAGEMENT

283. FIELD STUDIES IN LIMNOLOGY

First semester. Three credits. One 6-hour laboratory. Prerequisite: Plant Science 271. Team and individual research projects in limnology.

Mr. Whitworth, Mr. Widmer

390. ECOLOGY OF FISHES

Second semester. Six credits. Three class periods and three 2-hour laboratory periods. Open only with consent of instructor. Students who have taken Plant Science 291 may receive only three credits. An extended field trip is required. Interrelationships of fishes and their environments.

Mr. Whitworth

FORESTRY

204. FOREST ECOLOGY

First semester. Three credits. Two class periods and one 3-hour laboratory period. Prerequisite. Biology 110, Plant Science 203 or consent of instructor. A study of the basic factors and environmental interrelationships which affect the formation, growth, development and life of forest stands. The effects of forest trees and stands on the environment. Laboratory work requires trips to surrounding forest stands.

Mr. Ferrill

208. SILVICULTURE

Second semester. Three credits. Two class periods and one 3-hour laboratory period. Prerequisite: Plant Science 204. A study of the application of forest ecology. Analysis of the silvicultural systems practiced in the United States and abroad. Field trips to forest stands in the state away from campus are required.

Mr. Ferrill

## WILDLIFE MANAGEMENT

### 280. WILDLIFE ECOLOGY

Second semester. Three credits. Three class periods. Prerequisite: Biology 270 or Plant Science 204. Not open for credit to students who have passed Plant Science 273. A discussion of the principles upon which wildlife conservation is based. Mr. McDowell

### 380. ADVANCED WILDLIFE ECOLOGY

Second semester. Three credits. Hours by arrangement. Open only with consent of instructor. An intensive study of ecological investigations of wildlife carried out by natural resource agencies throughout North America. Field trips are required. Mr. McDowell

## POLITICAL SCIENCE

### 271-272. FORMATION OF PUBLIC POLICY IN THE UNITED STATES

Either semester. Three credits. Three class periods. Prerequisite: Political Science 173. The process by which the institutions of government formulate policy. The role of the executive, the legislature, and the administrative bureaucracy as they interact with each other and with groups and individuals. Mr. Shannon

### 343. THE POLITICAL PROCESS: LEGISLATURES AND LEGISLATION

First semester. Three credits. Three class periods. Open only with consent of instructor. Mr. Shannon

### 368. ADMINISTRATION IN DEVELOPING COUNTRIES

First semester. Three credits. Three class periods. Open only with consent of instructor. Strategies of implementing development in Latin America, Asia, and Africa; social, political, and cultural obstacles to administrative reform in developing nations; problems of technical assistance in overseas administration; theories of comparative administration. Mr. Tenzer

### 371. URBAN POLITICS

First semester. Three credits. Three class periods. Open only with consent of instructor. Analysis of urban political systems. Emphasis on both theoretical analysis of political structures and knowledge of urban problems and proposed solutions.

Departmental Staff

## Table II

### Participating Faculty and Their Individual Courses Relating to Water Resources

AITKEN, JANET M., Ph.D., Professor of Geology  
Geology 209. Field and Structural Geology

BLACK, ROBERT F., Ph.D., Professor of Geology  
Geology 220. Principles of Geomorphology  
Geology 221. Pleistocene and Glacial Geology

BLICK, DAVID J., Ph.D., Professor of Science Education  
Education 367. Problems in the Teaching of Natural Sciences

BOCK, PAUL, D.Eng., Professor of Hydrology and Water Resources  
Civil Engineering 267. Water Resources Engineering (See Mr. Posey)  
Civil Engineering 320. Investigations of Special Topics - Hydrologic  
Analysis, Introduction to Physical Hydrology, Rainfall-Runoff Relation-  
ships, Water Resources Planning  
Civil Engineering 383. Engineering Hydrology (See Mr. Posey)

BOHLEN, W. Frank, Ph.D., Assistant Professor of Geology  
Geology 373. Coastal Zone Processes

BOYCE, Byrl N., Ph.D., Associate Professor of Finance and Real Estate  
Finance 230. Principles of Real Estate (See Mr. Kinnard, Mr. Messner)

BRUSH, ALLAN H., Ph.D., Associate Professor of Biology  
Biological Sciences 420. Environmental Animal Physiology

