

courses

31. Epidemiology of the Health and Cognitive Status of the Elderly
 Fall of odd-numbered years. 3(3-0)
 P: HM 810 or concurrently.
 Interpretation of research on the health and cognitive status of elderly. Interpretation of statistical tests of hypotheses. Conclusions based on data.

FINANCE AND INSURANCE FI

Department of Finance and Insurance
The Eli Broad College of Business
and The Eli Broad Graduate School of Management

11. Financial Management
 Fall, Spring, Summer. 3(3-0)
 P: ACC 202 or ACC 230 or ACC 251H or HRI 302. R: Open only to juniors and seniors.
 Optimal management of the firm's assets and financing requirements. Analysis of financial statements, financial markets, risk, valuation, long-term and short-term financing and investment. International and ethical applications.

12. Introduction to Investments
 Fall, Spring, Summer. 3(3-0)
 P: FI 311.
 Theoretical and empirical analyses of securities. Risk and return formation. Security analysis and concepts of market efficiency. Common stocks, bonds, options, futures, and international securities.

131. Principles of Risk Management and Insurance
 Fall, Spring. 3(3-0)
 P: STT 315.
 Legal aspects of insurance contracts. Organization of insurance companies. Personal and business insurance coverages. Insurance regulation. International relationships.

113. Management of Financial Institutions
 Fall, Spring, Summer. 3(3-0)
 P: FI 311.
 Management, decision-making and policy formulation for depository and non-depository financial institutions. Emphasis on commercial banking, with attention also to S&Ls, credit unions and non-bank financial institutions.

114. Advanced Business Finance (W)
 Fall, Spring, Summer. 3(3-0)
 P: FI 312, FI 413 or concurrently. R: Open only to seniors in the College of Business. Completion of Tier I writing requirement.
 Advanced financial management of business firms. Theoretical and case applications that integrate capital budgeting, valuation, capital structure, mergers, international business finance, working capital management and ethical considerations.

434. Life and Health Insurance
 Spring. 3(3-0)
 P: STT 315, FI 311.
 Economics of life and health insurance in the United States, with international comparisons. Actuarial models, underwriting, marketing, and taxation. Diversity issues such as gender-based underwriting and the financial impact of AIDS.

451. International Financial Management
 Fall, Spring. 3(3-0)
 P: FI 311; ML 310 or EC 340.
 Financial management of multinational firms. Theoretical and applied aspects of international capital budgeting, capital structure, cash management, and exchange-rate risk. Ethical considerations.

455. Computer Applications for Financial Modeling
 Fall, Spring, Summer. 3(3-0)
 P: FI 311; ML 317 or STT 422 or STT 442.
 Application of personal and mainframe computers and software to corporate, personal and international financial analysis.

478. Investment Strategies and Speculative Markets
 Fall, Spring, Summer. 3(3-0)
 P: FI 312.
 Pricing, trading, hedging and speculating in financial markets. Effects of risk and maturity on security prices. Strategies with futures, options, and other financial instruments in domestic and international markets. Ethical considerations.

490. Independent Study
 Fall, Spring, Summer. 1 to 3 credits.
 R: Open only to seniors.
 Supervised independent study of special topics in finance or insurance.

801. Managerial Finance
 Fall, Spring. 3(3-0)
 P: ACC 800. R: Open only to students in the Program in Professional Accounting, to MBA students, and to students in programs for which FI 801 is a catalog-listed requirement.
 Short-, intermediate- and long-term problems. Financial planning and control. Applications in domestic and international settings.

821. Financial Management
 Spring. 3(3-0)
 P: ACC 811. R: Open only to MBA students in the Advanced Management Program.
 Managerial finance covering short-, intermediate- and long-term problems. Financial planning and control using financial theory and management techniques. Applications in domestic and international settings.

841. Risk Management for Commercial and Public Entities
 Fall. 3(3-0)
 R: Open only to graduate students in the College of Business.
 Analysis of exposures, risk management alternatives, and their social, legal and economic implications. Cost and benefit analysis of decisions.

851. Introduction to Investments
 Fall, Spring. 3(3-0)
 P: FI 801. R: Open only to students in the Program in Professional Accounting and to MBA students.
 Security risk and return concepts. Security analysis and concepts of market efficiency. Emphasis on equity investments. Bonds, options, futures, and international securities.

852. Financial Markets and Strategies
 Spring. 3(3-0)
 P: FI 851. R: Open only to students in the Program in Professional Accounting and to MBA students.
 Theories concerning domestic and international financial markets and instruments. Effects of risk and maturity on prices. Arrangement of business and portfolio risk and returns with options and futures.

