490. Independent Study
Fall, Spring, Summer. 1 to 3 credits.
R: Open only to seniors in Financial Administration. Approval of department.
Supervised independent study of special topics in finance or insurance.
QA: FI 495

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.
QP: ACC 839 QA: FI 889

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.
QA: FI 889

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.
QA: FI 850

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.
QP: FI 888 QA: FI 874

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.
QP: FI 871 QA: FI 870

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.
QP: FI 888

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.
QP: FI 888 QA: FI 872, FI 873

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.
QP: FI 888 QA: FI 817

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.
QP: FI 888 QA: FI 878

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.
QA: FI 890

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.
QA: FI 990

981. Corporate Finance Theory
Spring of even-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.
QP: FI 990 QA: FI 991

982. Investment Theory
Spring of odd-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.
QP: FI 990 QA: FI 992

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.
QP: FI 990

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.

QA: FI 999

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.
QA: FW 100

203. Resource Ecology
Fall, Spring. 3(3-0)
Basic concepts of ecology which provide a foundation for examing environmental problems and their solutions.
QP: BOT 201, NS 142 QA: F W 203

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.
QA: FW 305

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.

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.
QA: FW 402

324. Wildlife Biometry
Fall. 3(2-13)
P: MTH 116, ZOL 250.
Quantitative techniques to analyze and interpret fisheries and wildlife data.
QP: MTH 111, ZOL 389 QA: FW 340

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.
QP: BS 212 QA: FW 328

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.
QP: FW 340, ZOL 389, CEM 141 QA: FW 302

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.
QP: BOT 450, FOR 304 QA: FW 410

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.
QP: FW 302, FW 340 QA: FW 412

420. Stream and Aquatic Insect Ecology
Fall. 3(2-3) 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.
QP: BS 212 QA: FW 478, ENT 420

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.
QP: FW 340, ZOL 389 QA: FW 424

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.
QP: FW 410, FW 412, FW 413 QA: FW 434

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.
QP: BS 212

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.
QP: FW 301, ZOL 307, ZOL 428 QA: FW 471, ZOL 471

472. Limnology
Fall. 3(3-0) Interdepartmental with Zoology.
P: CEM 141, ZOL 250. R: 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.
QP: CEM 141, ZOL 389 QA: FW 476

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.
QP: FW 476 QA: FW 477, FW 473

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.
QP: ANS 313A, ANS 313B or FW 302 or ZOL 389 QA: FW 475

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.
QP: FW 471 QA: FW 473

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.
QP: RD 301 or PRR 320 QA: FW 484

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.
QP: BS 212 QA: FW 404

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.
QA: FW 810

814. Environmental Chemodynamics
Fall. 4(4-0)
R: Open only to graduate students in College of Agriculture and Natural Resources, College of Engineering, College of Human Medicine, College of Natural Science, College of Osteopathic Medicine, or College of Veterinary Medicine.
Chemical and environmental factors controlling the distribution of organic and inorganic chemicals in air, water and soil. Monitoring.
QA: FW 802

824. Analysis of Wildlife Populations
Spring of odd-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.
QP: STT 421

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.
QP: FW 412, FW 424 QA: FW 826

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.
QP: ZOL 441 or CSS 350 or ANS 314 QA: FW 828

831. Aquatic Toxicology
Spring of even-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.
QA: FW 831

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.
QA: FW 860

872. Fishery Habitat Analysis and Management
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.
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.
QP: FW 475

876. Applied 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.
Applied aquatic ecology. Quantitative relationships between physical, chemical, and biological parameters in polluted and unpolluted lakes.
QA: FW 876

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.
QA: FW 877

878. Dynamics of Trace Contaminants in Aquatic Systems
Spring of odd-numbered years. 5(3-4)
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 in aquatic environments. Fate models.
QA: FW 878

879. Advanced 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.
Physical, chemical, and biological processes affecting productivity of aquatic ecosystems.
QP: FW 477 QA: FW 874, FW 875

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.
QA: FW 802

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.
QA: FW 801

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.

QA: FW 899

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.

QA: FW 999

FOOD ENGINEERING FE

Department of Agricultural Engineering
College of Agriculture and Natural Resources
College of Engineering

329. Fundamentals of Food Engineering
Spring. 3(4-0) 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.
QP: PHY 237, FSC 211, MTH 109 or MTH 111 QA: ATM 329, FSC 430

381. Food Process Engineering I
Fall. 3(3-0)
P: CHE 311 or CE 321 or ME 332. R: Open only to majors in College of Engineering.
Rheological behavior of fluid and semi-solid foods. Applications in mixing, pipeline design, extrusion, calendering, and coating.
QP: MTH 310, CHE 340 or CE 321 or ME 332 QA: FE 475

433. Food Dehydration
Spring. 3(3-0)
P: CHE 321 or ME 410. R: Open only to majors in College of Engineering.
Dehydration of food and agricultural products. Bin, belt, rotary, spray, microwave, and solar drying of food products.
QP: AE 352, CHE 343 QA: F E 433