BUCK, JOHN D., Ph.D., Assistant Professor of Biology  
Biological Sciences 236. Marine Microbiology  
Biological Sciences 396. Investigation of Special Topic - Marine  
Microbiology

CAMERON, J.A., Ph.D., Associate Professor of Biology  
Biological Sciences 233. Public Health Bacteriology

DAMMON, ANTONI W.H., Ph.D., Associate Professor of Biology  
Biological Sciences 463. Plant Ecology

DOWLING, JOHN J., Ph.D., Associate Professor of Geology  
Geology 265. Introduction to Geophysical Methods

DUDA, EDWARD J., Ph.D., Associate Professor of Plant Science, Bartlett Arboretum  
 Plant Science 201. Open Space Ecology

DYRLI, ODVAR E., Ed.D., Associate Professor of Education  
 Education 464. Materials and Meetings in the Teaching of Elementary School Science

FENG, SUNG YEN, Ph.D., Associate Professor of Biology  
 Biological Sciences 461. Pathobiology of Invertebrates

FERRILL, MITCHELL D., D.F., Associate Professor of Forest Ecology  
 Plant Science 204. Forest Ecology  
 Plant Science 208. Silviculture

FITZGERALD, WILLIAM F., Ph.D., Assistant Professor of Geology  
 Geology 371. Chemical Oceanography

FRANZ, DAVID R., Ph.D., Assistant Professor of Biology  
 Biological Sciences 275. Invertebrate Zoology  
 Biological Sciences 442. Malacology  
 Biological Sciences 443. Marine Ecology  
 Biological Sciences 469. Seminar - Marine Biology

GARVINE, RICHARD W., Ph.D., Assistant Professor of Mechanical Engineering  
 Geology 370. Physical Oceanography  
 Geology 374. Geophysical Fluid Dynamics

GRATZER, MIKLOS J., Ph.D., Assistant Professor of Forest Recreation  
 Plant Science 220. Forest Recreation  
 Plant Science 223. Forest Recreation Planning

GREENE, NORBERT D., Ph.D., Professor of Metallurgy  
 Metallurgy 343. Corrosion  
 Metallurgy 345. Theory of Electrochemical Processes  
 Metallurgy 347. Advanced Topics in Electrochemical Processes

GRIFFIN, GARY F., Ph.D., Associate Professor of Agronomy  
 Plant Science 377. Soil Analysis

HEALY, KENT A., Sc.D., Associate Professor of Civil Engineering  
 Civil Engineering 346. Ground Water Flow and Drainage Design

HELFGOTT, THEODORE, Ph.D., Assistant Professor of Civil Engineering  
 Civil Engineering 260. Water and Wastewater Treatment (See Mr. Widmer)  
 Civil Engineering 263. Environmental Engineering Fundamentals (See Mr. Laak, Mr. Widmer)

Civil Engineering 264. Sanitary Engineering Laboratory (See Mr. Laak, Mr. Widmer)  
Civil Engineering 265. Environmental Engineering Hydraulics (See Mr. Laak, Mr. Widmer)  
Civil Engineering 320. Investigation of Special Topics: Aquatic Engineering Chemistry, Industrial Wastes (See Mr. Sundstrom)  
Civil Engineering 391. Advanced Sanitary Engineering Laboratory (See Mr. Laak, Mr. Widmer)  
Civil Engineering 396-397. Advanced Water and Wastewater Treatment  
See Mr. Laak, Mr. Widmer)

HOLZER, THOMAS L., Ph.D., Assistant Professor of Geology

Geology 229. Engineering Geology  
Geology 234. Introduction to Ground Water Hydrology  
Geology 355. Advanced Hydrogeology  
Geology 357. Field Problems in Hydrogeology

KINNARD, WILLIAM N. Jr., Ph.D., S.R.A., M.A.I., Professor of Finance and Real Estate

Finance 230. Principles of Real Estate (See Mr. Boyce, Mr. Messner)

KLEI, HERBERT E. Jr., Ph.D., Associate Professor of Chemical Engineering

Chemical Engineering 280. Introduction to Environmental Rate Processes  
(See Mr. Sundstrom)  
Chemical Engineering 281. Environmental Chemical Engineering (See Mr. Sundstrom)  
Chemical Engineering 381. Transfer Processes in Environmental Systems  
(See Mr. Sundstrom)

