
Graduate Studies Catalog

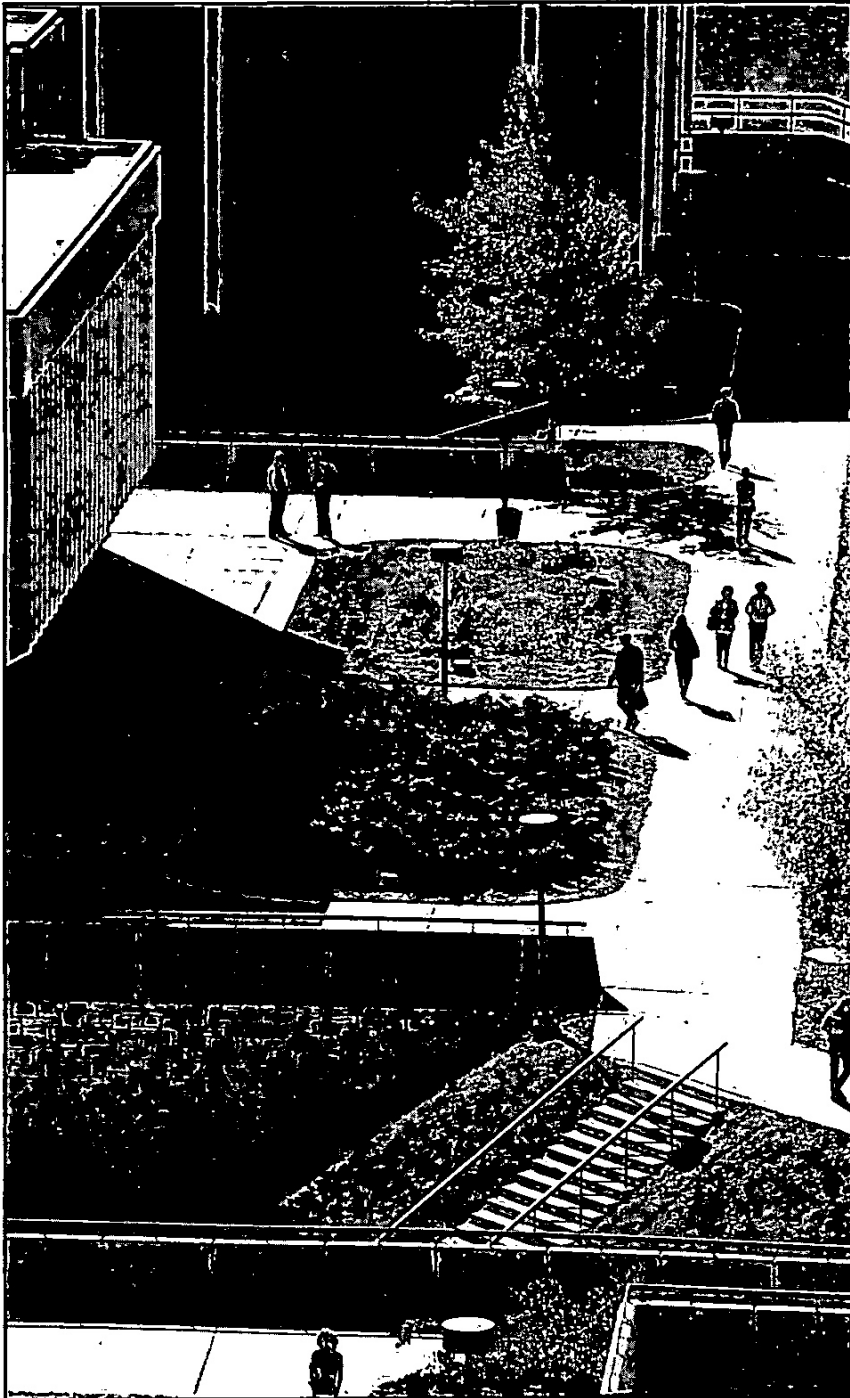
1984-86

University of Wisconsin-Green Bay

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Introduction



PHILOSOPHY

The University of Wisconsin-Green Bay offers challenges and opportunities to students who come with a variety of perspectives, expectations, and goals by combining strengths from two long-established traditions in higher education. The land grant tradition contributes emphasis on practical application of learning, experience, and career orientation. The liberal arts tradition provides rigorous learning in the academic disciplines, critical analysis of issues and values, and concern for the individual.

The combination of these two traditions at UWGB provides particularly strong preparation for the future. It goes beyond imparting today's information and helps students to prepare for the uncertainties of the future.

What is certain is that many career opportunities available now will disappear; within a decade there will be new occupations unheard of today. Employment trends show that most persons entering a career now can expect to change fields at least once during their lifetimes. Furthermore, facts learned today will become outdated with increasing frequency. The person most prepared for such a world will be the person with the broadest abilities and preparation—the person who is prepared to be a lifelong learner.

What enables the University to combine the best of two traditions is its distinctive academic plan which encourages interdisciplinary and cross-disciplinary studies. The interdisciplinary approach helps students to see relationships between traditional disciplines, apply resources from various disciplines to complex problems, relate what they are studying in class to their own educational and career objectives, and be prepared to work with persons whose specialties are different from their own.

HISTORY

The University of Wisconsin-Green Bay is one of the newest members of the University of Wisconsin System. With about 5000 undergraduate students and 250 graduate students, the University is large enough to offer a diversity of programs, and small enough to offer students an individualized educational experience. The University has over 160 full-time faculty, 91 percent of whom have earned a doctorate or its equivalent.

UWGB began in 1965 when the Wisconsin Legislature authorized a new campus of the University of Wisconsin System to serve the growing urban population in northeastern Wisconsin. Because it was new the University had an opportunity that few universities have—an opportunity for a new start.

UWGB's planners were able to study the state of higher education carefully and try to plan a university that had special meaning for the last portion of the twentieth century. This has given UWGB a singular position within the University of Wisconsin System; it is assigned a special mission to provide an educational program that is substantially different from that of any other UW System unit. A unique aspect of UWGB's mission is its organization around a central theme—that of the relationship between humans and their environments. The concern with the nature and effects of human relationships with the physical, social, cultural, biological, and aesthetic environments has gained national and international recognition for the University.

ACCREDITATION

UWGB is accredited by the North Central Association of Colleges and Schools for the bachelor's degree and for graduate work at the master's degree level. Accreditation is granted after a thorough examination of all aspects of a college or university by a team of faculty and administrators from other established institutions.

PROGRAMS OF STUDY

There are two groups of graduate programs available at the University of Wisconsin-Green Bay. First, there are the UWGB mas-

ter's degree programs, including the programs in Community Human Services, Environmental Administration, and Environmental Science.

Second, there are the cooperative programs in Education; these programs represent a cooperative effort between UWGB and either UW-Milwaukee (UW-M) or UW-Oshkosh (UW-O). The degree is granted by the institution cooperating with UWGB but all course work is normally completed at UWGB. The cooperative programs include Administrative Leadership (UW-M), Educational Psychology: Counseling (UW-M), Curriculum and Instruction (UW-M), and Reading (UW-O).

Each of these groups of programs is described in a separate section of this catalog.

ACADEMIC CALENDAR

The University operates on a 4-1-4 semester plan with the fall semester beginning in early September and ending in mid-December and the spring semester running from early February to the end of May. January interim is a month in which students can concentrate on a single course, project, or thesis work. An eight week summer session is also offered, along with special summer workshops and other academic programs of varying lengths.

STUDENTS

Students enrolled in the UWGB graduate program come from many states and several foreign countries. The largest number are state residents. Nearly all students in the cooperative programs in Education come from Green Bay and nearby communities.

Although some students attend the graduate program on a full-time basis, many students attend on a part-time basis, combining their studies with job or family responsibilities. Classes are generally scheduled to accommodate such part-time students.

International Students

The University is authorized under federal law to enroll non-immigrant alien students. Additional information about international student admission can be found in the section of this catalog on Admissions, Costs, Financial Aid.

Handicapped Students

UWGB has a continuing concern to insure equal and independent access for handicapped students to the full range of opportunities within the University. The campus is designed to present as few barriers as possible to handicapped students. All of the academic buildings are interconnected so that once inside, students can move between buildings without returning to the outside. A variety of services is available for students with handicaps. Persons needing special services should not hesitate to inquire.

CAMPUS

The University is situated on a beautifully landscaped 800 acre site located seven miles from the city center of Green Bay, Wisconsin. All of the University's academic buildings have been built since 1969.

The central landmark on campus is the eight-story Library Learning Center. Clusters of academic buildings are grouped like points of the compass on the north, south, and west around the Library Learning Center. The academic buildings and the Commons are connected outdoors by plazas and walkways and indoors by a system of concourses. The concourses and ramps and elevators in every building make the University particularly accessible to handicapped students and visitors.

The Phoenix Sports Center, east of the academic buildings, includes the gymnasium, swimming pool, handball courts, team rooms, and other indoor athletic facilities. Tennis courts, baseball and softball diamonds, and other playing fields are nearby. UWGB's soccer team plays its games at Phoenix Field on the campus' east side.

Student apartments are near the Commons and academic buildings and not far from the gym, swimming pool, and other sports facilities.

Three other buildings are used for student activities. Shorewood Club West has a rathskeller, fireplace lounge, and game rooms; Shorewood Club East contains cafeteria facilities and a large room that can be used for special events; and the Pro Shop houses student organizations. The Shorewood Clubs are headquarters for golfing in summer and cross-country skiing in winter.

Canoes, sailboats, and other recreational equipment are available for rent at the University's dock facility on the bay. Also on the bay is Community Park, a picnic and recreation area.

Since the primary buildings are clustered, much of the campus is left open for recreational use. The nine hole golf course is used in winter for cross-country skiing. Bicycle, cross-country skiing, and pedestrian paths connect all parts of the campus. The Cofrin Memorial Arboretum being developed around the periphery of the University campus consists of about 165 acres demonstrating several very different natural areas.

FACILITIES

Facilities used by the graduate program, in addition to general classroom and office space, include laboratories, the library, computer center, and a number of ancillary programs or research centers. Each of these is described below.

Laboratories

The University has devoted a significant portion of its resources to developing laboratory facilities to support the natural and social sciences. In addition to the instructional laboratories, the university has several special laboratory areas that are extensively used by graduate students, such as a water analysis laboratory, a resource recovery laboratory and two-person graduate research laboratories.

These laboratories are equipped with gas and liquid chromatographs, spectrophotometers (UV, IR, Visible), a nuclear magnetic resonance apparatus, X-ray energy-dispersive emission spectrometer, atomic absorption spectrometer, total carbon analyzer, autoanalyzer, and growth chambers. Recently two microcomputer systems were purchased, one for general laboratory use primarily by students in the natural sciences, and the other for computer mapping and spatial data analysis primarily to be used by students and faculty in the social sciences. The University recently acquired, by way of a donation, a commercial, high pressure briquetting machine, including ancillary equipment such as curing units, ovens, analytical and strength determination instruments, lab benches, etc. These materials are used in applying the Reclaform process for briquetting coke fines, anthracite fines and bituminous fines.

Library

The University places high priority on development of excellent library facilities. The library currently contains 260,000 catalogued books; 4,000 serials (magazines, newspapers, journals); 330,000 government documents; 44,000 maps and charts; and a number of special collections. Of particular importance to the master's program is the documents collection. The library is a depository for publications of the United States government, the Rand Corporation, the State of Wisconsin, the Canadian government, and the United Nations. In addition, the library purchases many publications of intergovernmental organizations, such as the United Nations Educational, Scientific and Cultural Organization (UNESCO), the Food and Agriculture Organization (FAO), the Organization for Economic Cooperation and Development (OECD), and the World Meteorological Organization (WMO). The library also participates in an excellent interlibrary loan system.

Computer

The computer system consists of a multi-processed Telefile T-85 and Xerox SIGMA-6 with two million bytes of memory. The system has two tridensity tape drives, two line printers, a card reader, and 1.5 billion bytes of disk storage. Most of the activity on the system comes from the 80 terminals located on campus. Twenty-five of these terminals are located in a workroom adjacent to the Computer Center. This room is open Monday through Friday from 8 a.m. to 11:30 p.m. and on Saturdays for student use. The terminal workroom also contains micro-computers for student and faculty use. During daytime hours and some nonprime hours, there are consultants and lab assistants in this room to help solve programming problems. Software capabilities include an Extended Data Management System (EDMS), graphics, and a variety of computer languages such as: BASIC, FORTRAN, COBOL, PASCAL, LISP, Assembly and others. Key punching and test-grading equipment are also available. Statistical analysis programs include BMDP, MINITAB, and SPSS.

Sea Grant Program

UWGB faculty members participate in the University of Wisconsin Sea Grant College Program. The Green Bay program involves public education work and research projects dealing with water quality, fisheries, coastal marshes, and human impact on the bay of Green Bay and the Great Lakes. Several University boats are available for research.

School Services Bureau

The School Services Bureau helps to meet specific educational needs in the larger community with the assistance of faculty and staff at the University of Wisconsin-Green Bay and in local school districts. It works to:

- identify resource persons and programs for classroom and other in-school activities.
- develop and conduct in-service programs.
- serve as a liaison to UWGB departments responsible for credit courses; non-credit conferences, workshops and seminars; and other educational activities.

- participate in cooperative study and research activities.
- arrange for consultant services.

Area Research Center

The Area Research Center of the UWGB Library is a depository for municipal and county manuscript records. These records provide a rich source of organizational information for students of history, genealogy, and local culture. This center is one of the most active units in the network established by the State Historical Society.

Richter Natural History Collections

In 1975 the University was honored by the generous gift of the extensive natural history collections of Carl H. Richter from Oconto, Wisconsin. The collection contains over 11,000 sets of bird eggs and is the 11th largest bird egg collection in North America. The Richter Collections also contain over 1,200 scientific skins and 100 mounted bird specimens. Most are from North America with a small series from Mexico and South America and a few species from Europe and New Zealand. Smaller collections of regional mammals, reptiles, and worldwide collections of Mollusks and Lepidoptera are also included.

Natural Areas

UWGB has received three natural areas as gifts, Toft Point (610 acres), Fuller Point (158.7 acres), and the Oconto Aquatic Marsh (7.3 acres), and has the use of two other areas, Point Sable and Lily Lake. In addition, natural areas are being developed on the Green Bay campus itself. In 1975, the University received a gift to develop a 200 acre public arboretum around the campus periphery as a memorial to John and Austin Cofrin.

Brown County Energy Conservation Center

The Energy Conservation Center is established by a grant from the Office of State Planning and Energy to provide a cooperative arrangement among several institutions for obtaining data on energy utilization in the community and to formulate possible energy conservation strategies.

Resource Recovery Facility

A laboratory in the Laboratory Sciences building is equipped for research on utilization of waste materials through a grant from the National Science Foundation. The laboratory contains analytical instrumentation including an atomic absorption spectrophotometer, an X-ray spectrometer, and a bomb calorimeter. The laboratory also houses a computer graphics terminal and an IBM device coupler to interface instruments to the campus computer. Among recent projects are: evaluating use of sewage sludge on corn crops in clay soils of Brown County; anaerobic digestion of farm and municipal wastes; and evaluation of energy-intensiveness of solid waste collecting alternatives.

Students interested in waste management may wish to arrange an internship with the Solid Waste Division of the Environmental Protection Agency in Washington, D.C., the Wisconsin Department of Natural Resources, the Brown County Solid Waste Authority, or one of the local or regional planning agencies.

Other Facilities

In addition to the above UWGB activities, two other agencies, the Bay Lake Regional Planning Agency and the U.S. Fish and Wildlife Service are housed on the UWGB campus. Students may wish to consider these agencies for possible internships or employment.

COMMUNITY

Green Bay is the site of Wisconsin's oldest European settlement. The French explorer Jean Nicolet sailed into Green Bay in 1634, fourteen years after Plymouth Rock, and landed not far from the present site of UWGB. Before the French arrived, the area was the home of the Potawatomi, Winnebago, Menominee, Sauk, Fox, and Chippewa Native American people.

The first Europeans were fur trappers and missionaries and they were followed by lumbermen. Green Bay's location at the mouth of the Fox River, connecting inland waterways with the Great Lakes, caused it to develop early as a trading center. Since the completion of the St. Lawrence Seaway in 1959, Green Bay has been an international port.

Today, Green Bay's 90,000 residents include descendants of the native American groups, French, English, Belgians, Poles, Germans, Scandinavians, Dutch, and Irish.

Green Bay is a manufacturing city and the county seat of Brown County. Major industries are paper products, metal working, and food processing. Green Bay is the major health care center for Northeast Wisconsin. A major interest of Green Bay residents is its professional football team, the Green Bay Packers.

Community resources include theater and music organizations, a good public library system, daily and weekly newspapers, three AM and three FM commercial radio stations as well as one state network public radio station, and five commercial television stations. Broadcasting from the campus are WGBW, an FM radio station, and WPNE-TV, public television station. Other schools in the community include St. Norbert College, a co-educational private Catholic college in suburban DePere; and Northeast Wisconsin Technical Institute.

Although Green Bay and much of the Fox River valley is industrial, most of Northeast Wisconsin is farmland devoted primarily to dairying. The landscape is gently rolling, marked by rounded ridges and hills shaped by the last great ice age which covered the region.

Green Bay is the gateway to two major areas of Wisconsin known for their natural beauty. Door County is the peninsula jutting into Lake Michigan which creates Green Bay. It is characterized by small farms, orchards, small villages with attractive harbors, and miles of shoreline. It has been a vacation area for a long time and is known for summer cultural activities. Northern Wisconsin is known for lakes and forests and the Lake Superior area.

Major cities are within easy traveling distance from Green Bay: Milwaukee is 114 miles south; Madison is 132 miles southwest; Chicago is 220 miles south, and Minneapolis-St. Paul is 285 miles west of Green Bay.

EFFECTIVE DATES

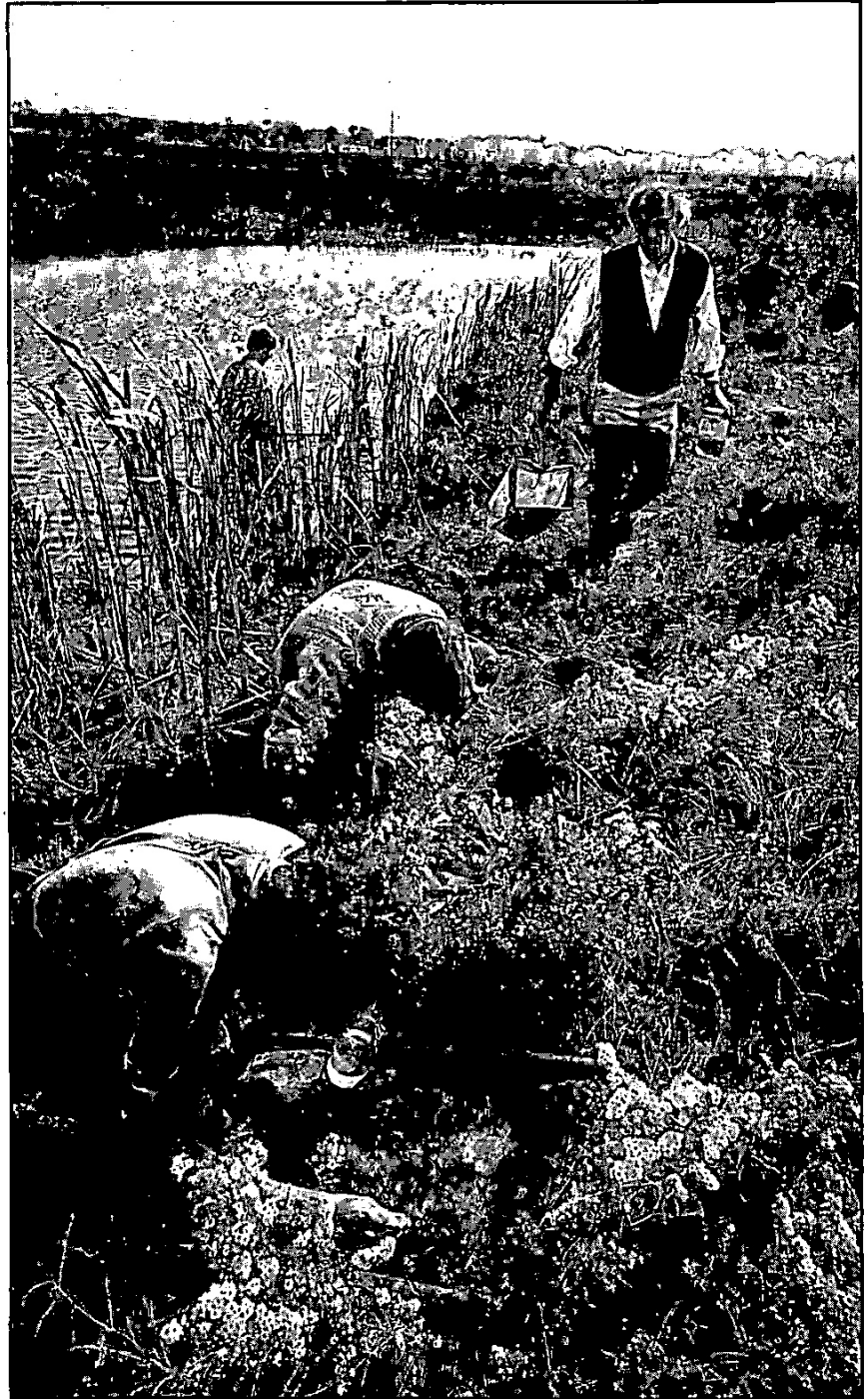
Effective dates for this catalog are September 1, 1984 through August 31, 1986.

All of the information contained in this catalog was accurate at the time of its printing. In the normal course of things, changes in some of this information can be expected to take place before the expiration date for the catalog. For example, fee and tuition schedules change annually by action of the University of Wisconsin System Regents and/or the Wisconsin Legislature. New courses can be expected to be added and some listed courses may be altered to remain current with needs.

Current fee and tuition information is distributed as far in advance of each session as possible through the *Timetable* or a fee information sheet, both published by the Registrar's Office. Fee information appears in the *Timetable* for each fall, spring, January or summer session if fees have been determined before that publication is printed. If the information is received too late for the *Timetable*, it appears on a fee information sheet which is available to every student or prospective student.

Course information for each session is published in the *Timetable*. Course changes which take place too late to be included are listed on addenda sheets given to students at the time of registration and are posted at the Registrar's Office.

Master's Degree Programs at UWGB



General Information

TOTAL CREDITS

A minimum of 30-36 credits, depending upon the chosen area of emphasis and specialization, is required for completion of the M.S. or M.A. degree.

GRADES

All courses and assigned studies are graded on a 4.0 scale (A = 4.0, B = 3.0, C = 2.0, D = 1.0, F = 0.0). Thesis credits or internship credits are given an in-progress (PR) grade each semester until the thesis or internship is formally accepted as completed at which time the grade will be changed to pass (P) or no credit (NC). The grade must be altered to a pass (P) prior to graduation.

Students are expected to maintain a cumulative grade point average of at least 3.0 and must achieve this gpa to obtain the master's degree. Students who fail to maintain this in their studies are subject to probation and/or drop as specified in the Graduate Academic Rules and Regulations.

ACADEMIC RULES AND REGULATIONS

The Graduate Academic Rules and Regulations are explained in a later section of this catalog. The *Timetable* contains information about registration procedures, fee information, listing of courses offered during that particular session, and other information.

TIME LIMIT

Matriculated graduate students have a limit of five years to complete all requirements for the M.S. or M.A. degree. This time period begins with the first day of the first term of enrollment with a classification of MS5 or MA5.

COURSE REQUIREMENTS

A program plan must be developed by the student and his/her graduate committee to satisfy the requirements of an area of emphasis and specialization with the remaining credits to be earned by selecting appropriate elective courses. An acceptable program plan must include:

Graduate Core Courses (12 credits or more)

Graduate core courses are the courses numbered at the 700 level (700-794). These courses are open only to graduate students.

Thesis Credits (6 credits)

Students are required to register for a minimum of 1 credit of thesis during the semester in which the thesis defense is to occur. A student may earn more than 6 credits for thesis; however, only 6 credits may be applied toward the degree requirements.

Assigned Study Courses

A typical program plan will also include assigned study courses. Assigned study courses provide students with opportunities to gain specialized knowledge, skills, and experiences. The assigned study courses may include dual-listed undergraduate/graduate courses (i.e., courses numbered at the 500 and 600 levels), selected upper level undergraduate courses, directed (independent) study, transfer credits, and internships. Each of these opportunities is described.

Undergraduate/Graduate courses (XXX-500 to XXX-595 and XXX-600 to XXX-695): Graduate students may register for specific undergraduate courses designated as undergraduate/graduate (UG/G) without submitting an assigned study card. These courses are identified by course numbers at the 500 and 600 levels.

For each of the following types of assigned study, a graduate assigned study card with approvals of the instructor and graduate adviser must be filed with the study list request. (Specific instructions and sample forms are printed in the *Timetable* for each term.)

Academic standards for awarding graduate credit in graduate/undergraduate courses exceed the standards for awarding undergraduate credit. The increase in standards may be in the form of additional academic work and/or an increase in grading standards.

Selected Undergraduate Courses (XXX-596 or XXX-696): Courses numbered at the 300 and 400 levels may be taken for graduate credit under certain circumstances and conditions. These conditions are: (1) The course must contribute to a coherent program of study; (2) The course may not be a foundation course; (3) Extra work is assigned or a superior performance is demanded for an equivalent grade, when compared to that of undergraduates in the same course.

Independent Study (002, 004, 006, 008, or 009-798): Independent study may be undertaken in the form of reading and research completed under the supervision of a member of the graduate faculty. This type of study should be undertaken only when an approved program plan is filed which includes the independent study course as an integral part of the individual program. Under normal circumstances a maximum of 6 credits of independent study may be applied toward the degree; however, with strong recommendation and rationale provided by the major professor, additional independent study credits may be allowed. To arrange for independent study courses students must prepare a proposal that includes a statement of objectives, a list of readings, and/or projects to be completed, and a statement of how the work is to be evaluated and graded. The proposal is filed in the Graduate Office and will be included in the student's file.

Internship (002, 004, 006, 008, or 009-797): An internship, usually undertaken outside of the University setting, must be an experience that provides a genuine training ground for the application of knowledge and understanding relevant to the student's area of study.

Furthermore, it must be preplanned and incorporate predetermined criteria for grading. A full description of internship activities, including methods of academic evaluation, must be submitted to the student's major professor and the director of graduate studies for inclusion in the student's file. The internship must be sponsored by a member of the graduate faculty, although day-to-day administration of the experience may be in the hands of a non-faculty supervisor. An internship may be required by some graduate tracks. Experience gained in permanent employment cannot normally be counted as an internship. The amount of credit acquired through an internship (normal maximum is 6 credits) is determined by the student's graduate committee subject to approval by the director of graduate studies. The graduate program will not award credit for prior experience. An internship, however valid, if undertaken prior to enrollment in the program, cannot carry credit toward the M.S. or M.A. degrees.