860. International Financial Management
 Fall. 3(3-0)
 P: FI 801. R: Open only to graduate students in Business.
 Capital budgeting, capital structure decisions, cash management, foreign currency markets and exchange rate risk management. Ethical and tax considerations.

862. Advanced Managerial Finance
 Fall, Spring. 3(3-0)
 P: FI 801. R: Open only to graduate students in Business.
 Financial planning and control using financial theory and management techniques. Applications in international settings. Use of business cases.

865. Financial Decision Models
 Fall. 3(3-0) Interdepartmental with Accounting.
 P: FI 801. R: Open only to students in M.B.A. programs and to students in Program in Professional Accounting.
 Development and application of computerized financial models in finance and accounting, and in control activities. Use of financial planning software on personal and mainframe computers. Use of models in case analysis.

878. Bank Management
 Spring. 3(3-0)
 P: FI 801. R: Open only to graduate students in Business.
 Nature, structure and management of commercial banks. Focus on products and services offered, risks, policies, and strategies. Applications in domestic and international settings.

890. Independent Study
 Fall, Spring. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course.
 R: Open only to graduate students in Business. Approval of department.
 Faculty-guided research projects.

980. Theory of Finance
 Fall. 3(3-0)
 R: Open only to Ph.D. students in Business or approval of department.
 Introduction to the financial theory of the firm. Theoretical models dealing with capital structure, cost of capital, dividend policy and leasing.

981. Corporate Finance Theory
 Spring of odd-numbered years. 3(3-0)
 P: FI 980. R: Open only to Ph.D. students in Business.
 Theoretical foundations. Recent empirical research in capital structure, dividend policy, and agency theory.

982. Investment Theory
 Spring of even-numbered years. 3(3-0)
 P: FI 980. R: Open only to Ph.D. students in Business.
 Market efficiency, stochastic processes, option pricing, efficient set mathematics, intertemporal asset pricing and arbitrage pricing theory.

993. Finance Workshop
 Fall. 3(3-0)
 P: FI 980. R: Open only to Ph.D. students in Finance.
 Critical evaluation of original research papers by faculty and students.

999. Doctoral Dissertation Research
 Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 99 credits in all enrollments for this course.
 R: Open only to Ph.D. students in Finance and Insurance.

FISHERIES AND WILDLIFE FW

Department of Fisheries and Wildlife
College of Agriculture and Natural Resources

100. Introduction to Fisheries and Wildlife
 Fall. 1(1-0)
 Fisheries and wildlife history, philosophy and management in the context of conservation ethics.