KOLEGA, JOHN J., Ph.D., Associate Professor of Agricultural Engineering

Agricultural Engineering 227. Soil and Water Engineering  
Agricultural Engineering 235. Utilities for Agriculture and Environment

KOONTZ, HAROLD V., Ph.D., Associate Professor of Biology

Biological Sciences 409. Mineral Nutrition of Plants  
Biological Sciences 413. Application of Isotopic Tracers to Biological Research

LAAK, REIN, Ph.D., Assistant Professor of Civil Engineering

Civil Engineering 263. Environmental Engineering Fundamentals  
(See Mr. Helfgott, Mr. Widmer)  
Civil Engineering 264. Sanitary Engineering Laboratory (See Mr. Helfgott, Mr. Widmer)  
Civil Engineering 265. Environmental Engineering Hydraulics (See Mr. Helfgott, Mr. Widmer)  
Civil Engineering 268. Limnology (See Mr. Widmer)  
Civil Engineering 391. Advanced Sanitary Engineering Laboratory  
(See Mr. Helfgott, Mr. Widmer)  
Civil Engineering 392. Industrial Wastes (See Mr. Widmer)

Civil Engineering 393. Public Health Engineering (See Mr. Widmer)  
 Civil Engineering 394. Water Pollution I (See Mr. Widmer)  
 Civil Engineering 395. Water Pollution II (See Mr. Widmer)  
 Civil Engineering 396-397. Advanced Water and Wastewater Treatment  
 (See Mr. Helfgott, Mr. Widmer)

LANGLEY, ROBERT S., Ph.D., Associate Professor of Geography  
 Geography 271. Political Geography  
 Geography 289. Advanced Political Geography

LENT, JOSEPH M., M.Ed., Professor of Horticulture  
 Agriculture and Natural Resources 140. Man and His Environment IV  
 Plants (See Mr. Peters)

LEONARD, ROBERT L., Ph.D., Assistant Professor of Agricultural Economics  
 Agricultural Economics 350. Natural Resource Economics

LUND, WILLIAM A. Jr., Ph.D., Associate Professor of Biology  
 Biological Sciences 444. Marine Ichthyology

MASTERTON, WILLIAM L., Ph.D., Professor of Chemistry  
 Chemistry 355-356. Chemical Thermodynamics

McDOWELL, ROBERT D., Ph.D., Professor of Wildlife Ecology  
 Agriculture and Natural Resources 130. Man and His Environment III -  
 Natural Resources  
 Plant Science 280. Wildlife Ecology  
 Plant Science 380. Advanced Wildlife Ecology

MESSNER, STEPHEN D., D.B.A., Associate Professor of Finance and Real Estate  
 Finance 230. Principles of Real Estate (See Mr. Boyce, Mr. Kinnard)  
 Finance 235. Introduction to Regional Science  
 Finance 331. Regional Science and Urban Economic Studies

PAGE, JOANNA R., Ph.D., Assistant Professor of Biology  
 Biological Sciences 290. Introductory Phycology (See Mr. Trainor)  
 Biological Sciences 460. Advanced Phycology (See Mr. Trainor)

PASKAUSKY, DAVID F., Ph.D., Assistant Professor of Geology  
 Geology 375. Theories of Ocean Circulation

PETERS, ROBERT A., Ph.D., Professor of Agronomy  
 Agriculture and Natural Resources 140. Man and His Environment IV -  
 Plants (See Mr. Lent)  
 Plant Science 351. Crop Ecology

POSEY, CHESLEY J., M.S., Professor of Civil Engineering  
 Civil Engineering 267. Water Resources Engineering (See Mr. Bock)  
 Civil Engineering 338. Hydraulics of Open Channels (See Mr. Scottron)  
 Civil Engineering 383. Engineering Hydrology (See Mr. Bock)  
 Civil Engineering 385. Hydraulic Structures (See Mr. Scottron)  
 Civil Engineering 386. The Flood Problem

ROBERTS, ARTHUR D., Ed.D., Assistant Professor of Education  
 Education 311EN. Workshop in Education: Environmental Studies  
 Education 325. Foundations of Curriculum Development

RUMNEY, GEORGE R., Ph.D., Associate Professor of Geography  
 Geography 261. Climatology

SCOTT, NORMAN J., Ph.D., Assistant Professor of Biology  
 Biological Sciences 465. Herpetology