Seminars, Colloquia, and Other Experiences: From time to time, professors or groups of professors may organize courses, semi-formal seminars, colloquia, field trips, and so on, around some topic of mutual interest. Such experiences are comparable to directed study undertaken as a group rather than as an individual experience, and may carry graduate credit. Graduate students are encouraged to take the initiative in founding and developing such experiences.

The assigned study component of the program plan may also include a maximum of 12 graduate credits earned at other institutions prior to admission. Evaluation of transfer credits is the responsibility of the student's graduate faculty committee at the time that the program plan is approved. These credits are subject to the review of the director of graduate studies and the registrar.

Any additional courses to be taken at other institutions and to be included as credits toward the degree must receive prior approval from the student's major professor and the director of graduate studies.

ADMISSION WITH ADVANCED STANDING

All graduate coursework completed at UWGB or at other graduate schools prior to admission to the M.S. or M.A. degree program will be evaluated by the student's graduate faculty committee when the student's program plan is prepared. The total number of credits earned prior to matriculation into the degree program either at other institutions or as a graduate special student (GSP classification) at UWGB cannot exceed 15 credits. Of these, a maximum of 12 credits may be accepted from other institutions.

SPECIAL STUDENTS

Persons holding baccalaureate degrees or higher who wish to enroll in courses at UWGB but do not wish to pursue a graduate degree may enroll as special students. Graduate credit will be awarded provided that the student registers in graduate level courses as a graduate special student (GSP classification) and pays graduate fees. Credits for which no graduate fees were paid nor graduate credit awarded cannot be retroactively converted to graduate credits.

TRANSFER CREDIT POLICY

Transfer credit is defined as credit earned at an institution other than UWGB which is to be applied to master's degree requirements at UWGB. Acceptance of transfer credits is determined by a review of the credits by the office of the Registrar, and development of the program plan which includes the credits as part of a coherent program of study. Acceptance of the transfer credits is subject to review and approval by the director of graduate studies. Following are general guidelines for evaluating potential transfer credits:

- A maximum of 12 semester credits of graduate work may be accepted as transfer credits.
- A letter grade of A or B must be earned in each course transferred.
- The courses must contribute to a coherent program of study.

- The institution granting the credit must be regionally accredited at the master's level.

- The credits must be reasonably recent, usually earned within the five years prior to admission.

- Credits earned through extension courses offered or sponsored by universities outside of the state of Wisconsin will be subject to particular scrutiny.

- Credits earned under conditions (academic classification, time limitation, etc.) that make them unacceptable toward a degree at the institution where the credits were earned will not be accepted by UWGB.

USE OF SPECIAL PETITION

Requirements may be modified or adapted to take into account special educational or program needs of a student. A request to waive or modify an academic requirement of the graduate program is submitted on a special petition form. Special petition forms are available at the Academic Advising Office (SS 1930) or the Graduate Office (CC 335). If a change in a program requirement is being requested, the petition should include a statement from the major professor or graduate committee regarding the change.

THESIS REGISTRATION

Only students with a MS7 or MA7 classification are allowed to register for thesis writing credits (799). These classifications are assigned to a matriculated graduate student following acceptance of an approved graduate program plan and thesis proposal. Enrollment for thesis credits (799) may be for 1 to 6 credits per term and may be spread over several terms as appropriate to the time available to work on the thesis. A student must be registered for a minimum of 1 thesis credit during the final semester in which the thesis has been scheduled.

PROGRESS TOWARD THE DEGREE

This section is a guide to the necessary steps to be taken and forms to be completed from admission to completion of the program and final graduation.

Selection of a Graduate Committee

It is the student's major professor and graduate committee members who make final decisions about the acceptability of the program plan and quality of the student's thesis. Therefore, it is important that a student select a major professor and committee early in the program. For students in a specific area of emphasis, the coordinator or adviser for a specialization normally assists in this process. The committee is comprised of three graduate faculty members, approved by the appropriate track coordinator, one of whom is requested by the student to act as the major professor. Students are encouraged to ask a person from outside the University to join their committees.

The committee is responsible for supervising the student's program of study and should:

- Guide the student in appropriate selection of courses and assigned studies to ensure that the student is aware of all relevant material necessary to a complete understanding of the chosen field of study.
- Determine whether the student has accumulated and demonstrated sufficient ability to engage in the analytic process of problem solving.
- Make certain that the student's thesis project is consistent with the degree, confronts the interdisciplinary relationships of the subject area, and focuses on problem-solving methodology rather than narrowly approaching it within the framework of a conventional discipline.

If a change is desired in a committee, it is the student's responsibility to explain to the committee members why the change is desirable or necessary. If the change is acceptable to the outgoing and incoming professors, the student should then notify the Graduate Office.

Graduate Student Program Plan

The primary responsibility for ensuring that each student's program plan conforms to the requirements and regulations of the M.S./M.A. program rests with the student's graduate committee. The student meets

with his/her committee to discuss the program plan and to gain the committee's approval. The program plan is subject to final approval by the coordinator of the emphasis area and the director of graduate studies who may suggest amendments to ensure that the plan conforms to the overall philosophy and requirements of the M.S./M.A. program. The Graduate Office will contact the major professor and student if corrections are necessary for approval. *The program must be submitted to the Graduate Office prior to registration for courses for a second term as a degree-seeking student.* Changes in the plan may be made, but are subject to further review by the director of graduate studies. *All changes must be submitted to the Graduate Office so that the student's file remains current.*

Documents explaining why certain coursework is listed should accompany the program plan to the director of graduate studies, if appropriate.

These may include:

- Documents of transfer credits accepted by the student's committee.
- Petition for changes in graduate program requirements.

At this time, the student also files an intent to graduate form listing the earliest possible graduation date.

In preparing the program plan, the student should use the *Guidelines for Completing the Graduate Program Plan*, available in the Graduate Office.

Thesis Proposal

The thesis proposal is the formal document which provides an overview of the thesis project. The proposal includes an explanation of the research problem, issue, or situation to be addressed, its relevance to environmental studies, and the methods and resources to be used in developing the thesis.

In preparing the thesis proposal, the student should use *Guidelines for Preparing the Thesis Proposal*, a copy of which may be obtained in the Graduate Office.

After the student has completed 15 credits of coursework and prepared the thesis proposal for approval at a formal meeting with the major professor and committee, the completed request to present thesis proposal (form GR-1) should be sent to the Office of Graduate Studies. The form GR-1 should be submitted at least one week in advance of the meeting. If the thesis proposal is approved, the major professor and committee members sign form GR-2 and forward it, with a copy of the thesis proposal to the Office of Graduate Studies. It is the responsibility of the graduate committee to supervise and evaluate the thesis and assure completeness of all thesis materials.

The thesis is a formal document and must be prepared to conform to UWGB library requirements. General information about these requirements is available from the Office of Graduate Studies. *It is the student's responsibility to prepare and present the thesis in an acceptable format.* Several writers' guides and style manuals are commercially available.

Thesis Defense

The thesis defense is an open event attended by the candidate's graduate committee, and also open to the general public. The primary purpose of the defense is for the committee to ascertain whether the student has adequately understood and seriously attempted a solution of the thesis problem.

The GR-3 form is a request to schedule the thesis defense. This form must be completed and submitted to the Graduate Office at least one week in advance of the proposed date for the defense. Unless there are specific arrangements acceptable to all parties, the student should schedule the thesis defense during one of the academic terms, preferably during the fall, January, or spring terms.

Before attending the thesis defense, the candidate should obtain a GR-4 form from the Graduate Office. This form should be given to the major professor, whose responsibility it is to have the form completed, signed by the appropriate parties, and returned to the Graduate Office upon satisfactory completion of the thesis defense. A

dissenting signature must be accompanied by an explanation from the dissenting member. The director of graduate studies has the right to grant or withhold approval of the thesis defense pending resolution of such differences. A candidate is considered to have passed his or her thesis defense only after all issues have been resolved and the completed GR-4 has been returned to the office of Graduate Studies.

Deposition of the Thesis

Upon satisfactory conclusion of the thesis defense and an acceptable graduate summary from the Registrar's Office, the candidate is expected to supply two copies of the thesis, including two copies of all audio/visual aids where appropriate, to the Graduate Office. After appropriate signatures are obtained, two copies are forwarded with a binding fee (\$6 per copy at the time of printing, but subject to change), collected from the student, to the UWGB library as a permanent record of the student's scholarly or creative activity. If the student desires, additional copies may be bound at the same per copy fee payable to the Library. Diplomas are not awarded until all the requirements listed above have been met.

Commencement Deadlines

UWGB holds two commencements each year, at the end of the fall and spring semesters. For graduation in the fall, all requirements must be completed prior to December 1. For spring, all requirements must be completed by May 1. A request to graduate form must be completed and turned into the Registrar's Office prior to December 1 and May 1, respectively. Students who complete thesis work during the summer session and wish to participate in the commencement ceremony may participate in the following fall ceremony.

DEGREES

The degree awarded is determined by the student's program of study. A student who completes degree requirements specified by the Environmental Administration or Environmental Science emphases will receive the Master of Science (M.S.) in Environmental Studies. One who completes degree requirements specified by Community Human Services will receive the Master of Arts (M.A.) in Environmental Studies. The degree earned by a student with a personally-defined emphasis is determined by the student's graduate faculty committee.

COURSE DESCRIPTIONS

In the course descriptions in the catalog, commonly used abbreviation include:

cr	credits
P	prerequisite(s)
gr st	graduate standing
fr	freshman
soph	sophomore
jr	junior
sr	senior
cons inst	consent of instructor

Following each course is an indication of when it is offered, with abbreviations F—Fall, J—January, S—Spring, and SS—Summer Session. An "O" or "E" means that the course is offered in alternate years (odd or even), with the year being defined by the fall semester, for example, 1984-85 is an even year for all terms in that year. An asterisk (*) indicates that a course is given on an irregular basis, e.g., every third or fourth year. If no indication of schedule is indicated, then no fixed schedule has been established for the course. Schedules of graduate/undergraduate courses, are not listed in this book.

Admissions, Costs, Financial Aids

ADMISSION INFORMATION

Admission to a UWGB graduate degree program is a decision by the director of graduate studies and the faculty for the area of emphasis identified by the student on the application form. The decision is a judgment of the student's suitability, based on educational background and educational objectives, to pursue the M.S. or M.A. in Environmental Studies Degree, and an estimate of the applicant's potential to succeed in graduate degree work at the University of Wisconsin-Green Bay.

ADMISSION REQUIREMENTS

While UWGB has a basic admission policy for the M.S. or M.A. in Environmental Stud-

ies Degree, a philosophy of personalized admission assures that each applicant will be considered on an individual basis. Entry requirements for full admission include:

1. A baccalaureate degree from an accredited institution.
2. A 3.0 grade point average, measured on a 4.0 scale, for the final two years of study. Students from schools not using a grading system will be evaluated on an individual basis.
3. Specific prerequisites for entrance to the area of emphasis specified on the application.

Students who do not meet the 3.0 gpa requirement or have other deficiencies may

be admitted on a provisional basis. Provisionally admitted students who maintain a 3.0 gpa through 9 credits of graduate work subsequently will be fully admitted.

International students must be prepared to submit a minimum score of 500 on the Test of English as a Foreign Language (TOEFL). International student applicants must show official evidence of having financial resources which are adequate to provide for their educational expenses.

THE APPLICATION

An application form can be obtained on campus at the Office of Admissions or the Office of Graduate Studies. Forms will be mailed in response to telephone requests, (414) 465-2484, or written requests directed

to: Office of Graduate Studies, University of Wisconsin-Green Bay, 2420 Nicolet Dr., Green Bay, Wisconsin 54301-7001.

The following documents are required:

1. The application, completed in full.
2. A 200-300 word statement describing principal areas of academic interest, capabilities, experience, and reasons for pursuing the M.S. or M.A. in Environmental Studies Degree.
3. Official undergraduate and graduate transcripts from each previous college or university attended, sent directly to UWGB from these institutions.
4. Three letters of recommendation from responsible persons who can comment on academic abilities.

Under the requirements of the Buckley Amendment to the Family Educational Rights and Privacy Act of 1974, student files are open to their inspection except for letters of recommendation for which the right of inspection has been waived.

Other supporting documentation such as personal records of professional or community achievement may also be submitted.

THE ADMISSION PROCESS

The admission process is initiated by submitting the completed application form to the Office of Admissions. The Admissions Office notifies applicants whose files are incomplete. When the file is complete, the transcripts of previous undergraduate work and of all graduate courses are examined by the Office of the Registrar. Factors which may affect either admission to the graduate program or the acceptance of transfer credits are noted. The file is forwarded to the Office of Graduate Studies where the director of graduate studies, on the advice of the Admissions Committee for the area of emphasis specified on the admissions form, either admits the applicant to the graduate program and area of emphasis, provisionally admits the applicant, or denies admission. In the event that a student is denied admission, a reason for the denial will be provided along with an explanation of available options. Students denied admission may request reconsideration by writing to the director of graduate studies. The re-

quest should include a rationale for reconsideration. Applicants who have been denied admission may reapply after the lapse of one semester.

PERMIT INFORMATION

A permit to register is sent to each student upon his/her admission to the graduate program. The following information appears on the permit:

Student Number

The permanent student number of each applicant is his/her social security number or a University assigned identification number.

Classification and Year

The status of each student is designated by one of these abbreviations:

MS5/MA5 First semester M.S. or M.A. student without approved program plan.

MS6/MA6 M.S. or M.A. student with approved program plan. A degree seeking student may not register for classes in a second term without an approved program plan.

MS7/MA7 M.S. or M.A. student with approved program plan and approved thesis proposal. A student may not register for thesis credits without the MS7 or MA7 classification.

GSP Graduate Special student. This classification indicates that course work is being taken for graduate credit, however, the student is not participating in the UWGB degree program. A graduate special student who decides to pursue a UWGB graduate degree is required to submit an application form to enter the degree program. Often the credits earned as a graduate special student may be applied toward the M.S. or M.A. degree; however, there is no guarantee of this.

Students who entered the Master of Environmental Arts and Sciences (MEAS) degree program prior to Fall, 1981, will be classified ME5, ME6, or ME7, where the 5, 6, and 7 designations indicate progress toward the degree in the manner cited for the M.S. or M.A. classifications.

APPLICATION FEE

A non-refundable twenty dollar (\$20) application fee is required of all students who

apply for admission to the graduate program of the University of Wisconsin-Green Bay or any other graduate school within the University of Wisconsin System. The \$20 fee does not apply to students who wish to be admitted as special students (i.e. non-degree students). The fee does not apply to students seeking readmission after a period of inactivity or students seeking reconsideration for admission provided that reconsideration is sought within a period of two years, measured from the first day of that term for which the original admission was sought.

APPLICATION DEADLINE

Application, undergraduate transcripts, and letters of recommendation should be submitted no later than July 1 for entry into the M.S./M.A. degree program for the fall semester. The application deadline for the spring semester is December 1. Students who do not meet these deadlines have an opportunity to take courses as a graduate special student and apply for admission to the degree program for the next semester.

ACTIVE/INACTIVE STATUS

Students who have been admitted into the graduate program and have earned credits in the program, who subsequently earn no graduate credit at UWGB for four consecutive semesters without notifying the Graduate Studies Office by filing a request to leave, are considered inactive and must be formally readmitted before they can re-enroll. Inactive students who are required to reapply must meet admission standards in effect at the time of readmission and are expected to meet degree requirements in effect at that time. The \$20 application fee does not apply to students seeking readmission after a period of inactivity.

For students admitted into the program who do not enroll for classes, UWGB will keep their records for two years. If the student wishes to enroll after that two year period, he or she will have to reapply for admission and pay another \$20 application fee.

COSTS

Tuition and fees for full-time graduate study (9 credits or more) for the 1984-85 academic

year were \$752.50 per semester for residents of Wisconsin and \$2151 per semester for non-residents. Part-time students were assessed a fee of \$84.50 per credit for residents of Wisconsin and \$240.00 for non-residents. Fees and tuition are subject to change by action of the University of Wisconsin Board of Regents and the Wisconsin Legislature. The actual costs for each academic year are announced in advance in the *Timetable* or on fee information sheets and are available on request from the office of the Registrar.

RECIPROCIITY

A reciprocity agreement exists between Minnesota and Wisconsin. Minnesota students may pay Minnesota in-state tuition and fees to attend public universities in Wisconsin. Students must apply directly to the Minnesota Higher Education Coordinating Commission, Suite 901, Capitol Square, 550 Cedar Street, St. Paul, MN 55101.

GRADUATE ASSISTANTSHIPS

Graduate assistantships are available on a competitive basis. Graduate assistantships carried a stipend of \$5271 in 1984-85. Students receiving assistantships are expected to devote approximately 20 hours per week performing assigned duties. Typical duties are: to serve as a teaching assistant in a laboratory or discussion class; tutor students in the Skills Learning Program; assist in a staff office; or serve as a research assistant.

To be eligible for graduate assistantships students must:

- be fully admitted to the M.S. or M.A. degree program;
- be enrolled for a minimum of six credits of course work each semester and no less than 15 credits during the academic year.

Applications for a graduate assistantship should be filed before March 15 for the following September. Applications received after this date or at other times of the year

will be considered for unfilled assistantships or assistantships funded from grant monies. Students who wish information on availability of assistantships should inquire at the Graduate Office.

NON-RESIDENT TUITION WAIVERS

A limited number of non-resident tuition waivers are available on a competitive basis to recipients of graduate assistantships. International students may also apply for waiver of non-resident fees.

OTHER FINANCIAL AID

In addition to graduate assistantships, students may apply for several other grant or aid programs, such as National Direct Student Loans, Wisconsin Guaranteed Student Loans, or University work/study awards. Minority students may apply for Advanced Opportunity Grants or Wisconsin Indian Student Assistance Grants. For more information, contact the Financial Aids Office, (414) 465-2075.

Community Human Services

Coordinator: Robert A. Mendelsohn
(414) 465-2395

Purpose and Description

PURPOSE

The Community Human Services track trains persons to understand, modify, create, and use systems and organizations that deal with psychological and social needs and problems. These include, but are not limited to: welfare agencies, police departments, mental health organizations, health agencies, school systems, community and neighborhood organizations and units of industrial organizations that seek to help troubled employees. It also trains for interventions into the social and psychological problems that arise in any organization, profit or nonprofit.

The emphasis is on systems, whether they be formal organizations or informal associations of people. Recognition of ways in which environments and systems help

shape behavior facilitates the fullest understanding of individuals. Acting on and through systems and environments provides the most efficient and effective way of helping them. The conceptual approach to these systems is interdisciplinary: psychological, social, political, and economic.

Human service systems need individuals who understand the forces affecting human service delivery, who can help them become more responsive to clients, who can influence the beliefs and attitudes people have about human services, and who can deliver effective human services. The faculty believes that for these kinds of roles, skills in the following areas are necessary:

- planning and problem solving;
- research and evaluation;
- education of others (such as paraprofessionals);
- analyzing social systems, organizations, and delivery systems;
- consultation, helping, and communication;

- intervention, change, and community organization;
- self-awareness.

The track provides these skills through course work; a major intensive internship; and a research thesis. The focus of much of this training is in the community. Community professionals are actively involved in the program as faculty, supervisors, committee members, and advisers.

ADMISSION REQUIREMENTS

Admission to the Community Human Service track is determined by the applicant's previous academic record, letters of recommendation when needed, and a personal interview. The interview is scheduled after the completed application file is received by the coordinator. A GPA of 3.0 or better does not guarantee admission. Significant experience with a human service agency may be taken into account.

CAREER POSSIBILITIES

Community Human Services prepares students for positions in both traditional and innovative agencies. The educational combination of systems theory, interdisciplinary education, field experience, and intervention training offers an attractive combination for human service organizations.

A graduate might work:

- in a planning agency, seeking to evaluate, coordinate, and plan new human services;
- in an industrial organization, setting up human services programs for troubled and troubling persons (alcoholics, etc.);
- in a mental health center, establishing networks between secondary care givers and traditional mental health workers, planning new programs, counseling, consulting, and training; assisting in career planning;
- in schools, collaborating with personnel in early identification of troubled children or in setting up classrooms which improve the learning environment;
- in neighborhoods, organizing residents and increasing their sense of control and community;
- as administrators, fundraisers, and program developers in traditional and innovative agencies;
- in personnel departments;
- in private consulting practice.

Most students have had work experience in human service agencies as direct service providers, administrators, planners, or in other roles. They hold, or have held, positions in centers for the developmentally disabled, hospitals, mental hospitals and clinics, crisis intervention centers, police departments, residential treatment homes, planning agencies, neighborhood organizations, counseling centers, school systems, and others. Many intend to stay in their present work settings using the track to improve the quality of their work, increase their organization's effectiveness, move to new positions in their organization or attain credentials. Many attend graduate school part-time. Students also enter the track with a wide variety of educational backgrounds. The resulting diversity increases the track's resources and the sophistication of students and faculty. Community Human Service

students play a significant role in identifying learning needs and suggesting learning experiences to meet those needs.

DEGREE REQUIREMENTS

Students choose a major professor from the Community Human Services faculty upon admission to the program. They then form a graduate committee comprised of three graduate faculty members and add a community person who has expertise in the area of the student's specialization (see below). The committee and the student design the student's personal program of study and approve all major program decisions.

The 36 credits of the track are divided into core and specialization courses and experiences. The core courses (15 credits) develop the common substance of the program—the values, skills and knowledge the program expects all students to possess. The emphasis is on basic concepts, field and research skills, and change methodologies. The remaining 21 credits are devoted to the student's specialization: The individualized specialization permits each student to draw upon his/her unique life experiences, attain specific personal goals, articulate prior experience into new career potential and change career direction, if desired. This individually tailored aspect of the program is a special feature of the Community Human Services track and the University as a whole. The aforementioned 21 credits include the internship and thesis which are the central feature of the specialization and occur in field settings. Certain specializations are well defined and are associated with other academic programs: gerontology with the Human Development program; administration and management with the Environmental Administration program and Business Administration program; education with the Education program. Other specializations are inter-unit including a specialization in research evaluation based on course offerings from several units. Students may also create their own specializations. The main requirement is that the courses and experiences selected form a coherent focus and be approved by the student's graduate committee.

Core Required Courses

- 009-737 Community Human Services
- 009-739 Behavioral Research Strategies
- 009-769 Seminar in Community Human Services
- 009-702 Principles and Practices of Consultation
- 009-703 Community Organization and Planning

Electives

- 009-736 The Concept of Change and Social Intervention
- 009-765 Evaluating Social Programs
- 009-726 Skills Training for Coping in the Professional World

Other electives as decided upon by the student and adviser.

INTERNSHIPS (1-6 credits)

The internship is a variable credit, supervised placement in a community setting linked to the delivery of human services and to the student's specialization. Internships are available only to students who have been admitted to degree candidacy. Internship sites have included mental health centers, Native American programs, counseling agencies, planning organizations, health agencies, police departments, and centers for the developmentally disabled. The internship reveals the full scope of the problems, opportunities and drama of a system in action. It allows the student to develop skills and test his or her abilities.

Students must spend sufficient time in their internship system to carry out an analysis of it. Thus, the internship must be of sufficient duration for the student to have extensive interaction with a variety of persons in the organization. This will permit the development of a network of expanding contact and the perception of the development and flow of activities. Taking these factors into consideration, therefore, the internship usually lasts between six months and one year on a part-time basis.

The internship is evaluated on the basis of a written report that demonstrates an understanding of the characteristics of the system, informed by theory. System characteristics which may be included in this analysis are:

role, power, reward structure, values, norms, beliefs, communication, and interaction with other systems. The internship is also frequently used to help the student develop specific skills such as counseling techniques, research design, administration, and so on.

Employed students may use their work setting for their internship site if approved by the student's graduate committee. However, regular duties do not qualify for the internship. New programs that arise from the work setting, those that connect the work setting to other settings, research projects, and new training programs are several acceptable internship possibilities. For example, a police officer might design referral procedures between the police department and counseling agencies, monitor their effectiveness, and evaluate the results.

THESIS (6 credits)

The thesis is the culmination of the student's research of a problem area relevant to his or her program of study and a demonstration of scholarship, writing ability, and systematic thinking. Applied research in the community is encouraged, often in conjunction with a community agency, for example, in the agency where the internship was completed. The student may choose one of two thesis types. The first is the traditional one of collecting new information and its subsequent analysis in the form of a research report with a prior problem statement and literature review. Previous theses of this type have included a study of the effectiveness of counseling agencies, an intervention designed to increase the effectiveness of a board of directors, the prospects for developing services for the frail elderly and the determinants of funding decisions of mental health boards. The second type of thesis consists of the actual development and implementation of a new program within the internship site. This too includes a prior problem statement and literature review.

Faculty

Baker, Bela O., Associate Professor of Social Change and Development (psychology); B.A. (1950), San Jose; Ph.D. (1961), UC-Berkeley.

Personality assessment, especially biographical and case study techniques. Program evaluation methods. Innovation in higher education. Cultural and individual variations in temporal perspectives. Social psychology, social change, motivation and thinking.

Day, H. Jack, Professor of Science and Environmental Change; B.S. (1952), M.S. (1953), Ph.D. (1963), UW-Madison.

Water resources, fluid mechanics, hydrology and related applications of engineering to society and technology. Regional water quality and associated land management and flood plain management. Resource management. Interaction of physical and psychosocial forces.

Galaty, David H., Associate Professor of Humanistic Studies; B.A., Trinity; Ph.D. (1971), Johns Hopkins.

History of science and technology, history of impacts on environments, human values, values implications of social services.

Harris, John H., Associate Professor of Managerial Systems; B.B.A., UW-Madison; M.B.A., American; D.B.A., (1981), Kentucky. Management, organizational behavior, performance appraisal, organizational theory.

Lindstrom, Andrea L., Assistant Professor of Human Development; B.A., UCLA; M.A., California State; Ph.D. (1980), UC-Santa Barbara.

Counseling and psychotherapy, abnormal behavior, tests and measurements, aging, sex role development.

Littig, David M., Associate Professor of Urban Studies (political science), and Co-Director of Local Government Systems Program; B.A. (1960), Indiana; M.A., Ph.D. (1974), UW-Madison.

Urban politics and public policy—neighborhood government and social welfare policy. Analysis of public policy. Impact of federalism on public policy outcomes.

U.S. mass transportation policy. Comparative study of urban policy in advanced industrial nations. Current research on intellectual and ethical development in the college years. Latin American politics.