- 110. Conservation and Management of Marine Resources**
Spring. 3(3-0)
Marine environment, resource distribution, and human impacts on selected marine commercial fisheries. Conflicts in management goals between government and industry. Management goals and techniques in preserving and conserving marine resource biodiversity.
- 203. Resource Ecology**
Fall, Spring. 3(3-0)
Basic concepts of ecology which provide a foundation for examining environmental problems and their solutions.
- 205. Principles of Fisheries and Wildlife Management**
Spring. 3(3-0)
Characteristics of the fish and wildlife resource. Ecological and societal factors influencing the management of fish and wildlife. Management techniques.
- 207. Great Lakes: Biology and Management**
Spring. 3(3-0) Interdepartmental with Resource Development.
Living aquatic resources of the Great Lakes: environmental history, biological resources and their management. Policy issues.
- 210. Introduction to Gender and Environmental Issues**
Spring. 3(3-0) Interdepartmental with Resource Development, Women's Studies, Forestry, and Public Resource Management.
R: Not open to freshmen.
The concept of gender. Overview of environment and habitat. Historical gender roles in environmental management. Gender-based theoretical perspectives. Case studies on developing and developed countries. Environmental management with emphasis on fisheries, wildlife and wetlands. Women environmental professionals.
- 284. Natural History and Conservation in Michigan**
Fall. 3(2-3)
R: Not open to freshmen.
Identification, habitat requirements, and distribution of Michigan's flora and fauna. Interrelationships which influence natural resource use. Field trips required.
- 324. Wildlife Biometry**
Fall. 3(2-3)
P: MTH 116, ZOL 250.
Quantitative techniques to analyze and interpret fisheries and wildlife data.
- 326. Introduction to Waste Management**
Fall. 3(3-0) Interdepartmental with Resource Development. Administered by Resource Development.
P: RD 201, RD 320. R: Not open to freshmen.
Waste management definitions, techniques, technologies, and strategies. Integrative approach to waste management as an environmental, social, and political subject.
- 328. Vertebrate Pest Control**
Spring. 3(3-0)
P: BS 110.
Role of vertebrate animals as agents damaging to human interests. Damage evaluation. Damage control strategies and techniques.
- 364. Ecosystem Processes**
Spring. 3(2-2)
P: CEM 141, FW 324.
Concepts of ecosystem structure and function developed from basic scientific laws and relationships.
- 410. Upland Ecosystem Management**
Spring. 4(3-3)
P: FOR 404 or ZOL 250.
Analysis and management of upland ecosystems to meet wildlife management and biodiversity objectives. Mitigation of human impact.
- 412. Wetland Ecosystem Management**
Fall. 3(3-0)
P: FW 364 or ZOL 250.
Ecosystem components and processes applied to wetland management. Mitigation of human impact.
- 420. Stream and Aquatic Insect Ecology**
Fall. 4(3-3) Interdepartmental with Entomology and Zoology.
P: BS 110, CEM 141.
Biological and environmental factors determining structure and function of stream and aquatic insect communities. Aquatic insect systematics.
- 424. Population Analysis and Management**
Fall. 4(3-3)
P: FW 364.
Statistical, ecological and management concepts and methods needed to analyze and interpret demographic data and manage fish and wildlife populations.
- 431. Comparative Limnology**
Summer. 4 credits. Given only at W.K. Kellogg Biological Station. Interdepartmental with Zoology, and Botany and Plant Pathology. Administered by Zoology.
P: CEM 141 or CEM 151; ZOL 250. R: Not open to students with credit in FW 472. Not open to students with credit in FW 472.
Physical, chemical, and biological aspects of lakes and streams. Introduction to freshwater biology, and population and community ecology.
- 434. Human Dimensions of Fisheries and Wildlife Management**
Spring. 3(3-0)
P: FW 324. R: Not open to freshmen and sophomores.
Sociological implications of public policy and planning processes in fisheries and wildlife management resources.
- 444. Conservation Biology**
Fall. 3(3-0) Interdepartmental with Zoology.
P: BS 110.
Ecological theories and methodologies to manage species, communities and genetic diversity on a local and global scale.
- 462. Invertebrate Fisheries and Wildlife Management**
Fall. 4(3-3)
P: ZOL 355.
Natural history, conservation and management of selected invertebrate species including commercially important, exotic, non-game, and selected threatened and endangered species.
- 464. Natural Resource Economics and Social Science**
Fall. 3(2-2) Interdepartmental with Forestry, Park and Recreation Resources, and Resource Development. Administered by Forestry.
P: EC 201 or EC 202. R: Not open to freshmen and sophomores.
Application of economic and social science principles and techniques to production and consumption of natural resources. Benefit-cost analysis. Regional impact analysis. Social impact assessment.
- 465. Ecological Risk Assessment**
Spring of odd-numbered years. 3(3-0) Interdepartmental with Resource Development.
P: CEM 143, CEM 161, ZOL 355; FW 324 or STT 200 or STT 201.
Ecotoxicology. Monitoring and modeling the fate of toxins in ecosystems. Dose response relationships. State and federal regulations related to environmental contaminants.
- 466. Natural Resources Planning and Policy**
Spring. 3(2-3) Interdepartmental with Forestry, Park and Recreation Resources, and Resource Development. Administered by Forestry.
P: FOR 408; FOR 464 or FW 434 or FW 424; FW 472 or PRR 443 or RD 415 or RD 460. R: Open only to seniors and graduate students in College of Agriculture and Natural Resources.
Scientific, environmental, social, and institutional factors affecting planning and policy-making. Focus on ecosystem-based planning and policy issues through development of a multiple-use plan. Case studies.
- 471. Ichthyology**
Fall. 3(2-3) Interdepartmental with Zoology.
P: ZOL 228.
Fish morphology, physiology. Development, behavior, evolution and ecology. World fishes with emphasis on freshwater fishes.
- 472. Limnology**
Fall. 3(3-0) Interdepartmental with Zoology.
P: CEM 141, ZOL 250. R: Not open to students with credit in ZOL 431. Not open to students with credit in ZOL 431.
Ecology of lakes with emphasis on interacting physical, chemical, and biological factors affecting their structure and function.
- 474. Fishery and Limnological Techniques**
Fall. 3(1-6) Interdepartmental with Zoology.
P: FW 472 or concurrently.
Field and laboratory investigations of physical, chemical, and biological parameters of lakes and streams.
- 475. Aquaculture**
Spring. 3(3-0)
P: ANS 313 or FW 364 or ZOL 250.
Propagation and rearing of aquatic organisms used for food, bait and recreational fisheries management. Culture principles and techniques for important aquatic species. Commercial potential.
- 477. Pest Management I: Pesticides in Management Systems**
Fall. 3(3-0) Interdepartmental with Entomology, Horticulture, and Crop and Soil Sciences. Administered by Entomology.
P: CEM 143; BOT 405 or CSS 402, ENT 404 or ENT 470 or FW 325.
Chemistry, efficient use, environmental fate, and legal aspects of pesticides.
- 478. Pest Management II: Biological Components of Management Systems**
Spring. 3(2-3) Interdepartmental with Entomology, Horticulture, Crop and Soil Sciences, and Forestry. Administered by Entomology.
P: ENT 404 or ENT 470 or BOT 405 or CSS 402 or FW 328.
Principles of host plant resistance and biological control and their relationship to the design of agroecosystems. Classification of insect biological control agents.
- 479. Fisheries Management**
Spring. 3(2-2)
P: FW 424, FW 471, FW 474.
Manipulation of aquatic populations and their habitats to achieve societal goals for fishery resources. Management of human impact and biotic diversity.