SCOTTRON, VICTOR E., D.Eng., Professor of Civil Engineering  
 Civil Engineering 338. Hydraulics of Open Channels (See Mr. Posey)  
 Civil Engineering 384. Hydraulic Machinery and Transients  
 Civil Engineering 385. Hydraulic Structures (See Mr. Posey)

SHANNON, W. WAYNE, Ph.D., Associate Professor of Political Science  
 Political Science 271-272. Formation of Public Policy in the United States  
 Political Science 343. The Political Process-Legislatures and Legislation

SLATER, JAMES A., Ph.D., Professor of Biology  
 Biological Sciences 459. Aquatic Insects

STREAMS, FREDERICK A., Ph.D., Associate Professor of Biology  
 Biological Sciences 450. Population and Community Ecology  
 Biological Sciences 451. Biological Control

SUNDSTROM, DONALD W., Ph.D., Professor of Chemical Engineering  
 Chemical Engineering 280. Introduction to Environmental Rate Processes  
 (See Mr. Klei)  
 Chemical Engineering 281. Environmental Chemical Engineering (See Mr. Klei)  
 Chemical Engineering 320. Investigation of Special Topic - Industrial  
 Wastes (See Mr. Helfgott)  
 Chemical Engineering 381. Transfer Processes in Environmental Systems  
 (See Mr. Klei)

TAIT, COLIN C., LL.B., Professor of Law  
 Legal Control of the Environment

TENZER, MORTON J., M.A., Acting Director, Institute of Urban Research  
 Political Science 368. Administration in Developing Countries

THOMAS, HUGO E., Ph.D., Associate Professor of Geology  
 Geology 217. Sedimentation  
 Geology 344. Environmental Geology

TRAINOR, FRANCIS R., Ph.D., Professor of Biology  
 Biological Sciences 290. Introductory Phycology (See Mrs. Page)  
 Biological Sciences 460. Advanced Phycology (See Mrs. Page)

WALSH, ROBERT E., LL.M., Professor of Law  
 659 or 660. Land Use Planning and Control

WASS, PHILMORE, Ph.D., Professor of Education  
 Education 326EE. Curriculum Laboratory: Economic Education  
 Workshop on Economics and Environmental Quality

WEINER, PAUL, Ph.D., Associate Professor of Economics  
 Economics 294. Government and Industry  
 Economics 381. Industry and Government  
 Economics 382. Topics in Public Policy Toward Industry

WENGELL, R. WILLIAM, Ph.D., Associate Professor of Agronomy  
 Plant Science 375. Soil Physics

WHITAKER, JAMES H., M.S.A., Associate Professor of Agricultural Engineering  
 Agricultural Engineering 246. Principles of Environmental Control

WHITWORTH, WALTER R., Ph.D., Associate Professor of Fisheries  
 Plant Science 283. Field Studies in Limnology (See Mr. Widmer)  
 Plant Science 390. Ecology of Fishes

WIDMER, WILBUR J., S.M., Associate Professor of Civil Engineering  
 Civil Engineering 260. Water and Wastewater Treatment (See Mr. Helfgott)  
 Civil Engineering 263. Environmental Engineering Fundamentals (See  
 Mr. Helfgott, Mr. Laak)  
 Civil Engineering 264. Sanitary Engineering Laboratory (See Mr. Helfgott,  
 Mr. Laak)  
 Civil Engineering 265. Environmental Engineering Hydraulics (See Mr.  
 Helfgott, Mr. Laak)  
 Civil Engineering 268. Limnology (See Mr. Laak)  
 Civil Engineering 294. Problems in Civil Engineering: Studies of Selected  
 Environmental Problems.



Civil Engineering 391. Advanced Sanitary Engineering Laboratory (See Mr. Helfgott, Mr. Laak)  
Civil Engineering 392. Industrial Wastes (See Mr. Laak)  
Civil Engineering 393. Public Health Engineering (See Mr. Laak)  
Civil Engineering 394. Water Pollution I (See Mr. Laak)  
Civil Engineering 395. Water Pollution II (See Mr. Laak)  
Civil Engineering 396-397. Advanced Water and Wastewater Treatment (See Mr. Helfgott, Mr. Laak)  
Civil Engineering 401. Ocean Engineering I  
Plant Science 283. Field Studies in Limnology (See Mr. Whitworth)