Mendelsohn, Robert A., Associate Professor of Social Services (psychology) and Coordinator, Community Human Services; B.A. (1954), Cornell; M.A. (1958), Ph.D. (1963), Michigan.

Community psychology and community mental health; social psychology of human service delivery; social psychology; social planning; social problems; police-social scientist interaction.

Pollis, Nicholas P., Professor of Urban Studies (psychology); B.A. (1951), Johns Hopkins; Ph.D. (1964), Oklahoma.

Small group formation and functioning, basic theory and cross-cultural applications: Social judgment and attitude change as related to specific social issues. Collective behavior as mediated by behavior settings and normative factors. Analysis of organizational structures with emphasis on organization development. Socio-cultural aspects of urban stress. The relationship of conformity and compliance to social change. Altruism and helping behavior.

Rodeheaver, Dean, Assistant Professor of Human Development, B.A., M.A., Ph.D. (1983), West Virginia.

Aging, adult development, social and personality development, gender roles.

Troyer, Michael D., Associate Professor of Managerial Systems; B.A. (1966), Cornell; M.A. (1971), Ph.D. (1975), Duke.

Health economics, administration and financial management of nonprofit and human service organizations, health care systems and the delivery of health services, health planning, ethics and social responsibility for business and human services.

White, Rolfe E., Associate Professor of Social Services, B.A., M.S.W., Case Western Reserve; Ph.D. (1978), Lawrence.

Social work, counseling methods, evaluation of practice, development of self-help support systems.

Additional ad hoc faculty support provided by:

Kelley, Nancy E., M.S.W.; A.C.S.W., social work.

Nerad, Daniel, M.S.W., social work, Green Bay Public Schools.

Schwally, Linda, M.E.A.S., Director of Human Development, American Foundation of Religion and Psychiatry.

Course Descriptions

GRADUATE ONLY (700-LEVEL) COURSES

009-702 Principles and Practices of Consultation 3 cr.
Examines the kinds of consultation most in use with special emphasis on process consultation. Stages of carrying out a consultation, personal qualities and skills desirable in a consultant, and methods of determining consultation outcomes are discussed. The first part of the course focuses on the literature and includes role plays and guest lectures. Students then plan and carry out an actual consultation with class activity focused on facilitating these field experiences and conferring with the consultants. A final report concludes the course. P: gr st.

009-703 Community Organization and Planning 3 cr.
Reviews and examines community organization and social planning and the problems inherent in its practice. A community problem-solving model aimed at social planning and community organization is examined including: setting priorities in a community; doing research studies, the politics of planning, developing and implementing plans of action, the strategy and tactics of social action, goal analysis, decision-making analysis, feedback mechanisms and planning management. P: gr st.

009-726 Skills Training for Coping in the Professional World 3 cr.

This course assists the student in developing skills in communication, assertion, time management, emotional awareness, and rational management. It will also help the student be more effective in the interaction between external aspects and the self, using the self in more creative ways. In addition, the class will discuss and work with a method to analyze the students' skills and experiences with a focus on developing job descriptions that maximally use the students' special interests, talents, and strengths.

009-736 The Concept of Change and Social Intervention 3 cr.

General concepts of planned change as they apply to various efforts as change agents. This course, which uses general systems theory as the theoretical background, concerns itself more with specific methodologies for defining problems and the various skills, techniques and processes involved in intervening. A course participant should learn skills useful in intervening in any size system whether the client is an individual, family, or societal institution. Specific attention will be paid to the role of the "change agent" and how this person functions given limited resources. P: gr st.

009-737 Community Human Services 3 cr.

The insights and methods of many fields of study are used to provide an integrated picture of the nature and functioning of human service agencies and programs. It examines them through the concerns that shaped them—e.g., mental health, social problems, community development—and through organizational, ecological and general systems theory. Specific topics include the community mental health movement, crisis theory, social movements; economic and political forces affecting human service delivery, planning, and methods in intervention to increase program effectiveness. The course is taught by members of the Community Human Services emphasis area. P: gr st.

009-739 Behavioral Research Strategies 3 cr.

Conceptual and procedural issues in research. This is a laboratory course in research methods and design. This course provides knowledge and skills to collect adequate, accurate, and useful information about behavioral science questions. Although issues of control and experimental design are a central concern, the concepts, techniques, and skills learned in this course are applied to a variety of research situations. P: introductory statistics.

009-765 Evaluating Social Programs 3 cr.

Since the early 1960's there has been a growing trend to ask programs providing social or educational services to provide evidence that they are effective. A new field—evaluation research—has emerged in response to this trend by adapting the methods of social research to the problem of assessing program quality. This course provides an introduction to evaluation research. It emphasizes such issues as identifying program goals, choosing outcome measures, defining appropriate samples, data collection strategies; and evaluating and disseminating results. Political, administrative, and ethical problems of evaluation are considered throughout. Course procedure is informal with much of the class time spent in developing and discussing model evaluation studies. P: introductory statistics.

009-769 Seminar in Community Human Services 3 cr.

Primarily for students enrolled in the Community Human Services program, this seminar logically precedes the internship. Students study aspects of organizational functioning intensively for the first third of the course, leading to an all day workshop on organizational structure and function. The remainder of the course is spent doing a field study of a specific human service organization, culminating in a written class organizational analysis. The analysis is guided by one or more organizational theories. Program faculty and practicing human services personnel will attend many of the class sessions. P: 009-737 and enrollment in Community Human Services track or cons inst.

009-795 Special Topics

This course number is used to designate courses and seminars offered by graduate faculty in response to special demand or on an experimental basis. Topics may be chosen to address current issues of general concern, special interests of student groups or faculty members, or special resources of visiting faculty. The title of the special topics course as announced in the *Timetable* will appear on transcripts of the students who enroll. Credits earned in the 795 special topics courses may not be applied toward the graduate core requirement.

009-797 Internship 1-6 cr.

Supervised work experience in an appropriate program or agency. Students may enroll for internship credits only when such activity is included in the approved program plan and all required course work is satisfactorily completed. Students write a contract with their major professor and complete a major report on the organization. P: Student classification of MS6, MA6, ME6 or higher.

009-798 Directed Study 1-3 cr.

Reading and research under the supervision of a member of the graduate faculty. Directed study credits may only be earned when this activity is included as part of an approved program plan. P: Student classification of MS6, MA6, ME6 or higher.

009-799 Thesis 1-6 cr.

Research and preparation of thesis document. Enrollment may be for 1-6 credits per term. Although more than six thesis credits may be earned, a maximum of six credits can be applied toward a degree. P: Student classification of MS7, MA7, or ME7.

UNDERGRADUATE/GRADUATE (500-699 LEVEL) COURSES

302-610 Introduction to Education of Exceptional Children 3 cr.

A survey of the many types and/or kinds of exceptionalities that are found in the school population, the needs of such children and some methodologies towards meeting the individual needs of these exceptionalities (and others). Provides information that will enable the teacher or parent to recognize and understand the gross exceptionalities that exist, along with many subtleties that are unique and deserving specific attention and methodologies in the educational population and general population of children.

302-615 Counseling Role of the Classroom Teacher 3 cr.

Provides teachers and future teachers with the knowledge of specific counseling and guidance skills necessary to enhance their counseling effectiveness. The course will focus on becoming more aware of these skills and how one best implements them in the classroom.

302-662 The Adult Learner 3 cr.

Helps the student (1) acquire knowledge of various physiological, psychological, and sociological factors relevant to adult development throughout the life span and of their implications for learning; (2) develop an understanding of the key elements involved in the teaching-learning process; (3) develop an understanding of some of the important research in adult learning; and (4) develop a personalized learning theory.

481-620 Tests and Measurements 3 cr.

Methods and problems of measuring human characteristics, including determination of validity, reliability, and interpretive schemas for such measures. Examination of selected tests in intelligence, achievement, attitudes, interests and personality. Typical uses of tests and methods for reviewing tests.

481-629 Theories of Personality 3 cr.

Major ideas and systematic statements about the organization, function, change, and development of human personality. Readings acquaint the student with a variety of personality theorists such as Freud, Adler, Jung, Sullivan, Erikson, Dollard and Miller, Skinner, and selected existentialists.

481-631 Cognitive Development 3 cr.

The development of cognitive functioning from infancy to adulthood. The stimulus-response, cognitive, and psychoanalytic approaches to intellectual development are analyzed. Current issues and research are critically examined.

481-635 Abnormal Behavior 3 cr.

Deviations from normal intellectual, physical, emotional, and social development (e.g. retardation; psychopathology, emotional problems) throughout the life cycle are covered. Included study of accelerated development, delayed development, and disturbances in development. Biological and environmental origins of deviations are examined.

481-636 Counseling with Children and Adolescents 3 cr.
Introduction to theories and principles of counseling as applied to children and adolescents. Surveys different theoretical approaches and techniques for helping children and adolescents cope with the developmental deviations introduced in 481-435.

481-637 Counseling with Adults and the Aged 3 cr.
Introduction to theories and principles of counseling as applied to adults and the aged. Surveys different theoretical approaches and techniques for helping adults and the elderly cope with the developmental problems of the latter half of the life cycle introduced in 481-435.

481-639 The Social, Behavioral and Biological Implications of Aging 3 cr.
An interdisciplinary overview of older Americans, with emphasis upon creating for them an optimum environment. Physiological change, problems of meeting health care needs, social status, and psychological change, with emphasis upon individual difference. Historical and anticipated future changes in the older population will be discussed.

575-585 Management of the Nonprofit Organization 3 cr.
The operation and management of organizations that operate within our society for purposes other than generating profit for owners or shareholders. Models such as the hospital and the university focus on the operational principles, optimizing criteria, and management control techniques characteristic of such institutions. In addition to examining the areas of accounting, finance, marketing, organization, and personnel, the nonprofit organization is discussed in terms of its social responsibility and the political and economic conditions in which it operates. Case studies used in seminar format.

575-662 Seminar in Personnel Management 3 cr.
Provides a foundation through discussion of personnel problems and experiences which can be translated into developing corporate personnel policies. Case studies related to urban, cultural and legal realities along with making decisions which affect the administration and development of personnel policies are included.

820-615 Organizational Psychology 3 cr.
Relation between social structure and psychological behavior, problems of bureaucracy, leadership styles, communication networks, decision-making processes, and group productivity.

820-638 Group Dynamics 3 cr.
Psychological principles as they apply to the individual in social groups, experimental analyses of group formation, maintenance of morale, and productivity.

Environmental Administration

Coordinator: Daniel J. Alesch
(414) 465-2363 or 2767

Objectives and Description

A principal objective of the graduate track in Environmental Administration is to prepare highly skilled and imaginative individuals for middle-management and policy-making positions in government, nonprofit organizations, and the private sector. For persons with such career objectives, the Environmental Administration track, consisting of specializations in administrative sciences, policy analysis, and systems planning and analysis, is most appropriate. It can prepare individuals to:

- identify and analyze policy-relevant problems of major importance;
- design, evaluate, and implement strategies and programs for addressing such problems; and
- design, manage, and evaluate project teams and organizational systems concerned with such problems, policies, programs, and strategies.

The **administrative sciences** specialization is intended for students who wish to pursue primarily management careers in public or private organizations. Students complete a set of courses designed to meet criteria published by the National Association of Schools of Public Affairs and Administration. A student choosing this specialization will be able to complete a set of courses generally typical of those which lead to an M.S. in Administrative Sciences at other institutions.

The **policy analysis** specialization is for students who want to focus their graduate studies on substantive policy issues associated with contemporary public problem-solving activities, on characteristics of the public policy system, and on methods of policy analysis.

The **systems planning and analysis** specialization is for quantitatively oriented students who wish to engage in sophisticated, professional systems planning and analysis, making use of the perspectives and tools of the contemporary fields of management and policy sciences.

Courses of study within the Environmental Administration track are intended to meet the needs of several categories of potential students:

- recent graduates in the social, physical, and natural sciences who lack adequate preparation for entry into professional-level administrative, managerial, planning, and policy analysis positions;
- full-time professional employees of government, regulatory agencies, nonprofit organizations, or business and industrial organizations who live within commuting distance of the campus and who must pursue their graduate studies on a part-time basis; and
- students with undergraduate or graduate degrees in the sciences who wish to develop skills and understanding in managing organizations involved in environmental analysis or regulation.

PREREQUISITES

Students who are adequately prepared when they enter the program may earn the degree by satisfactorily completing 30 credits of coursework and independent study and a 6-credit thesis. Students who lack appropriate prerequisites or technical knowledge will have expanded requirements.

The three specializations within the Environmental Administration track share a common core of prerequisites that must be met before the student engages in significant additional study.

Each student's prior academic and work experience is evaluated when they enter the Environmental Administration track. Students are expected to have knowledge equivalent to that obtained in lower division undergraduate courses in: American government and political science, statistics, economics, and computer science (or a computer language). They also are expected to have adequate writing skills. Lack of appropriate background in any of these areas may be remedied by taking relevant undergraduate courses (such courses do not count as part of the master's degree program) or by demonstrating competency in the subject areas to the faculty.

DEGREE REQUIREMENTS

Students who are adequately prepared when admitted to the track may earn the degree by satisfactorily completing 30 credits of coursework and independent study and a 6-credit thesis. As part of the 30 credits of coursework, each student must complete, at a minimum, 3 credits of research methods. Each of the three specializations requires at least an 18 credit sequence of courses and additional credits of electives. Each also requires a 6-credit master's thesis. The total track requirement is 36 credits including the thesis. Detailed requirements are described below.

TRACK REQUIREMENTS

Coursework: Each student will complete a core of three courses (9 credits) and the coursework required for one of the specializations. The required core courses should be taken as early as possible in a student's coursework. The core consists of:
002-753 Administrative Theory and Behavior
002-760 Research Design for Administrative and Policy Sciences
350-620 Decision Theory and Methods

Comprehensive evaluation: Following completion of at least one semester's work and prior to being authorized by their individual graduate committees to submit a master's thesis proposal, students will undergo a comprehensive evaluation by the faculty. The purpose is to determine whether students are prepared adequately to advance to master's project status. The evaluation is based upon the student's demonstrated performance in coursework.

Each student is informed of his or her evaluation in writing by the track coordinator. Students whose evaluations are satisfactory and who are at appropriate points in their programs may submit a thesis proposal. Some students may be required to take additional work before continuing with the thesis. In unusual cases, the track coordinator may recommend to the director of graduate studies that the student be terminated from the program.

Master's thesis: Each degree candidate must complete a 6-credit master's thesis to integrate and focus his or her graduate studies and to demonstrate mastery of the knowledge and skills expected of those who successfully complete the program. Master's theses must be problem-focused. The thesis is the culmination of the student's program in the Environmental Administration track.

Required and elective courses by program area: The following sections list courses required in each specialization and possible electives. Note that students may take electives outside of those listed in special circumstances, depending, for example, on their individual thesis topic.

Administrative Sciences

CORE COURSES:

The following courses are required. Students must take Management of Complex Organizations before enrolling in Organizational Analysis, Executive Decision Making, or Organizational Change and Development.
002-757 Management of Complex Organizations
008-768 Multivariate Statistical Analysis

Choose two of the following:
002-750 Executive Decision Making
002-755 Organizational Analysis
002-770 Organizational Change and Development

ELECTIVES

At least three courses are required. They may be drawn from the list below, from courses not taken above, or from other courses as approved by the student's adviser.

350-505 Regulatory Policy and Administration
350-615 Public and Nonprofit Budgeting
350-621 Planning Theory and Methods
575-663 Labor Legislation and Administration
600-483 Business and Industrial Statistics
002-756 The Policy-Making Process
002-758 Problems in Environmental Administration
002-760 Organizational Change and Development
008-724 Hazardous and Toxic Materials
008-730 Technology Assessment and Environmental Impacts
008-751 Bases of Community Health
008-759 Coastal Zone Management
008-764 Mathematics of Operations Research and Management
008-767 Statistical Design and Analysis of Experiments
009-737 Community Human Services
009-765 Evaluating Social Programs

Policy Analysis

CORE COURSES

The courses listed below are required.
350-660 Public Policy Analysis
008-768 Multivariate Statistical Analysis
002-757 Management of Complex Organizations
OR
002-752 Environmental Policy and Administration

ELECTIVES

At least 9 credits from the following courses are required.
350-505 Regulatory Policy and Administration

350-621 Planning Theory and Methods
 350-660 Public Policy Analysis
 778-416 American Legislative Process
 862-660 Resource Management Strategy
 944-305 Urban Politics and Policy
 944-351 Transportation and the City
 944-421 Urban Planning
 002-752 Environmental Policy and Administration
 002-756 The Policy-Making Process
 002-758 Problems in Environmental Administration
 008-759 Coastal Zone Management
 009-736 The Concept of Change and Social Intervention
 009-765 Evaluating Social Programs

Systems Planning and Analysis

CORE COURSES

The following courses are required:
 350-615 Public and Nonprofit Budgeting
 350-621 Planning Theory and Methods
 002-755 Organizational Analysis
 008-768 Multivariate Statistical Analysis

008-764 Mathematics of Operations Research and Management
OR
 008-704 Discrete Multivariate Analysis

ELECTIVES

At least 6 credits of electives are required. They may be drawn from the following list or the student may elect other courses with approval of the adviser.
 600-355 Applied Mathematical Optimization
 944-421 Urban Planning
 002-750 Executive Decision Making
 002-756 Policy-Making Process
 002-757 Management of Complex Organizations
 002-770 Organizational Change and Development
 008-730 Technology Assessment and Environmental Impacts
 008-765 Evaluating Social Programs
 008-767 Statistical Design and Analysis of Experiments

Faculty

Alesch, Daniel J., Associate Professor of Public and Environmental Administration; B.S. (1962) M.S. (1964) UW-Madison; M.A. (1969) Ph.D. (1970) UC-Los Angeles.

Planning methods, budgeting, program planning and evaluation, decision-making, decision theory, managing state and local government.

Bailey, Mary T., Assistant Professor of Public and Environmental Administration. A.B. (1960), Bryn Mawr; M.P.A. (1978), Ph.D. (1984), Pittsburgh.

Public budgeting systems, regulation and administrative law, organization theory, energy policy.

Clary, Bruce B., Associate Professor of Public and Environmental Administration. B.A. (1968) UC-Santa Barbara; M.A. (1974); Ph.D. (1977) USC.

Urban management, research methodology, organizational and policy analysis, technology assessment.

Harris, John H., Associate Professor and Area Coordinator of Management, Business Administration. B.B.A. (1969), UW-Madison; M.B.A. (1973), American; Ph.D. (1981) Kentucky.

Management, organizational behavior, and organizational theory.

Jowett, David, Professor of Science and Environmental Change; B.Sc. (1956), University College of North Wales; Ph.D. (1959), Wales.

Statistics, statistical computing. Design of experiments, multivariate analysis, especially as applied to problems in bioscience and social science. Population genetics and population modeling. Computer models of biological systems. Ecological genetics, plant breeding, agriculture. Biometrics, biomathematics, ecosystems modeling.

Kraft, Michael E., Professor of Public and Environmental Administration (political science); A.B. (1966), UC-Riverside; M.A. (1967), Ph.D. (1973), Yale.

American politics and government; public policy analysis; congressional behavior and legislative processes; environmental

and population policy; the social, economic and political consequences of population stabilization in the United States; political adaptation to a sustainable society; the utilization of public policy analysis and social science research by political decision makers, especially in the environmental and population policy areas; the political context of policy implementation; the impact of presidential leadership on public policy making.

Littig, David M., Associate Professor of Urban Studies (political science), and Co-Director of Local Government Systems Program; B.A. (1960), Indiana; M.A., Ph.D. (1974), UW-Madison.

Urban politics and public policy—neighborhood government and social welfare policy; Analysis of public policy. Impact of federalism on public policy outcomes. U.S. mass transportation policy. Comparative study of urban policy in advanced industrial nations. Current research on intellectual and ethnical development in the college years. Latin American politics.

Pollis, Nicholas P., Professor of Urban Studies (psychology); B.A. (1951), Johns Hopkins; Ph.D. (1964), Oklahoma.

Small group formation and functioning, basic theory and cross-cultural applications. Social judgment and attitude change as related to specific social issues. Collective behavior as mediated by behavior settings and normative factors. Analysis of organizational structures with emphasis on organization development. Socio-cultural aspects of urban stress. The relationship of conformity and compliance to social change. Altruism and helping behavior.

Troyer, Michael D., Associate Professor of Managerial Systems; B.A. (1966), Cornell; M.A. (1971), Ph.D. (1975), Duke.

Health economics, administration and financial management of nonprofit and human service organizations, health care systems and the delivery of health services, health planning, ethics and social responsibility for business and human services.

Wenger, Robert B., Associate Professor of Science and Environmental Change (mathematics); B.S. (1958), Eastern Mennonite; M.A. (1962), Pennsylvania State; Ph.D. (1969), Pittsburgh.

Systems analysis. Theory and applications of mathematical optimization. Resource recovery and solid waste management problems. Energy usage in solid waste systems. Management models for controlling ragweed pollen. Algebra, operations research.

Yarbrough C. Jarrell, Associate Professor of Urban Studies (political science); B.A. (1961), Western Washington; M.A. (1963), M.A. (1966), Ph.D. (1971), Washington.

American government and politics, political theory, public law, environmental policy and administration—particularly coastal land use policy and urban resource policy. Urban environmental management.

Course Descriptions

GRADUATE ONLY (700-LEVEL) COURSES

002-742 Population and Public Policy 3 cr.

An introduction to population problems facing governments at the international, national, and state and local level, and associated issues in public policy. The course focuses on issues raised by population changes (size, growth rates, distribution, composition); methods of policy and program analysis; and political, organizational, social, and ethical aspects of population policymaking and implementation. Topics emphasized will depend to some extent on student interests. P: gr st. Course in public policy or human population studies or cons inst. (*).

002-750 Executive Decision-Making 3 cr.

Examines the theory of individual and group decision making, the process and consequences associated with alternative decision making styles and systems, and develops skill in the use of the major decision assisting tools. Uses case studies and examples from the fields of environmental management, public administration, and business or industrial management. P: course in statistics, prior or concurrent registration in 002-753 or 002-754 recommended. (S)

002-752 Environmental Policy and Administration 3 cr.

Analyzes environmental policy-making and implementation, with emphasis on advanced industrialized societies, and a special focus on the United States. Topics include the nature of environmental problems; indicators of environmental quality and change; the political and administrative context of environmental problems; policy-making and implementation at federal, state, and local levels—with comparisons to other nations and to international efforts; political, organizational, legal, and technical constraints on environmental administration; policy and program evaluation; and selected problems and issues in environmental policy and administration. The particular focus reflects students' needs and interests. P: 002-756 or cons inst. (S-O)

002-753 Administrative Theory and Behavior 3 cr.

The structure and internal system maintenance processes of formal organizations, with an emphasis on the roles of supervisors, team leaders, executives, managers, administrators, and administrative staff specialists. The major theories and schools of thought in the fields of administrative behavior, organizational theory and leadership are examined. Attention is given to major factors which influence the success of organizational activity and administrative behavior, and to effects associated with a range of organizational and administrative practices and behavior. P: gr st. (F)

002-755 Organizational Analysis 3 cr.

Examination of organizations, clusters of organizations, and other complex systems where there is interdependency among persons, technologies, and natural systems for the purpose of accomplishing stated objectives. The emphasis is prescriptive. The approach is intended to result in more effective analysis, design, and intervention in such systems to achieve objectives. The approach is applicable for planners, managers, and change agents in private, non-profit, and public sectors. P: 350-421 or 005-533 or cons inst. (F)

002-756 The Policy-Making Process 3 cr.

American governmental institutions, policy-making processes, and public policy issues. Topics covered each semester will depend upon student interests and needs, but will include: the nature, purpose, and scope of American government; approaches to the study of government, politics, and public policy; political, behavior and its impact on policy making; the structure and operation of governmental institutions at national, state, and local levels; social, technical, administrative, political, legal and economic constraints on policy-making and implementation; public policy analysis; and selected issues and problems in contemporary public policy. P: gr st. (*)

002-757 Management of Complex Organizations 3 cr.

Advanced concepts and methods of managing project teams, complex organizations, and multiorganizational systems in the public, non-profit, and private sectors. Major topics include administrative leadership, constraints on organizational managers, internal control and management processes, problems and philosophies of public and private enterprise management, and others. Course uses a central text, separate readings for students depending on their interest in the public, non-profit, or private sectors, and a variety of learning methods, including case studies. P: 002-753 or cons inst. (S)

002-758 Problems in Environmental Administration 3 cr.

Guided student study and supervised student exercises and problem-solving conducted study around a selected set of formal problems designed to depict the typical decision problems faced by environmental administrators and further designed to require solutions typical of those expected of mature practitioners. P: cons inst.

002-760 Research Design for Administrative and Policy Sciences 3 cr.

An introduction to theory and methods of research in the social sciences. Topics include the philosophy of science, role of theory, research designs, types of data collection and program evaluation. Emphasis is on problems of field research, especially in the administrative and policy sciences. P: gr st. (F)

002-770 Organizational Change and Development 3 cr.

Focuses on practical applications of being an organizational change agent. Main areas of emphasis include facilitation, team building, process vs. expert consultation, sociotechnical systems theory, large scale systems change, quality of worklife, and so on. It is assumed that students come to the course with an understanding of organizational processes since the focus concerns

manipulating these processes to achieve organizational effectiveness and satisfaction of individual needs. Intended as a capstone course to Organizational Analysis and Management of Complex Organizations. P: gr st.; Course in organizational behavior, analysis, or psychology, or cons inst. (S)

002-795 Special Topics

This course number is used to designate courses and seminars offered by graduate faculty in response to special demand or on an experimental basis. Topics may be chosen to address current issues of general concern, special interests of student groups or faculty members, or special resources of visiting faculty. The title of the special topics course as announced in the *Timetable* will appear on transcripts of the students who enroll. Credits earned in the 795 special topics courses may not be applied toward the graduate core requirement.

002-797 Internship 1-6 cr.

Supervised work experience in an appropriate program or agency. Students may enroll for internship credits only when such activity is included in the approved program plan. A description of activities including criteria for grading must be submitted to the student's major professor and director of graduate studies. P: student classification of MS6, MA6, ME6 or higher.

002-798 Directed Study 1-3 cr.

Reading and research under the supervision of a member of the graduate faculty. Directed study credits may only be earned when this activity is included as part of an approved program plan. P: student classification of MS6, MA6, ME6 or higher.

002-799 Thesis 1-6 cr.

Research and preparation of thesis document. Enrollment may be for 1-6 credits per term. All students are expected to include 6 thesis credits in their program plan. Although additional thesis credits may be earned, a maximum of 6 credits can be applied toward a degree. P: student classification of MS7, MA7, or ME7.

008-724 Hazardous and Toxic Materials 3 cr.