Descriptions — Fisheries and Wildlife of Courses

484. Environmental Education
Spring, 3(3-0)
P: AEE 101 or PRR 320 or RD 201 or TE 150. R: Not open to freshmen and sophomores.
 Methods, materials and theory for teaching environmental education in formal and nonformal educational settings.

490. Independent Studies of Fisheries and Wildlife Problems
Fall, Spring, Summer. 1 to 5 credits. A student may earn a maximum of 5 credits in all enrollments for this course.
P: BS 110. R: Not open to freshmen and sophomores. Approval of department and application required.
 Special topics in fisheries and wildlife.

810. Human Dimensions Research in Fisheries and Wildlife
Fall of even-numbered years. 3(3-0)
 Methods of surveying, educating and involving the public to achieve fish and wildlife management goals. Review of human dimensions research and current case studies.

814. Environmental Chemodynamics
Spring of even-numbered years. 4(4-0)
 Chemical and environmental factors controlling the distribution of organic and inorganic chemicals in air, water and soil. Monitoring.

817. Ecology and Evolution in Aquatic Systems
Summer. 4 credits. Given only at W.K. Kellogg Biological Station. Interdepartmental with Zoology, and Botany and Plant Pathology. Administered by Zoology.
P: ZOL 250 or ZOL 431.
 Experimental field studies of population and community ecology of freshwater lakes and streams. Emphasis on interactions among species and between biotic and abiotic factors.

824. Analysis of Wildlife Populations
Spring of even-numbered years. 3(2-3)
 Statistical and ecological concepts, methods and computer techniques needed to analyze and interpret demographic data from fish and wildlife studies.

826. Ecology and Management of Waterfowl
Fall of even-numbered years. 3(2-3)
P: FW 412, FW 424.
 Physiological, behavioral, and population characteristics of waterfowl. Current issues and management.

828. Conservation and Genetics
Fall of odd-numbered years. 3(3-0)
P: ZOL 341 or CSS 350 or ANS 314.
 Population genetic principles applied to ecology and management of fish and wildlife.

831. Aquatic Toxicology
Spring of odd-numbered years. 4(3-2)
R: Open only to graduate students in the Colleges of Agriculture and Natural Resources, Engineering, Human Medicine, Natural Science, Osteopathic Medicine, and Veterinary Medicine.
 Techniques for assessing acute and chronic effects of toxicants on biochemical, physiological, organismal, population, community and ecosystem levels of organization.

860. Wildlife Nutrition
Fall of odd-numbered years. 3(2-2)
R: Open only to graduate students in the Colleges of Agriculture and Natural Resources, and Natural Science.
 Nutritional ecology of wild species. Techniques for analyzing and improving nutritional qualities.

872. Fishery Habitat Analysis and Management
Spring of odd-numbered years. 3(3-0)
R: Open only to graduate students in the Colleges of Agriculture and Natural Resources, Engineering, and Natural Science.
 Fish habitat use. Analysis and manipulation of habitats to enhance fish production in freshwater ecosystems.

875. Advanced Aquaculture
Fall of odd-numbered years. 3(3-0)
P: FW 475. R: Open only to seniors and graduate students.
 Adaptations and responses of aquatic organisms to environmental change in aquaculture systems. Research methods and applications for aquaculture planning and management decisions.

