Biology

Graduate Faculty

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Programs

• Biology, M.S. master

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Required Credits: 30
Required GPA: 3.0

I. REQUIRED CORE

• BIOL 6350 Computer Applications in Statistics (3 credits)
• BIOL 6890 Grants and Contracts (2 credits)
• BIOL 6894 Advanced Graduate Project (3 credits)

Must be taken four times over four semesters for 4 credits:

• BIOL 6880 Seminar (1 credit)

II. REQUIRED ELECTIVES

Select, with consent of advisor, a minimum of 12 semester credits of graduate level course work in Biology or related field.

III. REQUIRED RESEARCH

Complete the following course for 6 credits.

• BIOL6990

Competency Requirement

Statistics: A working knowledge of applied statistics. This requirement may be satisfied by successfully completing BIOL 6350 Computer Applications in Statistics (3 credits)

WRITTEN EXAMINATION All major programs require satisfactory completion of a final written examination which needs to be successfully completed prior to scheduling the oral examination. Please consult with your academic advisor for requirements specific to your area of study.

Biology Courses

BIOL 5030 Wetland Delineation and Classification (3 credits)
This training course for the identification, delineation, and classification of wetlands covers the major types of wetlands and their general delineation procedures. Hydrological, soil, and vegetation characteristics will be used to identify and map wetland boundaries. Focuses on current regulations as established by the US Army Corps of Engineers’ 1987 Wetland Delineation Manual with additional regulations specific for the state of Minnesota. Satisfies the requirements for basic delineation training as specified by the Corps of Engineers and certification programs in many states.

BIOL 5120 Soils (4 credits)
Introduction to principles of soil genesis, classification, physical and chemical properties, and biological significance. Lecture and laboratory.

BIOL 5200 Freshwater Invertebrates (4 credits)
Morphology and functional roles of representative freshwater invertebrates, their ecological and habitat interrelationships. Lecture and laboratory.

BIOL 5210 Parasitology (4 credits)
The biology of animal parasites, their identification, biochemistry, immunology, and epidemiology. Lecture and laboratory.

BIOL 5250 Human Anatomy (4 credits)
Anatomical structure of the human body, from individual organ systems to the integrated whole.

BIOL 5260 Human Physiology (4 credits)
Physiological and pathophysiological principles and control mechanisms of organ systems within humans. Lecture and laboratory.

BIOL 5270 Histology (4 credits)
Microscopic anatomy of vertebrate tissues and organs with functional correlations. Lecture and laboratory. Prerequisites: BIOL 5250, BIOL 5260

BIOL 5310 Entomology (4 credits)
The biology of insects, their natural history, morphology, classification, and economic importance. Lecture, laboratory, and field study.

BIOL 5330 Upland Wildlife Management (3 credits)
An advanced pre-professional course for majors in natural resources, biology, and related fields. Lectures cover the history, philosophy, evolution, and application of wildlife management with a focus on upland wildlife as a renewable, sustainable natural resource. The course fulfills some professional certification requirements of The Wildlife Society and is recommended for students planning graduate study or employment in natural resources management.
further consider the human genome as itself a component of an even larger instrumentation and scale, and the unprecedented volume of data produced, conservation of whole genomes. Because of its reliance on precision instrumentation and scale, and the unprecedented volume of data produced, genomics is unusual among biological disciplines in its integration of engineering, statistics, and information science. Genomics also requires the biologist to engage in systems thinking by taking a wide view of the dynamic physical and informational network that comprises a single genome. One must further consider the human genome as itself a component of an even larger network of genomes that make up the holobiont.
BIOL 5723 Ecosystem Ecology (3 credits)
Fundamentals of the study of ecosystems, with emphasis on the integration of abiotic and biotic components in the development of ecosystem processes. Comparisons and interactions between terrestrial, wetland, aquatic, and atmospheric systems across the major biomes.

BIOL 5730 Plant Diversity (4 credits)
Classification, phylogeny, collection, field identification, and uses of wild plants. Lecture and laboratory.

BIOL 5780 Wildlife Management Techniques (5 credits)
This course emphasizes application of ecological principles, knowledge, and practical field skills to data collection used in the management of wildlife resources and their habitats. Use of literature, development of basic field and laboratory skills, and application of management and research principles are integral. Designed for upper level students who have met prerequisites, and graduate students, who are preparing for professional careers in wildlife conservation, natural sciences, and related areas of natural resources management. The course helps fulfill The Wildlife Society professional certification requirements.

BIOL 5830 Aquatic Plants and Algae (4 credits)
Survey of the morphology, physiology, taxonomy, systematics, and ecology of algae and aquatic vascular plants. Lecture, laboratory, and field study.

BIOL 5840 Wetlands Ecology (3 credits)
Survey course develops a basic understanding of the terminology, classification, ecology, values, and conservation of wetlands. Covers wetland systems from around the world, with emphasis on wetlands in North America.

BIOL 5844 Wetlands Ecology Lab (1 credit)
Laboratory course to supplement BIOL/ENVR 5840 Wetlands Ecology. Intended to strengthen a basic understanding of the terminology, classification, ecology, values, and conservation of wetlands. Prerequisite or Corequisite: BIOL/ENVR 5840 or consent of instructor.

BIOL 5850 Marine Biology (3 credits)
Lecture course introducing major concepts and theories. Includes physical and chemical components of the oceans, with special interest paid to the major groups of organisms living in marine systems. Emphasis on the different types of marine systems (coral reefs, mangroves, open water, etc.).

BIOL 6010 Advanced Topics in Biology (1 credit)
Advanced interdisciplinary study of the biological sciences. Intensive lectures, literature reviews, and discussions on fundamental and contemporary topics that have shaped and continue to shape our understanding of natural systems. Topics vary based on the interests of the students and instructor.

BIOL 6350 Computer Applications in Statistics (3 credits)
An examination of several computer-based packages for statistical analysis, focusing on selection of appropriate statistical procedures, processing by computer, and interpretation of results.

BIOL 6880 Seminar (1 credit)
This course is designed to guide biology graduate students in completion of their M.S. in Biology. Students will take the course four consecutive semesters. Each semester students will have specific requirements for completing the course, which will move them towards completion of their degree.

BIOL 6890 Grants and Contracts (2 credits)
A practical investigation of grantsmanship with emphases on funding sources, creative writing, effective conduct of project and reporting results. Gives students first-hand practice in all phases of grantsmanship. Review and critique both qualitative and quantitative model proposals.

BIOL 6894 Advanced Graduate Project (3 credits)
Students learn laboratory or field techniques and carry out research under the supervision of a faculty advisor.

All-University Courses

The course numbers listed below, not always included in the semester class schedule, may be registered for by consent of the advisor, instructor, or department chair, or may be assigned by the department when warranted. Individual registration requires previous arrangement by the student and the completion of any required form or planning outline as well as any prerequisites.

1910, 2910, 3910, 4910 DIRECTED INDEPENDENT STUDY
1920, 2920, 3920, 4920 DIRECTED GROUP STUDY
1930, 2930, 3930, 4930 EXPERIMENTAL COURSE
1940, 2940, 3940, 4940 IN-SERVICE COURSE
1950, 2950, 3950, 4950 WORKSHOP, INSTITUTE, TOUR
1960, 2960, 3960, 4960 SPECIAL PURPOSE INSTRUCTION
1970, 2970, 3970, 4970 INTERNSHIP
1980, 2980, 3980, 4980 RESEARCH
1990, 2990, 3990, 4990 THESIS