The handling, processing, and disposal of materials which have physical, chemical, and biological properties presenting hazards to human, animal, and plant life; procedures for worker safety and for compliance with regulations. Topics include organic and inorganic materials, radioactive materials, and pathogenic human, animal, and plant wastes. Required field trip. P: undergraduate courses in chemistry, physics, bio-organic chemistry or equivalent. (S)

008-751 Bases of Community Health 3 cr.

An overview of community health including concepts of health and disease. Indices of health status discussed, as well as patterns of morbidity and mortality. Students are introduced to the process of perception, identification and delineation of health problems, along with strategies for intervention. Such strategies include safe water supply, immunization, proper nutrition, appropriate laws and policies. Significant problem areas are analyzed, including problems of the environment, population, food, and communicable disease. Special emphasis is placed on the concept of humans and their environment and how these interrelationships affect community health. The role of public health in diagnosing and treating disease is explored. The American health care system is discussed, along with basic principles of health care organization. P: gr st. (F-O)

008-759 Coastal Zone Management 3 cr.

Examination of the interdependency of humans and coastal zone environments, causative factors of problems to all coastal environments, state coastal zone management programs and the demand for resource development in various coastal regions in the U.S. The course focuses on the coastal areas of the bay of Green Bay and Lake Michigan, but also includes a broader geographic perspective. P: gr st and cons inst. (S-E)

008-764 Mathematics of Operations Research and Management Science 3 cr.

Mathematical models which are frequently and extensively used in analyzing environmental, public sector, management, and business problems. These models include allocation, network, location, scheduling, and queuing models. An important part of the course is a study of applications of models through case studies or other examples. P: undergraduate courses in calculus and matrix algebra, or cons inst. (S-E)

008-767 Statistical Design and Analysis of Experiments 4 cr.

Review of the common principles underlying the design of experiments and methods of analysis for such experiments. The purpose is to enable students to design and analyze their own experiments, for any degree of experimental complexity, and to understand the description and analysis of such experiments in the literature. Topics include the principles of replication, error, linear models and least squares, hierarchical models, blocking and factorial designs. Complex designs such as Latin squares, incomplete blocks, split plots, and the concepts of expectation of mean squares are developed as justification for the statistical tests applied. Non-parametric statistical methods, particularly as applied to designed experiments, concepts of ordinal and nominal data and chi-square contingency analysis are discussed. The principles are motivated throughout by reference to the theory and practice of scientific experimentation, and illustrated by examples. Laboratory analyses are performed on actual experimental data. P: elementary course in statistics. (F)

008-768 Multivariate Statistical Analysis 4 cr.

Analysis of multifactorial data. Regression, multiple regression, curvilinear regression, nonlinear regression, correlation, multiple and partial correlation, path analyses, principle components, factor analysis, discriminant analysis. Emphasis on the computer analysis of actual data. P: elementary statistics and cons inst. (S)

008-778 Epidemiology 3 cr.

Concepts and methods of epidemiology are presented in lectures and in weekly problems. The problems are involved with establishing criteria for research problem designing and investigating epidemiological problems both in the community and on a global basis. Problems include examples of both infectious and non-infectious diseases. Examples of the non-infectious diseases will be environmental in nature (for example the effect of noise, or color on work performance). A team-oriented field project is a requirement. Each student is expected to contribute to the project and to preparation of a paper. The functioning of epidemiology in community health is emphasized. P: course in statistics. (S-O)

009-736 The Concept of Change and Social Intervention 3 cr.

General concepts of planned change as they apply to our various efforts as change agents. This course, which uses general systems theory as the theoretical background, concerns itself more with specific methodologies for defining problems and the various skills, techniques and processes involved in intervening. A course participant should learn skills useful in intervening in any size system whether the client is an individual, family, or societal institution. Specific attention will be paid to the role of the "change agent" and how this person functions given limited resources. P: gr st. (S-E)

009-737 Community Human Services 3 cr.

The insights and methods of many fields of study are used to provide an integrated picture of the nature and functioning of human service agencies and programs. It examines them through the concerns that shaped them—e.g., mental health, social problems, community development—and through organizational, ecological and general systems theory. Specific topics include the community mental health movement, crisis theory, social movements, economic and political forces affecting human

service delivery, planning; and methods of intervention to increase program effectiveness. The course is team taught by members of the Community Human Services emphasis area. P: gr st. (F)

009-739 Behavioral Research Strategies 4 cr.

Conceptual and procedural issues in research. This is a laboratory course in research methods and design. This course provides knowledge and skills to collect adequate, accurate, and useful information about behavioral science questions. Although issues of control and experimental design are a central concern, the concepts, techniques, and skills learned in this course are applied to a variety of research situations. P: introductory statistics. (F)

009-765 Evaluating Social Programs 3 cr.

Since the early 1960's there has been a growing trend to ask programs providing social or educational services to provide evidence that they are effective. A new field—evaluation research—has emerged in response to this trend by adapting the methods of social research to the problem of assessing program quality. This course provides an introduction to evaluation research. It emphasizes such issues as identifying program goals, choosing outcome measures, defining appropriate samples, data collection strategies, and evaluating and disseminating results. Political, administrative, and ethical problems of evaluation are considered throughout. Course procedure is informal with much of the class time spent in developing and discussing model evaluation studies. P: introductory statistics. (S)

UNDERGRADUATE/GRADUATE (500-699 LEVEL) COURSES

298-602 Resource Economics Analysis 3 cr.

Application of tools and concepts in current economic decision-making with special emphasis upon common property resources management (i.e. water and air). P: jr st and 298-202 and 203.

350-505 Regulatory Policy and Administration 3 cr.

An examination of the purposes, structure, legal aspects, and operation of public regulatory agencies and programs in the United States. Topics include theories and controversies underlying regulatory policy, issues in contemporary regulatory policy and administration, and rational models and methods for risk analysis and decision-making. Case studies and exercises will cover a variety of regulatory processes, including those associated with public health, consumer protection, product safety, environmental quality, and energy development and use. P: 778-101 or 350-102 or cons inst.

350-610 Administration of Local Government I 3 cr.

Covers the contemporary mechanisms in local government management and policy implementation focusing on the basic authority, limitations, financing, and rights of local government. Introduces the participant to the authority structures of local government and their limitations; with emphasis on comparison of national models and opportunities to analyze those models against specific local government systems and functions.

350-611 Administration of Local Government II 3 cr.

Continuation of 350-610. Focuses on problem solving at the local level and implementing national policies at the local level. Opportunities include small team research in developing model programs and workable alternatives to the critical problems of local government. P: 350-610 or cons inst.

350-615 Public and Nonprofit Budgeting 3 cr.

Covers the history, philosophy, purposes, attributes, types, and operational elements of major public budgetary systems used in the United States, with emphasis on object, performance, program, and PPB systems and their applicability to various pro-

grams, organizations, and governmental jurisdictions. Examines principles and methods used in designing and managing public budgeting systems and relationship between program planning, policy planning, and budgetary operations. Develops skill in applying analytic and decision-assisting tools to public budgetary operations. P: 350-102, or another course in American government, or cons inst.

350-621 Planning Theory and Methods 3 cr.

Focuses on planning for complex socio-technical systems in the public sector, including analysis, design, evaluation, and control. Covers the theory of planning, general systems theory, the political and administrative setting of public planning operations, and methods of planning analysis, such as cost-effectiveness analysis and model building. Emphasizes practical application of theory and methods through case studies and projects, and provides both a theoretical and methodologic basis for study of specialized fields of planning, including those concerned with urban, regional, land use, environmental policy, and resource planning.

350-622 Decision Theory and Methods 3 cr.

Provides fundamental skills in decision theory and quantitative analysis. Theory is introduced to explain practical application. Emphasis is on building skills and understanding; includes decision making under risk and uncertainty, linear models, queuing, monte carlo, payoff matrices, probability considerations, and introductory modelling. Relevant for those interested in government business, or nonprofit organizations. P: one course in statistics or cons inst.

350-660 Public Policy Analysis 3 cr.

An introduction to public policy analysis and to the policy-making process in American government. Topics include approaches to the study of public policy, the nature of public problems, the policy agenda, policy formulation, assessment of policy alternatives, policy adoption, policy implementation and evaluation, and the use of policy analysis in decisionmaking. Special attention is given to political aspects of policy analysis, to models and methods for critical analysis and rational design of public policies, and to practical applications of policy studies. Develops skills in legislative research, preparation of position papers and other policy-development documents, and methods of policy analysis and evaluation. P: 778-101 or 350-102 or cons inst.

575-585 Management of the Nonprofit Organization 3 cr.

The operation and management of organizations that operate within our society for purposes other than generating profit for owners or shareholders. Models such as the hospital and the university focus on the operational principles, optimizing criteria, and management control techniques characteristic of such institutions. In addition to examining the areas of accounting, finance, marketing, organization, and personnel, the nonprofit organization is discussed in terms of its social responsibility and the political and economic conditions in which it operates. Case studies used in a seminar format. P: 575-382 or equivalent experience or cons inst.

575-610 Income Tax Theory and Practice 3 cr.

Federal and state income tax as applied to individuals, partnerships, and corporations: tax and raw source materials, written problems; tax planning and tax determination. P: 575-300.

575-614 Advanced Managerial Accounting 3 cr.

Cost concepts for decision making which include cost-profit analysis, breakeven analysis, differential and comparative cost, capital budgeting and control, profit performance measurements and linear programming for decision making. Use of responsibility accounting concepts and implication of transfer pricing for performance evaluation. Use of selected quantitative techniques in the cost accounting function. P: 575-312, 575-217 and 600-260.

575-624 Marketing Research 3 cr.

The techniques of obtaining and analyzing information about marketing problems; obtaining data from primary and secondary sources, and interpreting them for marketing decisions. Development of target market determination plans to test the feasibility and relevance of a proposed new small business or the expansion of an existing enterprise. P: 575-322 or cons inst.

575-626 Marketing Management 3 cr.

Contemporary environmental issues and managerial problems faced by marketing management. Develops analytical abilities. P: two marketing courses or cons inst.

575-629 Marketing Strategies for Non-Business Institutions 3 cr.

The applicability of marketing concepts, strategies and techniques to the problems faced by non-profit institutions in their attempts to relate to various societal needs. Relevant current literature is analyzed and field experience is gained in solving institutions' problems. P: 575-322.

575-643 Financial Planning and Control 3 cr.

The efficient management of working capital; analysis and projection of financial data for planning, control, and for dealing effectively with the financial dimensions of management decisions. P: 575-343.

575-662 Seminar in Personnel Management 3 cr.

Provides a foundation through discussion of personnel problems and experiences which can be translated into developing corporate personnel policies. Case studies related to urban, cultural, and legal realities along with making decisions which affect the administration and development of personnel policies are included.

575-663 Labor Legislation and Administration 3 cr.

Federal and state statutory and administrative regulations of social legislation and benefit programs; other regulations, including workmen's compensation, unemployment compensation, social security, and labor laws with respect to women and children. P: jr st or cons inst.

575-689 Problems of Business Management 3 cr.

Contemporary problems in business and public administration. In addition to cases, class exercises, and readings, the student undertakes a major project paper which relates a contemporary administrative problem to an existing or created business or administrative organization. P: 575-382 or cons inst.

600-555 Applied Mathematical Optimization 3 cr.

Analytical and numerical optimization techniques; linear, non-linear, integer, and dynamic programming. Techniques applied to problems of water, forest, air, and solid waste management. P: 600-202 and 320, or concurrent enrollment in 320.

820-615 Organizational Psychology 3 cr.

Relation between social structure and psychological behavior, problems of bureaucracy, leadership styles, communication networks, decision-making processes, and group productivity. P: sr st.

820-638 Group Dynamics 3 cr.

Psychological principles as they apply to the individual in social groups, experimental analyses of group formation, maintenance, morale, and productivity. P: sr st and 820-202.

862-660 Resource Management Strategy 3 cr.

Applications of principles of system analysis to designing resource management systems and to developing strategies for maintaining optimum environmental utilities. Decision models and the role of economic systems in resource management. P: sr st and some background in economics or conservation.

UNDERGRADUATE (300 and 400-LEVEL) COURSES

Graduate credit for the undergraduate courses with 300 or 400 level numbers is available only with special permission of the instructor and student's graduate adviser or the director of graduate studies. An assigned study card is required for registration in one of these courses.

298-306 Public Finance and Fiscal Policy 3 cr.

Effects of government spending and taxation on resource allocation, incomes, prices, and employment. Includes a consideration of the uses and effects of fiscal policy. P: jr st and 298-202 and 203, or cons inst.

350-435 Administrative and Policy Laboratory 3 cr.

Multi-disciplinary team investigation of selected problems, policies, operations, programs, program outcomes, organizations, and organizational subsystems in the public sector. Students participate in design and implementation of project plan and function in appropriate project-related roles.

575-485 Managerial Economics 3 cr.

Application of the basic theoretical tools of economic analysis (micro and macro) to the problems of business management, including topics on demand, production, costs, pricing, forecasting, etc. Current economic issues of interest to the manager, such as environmental policies and regulations are discussed. P: 298-202, 203 and sr st.

778-416 American Legislative Process 3 cr.

An examination of legislative institutions and policymaking, with special emphasis on the United States Congress. Topics include: the role of legislatures in American politics; the electoral process; the nature of representation and the impact of the public on policy decisions; the political behavior of legislators; the impact of formal and informal institutions and practices on public policy-making; political parties, leaderships, staffs, committees, rules and norms, interest groups and lobbying; the role of the mass media; the role of legislatures in policy innovation and social change. P: 778-100 or 778-101 or cons inst.

944-305 Urban Politics and Policy 3 cr.

Concerned with urban social theory and its relation to urban political processes and public policy. Of central concern is the question: To what extent are basic human needs, as identified by urban theorists, frustrated and/or fulfilled by urban political processes and public policy. Policy arenas examined include: urban renewal, welfare policy, urban transportation, fiscal policy.

944-351 Transportation and the City 3 cr.

The impact of the transportation subsystem of the city upon urban subsystems (residential, commercial) and upon urban dwellers.

944-421 Urban Planning I 3 cr.

Planning as a generic process—an examination of planning activities in the various delivery systems of the city, introduction to the basic methods and techniques of urban land use planning, contemporary issues in planning, implementation of plans, an overview of major federal programs for the delivery and improvement of the urban environment.

944-479 The Concept of Community in American Society 3 cr.

Analyzes changing concepts of community and consequent difficulties involved in American urbanization and industrialization. The term "community" is a complex concept encompassing a variety of both social structures and cultural paradigms. The course examines American tensions between community and individualism emerging from the interplay of agrarianism, urban-

ization, industrialization, nationalism, and the impact of mass culture on American life. Issues focused upon include the self and social interaction, naturalness and artificiality, freedom and order, and spontaneity and organization. Also, changing occupational patterns; family structure, ascribed sex roles and styles of pseudo-communities will be examined. In so doing, the course explores folklore and myth, law and art, social science and literature, and philosophy and political theory.

Environmental Science

Coordinator: Paul E. Sager
(414) 465-2277

Purpose and Requirements

The Environmental Science track is appropriate for students with a strong background in the natural sciences who are interested in investigating a variety of contemporary technical and environmental problems. Individuals who complete this degree will be prepared to take positions of responsibility in industry, consulting, laboratory/engineering firms, and/or governmental agencies, or to pursue additional graduate work. Emphasis is on developing skills appropriate for designing and conducting scientific investigations, interpreting data, making responsible decisions and communicating the results of environmental studies to other scientists, decision makers, and the general public.

ADMISSION REQUIREMENTS

At the time of application and entry into the graduate program, each student's prior academic work is evaluated. Applicants are expected to have a strong background in the natural sciences which includes college courses in biology, chemistry, physics, earth science and mathematics. A knowledge of statistics and computer science must be demonstrated. Additional requirements may be specified by a particular specialization. Provisions are made for students who need to strengthen their backgrounds in some areas. Credits earned in undergraduate courses numbered at the 100- and 200-level cannot be applied toward the graduate degree.

DEGREE REQUIREMENTS

Students with the proper undergraduate background at the time of entry may earn the Master of Science in Environmental Studies by completing 30-36 credits of coursework and thesis. Credit requirements are determined by the student's chosen

specialization and program of study. At least 12 credits of 700-level courses must be included in the programs.

A program plan is developed for each student with the assistance and approval of the major professor and student's graduate committee. Each program plan includes these required courses:

008-701 Perspectives in Environmental Science 3 cr.

AND/OR

008-730 Technology Assessment and Environmental Impacts 3 cr.

AND

008-762 Natural Science Seminar 1 cr.
008-799 Thesis 6 cr.

The remainder of the credits are earned by completing courses chosen from one of the areas of specialization or from those specified in the personalized program of study.

After successfully completing 15 credits, a student submits a thesis proposal. The proposal is reviewed and approved by the major professor, the graduate committee and the director of graduate studies before the student begins the research. Approval of the thesis proposal places the student in candidacy for the degree. Successful defense of the written thesis and completion of all courses in the student's program plan results in awarding of the M.S. degree.

SPECIALIZATIONS

Following are descriptions of specializations available in the Environmental Science track. The specializations are based on faculty strengths and interests. Personally designed specializations may be developed from relevant combinations of available courses.

Ecosystems Studies

Students have the opportunity to address problems of general features of ecosystems such as nutrient regeneration, productivity or trophic relationships. They can also fo-

cus on such specific questions as endangered species, predation or competition. Natural, managed and disturbed ecosystems are examined in classroom and field activities. Studies on aquatic systems can take advantage of the University's location on Green Bay and participation in the University of Wisconsin Sea Grant Program.

A student pursuing this specialization must complete a minimum of 30 credits of graduate work. All students are expected to include 862-672 Ecosystems Analysis I and 862-673 Ecosystems Analysis II in their programs of study unless they have completed equivalent ecology courses as part of their undergraduate work. All students also must complete either 008-767 Statistical Design and Analysis of Experiments, or 008-768 Multivariate Analysis. At least three courses must be selected from one of the course groups—Aquatic Systems or Terrestrial Systems. Additional courses may be selected from the other course group or the suggested list of electives.

Aquatic Systems (at least 9 credits)

008-749 Wetland Ecology and Management

008-759 Coastal Zone Management
204-541 Ichthyology
862-601 Stream Ecology
862-603 Limnology
862-605 Winter Conditions in Lakes
862-630 Quantitative Hydrology
862-634 Water Chemistry

Terrestrial Systems (at least 9 credits)

008-776 Bioclimatology
204-310 Plant Taxonomy
204-511 Plant Physiology
479-601 Agricultural Genetics and Food Production
862-307 Ecology of Fire
862-520 The Soil Environment
862-563 Plants and Forest Pathology
862-622 Environmental Biogeochemistry
862-666 Vegetation Management

Electives

- 008-701 Perspectives in Environmental Science
- 008-730 Technology Assessment and Environmental Impacts
- 009-741 Land Use Institutions and Policy
- 204-602 Advanced Microbiology
- 225-613 Instrumental Analysis
- 416-451 Computer Cartography
- 416-454 Advanced Air Photo Interpretation
- 478-412 Principles of Parasitology
- 862-421 Soils of Wisconsin Field Study Tour
- 862-654 Remote Sensing of the Environment by Satellite
- 862-578 Chemical Ecology
- 862-580 Radiobiology
- 862-650 Air Pollution Chemistry and Meteorology

Resource Planning and Management

This specialization is for students who wish to study concepts of natural resource management. Emphasis is on elaborating alternative strategies for effective policy implementation and planning for the future. Principles and techniques of quantitative analysis of resources are applied to problems of supply, distribution and utilization of energy, mineral and bioresources.

A student pursuing this specialization must complete a minimum of 36 credits of graduate work including the thesis project and Environmental Science track core courses. Additional courses must be selected as indicated from the course groups below:

Resource Utilization and Management (9 credits)

- 008-759 Coastal Zone Management
- 008-766 Waste Management/Resource Recovery Seminar
- 298-602 Resource Economics Analysis
- 862-520 The Soil Environment
- 862-542 Environmental Geology
- 862-545 Geology of Energy Resources
- 862-614 Conventional Energy Technology
- 862-615 Solar and Alternate Energy Systems
- 862-660 Resource Management Strategy
- 862-666 Vegetation Management

Methods and Techniques (5-7 credits)

- 008-730 Technology Assessment and Environmental Impact
- 008-764 Mathematics of Operations Research and Management Science
- 008-767 Statistical Design and Analysis of Experiments
- 008-768 Multivariate Statistical Analysis
- 296-620 Soil Classification and Geography
- 416-353 Air Photo Interpretation
- 416-355 Introduction to Quantitative Methods of Spatial Analysis
- 600-551 Data Structures, Storage and Retrieval
- 600-555 Applied Mathematical Optimization
- 834-356 Environmental Impact Analysis
- 862-654 Remote Sensing of the Environment by Satellite

Environmental Policy and Planning (3 credits)

- 002-752 Environmental Policy and Administration
- 002-754 Human Ecology and Public Policy
- 002-756 The Policy-Making Process
- 008-701 Perspectives in Environmental Science
- 834-522 Regional Planning
- 834-621 Techniques and Methods of Planning Analysis

Additional courses may be selected from any of the groups above or from the course list for the Environmental Science track.

Waste Management and Resource Recovery

Course work in this specialization addresses the recognized need for individuals with the scientific and technical knowledge to plan and evaluate waste treatment systems. Students study the handling, processing, treatment and disposal of municipal, industrial and agricultural wastes. They use mathematical tools for optimizing treatment costs and develop skills in management that apply to public agencies, consulting firms and industries.

Students must complete 30 credits of coursework including the thesis project. A minimum of 9 credits of waste management courses are required including:

- 008-766 Waste Management/Resource Recovery Seminar
- AND**

Six credits from the following:

Waste Processing and Disposal

- 008-724 Hazardous and Toxic Materials
- 862-518 Industrial Pollution Control Techniques
- 862-519 Industrial Pollution Control Field Trips
- 862-335 Water and Waste Water Treatment

The remaining credits may be selected from this suggested list of electives, choices to be determined by the students' interests (e.g., management, land disposal, mathematical modelling).

Quantitative Methods

- 008-764 Mathematics of Operations Research and Management Science
- 008-767 Statistical Design and Analysis of Experiments
- 008-768 Multivariate Statistical Analysis

Basic Science and Techniques

- 008-701 Perspectives in Environmental Science
- 008-730 Technology Assessment and Environmental Impact
- 204-602 Advanced Microbiology
- 226-617 Nuclear Physics and Radiochemistry
- 226-618 Nuclear Physics and Radiochemistry Laboratory
- 296-620 Soil Classification and Geography
- 862-520 Soil Environment
- 862-654 Remote Sensing of the Environment by Satellite
- 862-542 Environmental Geology
- 862-614 Conventional Energy Technology
- 862-415 Solar and Alternate Energy Systems
- 862-622 Biogeochemistry
- 862-634 Water Chemistry
- 862-630 Quantitative Hydrology
- 862-650 Air Pollution Chemistry and Meteorology

Management

- 002-750 Executive Decision Making
- 002-752 Environmental Policy and Administration
- 002-753 Administrative Theory and Behavior
- 002-757 Management of Complex Organizations
- 298-602 Resource Economic Analysis
- 350-615 Public and Nonprofit Budgeting
- 862-660 Resource Management Strategy

Community Health

This specialization provides general training for a career in public health. Specifically, students gain an overview of community health problems, knowledge of epidemiological principles, and advanced skills in data analysis and interpretation. Management skills are also addressed, including developing and applying health policies. The student also chooses electives which provide additional depth in a selected area, such as microbiology, community nutrition, nutrition or health education, or health administration.

Students pursuing this specialization must complete 30-36 credits of graduate coursework including the Environmental Science track core courses and thesis and the required courses listed below, with the remainder of the courses selected from the selected from the list of electives.

Required Courses (6 credits)

- 008-751 Bases of Community Health
- 008-778 Epidemiology

Quantitative Methods (3-4 credits required)

- 008-704 Discrete Multivariate Analysis
- 008-767 Statistical Design and Analysis of Experiments
- 008-768 Multivariate Statistical Analysis
- 600-564 Biometrics

Management (3 credits required)

- 002-753 Administrative Theory and Behavior
- 575-583 Management of the Nonprofit Organization
- Other selected courses

Electives (not inclusive)

- 002-758 Problems in Environmental Administration
- 009-703 Community Organization and Planning
- 204-602 Advanced Microbiology
- 478-402 Human Physiology
- 478-412 Principles of Parasitology
- 479-604 Food Science
- 479-621 Community Nutrition I
- 479-622 Community Nutrition II
- 479-685 Advanced Human Nutrition
- 479-688 Nutrition in Disease

Quantitative Methods and Data Analysis

Sophisticated analytical techniques are finding increased applications in the environmental sciences. Students interested in studying quantitative methods for processing, analyzing and integrating complex data sets can choose this specialization. Techniques of mathematical and statistical analysis are studied on theoretical and practical levels. Students learn methods of data synthesis, model formulation and graphic display using various types of computer technology. Skills applicable to numerous areas in the natural sciences are developed in this specialization.

Students must complete 30 credits of graduate coursework including the Environmental Science core courses and the thesis project. Many of the courses have advanced mathematics prerequisites.

Required Courses (7 credits)

- 008-764 Mathematics of Operations Research and Management Science
- 008-768 Multivariate Statistical Analysis

Remaining credits may be chosen from the following courses:

Statistical Analysis

- 008-704 Discrete Multivariate Statistical Analysis
- 008-767 Statistical Design and Analysis of Experiments
- 600-360 Theory of Probability
- 600-361 Mathematical Statistics
- 600-564 Biometrics
- 600-465 Business and Industrial Statistics

Mathematical Modeling and Mathematics

- 600-305 Ordinary Differential Equations
- 600-509 Systems of Ordinary Differential Equations
- 600-320 Linear Algebra I
- 600-350 Numerical Analysis
- 600-555 Applied Mathematical Optimization
- 600-395 Introduction to Applied Graph Theory and Combinatorics

Computer Science and Information Processing

- 600-551 Data Structures: Storage and Retrieval
- 600-352 Computer Graphics
- 600-553 Computer Organization and Programming
- 600-357 Theory of Programming Languages
- 600-450 Theory of Algorithms
- 600-451 Database Management Systems
- 600-452 Operating Systems
- 600-454 Artificial Intelligence
- 600-455 Microprocessors and Microcomputer Systems
- 600-456 Advanced Topics in Microcomputing
- 600-457 Compiler Theory

Applicable Natural Science Courses (not inclusive)

- 008-724 Hazardous and Toxic Materials
- 008-730 Technology Assessment and Environmental Impacts
- 754-517 Electromagnetic Radiation
- 862-518 Industrial Pollution Control Techniques
- 862-630 Quantitative Hydrology
- 862-660 Resource Management Strategy
- 862-650 Air Pollution Chemistry and Meteorology
- 862-672, 673 Ecosystems Analysis I, II

Technology Development and Assessment

Persons interested in studying technical approaches to environmental problems and evaluating the impact of technology can choose this specialization. Students study application of physical and mathematical principles in developing and managing technological systems. A skills based approach to technology assessment is taught. The basis of the thesis project is the development or assessment of a technology.