COURSES FOR WHICH INDIVIDUAL INSTRUCTORS ARE NOT LISTED

BIOLOGICAL SCIENCES

Biological Sciences 270. Evolution and the Environment

ECONOMICS

Economics 332. State and Local Finance

GEOLOGY AND GEOGRAPHY

Geology 272. Marine Sciences I  
Geology 273. Marine Sciences II  
Geography 151. Introduction to Physical Geography  
Geography 152. Introduction to Cultural Geography

MECHANICAL ENGINEERING

Mechanical Engineering 328-329. Saline Water Conversion

PLANT SCIENCE

Plant Science 228. Land and Water Policy

POLITICAL SCIENCE

Political Science 371. Urban Politics

**Table III**  
**Distribution of Water Resources Related Courses**  
**Within the Separate Colleges and Departments**

SCHOOL AND DEPARTMENT	NO. STAFF INVOLVED	TOTAL NO. COURSES GIVEN	NO. COURSES UNDERGRADUATE	NO. COURSES GRADUATE
<u>The College of Agriculture and Natural Resources</u>				
Agr. Econ.	1	1		1
Agr. Eng.	2	3	3	
Agr. and Nat. Resources	3	2	2	
Plant Science				
Agronomy	3	3		3
Conserv. and Resource Mgt.	2	4	4	
Fisheries Mgt.	1	2	1	1
Forestry	1	2	2	
Wildl. Mgt.	1	2	1	1
	<u>14</u>	<u>19</u>	<u>13</u>	<u>6</u>
<u>The College of Liberal Arts and Sciences</u>				
Biol. Sciences				
Microbiol.	2	3	2	1
Regulatory	2	3		3
System-Ecol.	9	14	3	11
Chemistry	1	1		1
Economics	1	4	1	3
Geol. and Geog.				
Geology	9	17	9	8
Geography	2	5	5	
Pol. Science	2	4	1	3
	<u>28</u>	<u>51</u>	<u>21</u>	<u>30</u>
<u>The School of Business Administration</u>				
Finance	3	3	2	1
<u>The School of Education</u>				
	4	5		5
<u>The School of Engineering</u>				
Chemical	2	4	2	2
Civil	7	21	7	14
Mechanical	1	1		1
Metallurgy	1	3		3
	<u>11</u>	<u>29</u>	<u>9</u>	<u>20</u>
<u>The School of Law</u>				
	2	2		2
Total	<u>62</u>	<u>109</u>	<u>45</u>	<u>64</u>

**Table IV**  
**Distribution of Water Resources Related Courses by**  
**Department and General Disciplinary Areas**

	BIOLOGICAL ASPECTS	ECOLOGICAL ASPECTS	NATURE OF WATER	WATER CYCLE	WATER SUPPLY AUGMENTATION AND CONSERVATION	WATER QUANTITY MGT. AND CONTROL	WATER QUALITY MGT. AND PROTECTION	WATER RESOURCES PLANNING	SOCIO-ECON- POLITICAL LEGAL ASPECTS	SOIL-PLANT- WATER RELA- TIONSHPIS	RESOURCES DATA	ENGINEERING WORKS
AGR. ECON.								350	350			
AGR. ENG.				227	235	227	235					246
AGR. & NAT. RES.					130				130,140	140		
BIOL. SCIENCE	233,236,270 275,413,420 451,459,465	236,270,290 442,443,444 450,451,459 460,461,463					233			409		
CHEM. ENG.							280,281,381					
CHEMISTRY				355,356								
CIVIL ENG.	260,264 268,394 395	263,268,294	401	267,383		265,267,346 383,386	260,263,264 391,392,393 394,395,396- 397	267,386	383,394 395			265,338 346,384 385,401
ECONOMICS									294,332 381,382			
EDUCATION									311EN,325 326EE,367 464			
FINANCE								230,235 331	230,235 331			
GEOL. & GEOG.			272,273 370,371 373,374 375	220,221 234,261 265,355 357,373 374,375		355,357		151,344	152,271 289		209,217 220	229
LAW								659, un- numbered course	659, un- numbered course			
MECH. ENG.					328-329							
METALLURGY												343,345,347
PLANT SCIENCE		201,204,208 280,283,380 390			201			228	220,223 228	204,351,375 377		
POL. SCIENCE									271-272 343,368 371			

NOTE: Courses may appear in more than one interest group.