876. Applied Limnology
Spring of even-numbered years. 3(3-0)
R: Open only to graduate students in the Colleges of Agriculture and Natural Resources, Engineering, and Natural Science.
 Applied aquatic ecology. Quantitative relationships between physical, chemical, and biological parameters in polluted and unpolluted lakes.

877. Fish Population Dynamics
Fall of even-numbered years. 3(3-0)
R: Open only to graduate students in the Colleges of Agriculture and Natural Resources, and Natural Science.
 Quantitative analysis of fish populations. Evaluation, causes, and impacts of the rates of change in survival, growth, reproduction, and recruitment for fish populations and their yield.

878. Dynamics of Trace Contaminants in Aquatic Systems
Spring of even-numbered years. 3(3-0)
R: Open only to graduate students in the Colleges of Agriculture and Natural Resources, Engineering, Human Medicine, Natural Science, Osteopathic Medicine, and Veterinary Medicine.
 Chemical and environmental parameters controlling movement and disposition of trace contaminants in aquatic environments. Fate models.

879. Advanced Limnology
Spring of odd-numbered years. 3(3-0)
R: Open only to graduate students in the Colleges of Agriculture and Natural Resources, Engineering, and Natural Science.
 Physical, chemical, and biological processes affecting productivity of aquatic ecosystems.

891. Advanced Topics
Fall, Spring, Summer. 2 to 4 credits. A student may earn a maximum of 10 credits in all enrollments for this course.
 In depth study of advanced topics in fisheries and wildlife.

892. Biodiversity
Spring. 2(2-0) A student may earn a maximum of 4 credits in all enrollments for this course. Interdepartmental with Zoology. Administered by Zoology.
P: ZOL 250.
 Status of world biota and factors in the decline and extinction of major groups of plants and animals. Theory and design of natural reserves. Assessment and ecological meaning of diversity. Management for global and local diversity.

893. Seminar in Fisheries and Wildlife
Fall, Spring. 1(1-0) A student may earn a maximum of 7 credits in all enrollments for this course.
 Study and research in advanced problems and current development in fisheries and wildlife.

897. Community and Ecosystem Ecology
Spring. 4(4-0) Interdepartmental with Zoology, and Botany and Plant Pathology. Administered by Zoology.
R: Open only to students in Interdepartmental Graduate Specializations in Ecology and Evolutionary Biology.
 Structure and function of natural communities and ecosystems. Community analysis along environmental gradients. Succession, food web analysis, energy flow, nutrient cycling, and effects of human activities on ecosystems.

898. Master's Research
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 10 credits in all enrollments for this course.
R: Open only to graduate students in Fisheries and Wildlife.
 Master's degree Plan B research paper.

899. Master's Thesis Research
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 99 credits in all enrollments for this course.
R: Open only to graduate students in Fisheries and Wildlife.

943. Techniques of Analyzing Unbalanced Research Data
Spring. 4(4-0) Interdepartmental with Animal Science, Forestry, Crop and Soil Sciences, and Horticulture. Administered by Animal Science.
P: STT 464. R: Open only to graduate students in the College of Agriculture and Natural Resources.
 Linear model techniques to analyze research data characterized by missing and unequal number of observations in classes. Simultaneous consideration of multiple factors. Estimable comparisons. Hypothesis testing. Computational strategies. Variance and covariance components. Breeding values.

976. Multivariate Methods in Agriculture and Natural Resources
Spring. 4(4-0) Interdepartmental with Forestry and Animal Science. Administered by Forestry.
P: STT 422, MTH 314. R: Open only to graduate students in the College of Agriculture and Natural Resources and in the Interdepartmental Graduate Specializations in Ecology and Evolutionary Biology.
 Application of multivariate methods to research problems. Hotelling's T-test, profile analysis, discriminant analysis, canonical correlation, principal components, principal coordinates, correspondence analysis, and cluster analysis.

999. Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 99 credits in all enrollments for this course.
R: Open only to Doctoral level graduate students in Fisheries and Wildlife.

FOOD ENGINEERING FE
Department of Agricultural Engineering
College of Agriculture and Natural Resources
College of Engineering

329. Fundamentals of Food Engineering
Spring. 3(3-0) Interdepartmental with Food Science.
P: FSC 211, MTH 124, PHY 231. R: Not open to freshmen and sophomores.
 Unit operations in food industry: fluid mechanics, heat transfer, rate processes, refrigeration, freezing, and dehydration. Thermal process calculations.