Recent thesis topics have focused on alternative energy systems, solar energy, resource recovery technologies and laser applications.

Students must complete 30 credits of graduate course work plus their thesis project. Students in the program typically have an undergraduate major or minor in chemistry, physics, engineering or equivalent.

Required Courses (at least 9 credits including 008-730)

- 008-730 Technology Assessment and Environmental Impacts
- 862-518 Industrial Pollution Control Techniques
- 862-519 Industrial Pollution Control Field Trip
- 862-614 Conventional Energy Technology
- 862-615 Solar and Alternate Energy Systems

Quantitative Methods (at least 6 credits)

- 008-764 Mathematics of Operations Research and Management Science
- 008-767 Statistical Design and Analysis of Experiments
- 600-509 Systems of Ordinary Differential Equations
- 600-550 Numerical Analysis
- 754-315 Mechanics III

Basic Science and Technology Electives

- 002-752 Environmental Policy and Administration
- 002-758 Problems in Environmental Administration
- 008-701 Perspectives in Environmental Science
- 008-724 Hazardous and Toxic Materials
- 008-766 Waste Management/Resource Recovery Seminar
- 226-320 Thermodynamics and Kinetic Theory
- 226-617 Nuclear Physics and Radiochemistry
- 226-618 Nuclear Physics and Radiochemistry Laboratory
- 600-455 Microprocessors and Microcomputer Systems
- 600-456 Advanced Topics in Microcomputing

- 754-317 Electromagnetic Radiation
- 754-404 Electricity and Magnetism
- 754-605 Electronics for Scientists
- 862-335 Water and Waste Water Treatment
- 862-650 Air Pollution Chemistry and Meteorology

UWGB/Institute of Paper Chemistry Inter-University Program

Matriculated UWGB graduate students can broaden their technical expertise by undertaking a program which combines engineering courses taught at the Institute of Paper Chemistry (IPC), Appleton, Wisconsin, with environmental science courses taught on the UWGB campus. Students interested in pursuing this program must meet the UWGB admission requirements and be approved by the IPC admissions office. Students in the program are candidates for a degree from UWGB. Tuition for all IPC courses is at prevailing IPC rates and payable through the UWGB Bursar's office. Students who complete this program will be capable of analyzing and interpreting data regarding the natural environment and will have the skills necessary to work with industrial systems, such as pollution control processes and equipment, sampling methods, and waste disposal techniques. Graduates will be well prepared to assume responsible positions in industry.

This program is designed for students who have received the bachelor's degree in chemistry, engineering, physics, or equivalent. Before attending classes at IPC, students must have completed course work in thermodynamics and ordinary differential equations. Other courses must be selected as indicated below for a total of 30 credits including the thesis project.

UWGB COURSES

Required Core Courses (4 credits)

- 008-701 Perspectives in Environmental Science (3 cr.)
- AND/OR**
- 008-730 Technology Assessment and Environmental Impacts (3 cr.)
- AND**
- 008-762 Natural Science Seminar (1 cr.)

Electives (minimum of 5 credits)

- 008-701 Perspectives in Environmental Science (3 cr.)
- 008-724 Hazardous and Toxic Materials (3 cr.)
- 008-730 Technology Assessment and Environmental Impacts (3 cr.)
- 008-764 Mathematics of Operations Research and Management Science (3 cr.)
- 008-766 Waste Management/Resource Recovery Seminar (3 cr.)

Science and Technology Electives

- 862-518 Industrial Pollution Control Techniques
- 862-535 Water and Waste Water Treatment
- 862-634 Water Chemistry
- 862-650 Air Pollution Chemistry and Meteorology
- 862-660 Resource Management Strategy

IPC REQUIRED COURSES
(6 quarter-hour credits)

- A141 Mass and Energy Balances
- A142 Transport Processes

Plus a minimum of 2 additional courses from:

- A143 Fluid Mechanics
- A144 Heat Transfer
- A145 Mass Transfer
- A247 Systems Engineering
- A248 Process Design

Faculty

Day, Harold Jack, Professor of Science and Environmental Change; B.S. (1952), M.S. (1953), Ph.D. (1963), UW-Madison. Water resources, fluid mechanics, hydrology and related applications of engineering to society and technology. Regional water quality and associated land management and flood plain management. Resource management.

Dutch, Steven I., Associate Professor of Science and Environmental Change (earth science-geology); B.A. (1969), UC-Berkeley; M. Phil. (1974), Ph.D. (1976), Columbia. Structural geology, tectonics, mineralogy, petrology. Pre-Cambrian geology.

Fischbach, Fritz A., Associate Professor of Science and Environmental Change (environmental health); B.S. (1959), Ph.D. (1966), UW-Madison.

Community ragweed pollenosis, air quality, small biological particulate structure and function, public health education. Environmental health, aeroallergens, biophysics.

Gandre, Donald A., Professor of Regional Analysis, B.S. (1956), Arizona State; M.S. (1961), Illinois, Ph.D. (1965), UW-Madison.

Great Lakes transportation, movement of coal via the railroads, and freight transportation in Wisconsin.

Girard, Dennis M., Associate Professor of Science and Environmental Change (mathematics and statistics); B.S. (1961), M.A. (1962), Detroit; Ph.D. (1968), Ohio State.

Applications of statistics in the life sciences with emphasis in the area of environmental contaminants, biometrics, biomathematics, multivariate statistical analysis, Fourier analysis, graph theory, econometric modeling, statistical computing.

Goldsby, Alice T., Associate Professor of Science and Environmental Change (microbiology); B.A. (1942), M.S. (1953), Utah State; Ph.D. (1963), UW-Madison.

Parasitic populations of domestic and wild animals. Water microbiology. The interaction of microbes with the environment.

Guilford, Harry G., Professor of Human Biology (human adaptability), (zoology); Ph.B. (1944), Ph.M. (1946), Ph.D. (1949), UW-Madison.

Parasite diseases of fishes, particularly disease caused by myxosporidia. Life cycles of trematode parasites. Vertebrate anatomy; parasitology, entomology, anatomy. Changes in biota of Wisconsin 1634-1910.

Harris, Hallet J., Professor of Science and Environmental Change; Coordinator of Sea Grant Green Bay Subprogram, Wisconsin Sea Grant Institute; B.A. (1961), Coe College, M.S. (1965), Ph.D. (1966), Iowa State.

Animal and wetland ecology; management of coastal areas, wildlife management.

Ihrke, Charles A., Associate Professor of Human Biology (population dynamics-biology); B.S. (1960), UW-Oshkosh; M.S. (1966), Nebraska-Omaha; Ph.D. (1969) Oregon State.

Genetics and cytogenetics. Chromosomal recombinations and analysis of factors influencing recombination frequency. Plant breeding and population genetics aspects of food production. Inheritance of disease syndromes in human health. Agricultural genetics; cellular biology.

Jowett, David, Professor of Science and Environmental Change; B.Sc. (1956), University College of North Wales; Ph.D. (1959), Wales.

Statistics, statistical computing. Design of experiments, multivariate analysis, especially as applied to problems in bioscience and social science. Population genetics and population modeling. Computer models of biological systems. Ecological genetics, plant breeding, agriculture. Biometrics, biomathematics, ecosystems modeling.

Kalman, Daniel, Assistant Professor of Science and Environmental Change. B.S. (1974), Harvey Mudd; M.A. (1975), Ph.D. (1980), UW-Madison.

The range of general mathematics; modeling, history and philosophy of mathematics, mathematics teaching; combinatorial linear algebra and graph theory.

Kaufman, William C., Professor of Human Biology (biology); B.A. (1948), Minnesota; M.S. (1952), Illinois; Ph.D. (1961), Washington.

Human and environmental physiology. Temperature regulation and the peripheral circulation as a thermoregulatory function. Evaluation and design of cold-weather clothing. Evolution and the origin of life, interrelationships of science and society.

Knapp, Gerrit J., Assistant Professor of Urban Studies. B.S. (1978) Willamette; M.A., Ph.D. (1982) Oregon.

Urban and regional economics, public finance, environmental economics, statistics.

Laatsch, William G., Associate Professor of Regional Analysis (geography); B.S. (1960), Carroll; M.S. (1966) Oklahoma; Ph.D. (1972), Alberta.

Morphology of landscape. The form and process of settlement. Settlement types in Northeastern Wisconsin. Ethnic settlements of North America. Development and community planning in thinly populated regions. Rural land use problems. Cultural geography.

Lanz, Robert W., Associate Professor of Science and Environmental Change (engineering); B.S. (1963), M.S. (1965), Ph.D. (1969), UW-Madison.

Engineering analysis of conventional energy systems used to support urban areas. Energy conservation practices and equipment modification in HVAC (heating, ventilating and air conditioning) and other existing energy intensive systems. Scientific analysis of alternative energy conservation systems such as solar, heat pumps and wind. Alternate fuels for electric power generation such as solid waste or sewage sludge. Theory and fatigue behavior of conventional structural materials. Mechanical engineering.

Mannino, Joseph A., Assistant Professor of Human Biology (anthropology); B.S. (1969), Western Michigan; M.A. (1974), Ph.D. (1978), Wayne State.

Human variability, particularly population pharmacogenetics; effects on human populations to man-made mutagens; physiologic adaptations of human populations to environmental stressors; evolutionary biology of primates.

Matter, Charles F., Associate Professor of Urban Studies (psychology); A.B. (1969), Lycoming, Ph.D. (1972), Washington.

Community noise and the effects of noise on people. Neurobehavioral consequences of environmental contaminants. Animal behavior. Evolution and behavior. Perceptual processing.

McIntosh, Elaine N., Associate Professor of Human Biology (nutritional sciences); B.A. (1945), Augustana; M.A. (1949), South Dakota; Ph.D. (1954), Iowa State; Community nutrition. Changing nutritional needs of the life phases. Special nutritional needs of "target" population groups. Problems of food safety, potential toxicity of substances in food. Dietetics, nutrition education.

McIntosh, Thomas H., Professor of Science and Environmental Change (earth sciences) and Senior Adviser to the Chancellor; B.S. (1956), M.S. (1958), Ph.D. (1962), Iowa State.

Soils, agronomic systems, biogeochemical cycles, especially nitrogen; remote sensing.

Mehra, Anjani K., Professor of Science and Environmental Change (chemistry-physics); B.S. (1962), M.S. (1964), Allahabad, India; Ph.D. (1967), I.I.T., Kapur, India. Solar energy as an alternative source of energy. Astronomy and cosmology. Spectroscopic studies of crystals. Solid state physics.

Moran, Joseph M., Professor of Science and Environmental Change (earth science); B.A. (1965), M.S. (1967), Boston College; Ph.D. (1972), UW-Madison.

Nature of climatic change, air pollution meteorology. Applications of paleoclimatic reconstruction techniques to Glacial-age evidence. Environmental implications of current climatic changes. Quaternary climatology, geology.

Morgan, Michael D., Associate Professor of Science and Environmental Change (biology); B.S. (1963), Butler; M.S., Ph.D. (1968), Illinois.

Relations between climatic change and plant production and distribution. Ecological relationships during late Pleistocene. Plant phenology.

Murray, James M., Professor of Regional Analysis (economics); B.S. (1956), M.A. (1958), North Dakota; Ph.D. (1962), Oregon. Regional economics including industrial and commercial location criteria. Economic development in both developed and less developed regions. Labor and manpower economics. Public finance, especially at local and state levels. Quantitative methods, new planned communities.

Nair, V.M.G., Professor of Science and Environmental Change (forest and plant pathology, mycology) and Director of International Programs; B.Sc. Madras; M.Sc., Aligarh; Associate I.A.R.I., Agricultural Ministry, New Delhi; Ph.D. (1964), UW-Madison.

International quarantine and disease control programs of plant-forest tree diseases. Weedicide-Silvicide applications in the establishment of exotic tree species in developing countries and their after effects on wildlife and fishes. Host parasite interactions of vascular wilt pathogens. Electron and three-dimension electron microscopy.

Niedzwiedz, William R., Assistant Professor of Regional Analysis. B.S. (1969), M.S. (1972), Massachusetts; Ph.D. (1981), Virginia Polytechnic.

Three-dimensional projection techniques as tools for research, instruction and public presentation; Remote sensing applications; land use planning; natural resource planning; environmental impact assessment; designing environments.

Norman, Jack C., Associate Professor of Science and Environmental Change (chemistry-physics); B.S. (1960), New Hampshire; Ph.D. (1965), UW-Madison.

Nuclear and radio-chemistry; environmental radioactivity. Distribution and cycling of natural and artificial radionuclides in the environment. Solar and other alternative sources of energy. Appropriate technology applications and education.

Presnell, Richard W., Associate Professor of Education; B.A. (1958), M.A. (1961), Iowa; Ph.D. (1971), Cornell.

Teaching-learning communication; processes and students' environments in elementary and secondary schools. Prob-

lem-solving education. Ecological education and outdoor environmental education processes.

Reed, John F., Professor Emeritus of Environmental Sciences (botany); A.B. (1933), Dartmouth; M.A. (1935), Ph.D. (1936), Duke.

Design and operation of institutions for international environmental planning and research. Plant ecology. Rocky Mountain botany. Botany-plant anatomy.

Rhyner, Charles R., Associate Professor of Science and Environmental Change (physics), and Director of Graduate Studies; B.S. (1962), M.S. (1964), Ph.D. (1967), UW-Madison.

Applied physics including radiation dosimetry, electronic instrumentation, and acoustical noise. Primary research interest is in modeling solid waste management systems. Radiological physics.

Sager, Dorothea B., Associate Professor of Human Biology (population dynamics and medical technology); B.A. (1959), Lawrence; M.S. (1961), Iowa; Ph.D. (1968), UW-Madison.

Physiology or reproduction; hormonal controls. Developmental and reproductive effects of environmental contaminants. Biological factors in family planning. Reproductive physiology, zoology, embryology.

Sager, Paul E., Professor of Science and Environmental Change; B.S. (1959), Michigan; M.S. (1963), Ph.D. (1967), UW-Madison.

Ecology of aquatic communities including nutrient studies in the phytoplankton of freshwater lakes. Eutrophication of lakes. Ecological effects of nutrient enrichment and water quality deterioration. Limnology.

Schwartz, Leander J., Professor of Science and Environmental Change and Associate Vice Chancellor (biology); B.S. (1957), UW-Platteville; M.S. (1959), Ph.D. (1963), UW-Madison.

Resource recovery: anaerobic digestion of organic wastes and/or use as fertilizers and in other applications; bacterial survival in aquatic ecosystems.

Sell, Nancy J., Associate Professor of Science and Environmental Change (chemistry-physics); B.A. (1967), Lawrence; M.S. (1968), Ph.D. (1972), Northwestern.

Industrial resource recovery, pollution control. Industrial energy conservation by raw material and waste recycling and reclamation.

Starkey, Ronald H., Associate Professor of Science and Environmental Change (chemistry); B.A. (1963), Augsburg; M.S. (1965), Ph.D. (1968), Michigan State.

Organic chemistry, natural products, synthesis, spectrometric identification; chromatographic separations; chemical ecology; air pollution chemistry, airborne carcinogens.

Stieglitz, Ronald D., Associate Professor of Science and Environmental Change (earth science-geology); B.S. (1963), UW-Milwaukee; M.S. (1967), Ph.D. (1970), Illinois.

Environmental geology, land capability studies, mineral resources, stratigraphic analysis, depositional systems land use sedimentary geology, applications of geology to land use problems.

Van Koeving, Thomas E., Associate Professor of Science and Environmental Change (science education); B.S. (1962), Western Michigan; M.A. (1965), Michigan; Ph.D. (1969), Western Michigan.

Science and environmental education, particularly at the elementary and secondary school level. Preservice and in-service teacher training in environmental education. Curriculum evaluation. Innovation in teaching high school physics and chemistry. Local and regional health care planning. Chemical education.

Wenger, Robert B., Associate Professor of Science and Environmental Change (mathematics); B.S. (1958), Eastern Mennonite; M.A. (1962), Pennsylvania State; Ph.D. (1969), Pittsburgh.

Systems analysis. Theory and applications of mathematical optimization. Resource recovery and solid waste management problems. Energy usage in solid waste systems. Management models for controlling ragweed pollen. Algebra, operations research.

White, Keith L., Professor of Science and Environmental Change (biology); B.S. (1950), UW-Madison; M.S. (1958), Montana-Missoula; Ph.D. (1962), UW-Madison.

Structure and function of forest and wetland plant communities. Preservation of natural areas: Effects of fire, grazing and logging on ecosystems. Plant ecology and resource management.

Wiersma, James H., Associate Professor of Science and Environmental Change (chemistry); B.S. (1961), UW-Oshkosh; M.S. (1965), Ph.D. (1967), Missouri-Kansas City.

Assessment of effects of water pollutants and water pollution abatement procedures on aquatic ecosystems. Development of new analytical chemical methods with emphasis on techniques applied to environmental problems. General interest areas—water chemistry and hazardous and toxic materials.

Course Descriptions

GRADUATE ONLY (700-LEVEL) COURSES

002-750 Executive Decision-Making 3 cr.

Examines the theory of individual and group decision making, the process and consequences associated with alternative decision making styles and systems; and develops skill in the use of the major decision assisting tools. Uses case studies and examples from the fields of environmental management; public administration, and business or industrial management. P: course in statistics, prior or concurrent registration in 002-753 or 002-754 recommended. (S)

002-752 Environmental Policy and Administration 3 cr.

Analyzes environmental policy-making and implementation, with emphasis on advanced industrialized societies, and a special focus on the United States. Topics include the nature of environmental problems; indicators of environmental quality and change; the political and administrative context of environmental problems; policy-making and implementation at federal, state, and local levels—with comparisons to other nations and to international efforts; political, organizational, legal, and technical constraints on environmental administration; policy and program evaluation; and selected problems and issues in environmental policy and administration. The particular focus reflects students' needs and interests. P: 002-758 or cons inst. (S-O)

002-753 Administrative Theory and Behavior 3 cr.

The structure and internal system maintenance processes of formal organizations, with an emphasis on the roles of supervisors, team leaders, executives, managers, administrators; and administrative staff specialists. The major theories and schools of thought in the fields of administrative behavior, organizational theory and leadership are examined. Attention is given to major factors which influence the success of organizational activity and administrative behavior, and to effects associated with a range of organizational and administrative practices and behavior. P: gr st. (F)

002-754 Human Ecology and Public Policy 3 cr.

Examines interactions between human beings and their environments as mediated by public policies; focusing on the impact of these processes on health, longevity, productivity, and life quality. Considers the interrelationships between socially significant macro problem sets, and focuses on application of general systems theory and of epidemiologic, policy analysis, demographic, and statistical risk assessment methods to identifying and analyzing psychosocial and pathophysiological problems. P: gr st. (S-E)

002-756 The Policy-Making Process 3 cr.

American governmental institutions, policy-making processes, and public policy issues. Topics covered each semester will depend upon student interests and needs, but will include: the nature, purpose, and scope of American government; approaches to the study of government, politics, and public policy; political behavior and its impact on policy making; the structure and operation of governmental institutions at national, state, and local levels; social, technical, administrative, political, legal and economic constraints on policy-making and implementation; public policy analysis; and selected issues and problems in contemporary public policy. P: gr st.

002-758 Problems in Environmental Administration 3 cr.

Guided student study and supervised student exercises and problem-solving conducted study around a selected set of formal problems designed to depict the typical decision problems faced by environmental administrators and further designed to require solutions typical of those expected of mature practitioners. P: cons inst.

008-701 Perspectives in Environmental Science 3 cr.

Applications of the scientific method to contemporary problems. Emphasis is on experimental design and data acquisition and interpretation. Major problem areas in the environmental sciences are reviewed through lectures and student research papers. Major areas of concern are aquatic studies, waste management/resource recovery, plant and agricultural ecology, environmental health, and rehabilitation of ecosystems. Students are expected to identify a specific problem, research the literature, formulate a hypothesis, and propose an experimental approach to investigate the problem. This process culminates in formation of a research protocol or "grant proposal." (F)

008-704 Discrete Multivariate Statistical Analysis 2 cr.

The statistical analysis of categorical data by log-linear models. Categorical data arises in circumstances when members of a population are characterized as either possessing or not possessing a particular property. For example, members of a human population may be characterized by sex, socio-economic status, medical status; presence of disease, opinion on current political events; behavior in specified circumstances, etc. Customarily this leads to two-way cross classifications where the cell entries are counts of subjects; and analysis is by chi-squared. Should 3, 4 or more criteria of classification be used, analysis becomes vastly more complex. This course discusses techniques for analyzing and interpreting such complex situations. (J-E)

008-724 Hazardous and Toxic Materials 3 cr.

The handling, processing, and disposal of materials which have physical, chemical, and biological properties presenting hazards to human, animal, and plant life; procedures for worker safety and for compliance with regulations. Topics include organic and inorganic materials, radioactive materials, and pathogenic human, animal, and plant wastes. Required field trip. P: undergraduate courses in chemistry, physics, biorganic chemistry or equivalent. (S)

008-730 Technology Assessment and Environmental Impacts 3 cr.

The purpose of technology assessment is to predict a broad range of impacts on the environment and society due to application of technological advances. Of particular interest are impacts which are indirect and may be unexpected. In addition to science-based impacts, the economic, legal, and social implications of technology are of concern. This course focuses on various methods used for technology assessment. Simulations are done using these strategies on a variety of problems or technologies. One technology, with wide-ranging potential environmental impact, is selected for an in-depth assessment by the class. (S)

008-749 Wetland Ecology and Management 3 cr.

Ecological processes and characteristics of wetlands such as primary productivity, hydrology, decomposition and nutrient dynamics are studied. Wetland classification systems are examined and evaluated. Management practices and potential as well as current approaches to values assessment are addressed. P: 862-302 or equivalent.

008-751 Bases of Community Health 3 cr.

An overview of community health including concepts of health and disease. Indices of health status are discussed, as well as patterns of morbidity and mortality. Students are introduced to the process of perception, identification and delineation of health problems, along with strategies for intervention. Such strategies include safe water supply, immunization, proper nutrition, appropriate laws and policies. Significant problem areas are analyzed, including problems of the environment, population, food, and communicable disease. Special emphasis is placed on the concept of humans and their environment and how these interrelationships affect community health. The role of public health in diagnosing and treating disease is explored. The American health care system is discussed, along with basic principles of health care organization. P: gr st. (F-O)

008-759 Coastal Zone Management 3 cr.

Examination of the interdependency of humans and coastal zone environment, causative factors of problems to all coastal environments; state coastal zone management programs and the demand for resource development in various coastal regions in the U.S. The course focuses on the coastal areas of the bay of Green Bay and Lake Michigan, but also includes a broader geographic perspective. P: gr st and cons inst. (S-E)

008-762 Natural Science Seminar 1 cr.

A course designed to provide natural science students the opportunity to gain knowledge about a variety of science specialty areas, and to give them experience in public speaking. Requirements include attending the seminars; writing a critique of each, and presenting one seminar on the student's own research. P: gr st in natural science-related program. (F, S)

008-764 Mathematics of Operations Research and Management Science 3 cr.

Mathematical models which are frequently and extensively used in analyzing environmental, public sector, management, and business problems. These models include allocation, network, location, scheduling, and queuing models. An important part of the course is a study of applications of models through case studies of other examples. P: undergraduate courses in calculus and matrix algebra, or cons inst. (S-E)

008-766 Waste Management/Resource Recovery Seminar 3 cr.

Topics include generating, processing, and disposing of municipal, industrial, and agricultural waste materials with emphasis on the technical and economic feasibility of various recycling processes. P: gr st. (F-O)

008-767 Statistical Design and Analysis of Experiments 4 cr.

Review of the common principles underlying the design of experiments and methods of analysis for such experiments. The purpose is to enable students to design and analyze their own experiments, for any degree of experimental complexity, and to understand the description and analysis of such experiments in the literature. Topics include the principles of replication, randomization, error, linear models and least squares; hierarchical models; blocking, and factorial designs. Complex designs such as Latin squares, incomplete blocks, split plots, and the concepts of expectation of mean squares are developed as justification for the statistical tests applied. Non-parametric statistical methods, particularly as applied to designed experiments, concepts of ordinal and nominal data, and chi-square contingency analysis, are discussed. The principles are motivated throughout by reference to the theory and practice of scientific experimentation, and illustrated by examples. Laboratory analyses are performed on actual experimental data. P: elementary course in statistics. (F)

008-768 Multivariate Statistical Analysis 4 cr.

Analysis of multifactorial data. Regression, multiple regression, curvilinear regression, nonlinear regression, correlation, multiple and partial correlation, path analyses, principle components, factor analysis; discriminant analysis. Emphasis on the computer analysis of actual data. P: elementary statistics and cons inst. (S)

008-776 Bioclimatology 3 cr.

The influence of the atmosphere on plants and animals including humans and the adaptations of organisms to the atmosphere. Emphasis is on subjects related to plant and animal productivity and to the well-being of organisms. P: Undergraduate courses in biology and physics. (F-O)

008-778 Epidemiology 3 cr.

Concepts and methods of epidemiology are presented in lectures and in weekly problems. The problems are involved with establishing criteria for research problem designing and investigating epidemiological problems both in the community and on a global basis. Problems include examples of both infectious diseases. Examples of the non-infectious diseases will be environmental in nature (for example the effect of noise, or color on work performance). A team-oriented field project is a requirement. Each student is expected to contribute to the project and to preparation of a paper. The functioning of epidemiology in community health is emphasized. P: course in statistics. (S-O)

008-795 Special Topics

This course number is used to designate courses and seminars offered by graduate faculty in response to special demand or an experimental basis. Topics may be chosen to address current issues of general concern, special interests of student groups or faculty members, or special resources of visiting faculty. The title of the special topics course as announced in the *Timetable* will appear on the transcripts of the students who enroll. Credits earned in the 795 special topics courses may not be applied toward the graduate core requirement.

008-797 Internship 1-6 cr.

Supervised work experience in an appropriate program or agency. Students may enroll for internship credits only when such activity is included in the approved program plan. A description of activities including criteria for grading must be submitted to the students' major professor and director of graduate studies. P: Student classification of MS6, ME6 or higher.

008-798 Directed Study

Reading and research under the supervision of a member of the graduate faculty. Directed study credits may only be earned when this activity is included as part of an approved program plan. P: Student classification of MS6, MA6, ME6 or higher.

008-799 Thesis 1-6 cr.

Research and preparation of thesis document. Enrollment may be for 1-6 credits per term. All students are expected to include 6 thesis credits in their program plan. Although additional thesis credits may be earned, a maximum of 6 credits can be applied toward a degree. P: Student classification of MS7, MA7, or ME7.

009-703 Community Organization and Planning 3 cr.

Reviews and examines community organization and social planning and the problems inherent in their practice. A community problem solving model aimed at social change is developed. Other elements of social planning and community organization examined include: setting priorities in a community, doing research studies, the politics of planning, developing and implementing plans of action, the strategy and tactics of social action, goal analysis, decision-making analysis, feedback mechanisms and planning management. P: gr st. (S-O)

009-739 Behavioral Research Strategies 4 cr.

Conceptual and procedural issues in research. This is a laboratory course in research methods and design. This course provides knowledge and skills to collect adequate, accurate, and useful information about behavioral science questions. Although issues of control and experimental design are a central concern, the concepts, techniques, and skills learned in this course are applied to a variety of research situations. P: introductory statistics. (F)

009-765 Evaluating Social Programs 3 cr.

Since the early 1960's there has been a growing trend to ask programs providing social or educational services to provide evidence that they are effective. A new field—evaluation research—has emerged in response to this trend by adapting the methods of social research to the problem of assessing program quality. This course provides an introduction to evaluating research. It emphasizes such issues as identifying program goals, choosing outcome measures, defining appropriate samples, data collection strategies, and evaluating and disseminating results. Political, administrative, and ethical problems of evaluation are considered throughout. Course procedure is informal with much of the class time spent in developing and discussing model evaluation studies. P: introductory statistics. (S)

UNDERGRADUATE/GRADUATE (500-699 LEVEL) COURSES

204-511 Plant Physiology 4 cr.

General physiology of vascular plants within the context of a plant life cycle. Seed dormancy and germination, metabolism, transport systems, mineral nutrition, patterns of plant growth and development, growth regulators, reproduction, and senescence. P: 204-203, 225-112.

204-602 Advanced Microbiology 3 cr.

Detailed study of microorganisms from virus to fungi in their environment. A study of both free-living and pathogenic organisms and their degrading abilities. P: 204-302.

225-530 Biochemistry 3 cr.

Nature and function of the important constituents of living matter, their biosynthesis and degradation: Energy transformation, protein synthesis, and metabolic control. P: 225-303 or 225-300, 301 and 204-202.

225-531 Biochemistry Laboratory 1 cr.

One three-hour laboratory per week. P: credit or concurrent registration in 225-330.

225-613 Instrumental Analysis 4 cr.

A survey of the theory and practice of analysis by instrumental methods including those based on absorption and emission of radiation, electroanalytic methods, chromatographic methods, and radio-chemical methods. P: 226-311 and credit or concurrent registration in 226-321.

226-617 Nuclear Physics and Radiochemistry 3 cr.

Introduction to the properties and reactions of atomic nuclei; the application of the properties of radioactive nuclei to the solution of chemical, physical, biological, and environmental problems. P: 226-112 and either 226-202 or 226-104 and 600-203.

226-618 Nuclear Physics and Radiochemistry Laboratory 1 cr.

One three-hour laboratory per week. P: credit or concurrent registration in 226-417.

296-620 Soil Classification and Geography 3 cr.

Morphological properties of soils, major kinds of soil horizons; principles of soil classification, taxonomic systems; soil-landscape relationships; genesis and global distribution of major kinds of soils, soil surveys and their interpretations for agriculture, engineering, and urban planning. Field trips. P: 296-320 or 202.

298-505 Natural Resources Economic Policy 3 cr.

Acquaints the student with policies leading to arrangements for the development, management, and use of natural resources. Emphasizes the longer time horizon required for the conservation of resources and a general concern for the quality of the ecosystem. P: jr st.

298-602 Resource Economics Analysis 3 cr.

Application of tools and concepts in current economic decision-making with special emphasis upon common property resources management (i.e., water and air). P: jr st and 298-202 and 203.

350-505 Regulatory Policy and Administration 3 cr.

An examination of the purposes, structure, legal aspects, and operation of public regulatory agencies and programs in the United States. Topics include theories and controversies underlying regulatory policy, issues in contemporary regulatory policy and administration, and rational models and methods for risk analysis and decision making. Case studies and exercises will cover a variety of regulatory processes, including those associated with public health, consumer protection, product safety, environmental quality, and energy development and use. P: 778-101 or 350-102 or cons inst.

350-615 Administrative Planning, Programming, and Budgeting Systems 3 cr.

Covers the history, philosophy, purposes, attributes, types, and operational elements of major public budgetary systems used in the United States, with emphasis on object, performance, program, and PPB systems and their applicability to various programs, organizations, and governmental jurisdictions. Examines principles and methods used in designing and managing public budgeting systems and relationship between program planning, policy planning, and budgetary operation. Develops skill in applying analytic and decision-assisting tools to public budgetary operations. P: 350-102, or another course in American government, or cons inst.

350-660 Public Policy Analysis 3 cr.

An introduction to public policy analysis and to the policy-making process in American government. Topics include approaches to the study of public policy, the nature of public problems, the policy agenda, policy formulation, assessment of policy alternatives, policy adoption, policy implementation and evaluation, and the use of policy analysis in decision making. Special attention is given to political aspects of policy analysis, to models and methods

for critical analysis and rational design of public policies, and to practical applications of policy studies. Develops skills in legislative research, preparation of position papers and other policy-development documents, and methods of policy analysis and evaluation. P: 778-101 or 350-102 or cons inst.

478-602 Human Physiology 3 cr.

The functions of the major organs and organ systems of humans other than the central nervous system and the special senses. P: 204-202, 203 and 226-111, 112, or equivalent.

478-613 Neurophysiology 3 cr.

The nervous system and its functions in perception, interpretation, and the production of physiological and behavioral response: fundamental concepts; neuronal function, sensory systems, and processing mechanisms: Emphasis is on limitations imposed by various environments. P: 204-202, 203 and 226-111, 112, or its equivalent or cons inst.

479-601 Agricultural Genetics and World Food Production 3 cr.

Inheritance as related to livestock and agronomic plants. Goals and techniques of selection, hybridization, and breeding for yield; pest and disease resistance; feed efficiency; and product quality. Emphasis on major food crops exploring the relationship among agricultural technology, population growth, and human nutritional requirements. P: 204-303 or 779-310.

479-604 Food Science 4 cr.

Standards of food quality, food preferences, food assay, food deterioration, adulteration; methods of preservation and distribution. Laboratory includes quantitative analysis of and instrumental procedures for various food components; arranged student visits and/or interaction with specific area food laboratories. P: 226-303 or 226-330.

479-621 Community Nutrition I 2 cr.

Nutritional problems of the individual and family within a local ecological setting—county, city, nation, region, and state. P: 694-302.

479-622 Community Nutrition II 2 cr.

Nutritional problems of the individual and family within a local ecological setting—county, city, special population segments. Includes field work. P: 694-421.

479-685 Advanced Human Nutrition 3 cr.

Physiological and biochemical principles of nutrition; fundamental concepts of human nutrition and nutritional diseases. P: 204-202; 226-330, 331; 694-232 or equivalent.

479-688 Nutrition in Disease 3 cr.

Therapeutic applications of nutrition in treatment of human disease. Emphasis is placed upon familiarization of students with the medical terminology, etiology, biochemical and clinical manifestations of disease conditions. Students will determine changes in nutrient intake, food and eating patterns necessary for treating disease conditions and construct suitable meal plans. P: 694-485; 226-330 or equivalent.

575-585 Management of the Nonprofit Organization 3 cr.

The operation and management of organizations that operate within our society for purposes other than the generation of profit for owners or shareholders. Models such as the hospital and the university focus on the operational principles, optimizing criteria, and management control techniques characteristic of such institutions. In addition to examining the areas of accounting, fi-

nance, marketing, organization, and personnel, the nonprofit organization is discussed in terms of its social responsibility and the political and economic conditions in which it operates. Case studies used in a seminar format. P: jr st or cons inst.

600-550 Numerical Analysis 3 cr.

Application of computer techniques in solving various mathematical and engineering related problems. Types of problems to be considered are: solutions of equations, factorization of polynomials, solutions of systems of equations, interpolation, curve fitting, differentiation, integration, and solutions of differential equations. In addition to writing computer programs to solve some of these problems, comparisons will be made among various techniques to determine errors involved in approximation schemes, advantages and disadvantages to applying a particular technique to a particular problem, and the unstable nature of some methods. P: 600-203, 600-320 or concurrent registration in 600-320 and FORTRAN ability.

600-551 Data Structures, Storage and Retrieval 3 cr.

An introduction to concepts involved in storage, retrieval, and processing of data for use in computer applications. Included are structures such as arrays, stacks, queues, linked lists, trees, and networks. Particular emphasis is placed on design of efficient algorithms that use these different structures for various processing needs. These include searching, sorting, evaluation of arithmetic expressions, construction of symbol tables, and memory management. P: 600-257.

600-553 Computer Organization and Programming 3 cr.

An introduction to binary, octal, and hexadecimal number systems, and data representation. A study of assembly language programming, including actual programming exercises. Included is an overview of computer software and hardware components. Topics considered are assemblers, loaders, compilers, memory, microprogramming, monitoring, gates, adders, circuits, and applications of Boolean algebra to circuit analysis. P: 600-257 and a background in algebra.

600-555 Applied Mathematical Optimization 3 cr.

Analytical and numerical optimization techniques; linear, non-linear, integer, and dynamic programming. Techniques applied to problems of water, forest, air, and solid waste management. P: 600-202 and 320, or concurrent enrollment in 320.

600-560 Theory of Probability 3 cr.

Probability as a mathematical system; with applications; basic probability theory; combinatorial analysis; distribution functions and probability laws; mean and variance of a probability law; expectation of a function with respect to a probability law; normal, Poisson, and related probability laws; random variables. P: 600-209.

600-561 Mathematical Statistics 3 cr.

Sample moments and their distributions; tests of hypotheses; point and interval estimation; regression and linear hypotheses; nonparametric methods; sequential methods. P: 600-320 and 360.

600-564 Biometrics 4 cr.

Emphasis on life science problems. Analysis of variance techniques; linear regression, correlation analysis and nonparametric techniques; introduction to statistical computation. P: 600-260.

600-610 Complex Analysis 3 cr.

Algebra and geometry of complex numbers; analytic functions, elementary transformations; integration; Taylor and Laurent series, contour integration; residues; conformal mapping. P: 600-209.

600-616 Orthogonal Functions and Partial Differential Equations 3 cr.

Fourier series, Fourier transform; orthogonal functions; Legendre and other polynomial systems; Bessel functions; characteristic functions and values; Green's function; wave equation in one and more dimensions; D'Alembert's solution; separation of variable in various coordinate systems; Dirichlet problem; strings and membranes; heat flow; electricity flow. P: 600-305 and 320.

834-522 Regional Planning 3 cr.

The concepts of planning, the history of its use in the development of regions, and the present status of planning in the United States with some international comparisons. P: jr st.

834-621 Techniques and Methods of Planning Analysis 3 cr.

The use and application of basic tools for urban and regional planning; source of data and other basic information; techniques and methods of population, economics, land use, housing; and transportation analysis and projects. P: jr st.

862-518 Industrial Pollution Control Techniques 2 cr.

This course will first explain general air and water pollution control methods, including the nature of the major existing pollutants and a brief overview of the present government regulations. Then several selected types of industries (for example, paper and pulp making, cement manufacture, iron and steel processing, breweries, foundries, chemical process industries...) will be discussed in detail; the general manufacturing process, how and where the major pollution arises; and the specific techniques used in that industry to control these emissions. P: 226-112.

862-519 Industrial Pollution Control Field Trips 1 cr.

Optional field course to accompany 862-518. Field trips will be scheduled to a variety of local industries including paper mill, foundry, MSD, etc. In addition, each student will be required to prepare a research paper. P: Concurrent registration in 862-518.

862-520 The Soil Environment 3 cr.

The physical, chemical, and biological properties of soil; formation, classification, and distribution of major soil orders; influence of soil on agricultural, engineering, urban, and water systems. Field trip. P: 226-108 or 112; 296-202 recommended.

862-521 The Soil Environment Laboratory 1 cr.

Laboratory and field study of physical, chemical, and biological properties of soils. P: credit or concurrent registration in 862-520.

862-563 Plants and Forest Pathology 3 cr.

Studies of important diseases of forest, shade, and orchard trees and diseases of representative economic plants; fungus deterioration in wood storage and their economic importance with methods of control; field trips. P: 204-203.

862-578 Chemical Ecology 2 cr.

Selected topics concerning the chemical interactions of organisms and the environment. Topics such as chemical communications, chemical defense mechanisms, and sex attractants will be covered. The course is in basic lecture format and each student is asked to prepare a paper on an aspect of chemical ecology which is of interest to him or her. P: cons inst.

862-580 Radiobiology 2 cr.

An introduction to the use of radionuclides (C^{14} , P^{32} , etc.) and sources of ionizing radiation in biology, medicine and environmental sciences. Emphasis is on experimental methods currently used in the life sciences. Including tracers in biology, radiation biology, nuclear medicine and radioecology. This course provides the background needed to obtain an NRC license to use radionuclides in most tracer experiments. Credit will not be given for both this course and 226-418.

862-601 Stream Ecology 3 cr.

A study of the structure and function of stream ecosystems. Functional relationships of feeding groups, nutrient spiraling and organic matter processing are examined as responses to stream morphology, stream order and watershed conditions. Extensive field sampling of Northeast Wisconsin streams.

862-603 Limnology 3 cr.

Physical, chemical, and biological interactions in lakes and streams as expressed in the nature and dynamics of aquatic communities; laboratory and field techniques used in characterizing the aquatic environment. P: 204-203 and 226-111.

862-605 Winter Conditions in Lakes 3 cr.

Physical, chemical and biological characterizations of selected Wisconsin lakes will be examined. Emphasis will be placed on limnological parameters that demonstrate trophic status and the effects of metabolism of lake ecosystems imposed by winter; conditions of low temperature and reduced light. Intensive sampling and analysis during a one week field trip to northern Wisconsin lakes will provide a data base for specialized individual student projects. An interdisciplinary analysis of the data will be accomplished through student seminar presentations of specialized projects. P: Advanced course work in ecology and/or chemistry desired (analytical chemistry); also cons of inst: 1 week field trip to northern Wisconsin.

862-614 Conventional Energy Technology 3 cr.

An advanced course on conventional energy conversion equipment, electric power generation facilities, available fuels, energy related to transportation of energy and policy. P: 600-203; 226-320.

862-622 Environmental Biogeochemistry 3 cr.

Microbial and chemical transformations of carbon, nitrogen, phosphorus, sulfur, and certain trace compounds in soil-water-atmosphere systems; fate of selected pesticides, fertilizers, natural and synthetic wastes in the ecosystem; beneficial and toxic effects on plants and animals, role in pollution on the environment; use of waste disposal systems for pollution abatement. Field trip. P: 204-202, 226-300, 296-202.

862-630 Quantitative Hydrology 3 cr.

Quantitative oriented study of the water cycle including precipitation; run off; infiltration, evapotranspiration and ground water. Numerical procedures for various water resource developments including hydrograph prediction in both urban and rural areas, reservoir and stream flow routing and hydrologic uncertainty. P: 600-202, 296-202.

862-634 Water Chemistry 4 cr.

The physical, chemical, and biological factors that alter the composition of surface and ground water. Field and laboratory analysis techniques. Field trip. P: 226-311.

862-650 Air Pollution Chemistry and Meteorology 3 cr.

Chemical reactions and transport phenomena in the unpolluted and polluted atmosphere with emphasis upon dispersal processes and control. P: 226-112.

862-654 Remote Sensing of the Environment by Satellite 3 cr.

Large area, small scale analysis of earth surface features by satellite imagery and data. Major emphasis is on use of LANDSAT (NASA Earth Resources Satellite). Hands on experience in manual interpretation of multispectral images with respect to vegetation, geology, soils, water resources and land use. Introduction to computer assisted analysis. Overview of other satellite systems including weather, passive and active microwave (radar) and thermal infrared. Fundamentals of the electromagnetic spectrum, sensors, and data processing systems. Public access to data and imagery. P: 296-202 or 416-250. See 834-454.

862-660 Resource Management Strategy 3 cr.

Applications of principles of system analysis to designing resource management systems and to developing strategies for maintaining optimum environmental utilities. Decision models and the role of economic systems in resource management. P: jr st and some background in economics or conservation.

862-666 Vegetation Management 3 cr.

An analysis of current practices in managing U.S. vegetation, including establishment, maintenance, control and conversion. An assessment of management tools, such as cutting, grazing, chemical spraying, flooding and burning. Experience with and potential for vegetation management on the UWGB campus is observed and discussed, e.g., prairie and pond establishment, tree and shrub control, erosion control, conversion of forest to park and old field to forest, maintenance of lawns, golf greens and fence rows. The various practices and tools are evaluated in regard to their effectiveness, economic cost and environmental impact. P: 204-203.

862-672, 673 Ecosystems Analysis I, II 4, 4 cr.

The dynamics of ecosystems, emphasizing principles essential to analysis, understanding, and management. Description of major ecosystems, energy relationships, nutrient cycling, limiting factors, genetic adaptations and mechanisms of evolution, and management problems. Field trips, environmental data collection and laboratory analysis, and an introduction to systems analysis. To be taken in sequence. P: 204-203, 225-112, 754-104 or 202, 296-202 and 600-260.

UNDERGRADUATE (300 AND 400-LEVEL) COURSES

Graduate credit for the undergraduate courses with 300 or 400 level numbers is available only with special permission of the instructor and the student's graduate adviser or the director of graduate studies. An assigned study card is required for registration in one of these courses.

203-302 Principles of Microbiology 4 cr.

A study of microorganisms and their activities. Included is their form, structure, reproductive physiology, metabolism, and identification; their distribution in nature and relationship to each other and to other living things. P: 204-202 and 226-108 or 226-112.

204-310 Plant Taxonomy 3 cr.

A laboratory, field and discussion course in identification and classification of plants of North America including flora of Wisconsin. P: 204-203.

204-315 Biology of Lower Green Plants 3 cr.

A survey of the photosynthetic non-vascular plants including the algae, lichens and bryophytes. Emphasis will be placed on morphological study of these groups and will also include field collections and laboratory identification. P: 204-203/jr st or cons inst.

204-341 Ichthyology 3 cr.

An examination of the biology of fishes including classification, phylogeny, functional morphology and population characteristics. Aspects of the ecology of the fishes will be studied in relation to behavior, distribution, diversity and production in fresh-water environments. P: 204-203 or equivalent.

204-347 Developmental Biology 4 cr.

Principles of development including gametogenesis, fertilization, gastrulation, organogenesis, and the effects of internal and external environmental factors on development. Laboratory work includes morphogenesis of amphibians, chicks and pigs, and work with living embryos. P: 204-203.

834-355 Introduction to Quantitative Methods of Spatial Analysis 3 cr.

The scientific approach to geographic problems; basic techniques for the analysis of spatial distributions and spatial relationships. P: a course in statistics.

834-356 Environmental Impact Analysis 3 cr.

Procedural requirements of NEPA; State NEPA equivalents; methodologies of and approaches to environmental impact analysis; assessment of alternatives; interdisciplinary exposure to substantive types of impacts using natural and social sciences; emphasis on social impact analysis; local field project in impact analysis. P: jr st.

862-307 Ecology of Fire 2 cr.

The use of fire to modify vegetation by native peoples in the past and by contemporary landscape managers. Examples of landscapes considered are grasslands, chaparral, southern pine forests and northern aspen forests. Causes and control of wild-fires are discussed, as well as their impact on air pollution and soil condition. Case histories of prescribed burning, e.g., blueberry production, big game management and bird habitat preservation are analyzed.

862-334 Solid Waste Management 3 cr.

A study of the nature of the solid waste problem including generation, collection, processing, and disposal. Special attention is given to the recovery of material and energy resources from solid wastes. Guest speakers and field trips will contribute to an understanding of local and regional solid waste problems and solutions.

862-335 Water and Waste Water Treatment 3 cr.

Fundamentals of water and waste water treatment systems including both sewage and potable water treatment plants and their associated collection and distribution systems. Study of the unit operation, physical, chemical, and biological, used in both systems. P: 296-202 or 225-111 or 204-202.

862-342 Environmental Geology 3 cr.

Applications of fundamental geologic concepts in the interpretation of environmental problems resulting from our exploitation of crustal resources. The environmental impact of construction, mining, waste disposal, natural geologic hazards, and the tapping of crustal energy reservoirs (fossil fuels, geothermal heat). P: 296-202.

862-345 Geology of Energy Resources 3 cr.

A survey of geological energy resources: petroleum and natural gas, coal, uranium and geothermal energy. Geological environment of these resources, methods of discovery and utilization, and environmental and economic problems associated with them. P: 296-200 or 296-202 or equiv.

862-415 Solar and Alternate Energy Systems 3 cr.

A study of alternate energy systems which may be the important energy sources in the future such as solar, wind, biomass, fusion, ocean thermal, fuel cells and magnetohydrodynamics. P: 226-104 or 754-202 or equivalent.

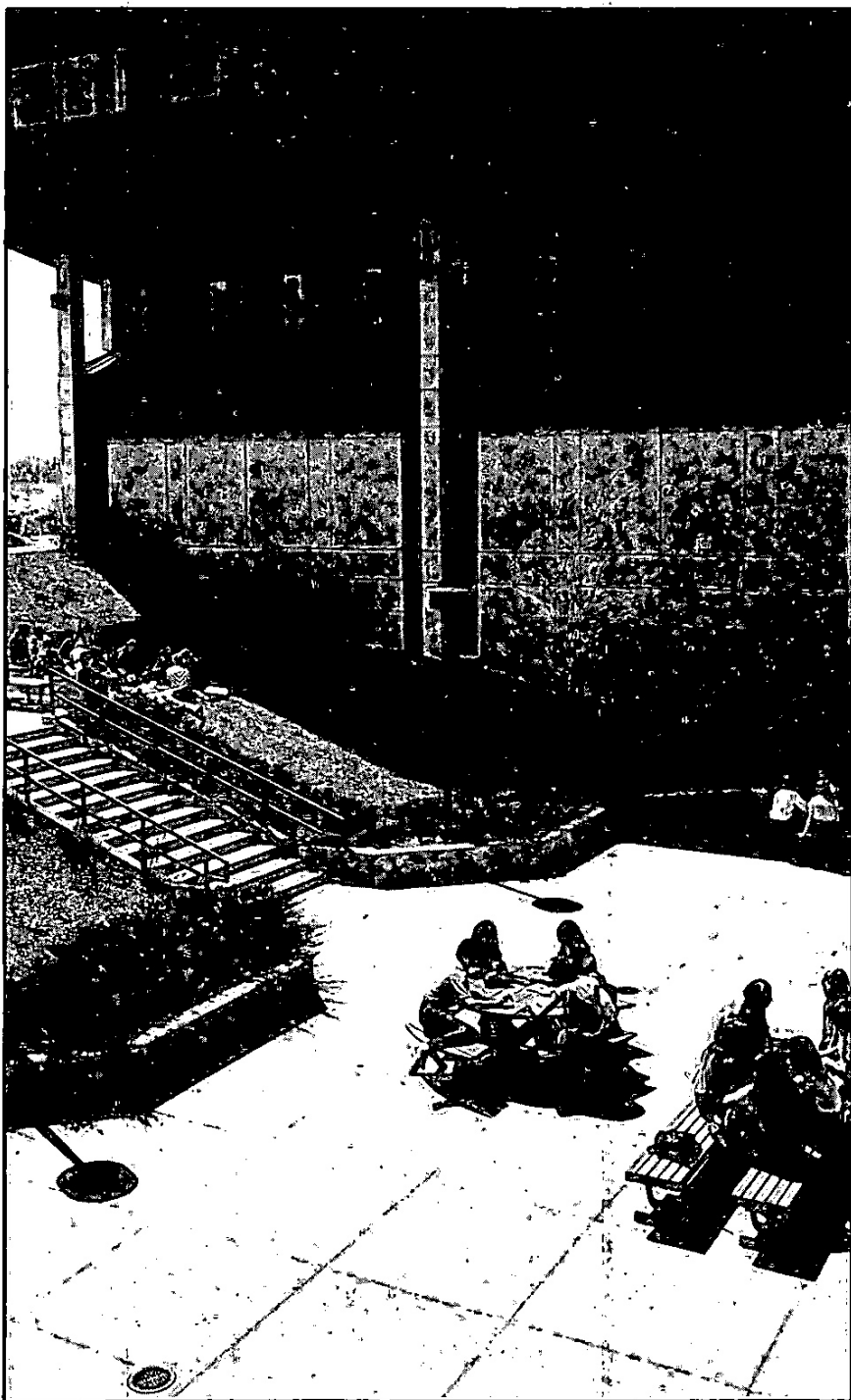
Personal Emphasis

A student may choose a personally defined emphasis which is a self-designed program. This alternative is appropriate for students who find that their educational objectives and interests are consonant with the M.S. or M.A. in Environmental Studies degree but are not appropriately addressed by one of the existing approved areas of emphasis.

A student who wishes to apply to the master's program with the intention of pursuing the personally defined emphasis must supply sufficient information in the statement of intentions to permit the admissions committee to determine whether the proposed area of study is compatible with the UWGB graduate program.

In writing the statement of intentions, the student should address these questions: (1) Is the proposed study track appropriate to the environmental studies degree? (2) Why can the proposed area of study not be addressed through one of the defined tracks? (3) What group of courses might be included for the program of study? The decision to admit the student will be based on the answers to these questions and also whether, in the judgment of the admissions committee, the appropriate faculty expertise and coursework is available to permit the student to accomplish his or her stated educational objectives. The program of study for a student pursuing a personally defined emphasis must include a minimum of 30 credits, of which at least 12 must be 700-level courses.

Cooperative Programs in Education



General Information

Through a series of cooperative arrangements between the University of Wisconsin-Green Bay and its sister campuses, UW-Milwaukee and UW-Oshkosh, four graduate programs in education may be completed at the UW-Green Bay campus. These programs are:

- Master of Science in Administrative Leadership—Educational Administration and Supervision Emphasis (UW-Milwaukee)
- Master of Science in Curriculum and Instruction (UW-Milwaukee)
- Master of Science in Education—Reading (UW-Oshkosh)
- Master of Science in Educational Psychology—Counseling Emphasis (UW-Milwaukee)

In these programs a coordinated set of UWGB and UW-Milwaukee or UW-Oshkosh courses are offered to enable students to complete requirements for these degrees on the UWGB campus. Students must be admitted to the graduate school and to the appropriate department of the degree

granting campus (UW-Milwaukee or UW-Oshkosh) and are subject to the rules and regulations of that campus. Students who satisfactorily complete degree requirements will receive the appropriate degree from the sponsoring campus and be recommended for any appropriate certification associated with the degree by that campus.

Students in these cooperative programs normally will include 12 UWGB credits in their programs of study. Lists of appropriate UWGB courses and a projected schedule of offerings are given later in this chapter. For information about course selection, students should contact Prof. James Busch, chairperson of the Education Program and coordinator of Cooperative Programs in Education at UWGB at (414) 465-2149.

APPLICATION FOR ADMISSION AND PROGRAM INFORMATION

Packets including further information on these programs and application forms for admission to the sponsoring campus graduate school and department are available from:

Education Department, SE 424
University of Wisconsin-Green Bay
2420 Nicolet Dr.
Green Bay, WI 54301-7001

Also, for more complete descriptions of the programs, courses, degree requirements, rules and regulations and other pertinent information, students should consult the appropriate sponsoring campus graduate catalog, which may be obtained from the UWGB Education Office or by contacting the graduate school of the sponsoring campus.

REGISTRATION

Registration for UW-Milwaukee or UW-Oshkosh courses may be completed by mail using forms available from the University of Wisconsin-Green Bay Education Office. Students register for UWGB courses in their program as Graduate Special students, which may be done on campus or by mail.

FEES

Students pay fees to the campus offering the courses in accordance with the fee schedule and procedures of that campus.

Administrative Leadership

DEGREE

Master of Science in Administrative Leadership—Educational Administration and Supervision Emphasis

DEGREE REQUIREMENTS

The degree program consists of 33 credits.

UW-Green Bay Courses, 12 credits

UWGB 302-606 Evaluation and Testing in Education

UWGB 006-795 Business Administration of School Systems

UWGB 006-780 Foundations of Curriculum Elective as approved by adviser, 3 credits

UW-Milwaukee Courses Taught on the UWGB Campus, 21 credits

UWM 103-705 Principles of Administrative Leadership

UWM 103-706 Practicum in Administrative Leadership

UWM 103-720 Collective Bargaining and Contract Administration in Education

UWM 103-740 Instructional Supervision

UWM 103-745 Seminar in Educational Administration and Supervision

UWM 103-840 Legal Aspects of Educational Administration

UWM 315-640 Human Development: Theory and Research

COMPREHENSIVE EXAMINATION

The student must pass a final comprehensive examination.

TIME LIMIT

A student must complete all requirements for the degree within seven years of the initial enrollment.

CERTIFICATION OPPORTUNITIES

Upon satisfactory completion of this program, persons who are eligible for a Wisconsin teaching license and have the required teaching experience may qualify for

a license as an elementary or secondary school administrator and/or supervisor.

**PROJECTED SCHEDULE OF COURSE OFFERINGS
SPRING 1985—SUMMER 1988**

(All courses are offered at the UWGB campus. The institution offering the course is indicated in parentheses.)

Spring 1985

- 103-745 Seminar in Educational Administration and Supervision (Milwaukee)
- 302-606 Evaluation and Testing in Education (UWGB)
- 302-610 Introduction to the Education of Exceptional Children, elective (UWGB)

Summer 1985

- 103-720 Collective Bargaining and Contract Administration in Education (Milwaukee)
- 006-780 Foundations of Curriculum (UWGB)

Fall 1985

- 103-705 Principles of Administrative Leadership (Milwaukee)
- 302-610 Introduction to the Education of Exceptional Children, elective (UWGB)

Spring 1986

- 103-740 Instructional Supervision (Milwaukee)
- 302-610 Introduction to the Education of Exceptional Children, elective (UWGB)

Summer 1986

- 103-706 Practicum in Administrative Leadership (Milwaukee)
- 315-640 Human Development: Theory and Research (Milwaukee)

Fall 1986

- 103-840 Legal Aspects of Educational Administration (Milwaukee)
- 302-610 Introduction to the Education of Exceptional Children, elective (UWGB)

Spring 1987

- 302-606 Evaluation and Testing in Education (UWGB)
- 302-610 Introduction to the Education of Exceptional Children, elective (UWGB)

Summer 1987

- 103-720 Collective Bargaining and Contract Administration in Education (Milwaukee)
- 006-780 Foundations of Curriculum (UWGB)

Fall 1987

- 006-795 Business Administration of School Systems (UWGB)
- 302-610 Introduction to the Education of Exceptional Children, elective (UWGB)

Summer 1988

- 103-745 Seminar in Educational Administration and Supervision (Milwaukee)

NOTE: Additional courses to meet the elective requirement will be available. Check the UWGB *Timetable* for updated information and time schedule for courses each semester.

Educational Psychology: Counseling

DEGREE

Master of Science in Educational Psychology—Counseling Emphasis

DEGREE REQUIREMENTS

The degree program consists of 39 credits.

UW-Green Bay Courses, 12 credits

UWGB 006-750 Statistical Methods Applied to Education

UWGB 481-620 Tests and Measurements

Electives as approved by adviser, 6 credits

For certification in school counseling electives must include UWGB 302-610, Introduction to the Education of Exceptional Children, if a comparable course has not been completed.

UW-Milwaukee Courses Taught on the UWGB Campus, 27 credits

UWM 265-603 Essentials of Counseling Practice

UWM 265-604 Awareness: Counseling, Poverty, and Urban Cultures

UWM 265-674 Fieldwork in Counseling

UWM 265-700 Foundations of Career Development

UWM 265-710 Counseling: Theory and Issues

UWM 265-800 Group Counseling Theory

UWM 265-970 Supervised Practicum in Counseling

UWM 315-640 Human Development: Theory and Research

One of the three following courses depending upon concentration:

UWM 265-810 Developmental Counseling in the Elementary School

UWM 265-811 Counseling in the Secondary School

UWM 265-900 Clinical Studies in Counseling

COMPREHENSIVE EXAMINATION

The student must pass a final oral or written comprehensive examination.

TIME LIMIT

The student must complete all degree requirements within five years of initial enrollment.

CERTIFICATION OPPORTUNITIES

Upon satisfactory completion of this program, persons who are eligible for a Wisconsin teaching license and have the required teaching experience may qualify for a license as a counselor at the elementary or secondary school level.

PROJECTED SCHEDULE OF COURSE OFFERINGS

SPRING 1985—SPRING 1988

(All courses are offered at the UWGB campus. The institution offering the course is indicated in parentheses.)

Spring 1985

265-603 Essentials of Counseling Practice (Milwaukee)
302-610 Introduction to the Education of Exceptional Children, elective (UWGB)

Summer 1985

265-604 Awareness: Counseling, Poverty, and Urban Cultures (Milwaukee)
265-800 Group Counseling Theory (Milwaukee)
006-780 Foundations of Curriculum (UWGB)

Fall 1985

265-674 Fieldwork in Counseling (Milwaukee)
006-750 Statistical Methods Applied to Education (UWGB)
302-610 Introduction to the Education of Exceptional Children, elective (UWGB)

Spring 1986

265-700 Foundations in Career Development (Milwaukee)
481-620 Tests and Measurements (UWGB)
302-610 Introduction to the Education of Exceptional Children, elective (UWGB)

Summer 1986

265-810 Developmental Counseling in the Elementary School (Milwaukee)
265-811 Counseling in the Secondary School (Milwaukee)
315-640 Human Development: Theory and Research (Milwaukee)

Fall 1986

265-900 Clinical Studies in Counseling (Milwaukee)
302-610 Introduction to the Education of Exceptional Children, elective (UWGB)

Spring 1987

265-970 Supervised Practicum in Counseling (Milwaukee)
302-610 Introduction to the Education of Exceptional Children, elective (UWGB)

Fall 1987

006-750 Statistical Methods Applied to Education (UWGB)
302-610 Introduction to the Education of Exceptional Children, elective (UWGB)

Spring 1988

481-620 Tests and Measurements (UWGB)
302-610 Introduction to the Education of Exceptional Children, elective (UWGB)

NOTE: Additional courses to meet the elective requirement will be available. Check the UWGB *Timetable* for updated information and time schedule for courses each semester.

Curriculum and Instruction

DEGREE

Master of Science in Curriculum and Instruction

DEGREE REQUIREMENTS

The degree program consists of 30 credits.

UW-Green Bay Courses, 12 credits

UWGB 006-780 Foundations of Curriculum
Electives as approved by adviser, 9 credits

UW-Milwaukee Courses Taught on the UWGB Campus, 18 credits

UWM 272-616 Urban Education: Teaching
UWM 272-714 Analysis of Instruction
UWM 272-819 Theory and Design of Curriculum
UWM 272-800 Master's Seminar in Curriculum and Instruction

Electives as approved by adviser, 6 credits, at least three of which must be in Curriculum and Instruction courses.

COMPREHENSIVE EXAMINATION

Neither a final written or oral comprehensive examination is required. Students must demonstrate their proficiency through satisfactory completion of the Master's Seminar in Curriculum and Instruction (272-800).

TIME LIMIT

Students must complete all degree requirements within five years of initial enrollment.

CERTIFICATION OPPORTUNITIES

Through selection of appropriate elective courses persons who are eligible for a Wisconsin teaching license and have the required teaching experience may qualify for a license as an elementary or secondary supervisor.

PROJECTED SCHEDULE OF COURSE OFFERINGS SPRING 1985—FALL 1986

(All courses are offered at the UWGB campus. The institution offering the course is indicated in parentheses.)

Required Courses

Spring 1985

272-819 Theory and Design of Curriculum (Milwaukee)

Summer 1985

006-780 Foundations of Curriculum (UWGB)

272-800 Master's Seminar in Curriculum and Instruction (Milwaukee)

Fall 1985

272-616 Urban Education: Teaching (Milwaukee)

Spring 1986

272-714 Analysis of Instruction (Milwaukee)

Summer 1986

272-800 Master's Seminar in Curriculum and Instruction (Milwaukee)

Fall 1986

272-819 Theory and Design of Curriculum (Milwaukee)

Elective Courses

UWGB and UWM will offer courses to meet the elective requirement each semester and summer session. Adviser's approval in advance of registering an elective course is required.

Reading

DEGREE

Master of Science in Education—Reading

DEGREE REQUIREMENTS

Approval pending, consult with program adviser or coordinator of Cooperative Programs in Education for information on status or any change in requirements.

Prerequisites: Applicants must hold teacher licensure or be eligible for same. Students should have taken:

- * The Learning Disabled Child or the Exceptional Child, 3 cr.
 - * Education Measurement or Literature for Children or Adolescents, 3 cr.
- If these have not been taken, they must be completed either as undergraduate courses or as graduate elective credits within the program.

The degree program consists of 30-36 credits.

UW-Green Bay Courses, 12 credits

- * UWGB 302-608 Diagnosis and Remediation of Reading Problems (equivalent to UWO 15-710)

Electives as approved by adviser, 9 credits.

UW-Oshkosh Courses Taught on the UWGB Campus, 18-24 credits

- * UWO 15-705 Reading in the Elementary School
- * UWO 15-735 Seminar in Secondary School Reading
- * UWO 15-720 Corrective Reading Clinic
- UWO 12-770 Foundations of Educational Research
- UWO 15-780 Administration and Supervision of Reading Programs
- UWO 15-785 Practicum in Reading

Research options and electives as specified in option 2 below:

- Option 1: UWO 15-795 Thesis 3-6 credits
- Option 2: UWO 15-7 Seminar in Reading Research (3 cr.)
- UWO Electives 6 credits

CREDIT REQUIREMENTS

Thirty credits applicable to the degree constitute the minimum requirements for students in Option 1 (thesis plan) in the MSE-Reading Program. In Option 2, the student is required to take 36 credits and complete a major paper developed in the Seminar in Reading Research.

COMPREHENSIVE EXAMINATION

Candidates in Option 1 orally defend their thesis to faculty committees in open meetings. Students in Option 2 must successfully complete a written comprehensive examination.

TIME LIMIT

All work applied toward the degree must be completed within a seven year time period.

CERTIFICATION OPPORTUNITIES

1. To be recommended for 316 (reading teacher) certification, the student must be enrolled in a graduate program and complete the 18 credits above marked with an asterisk.
2. To be recommended for 317 (reading specialist) certification, the student must complete the MSE-Reading degree.
3. At least 12 of the required credits for certification, including 15-720 must be taken at UW-Oshkosh or at UWGB in the UW-Oshkosh-UWGB MSE-Reading Cooperative Program.

4. A minimum of two years of teaching experience is required by the Department of Public Instruction for 316 and 317 certifications.

**PROJECTED SCHEDULE OF COURSE OFFERINGS
SPRING 1985-FALL 1986**

Spring 1985

- 302-519 Adolescent Literature in Secondary School Reading, recommended elective (UWGB)
302-610 Introduction to the Education of Exceptional Children, recommended elective (UWGB)
302-621 Reading Readiness and Language Development, recommended elective (UWGB)

Summer 1985

- 15-705 Reading in the Elementary School (Oshkosh)
006-755 Writing Programs in the Curriculum, recommended elective (UWGB)
006-780 Foundations of Curriculum, recommended elective (UWGB)
302-615 The Counseling Role of the Classroom Teacher, recommended elective (UWGB)
302-622 Reading in the Content Area, recommended elective (UWGB)

Fall 1985

- 15-780 Administration and Supervision of Reading Programs (Oshkosh)
302-610 Introduction to the Education of Exceptional Children, recommended elective (UWGB)

Spring 1986

- 15-785 Practicum in Reading (Oshkosh)
302-608 Reading Disability: Diagnosis and Remediation of Reading Problems (UWGB)

Summer 1986

- 15-720 Corrective Reading Clinic (Oshkosh)
15-735 Seminar in Secondary School Reading (Oshkosh)

Fall 1986

- 15- Seminar in Reading Research (Oshkosh)

Additional courses to meet the elective requirements will be scheduled as needed and appropriate by UWGB and UW-Oshkosh. Check the UWGB *Timetable* for updated information and schedule for courses each semester.

Faculty

Abbott, Clifford, Associate Professor of Communication and the Arts, B.A. (1969) Tufts; M.A. (1973) Ph.D. (1974) Yale. Linguistics, Native American languages.

Bruss, Lyle R., Adjunct Associate Professor of Education; Director, School Services Bureau; Director, Facilities Planning and Management; B.S. (1955), UW-Oshkosh; M.Ed. (1959), Illinois; Ph.D. (1970), UW-Madison.

Educational planning in school districts and higher education including such aspects as finance, facilities, and politics. Educational administration and governance of school districts.

Bryan, Dennis L., Associate Professor of Education (curriculum); B.S. (1960), M.S. (1962), Western Michigan; Ed.D. (1972), Michigan State.

The relationship between teaching behavior and student learning. Curriculum development and evaluation. School organization and curriculum designed for individualized learning. Environmental education through problem-focused curriculum.

Busch, James W., Associate Professor of Education (physics); B.S. (1951), UW-Superior; M.S. (1957), Ph.D. (1969), UW-Madison.

Science education, secondary education. Environmental education, evaluation of clinical experiences in education (student teaching-internships). Educational development in Middle Eastern countries, particularly science education. Elementary education, school mathematics.

Darula, Robert, Director and Specialist in School University Programs; B.E. (1969), M.S. (1972) UW-Whitewater.

Counseling, school-university relations.

Engelman, Marge A., Director of Outreach (adult education); Lecturer in Education; B.A. (1949), Illinois Wesleyan; M.A. (1952), Northwestern; M.S. (1965), Ph.D. (1977), UW-Madison.

Adult education; adult development and learning, educational gerontology, administration and governance of lifelong learning; creative problem solving, research on creativity in aging.

Hogan, Thomas P., Associate Professor of Human Development; Associate Vice Chancellor; Co-Director of Wisconsin Assessment Center; B.A. John Carroll; M.A., Ph.D. (1970), Fordham.

Educational and psychological measurement. Program evaluation and research methodology.

Hughes, Fergus, Chairperson and Associate Professor of Human Development, B.A. (1968) St. Johns University; M.A. (1972) Ph.D. (1972) Syracuse.

Life span human development, child and adolescent psychology.

Jansen, Richard, Director of Counseling and Health Services; Lecturer in Social Services, Lecturer in Education; B.A. (1957) UW-Madison, MSW (1962) UC-Berkeley.

Counseling, human relations, social services.

- Johnson, Patricia**, Assistant Professor of Communication and the Arts; B.A. (1959) University of Georgia-Athens; M.A. (1965) Duke; M.A. (1976), Ph.D. (1980) University of Illinois-Urbana-Champaign.
Linguistics and English as a Second Language.
- Koch, Kathryn A.**, Assistant Professor of Education-Reading, B.A. (1977), M.S. (1982), Ph.D. (1984) Purdue.
Reading comprehensive, remedial reading techniques, motivational strategies.
- Larmouth, Donald**, Associate Professor of Communication and the Arts, B.A. (1962) Minnesota; M.A. (1965), Ph.D. (1972) University of Chicago.
Linguistics, writing skills, composition theory.
- Laughlin, Margaret A.**, Associate Professor of Education (social sciences); B.A. (1959), M.A. (1964), California State; Ed.D. (1978), USC-Los Angeles.
Social science curriculum and methods of K-12; international/comparative education; multicultural/global perspectives; social, philosophical and historical foundations of education; curriculum; elementary and secondary methods and materials; study skills.
- Lindstrom, Andrea L.**, Assistant Professor of Human Development; B.A., UCLA; M.A., California State; Ph.D. (1980), California State-Santa Barbara
Counseling and psychotherapy, abnormal behavior, tests and measurements, aging, sex role development.
- Logan, Richard**, Associate Professor of Human Development; A.B. (1965) Harvard; Ph.D. (1972) Chicago.
Human Development, anthropology, family relations, culture and personality.
- Noppe, Lloyd**, Assistant Professor of Human Development, B.A. (1972) Lake Forest; Ph.D. (1978) Temple.
Developmental psychology, psychological testing, cognitive style.
- O'Hearn, George T.**, Professor of Education (physics); Director of Educational Development and Research; Co-Director of Wisconsin Assessment Center; B.A. (1957), M.S. (1960), Ph.D. (1964), UW-Madison.
Research design, program evaluation. International comparative education. Science curriculum development, teaching, methods and effectiveness. Scientific literacy—the cultural impact of science.
- Presnell, Richard W.**, Associate Professor of Education; B.A. (1958), M.A. (1961), Iowa; Ph.D. (1971), Cornell.
Teaching-learning communication, processes and students' environments in elementary and secondary schools. Problem-solving education. Ecological education and outdoor environmental education processes.
- Rodeheaver, Dean**, Assistant Professor of Human Development, B.A., M.A., Ph.D. (1983), West Virginia.
Aging, adult development, social and personality development, gender roles.
- Sewall, Timothy**, Associate Director of Educational Research and Development and Director of Testing, B.S. (1974) UWGB, M.Ed. (1975) Madison College.
School psychology, psychological testing, research methods, adult students.
- Spielmann, Daniel**, Lecturer in Managerial Systems and Special Assistant to the Chancellor; B.A. (1972), J.D. (1974) UW-Madison.
School law.
- Thompson, Phillip E.**, Associate Professor of Education (English); B.A. (1958); Beloit; M.S. (1962) UW-Madison; Ph.D. (1972), Illinois.
Discursive and nondiscursive symbolism; creativity, aesthetics, and the imagination. Composition and computer grading. Native American education, English, language arts and aesthetics education.
- Thron, Joan**, Director of Academic Support Program and Lecturer in Education. B.S. (1959) Emory; M.A. (1973) UW-Madison.
Children's literature, writing skills, composition theory.
- Van Koevering, Thomas E.**, Associate Professor of Science and Environmental Change and Education (science education); B.S. (1962), Western Michigan; M.A. (1965), Michigan; Ph.D. (1969), Western Michigan.
Science and environmental education, particularly at the elementary and secondary school level. Preservice and in-service teacher training in environmental education. Curriculum evaluation. Innovation in teaching high school physics and chemistry. Local and regional health care planning. Chemical education.

Course Descriptions

GRADUATE ONLY (700-LEVEL) COURSES

006-707 Outdoor Environmental Education: Philosophies and Practices 3 cr.

For teachers and others who want to become proficient in outdoor environmental education leadership roles. It will be sufficiently individualized to allow persons with minimal specific experience or training in outdoor environmental education as well as experienced outdoor environmental educators to further their studies and goals. Basic techniques of field ecology, botany, zoology and geology appropriate to outdoor environmental education are included, as well as outdoor recreation skills and philosophies. Sensitizing processes such as acclimatization are considered. The course is intended for persons in the humanities and social sciences as well as those in the natural sciences. Projects focus on developing outdoor environmental education leadership skills and resources. A minimum of 4 class hours each week will be spent outdoors. P: 302-407, or 006-781, or an equivalent course, or cons inst.

006-710 Practicum in Effective Instructional Skills 2 cr.

Designed for teachers and supervisors currently involved in schools. Analysis and application of effective teaching concepts and skills, including teacher demonstrations and simulations. P: gr st, must be currently involved in teaching.

006-750 Statistical Methods Applied to Education 3 cr.

Types of measures, data organization and display, measures of central tendency, variability, location, and correlation, hypothesis testing and interval estimation for common statistics in one and two sample cases, introduction to analysis of variance and chi-square. P: gr st, experience in schools or cons inst.

006-755 Writing Programs in the Curriculum, K-12 3 cr.

Current theories of composition, supported by language and discourse theory; contemporary composition practices for teaching writing as a process integrated into existing curricula. Although the course is sustained by current theories, the emphasis will be on pragmatic implications. P: gr st, certified or practicing educator or cons inst.

006-772 Contemporary Educational Thought 3 cr.

A critical examination of current thinking of educators, critics, social scientists, philosophers, and others as related to schools and schooling. Topics, problems, controversies and issues related to education at the local, national, and international level are included for discussion and consideration. P: gr st, experience in professional education, teacher certification, and cons inst.

006-780 Foundations of Curriculum 3 cr.

This course for experienced educators focuses on the philosophical, sociological, historic and psychological underpinnings of curriculum design, development and evaluation for the elementary, secondary and VTAE educator. It examines the forces influencing curriculum development and identifies issues related to curriculum design and development. P: gr st and experience with elementary, secondary, or VTAE education.

006-786 Current Issues and Trends in Education 3 cr.

In recent years numerous educational innovations have appeared on the scene, differing educational viewpoints (issues) have been articulated and alternative educational trends have been proposed. Educators and citizens are faced with numerous choices regarding education for the 1980's and beyond. Students enrolled in this class will critically examine and evaluate these innovations, issues and trends in education with particular attention focused on educational practices for the future. P: gr st or cons inst.

006-787 Analysis and Improvement of Teaching Effectiveness 3 cr.

This course provides teachers with the knowledge and background necessary to conduct an appraisal of their own teaching effectiveness. The central topic is the appraisal of teaching—concepts and processes. From this background, participants develop and implement an appraisal system to assess their own teaching effectiveness. Information gathered will be summarized and analyzed. Finally, teachers will conclude the course by developing a maintenance and improvement program for themselves. P: Must be teaching when the course is taken.

006-788 The Teacher and the Law 3 cr.

Concerns of teachers relating to tenure, nonrenewals, due process, free speech, student rights, and potential liability; administration of collective bargaining in education; brief introduction to statutory regulation and financing of school systems. Topics are considered with an emphasis on Wisconsin. P: gr st and teacher certification or cons inst.

006-789 International Comparative Education

Introduces the experienced educator to practices in selected Western and non-Western countries; explores the ways and the extent to which the school systems reflect the prevailing national characteristics and trends and documents in summary form the mechanisms of change and control which characterize these national systems of education. Students are encouraged to complete an in-depth analysis of schools and schooling practices in one of the target nations and to draw comparisons with American traditions. The role of education in the changing cultural milieu of the various nations is stressed. P: teacher certification or cons inst.

006-795 Special Topics

This course number is used to designate courses and seminars offered by graduate faculty in response to special demand or on an experimental basis. Topics may be chosen to address current issues of general concern, special interests of student groups or faculty members, or special resources of visiting faculty. The title of the special topics course as announced in the *Timetable* will appear on the transcripts of the students who enroll. Credits earned in the 795 special topics courses may not be applied toward the graduate core requirement.

006-798 Directed Study 1-3 cr

Reading and research under the supervision of a member of the graduate faculty. Directed study credits may only be earned when this activity is included as part of an approved program plan. P: student classification of MS6, MA6, ME6 or higher.

UNDERGRADUATE/GRADUATE (500 AND 600-LEVEL) COURSES

246-520 History of the English Language 3 cr.

The origins, development, and cultural background of the English language (dialects, grammar, pronunciation, spelling, vocabulary, and usage), including contemporary American English.

246-521 Sociolinguistics 3 cr.

Communications in social groups and application of linguistic principles to specific cultural problems, including the study of social and regional dialects, stylistic variations, bilingualism, linguistic interference, paralinguistic behavior, and language acquisition.

246-522 Modern Linguistics 3 cr.

Structure and system in language, with attention to modern English and including principles of structural linguistics (phonology, morphology, and syntax), tagmemic grammar, and generative-transformational grammar.

246-524 Psycholinguistics 3 cr.

A brief survey of language structures and an intensive examination of the psychological processes by which we produce and perceive those structures. Additional topics include: comparisons with animal communication and other communication methods; acquisition of language; origin of language; memory.

246-525 Applied Linguistics 3 cr.

Application of linguistic principles to specific problem areas, including language acquisition; the teaching of reading; the teaching of English as a second language; the teaching composition (especially remedial composition); and institutional communications; special emphasis upon problems faced by secondary school teachers. P: at least one course in linguistics.

302-508 Children's Literature: Contemporary Practices in the Elementary School 3 cr.

Examines practices which produce an effective children's literature program. Analysis of current children's books; development of instruction units and independent programs to foster positive attitudes toward reading; using books for personal development; using books for developing attitudes about social issues such as ecological concerns and social and minority group relations; and criteria of evaluation of content, methods, and effect on students.

302-515 Principles and Methods of Teaching English as a Second Language 2 cr.

Introduces the basic methods of teaching ESL and the underlying theories from linguistics, psychology, education, and sociolinguistics. Designed to give students opportunity to develop lessons for the ESL class using various methods, discuss and critique these methods, and consider their use in future situations. Required for certification to teach English as a Second Language. P: A minimum of one course in linguistics or another area to develop foundation academic competence to teach ESL plus 302-301.

302-519 Adolescent Literature in Secondary School Reading 3 cr.

Examines practices in high schools, junior high schools, and middle schools which produce effective adolescent literature programs. Includes analysis of literature for the adolescent, current practices in literacy curriculum, personal development and literature for the adolescent, literature and social issues, and criteria for evaluation of adolescent literature and literature program.

302-606 Evaluation and Testing in Education 2-3 cr.

Techniques for constructing tests and measurement systems; statistical procedures applied to classroom data; monitoring and assessing individual and group standardized tests. Students may participate in a task force student-initiated project for the third credit. P: jr st.

302-607 Developing Environmental Education Materials for the Schools 2-3 cr.

Focuses on developing instructional materials and strategies to integrate environmental concepts, environmental values clarification, problem identification and problem solving techniques into elementary and secondary programs both in and outside of the classroom. Environmental education materials and methods appropriate to a variety of areas of study are considered, including art, music, theater, social studies, mathematics, language arts, and conservation, as well as environmental sciences. Emphasis is on designing, using and evaluating instructional processes and materials. P: jr st.

302-608 Reading Disability: Diagnosis and Remediation of Reading Problems 3 cr.

Important causes of reading disability and appropriate corrective strategies and materials. Psychological, physiological, and sociological considerations affecting disabled readers. The student learns to administer related diagnostic instruments, interpret results; and prescribe instructional procedures. Designed to meet expectations of classroom teachers. Suitable for both elementary and secondary school teachers. P: 302-307 or 318.

302-610 Introduction to the Education of Exceptional Children 3 cr.

A survey of the kinds of exceptionalities found in the school population, the needs of such children, and some methods for meeting them. Information enables the teacher or parent to recognize and understand exceptional children and unique subtleties that deserve specific attention. P: jr st.

302-615 Counseling Role of the Classroom Teacher 3 cr.

Provides teachers and future teachers with knowledge of specific counseling and guidance skills necessary to enhance their counseling effectiveness. Focuses on becoming more aware of these skills and how they are best implemented in the classroom. P: teaching experience or upper division status in a teacher education program.

302-620 Integration of Contemporary Economic Problems in K-12 Curriculum 1-3 cr.

Introduces K-12 educators and other students to major economics concepts and explores materials and methods for effective integration of economics into overall school curriculum. P: completion of at least one education methods course and/or teaching experience. For graduate credit, graduate standing is required. See 302-420.

302-662 The Adult Learner 3 cr.

Designed to help students (1) acquire knowledge of various physiological, psychological, and sociological factors relevant to adult development throughout the life span and of their implications for learning; (2) develop an understanding of the key elements involved in the teaching-learning process; (3) develop an understanding of some of the important research in adult learning; and (4) develop a personalized learning theory. P: bachelor's degree and relevant professional experience or foundation courses in education, human development, or social services. Course, Principles of Adult Education is recommended.

481-620 Tests and Measurements 3 cr.

Methods and problems of measuring human characteristics; including determination of validity, reliability, and interpretive schemas for such measures. Examination of selected tests in intelligence, achievement, attitudes, interests, and personality. Typical uses of tests and methods for reviewing tests. P: a course in statistics.

481-631 Cognitive Development 3 cr.

The development of cognitive functioning from infancy to adulthood. The stimulus-response, cognitive, and psychoanalytic approaches to intellectual development are analyzed. Current issues and research are critically examined. P: 481-331, 332.

481-636 Counseling with Children and Adolescents 3 cr.

Introduction to theories and principles of counseling as applied to children and adolescents. Surveys different theoretical approaches and techniques for helping children and adolescents cope with the developmental deviations introduced in 481-435. P: 481-331, 332, 435.

**UNDERGRADUATE COURSES
(300 AND 400) NUMBERS**

Graduate credit for undergraduate courses with 300 or 400 level numbers is available only with special permission of the instructor and the student's graduate adviser or the director of graduate studies. An assigned study card is required for registration in one of these courses.

Graduate Academic Rules and Regulations



(These academic rules and regulations apply to courses sponsored by the University of Wisconsin-Green Bay. Courses sponsored by UW-Milwaukee or UW-Oshkosh, although offered at UWGB, are governed by the rules and regulations of the sponsoring institution, as indicated in its catalog and other publications.)

DEFINITIONS

Graduate Credits - are those credits which are taken under a graduate course number (500 level or above) by a student enrolled with a graduate classification (GSP, ME, MA, MS) and are duly noted by a letter "G" after the credits on any enrollment forms and records.

Attempted Credits - are those graduate credits for which a letter grade of A, B, C, D, WF or F has been earned. Attempted credits are used to calculate the grade point average.

Credit Load - is the total of all graduate credits, undergraduate credits and audited credits being taken in a given term.

Graduate Record - is the permanent record of all graduate level credits attempted and grades earned and includes courses which may not be completed such as "PF" or "I," as well as audited graduate credits.

Undergraduate Record - is a separate permanent record which will include any undergraduate courses taken. A complete transcript will include copies of both the graduate and undergraduate records compiled at UWGB.

Maximum Credit Load - is a specific limitation of the number of credits that a student is allowed to carry at any time during an academic term. For a graduate student in good standing this is defined as 12 credits in a semester and for a graduate student on probation this maximum is reduced to 9 credits; for a shorter term, lower pro rata limitations shall be in effect.

Minimum Credit Loads - is a specific minimum number of graduate credits for which a graduate student must be enrolled in a term to be eligible for a variety of programs and benefits, such as V.A. benefits, financial aids, and assistantships.

Grade Point Average (GPA) - is a numerical value used to express the general quality of all courses/credits completed on a regular graded basis (A, B, C, D, F, WF). Only attempted graduate credits taken at UWGB will be computed into the graduate gpa.

Probation - is an academic status assigned to a student who is achieving below the minimum gpa standards required for good standing and should be considered as an advisory warning that improved quality of work will be necessary to continue as a student.

Academic Drop - is a status assigned to a student who has a record of achievement consistently below the standards which are acceptable to the university. An academic drop means that the student is ineligible to enroll as a graduate student at UWGB until readmitted.

Good Standing - is a status assigned when a student is achieving at an adequate level (3.0 cumulative and semester gpa's).

Provisional Admission - is a conditional graduate admission status which shall be subject to review after 9 graduate credits have been attempted at UWGB.

GRADING SYSTEM AND GRADE POINTS

Letter Grade	Grade Points Per Credit
A (Excellent)	4.0
B (Good)	3.0
C (Fair)	2.0
D (Poor)	1.0
F (Unacceptable)	0.0
WF (Unofficial Withdrawal)	0.0
PR (Progress-temporary grade for an internship or thesis course)	No effect
P (Passed thesis or internship)	No effect
NC (Unacceptable thesis or internship)	No effect
U (Unsatisfactory audit)	No effect
S (Satisfactory audit)	No effect
N (No acceptable report from instructor, temporary grade)	No effect-until an acceptable grade is submitted.
I (Incomplete)	No effect-until removed or lapsed into the tentative grade assigned if the required work is not completed prior to the deadline established by the instructor, or the last day of classes for the following semester, whichever comes first.

ACADEMIC STANDING

Every student is expected to maintain certain standards of academic achievement in all work carried at the University. The University has established these standards in terms of the quality of the work, as measured by the semester and cumulative grade point averages.

Academic standings are reviewed at the end of each term and a revised standing will be reported to every student on the final grade report which is issued after each academic term.

PROBATION AND DROP STATUS

The University is concerned about students whose academic achievements seem to indicate that they are not able to meet the expectations of their instructors or are experiencing other problems that may be interfering with their studies. A probation action is an advisory warning that a student

should take appropriate actions to improve his/her achievement. A drop action is taken when the University feels that the student's academic achievement record to date indicates a need to interrupt enrolled status to reassess and reevaluate goals and plans. A student who has been placed on probation or drop status should give careful consideration to the factors that may be involved. The University encourages such students to seek assistance from counselors, graduate advisers and course instructors.

Every student is expected to maintain at least a B average (3.0 gpa) on all graduate work carried. Failure to achieve this minimum B average (3.0 gpa) in any term will result in a probation, continued probation or drop action at the end of that term, as shown below. Drop actions are taken at the end of each term, however, if a student was not enrolled for the fall semester, a drop action will not be taken solely on the basis of inadequate achievement in the January Interim.

1. Student in Good Standing

Grade-Point Requirements and Actions:

a 3.0 or better end of term cumulative gpa will result in continuing good standing.

a 2.0 to 2.999 end of term cumulative gpa will result in probation status.

a 1.999 or less end of term cumulative gpa will result in drop status; a student's graduate committee will review his/her record at that time and make a recommendation for continuation or to allow the drop status to go into effect.

action on a part-time student will be withheld until at least 9 credits have been attempted at UWGB.

2. Student on Probation

Grade Point Requirements and Actions:

a 3.0 or better end of term cumulative gpa will result in a return to good standing.

a 2.999 or less end of term cumulative gpa may result in a drop status at the end of any term after a cumulative total of 15 or more credits has been attempted at UWGB; a student's graduate committee will review his/her record at that point in time and make a recommendation for continuation or to allow the drop status to go into effect.

APPEALS

Academic probation is a nonpunitive warning and is not subject to an appeal. Academic drop status may be appealed by means of a special academic appeal to the director of graduate studies. The director may seek advice from the Graduate Board of Advisers. Any appeal should be filed within two weeks after the end of the semester. A student who is allowed to continue will be on probation and will be subject to any other special conditions that may be designated. Any appeal must include a clear explanation of the problems that resulted in the inadequate achievement and how the student proposes to resolve those problems.

READMISSION

Readmission after an academic drop is not an automatic process. The director of graduate studies may decide to deny readmission or to grant readmission subject to specific requirements or conditions. A student who is readmitted after an academic drop is always readmitted on probation and subject to the normal standards of achievement required to continue as a graduate student. An application for readmission should be submitted to the director of graduate studies at least 30 days in advance of the desired term of admission to allow for the full review process that may be required.

WITHDRAWAL FROM THE UNIVERSITY

A student who desires to withdraw from all academic course work at any time after completing the study list request form or final registration must see a counselor in the Student Development Center, his/her graduate adviser, or the director of graduate studies. A complete withdrawal without failure may be requested at any time before 4:30 p.m. on the afternoon of the last day of regularly

scheduled classes during the twelfth week of a semester, the sixth week of an eight week summer session or the second week of a January interim period. If a student has not attended classes or taken the final examination in a course, a grade of WF will be given unless official withdrawal procedures have been followed.

A decision to withdraw should be given careful consideration in terms of academic retention policy, veteran's benefits, Social Security benefits, financial aids and other situations that have specific prohibitions against withdrawals.

A withdrawal during the fifth through twelfth weeks of a semester will result in permanent recording of all courses of record at that time with a symbol of W (withdrew) after each course. The symbol of W is not a grade and has no effect on the grade point average.

COURSE DROPS

The course drop deadline has been established to allow the student ample opportunity to decide what content a course will cover, the type of readings and projects to be assigned, the instructor's teaching style and the methods of evaluation. In some courses results from a formal evaluation process may not be available before the drop deadline. In such cases it is the student's responsibility to contact the instructor **before** the drop deadline to obtain information useful in making the decision to drop. Therefore, feedback in the form of grades on papers or examinations are not an acceptable circumstance that would justify a late drop.

The drop deadline is intended to stimulate a student to weigh carefully all of the important considerations and to do this as early as possible. If a student decides that a course does not fulfill expectations, a reasonably early drop means that the student can then devote a greater portion of available study time and effort to remaining courses, and the instructor will be able to devote more time and effort to the students participating in the course. The deadline should provide an adequate opportunity to become acquainted with the course and make a decision as to whether it fits into one's program of study.

The two phases of the drop policy are described below:

1. First 4 weeks of a 14 week semester:
—student may drop any course without the instructor's signature
—no record of drop on permanent record
2. Fifth through eighth weeks:
—course will appear on permanent record with the symbol W (withdrew) or DR (dropped)
3. 9th-14th weeks:
—no official drops allowed, WF grade or F grade appears on transcript

For terms or classes of a shorter duration than 14 weeks, pro rata deadlines shall be established as follows:

Course Length in Weeks	Drop Deadline- End of Course Session Week	"W" or "DR" Symbol Recorded After
1.....	Wednesday, Week 1	Monday, Week 1
2.....	Friday, Week 1	Wednesday, Week 1
3.....	Wednesday, Week 2	Friday, Week 1
4.....	Friday, Week 2	Friday, Week 1
5.....	Wednesday, Week 3	Wednesday, Week 2
6.....	Friday, Week 3	Wednesday, Week 2
7.....	Wednesday, Week 4	Friday, Week 2
8.....	Friday, Week 4	Friday, Week 2
9.....	Wednesday, Week 5	Wednesday, Week 3
10.....	Friday, Week 5	Wednesday, Week 3
11.....	Wednesday, Week 6	Friday, Week 3
12.....	Friday, Week 6	Friday, Week 3
13.....	Wednesday, Week 7	Wednesday, Week 4
14 or more (normal semester course)	Friday, Week 8	Friday, Week 4

A course session week always ends on a Friday. All courses that begin or end on non-standard session weeks will have a non-standard drop deadline.

COURSE ADDS

After final registration a student may add other courses to his/her program if such an addition does not exceed the maximum credit load limitation and is completed before a specific deadline for additions. During a normal semester the add period is limited to the first two weeks of classes; for shorter terms an earlier deadline will be in effect. A student may petition for an exception if unforeseeable extenuating circumstances prevented compliance with the deadline.

LATE PROGRAM CHANGES AND WITHDRAWALS

A student may be granted permission to drop a course or courses after the eight week deadline, or make a complete withdrawal after the normal twelfth week deadline, if one of these specific criteria can be verified:

1. If the student has serious mental or physical health problems as verified by a physician's or professional counselor's statement.
2. If there is a death or prolonged serious illness in the immediate family as verified by the family physician.

Under any of these circumstances, a counselor in the Student Development Center or the director of graduate studies is authorized to grant permission for a late drop or withdrawal. If a student has any other reason for requesting a late drop or withdrawal he/she should direct a written appeal, stating the circumstances, to the director of graduate studies.

CLASS ATTENDANCE

A student is expected to attend all class sessions. If, for any reason, a student is unable to attend classes during the first week of classes, he/she is responsible for notifying the instructor(s), in writing, of the reason for nonattendance and intentions to complete the course. Registered students are obligated to pay all fees and penalties as listed on the fee schedule; **nonattendance does not alter these obligations in any way.**

MAXIMUM AND MINIMUM CREDIT LOADS

A student in good academic standing may register for any number of credits up to a maximum of 12 credits per semester. A student will not be allowed to register for credits in excess of 12 if he/she does not have prior written permission to carry an overload from the director of graduate studies. Likewise, any course adds that would have the effect of exceeding the maximum will not be processed if prior permission for an overload has not been granted.

A student may register for or reduce a program below 9 credits in a semester with the understanding that for certain purposes he/she will then be considered a part-time student. A student who reduces the credit load below 9 graduate credits should consult the appropriate offices concerning implications for financial aids, government benefits, and other programs with credit load eligibility stipulations.

MAXIMUM CREDIT LOAD, PROBATIONARY STUDENTS

Maximum semester credit load is 9 credits for a graduate student on probation.

GRADE AND GRADE APPEALS

Each student will receive a grade from the instructor in charge of a course at the end of the respective semester or session. Grades must be in the Office of the Registrar no later than 96 hours after the final examination. Accompanying the grade rosters received from the registrar each semester will be information on current grading policies.

If a student is dissatisfied and wishes to appeal a particular course grade, he/she must first contact the instructor who issued the grade. If the student is still dissatisfied he/she may appeal to the director of graduate studies who must, in turn, consult with the instructor in the course. If the student wishes to appeal further he/she consults with the vice chancellor of academic affairs who also consults with the instructor and the director of graduate studies. The Vice-Chancellor or Director acts in an advisory capacity to the student and instructor.

GRADE CHANGES

All final grades, with the exception of incompletes (I) or progress (PR), will become permanent grades at the end of the next semester. Any discussions with faculty regarding grade levels or missing (N) grades must be pursued within this time period.

INCOMPLETES

If, due to unusual yet acceptable circumstances, a student is unable to take or complete a final examination or other course work, he/she may arrange with the instructor

In matters not covered by the graduate academic rules and regulations as specified in this catalog, the graduate program follows rules and regulations for the undergraduate programs and courses at UWGB.

to receive an "Incomplete" in the course. The incomplete is filed with two tentative grades, one indicating the quality of the work to date, and a second to be assigned if no more work is completed, and a specific deadline for completing the work required for removal of the incomplete. The course instructor must file an incomplete removal form, stating the conditions for removal as well as the specific deadline for removal, before a grade of incomplete will be accepted for recording. Since the course is incomplete, grade points and degree credits remain undetermined until a permanent grade is established; however, a tentative academic action may be assigned on the basis of grades and credits received in other courses. Such an action will be reviewed after the incomplete has been converted into a permanent grade.

INCOMPLETES FOR GRADUATING STUDENTS

Students anticipating graduation must remove all pending incompletes by the end of the sixth week of the final semester of attendance. Outstanding incompletes will be considered as "I" grades for purposes of estimating eligibility for graduation.

REMOVAL OF INCOMPLETES

The course instructor is responsible for informing the student, the office of the Registrar and the Graduate Office as to the specific deadline for removal of an incomplete. If no earlier deadline is specified, an incomplete (I) must be removed no later than the last day of classes for the next semester; **this is the absolute maximum allowable deadline.** If no other grade is submitted by the instructor within this deadline, incomplete (I) grades shall become a permanent grade of F with normal effect on the student's grade point average and earned credits.

A student may file a special petition for an exception to the removal deadline if bona fide unanticipated extenuating circumstances prevented compliance with the removal deadline, such as the following:

1. The student has serious physical or mental health problems which have been documented by a physician or professional counselor's statement.

2. The student has had a death or serious illness in the immediate family and this has been documented by a physician's statement.
3. The course instructor is on leave during the semester for removal.

If a student is graduating, all "I" or "PR" grades must be converted to a permanent passing or failing grade before his/her commencement date. All grades on the record shall become permanent as of that date with no possibility for removal or change.

An incomplete (I) grade is normally a temporary grade which is given when, due to **unforeseeable extenuating circumstances**, a student is unable to complete the course requirements within the normal term, e.g., illness during the final examination period.

REPEATING COURSES

Students may repeat a course only upon special petition to the director of graduate studies. All repeated courses will be designated with a letter "R" after the grade on the transcript. When a repeated course is completed, the original grade and entry on the transcript will remain on the transcript but the credits, grade, and grade points earned for the most recent completion shall be the only enrollment completion that will have effect on the cumulative attempted credits, grade points earned, and the grade point average. Courses repeated at another institution have no effect on the grade point average at UWGB.

PASS-NO CREDIT GRADING

This special grading is permitted and required only for internship (797) and thesis writing (799) courses/credits at the graduate level, all other graduate credit courses must be taken on a regular graded basis.

AUDIT ENROLLMENT INFORMATION

With the permission of the instructor, a student may audit a course if space is available after students who have enrolled for credit have been accommodated. Special policies apply to senior citizen auditors and any other

students who enroll under the special half-price fee arrangements; these policy statements are published in the *Timetable* for each term. Conditions and requirements for class participation are completely at the discretion of the course instructor. A student enrolled for credit may change to auditor status, for grading purposes, at any time up to the course drop deadline. Audited credits do not count in the determination of credit completion requirements or for any program or benefits eligibility status. Audit credits do count toward maximum credit load limitations. Any change from audit status, for grading purposes, must be completed within the course add period.

SPECIAL PETITIONS

A special petition is a formal written request for an exception to normal rules, regulations, requirements, and procedures and may be granted or denied. The rules, regulations and requirements of the graduate program are the result of recommendations from the Graduate Faculty Board of Advisers and the Academic Actions Committee. Some rules may originate from legislative statutes or Board of Regents actions.

Exceptions to academic rules and regulations are granted if the petition states unforeseeable extenuating circumstances and relevant facts that fall within general parameters recommended by the Academic Actions Committee, and approved by the vice chancellor for academic affairs. The director of graduate studies has the responsibility for reviewing the petition. If a petition is denied the student has the right of further appeal to the Graduate Faculty Board of Advisers.

In the event that an appeal is contemplated, the following items should be considered:

1. Are the **relevant** facts clearly stated and documented?
2. Are the **extenuating** circumstances cited of an unforeseeable nature?
3. Are **relevant recommendations** from the instructor included, if this was appropriate?
4. Are needs and wants distinguishable on the basis of the statements?

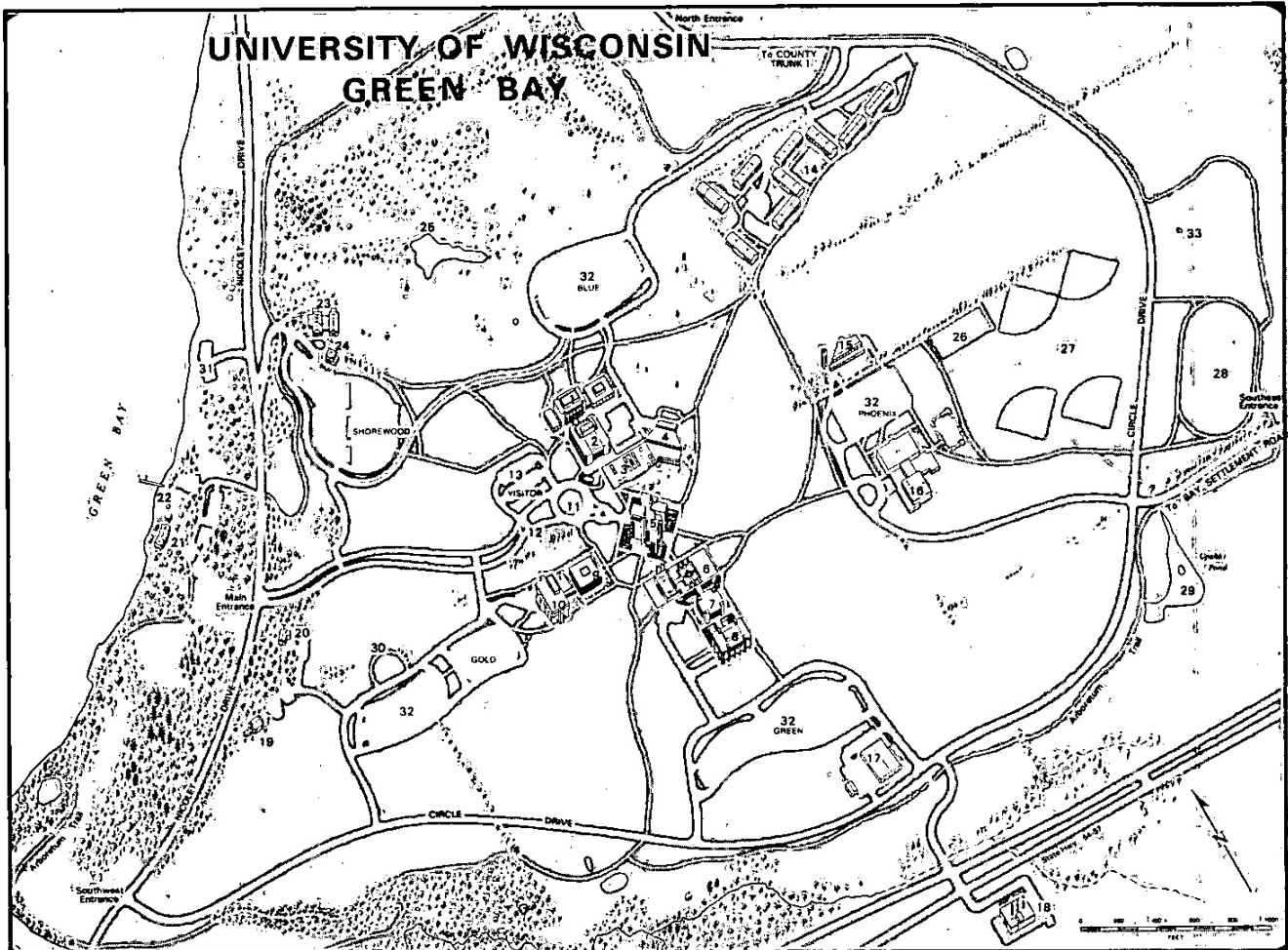
Calendar

Academic Year Calendar

Fall Semester	1984-85	1985-86	1986-87
Registration and new student period (or register by mail earlier)	Aug. 27-31	Aug. 26-30	Aug. 25-29
Classes begin	Sept. 4	Sept. 3	Sept. 2
Thanksgiving recess begins	Nov. 22	Nov. 28	Nov. 27
Classes resume	Nov. 26	Dec. 2	Dec. 1
Classes end	Dec. 12	Dec. 11	Dec. 10
Study and advising days	Dec. 13-14	Dec. 12-13	Dec. 11-12
Examinations begin	Dec. 17	Dec. 16	Dec. 15
Commencement (Sunday)	Dec. 23	Dec. 22	Dec. 21
Examinations end	Dec. 23	Dec. 21	Dec. 20
January Interim Period			
Classes begin	Jan. 7	Jan. 6	Jan. 5
Spring Registration (or register by mail earlier)	Jan. 29-31	Jan. 28-30	Jan. 27-29
Last day of classes	Feb. 1	Jan. 31	Jan. 30
Winter recess	Feb. 2-10	Feb. 1-9	Jan. 31-Feb. 8
Spring Semester			
Classes begin	Feb. 11	Feb. 10	Feb. 9
Spring recess	April 6	April 5	April 4
Classes resume	April 15	April 14	April 13
Memorial Day recess	May 26-27	May 25-26	May 24-25
Examinations begin	May 25	May 24	May 23
Examinations end	June 1	May 31	May 30
Commencement (Saturday)	June 1	May 31	May 30
Summer Session (8 Week Session)			
Registration	June 13-14	June 12-13	June 11-12
First day of classes	June 17	June 16	June 15
Last day of classes	Aug. 9	Aug. 8	Aug. 7

Please note: These dates may be subject to change. Consult the most recent *Timetable* to double check dates.

Campus Map



Map Key

- | | | |
|---------------------------------|------------------------------|---------------------|
| 1. Studio Arts (SA) | 11. Circle Entrance | 22. Dock Facility |
| 2. Creative Communication (CC) | 12. Welcoming Booth | 23. Shorewood Clubs |
| 3. Student Services (SS) | 13. Visitor Parking | 24. Pro Shop |
| 4. University Commons | 14. Student Apartments | 25. Golf Course |
| 5. Library Learning Center (LC) | 15. Ecumenical Center | 26. Tennis Courts |
| 6. Instructional Services (IS) | 16. Phoenix Sports Center | 27. Playing Fields |
| 7. Environmental Sciences (ES) | 17. Physical Plant Center | 28. Soccer Field |
| 8. Laboratory Sciences (LS) | 18. Utility Control Center - | 29. Upahki Pond |
| 9. Community Sciences (CS) | 19. Children's Center | 30. Amphitheater |
| 10. Socio-Ecology (SE) | 20. Language House | 31. Community Park |
| | 21. Bayshore Center | 32. Parking |
| | | 33. Weather Station |

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