392. Investment Planning  
Fall, Winter, Summer. 4(4-0) F 1391. 
Analysis of the various financial assets from which the individual or institution selects. Emphasis is on the analytical techniques and principles involved in the evaluation of financial instruments such as common stocks, bonds, preferred stock, and warrants. The role of particular types of securities in the portfolio management and investment planning process is examined and related to the current environment.

395. Principles of Urban Real Estate Administration  
Spring (4-0) EC 201 or F 1391 or approval of department. 
Concepts of urbanism city functions and growth, Analysis of physical location, legal, social, and other factors governing property values. Theories and techniques of valuing urban real estate.

491. Financial Markets  
Fall, 4(4-0) F 1391. 
Introduction to theories and models concerning financial markets. An analysis of financial instruments and major financial market participants. Governmental and legal influences on financial markets.

492. Management of Financial Institutions  
Winter, 4(4-0) F 1391. 
Emphasis is on the asset and liability management of commercial banks, savings and loan associations, credit unions, private and public pension funds, and trust institutions. Financial strategy is examined in light of legal and managerial constraints as well as fiduciary responsibility. Related issues include regulation and the concept of prudence.

493. Advanced Business Finance  
Spring, 4(4-0) F 1391, Seniors. 
Advanced study of the financial management of business firms. Special emphasis is placed on areas of major interest from both applied and theoretical points of view. Areas covered include capital budgeting, valuation, financial structure, mergers, and working capital management as well as other financial topics. Cases are used.

494. Strategies for Speculative Markets  
Winter, 4(4-0) F 1391. 
Use of stock options, futures and other financial instruments in domestic and foreign markets. The general theory of hedging risk.

495. Special Problems  
Fall, Winter, Spring, Summer. 1 to 4 credits. Senior F 1 major, approval of department. 
Independent study of special topics in finance or insurance.

496. Computer Financial Models  
Spring, 4(4-0) F 1391, MTA 217 or STT 422 or STT 442. 
Solution of business financial problems through the use of personal computers and selected software programs.

817. Quantitative Applications in Accounting and Finance  
Winter, 4(4-0) MGT 833, Interdepartmental with the Department of Accounting. 
Application of quantitative techniques to accounting, financial, and control activities, especially involving the data requirements of managerial decision models.

818. Research Techniques in Accounting and Finance  
Spring, 4(4-0) MTH 113, STT 423. Interdepartmental with and administered by the Department of Accounting. 
Properties of time series in accounting and finance with emphasis on ARIMA model and transfer-function model development. Applications and potential research areas.

850. Risk Management and Insurance Concepts  
Winter, Summer, 4(4-0) 
Analysis of business exposures and risk management techniques. Risk meeting alternatives and their economic, legal, and social implications. The role of insurance and employee benefits in risk management.

855. Market Cost-Revenue Analysis  
Winter, 4(4-0) 
One course in understanding and one in marketing, Interdepartmental with and administered by the Department of Marketing and Transportation Administration. 
Analytical tools for use in planning and controlling marketing activities. Emphasis on the determination of factors causing marketing cost differences and the assignment of costs to those factors. Application of tools to determination of expenditure-revenue patterns and market potential.

870. Financial Markets  
Fall, 4(4-0) F 1391. 
Financial markets, rates, and flows. Major theoretical explanation and empirical evidence concerning financial market behavior.

871. Portfolio Theory and Capital Markets  
Fall, Spring, 4(4-0) ACC 839, F 1388. 
Theoretical and empirical development in portfolio analysis and capital markets. Included topics are implementation of the Markowitz and Sharpe portfolio models, development and implications of the capital asset pricing model, and empirical studies of capital markets.

872. Management and Financing of Corporate Assets  
Fall, Summer, 4(4-0) F 1391 or concurrently. 
Principles of decision analysis in management of current assets, estimation of requirements for short-term funds, and valuation of capital budgeting and merger proposals. Analysis of actual business cases is supplemented by selected readings.

873. Long Term Financial Policies  
Winter, Spring, 4(4-0) F 1391 or F 1382. 
Planning capital structure and the cost of capital. Examines fundamental considerations of raising capital, debt management, dividend policy and problems in public issues. Analysis of actual business cases is supplemented by selected readings.

874. Investment Strategy  
Spring, 4(4-0) F 1391 or concurrently, F 1372 or F 1382. 
Analysis of various theories and techniques available to achieve superior selection and management of securities. Review and evaluation of significant literature in security analysis and investment.

878. Bank Management  
Spring, 4(4-0) F 1391. 
Provides a comprehensive working knowledge of commercial bank management. Topics include capital adequacy, liquidity, public policy and bank failures, regulation, consumer protection, and other internal and external banking industry issues.

990. Seminar in Financial Management Theory  
Fall, 4(4-0) Doctoral candidates with approval of department. 
The financial theory of the firm. Theoretical models dealing with capital structure, cost of capital, and dividend policy.

999. Doctoral Dissertation Research  
Fall, Winter, Spring, Summer. 1 to 5 credits. May be renewed for a maximum of 36 credits. Approval of department.

FISHERIES AND WILDLIFE  
F W

College of Agriculture and Natural Resources

100. Introduction to Fisheries and Wildlife  
Fall, I-1(0) Freshmen Fisheries and Wildlife Majors.
Fisheries and wildlife as a profession. Academic and nonacademic needs to meet professional objectives, using current management problems as a focus for discussion.
209. Resource Ecology

(9DC 209.) Fall, Winter, Spring, Summer. 3(3-0) Interdepartmental with the departments of Forestry, Geography, Resource Development, and Zoology.

Basic concepts of ecology which are the unifying basis for resource management, conservation policy of the analysis of environmental quality. Extensive use of guest lecturers.

301. Fish and Wildlife of North America

Winter. 5(3-4) B S 212 or approval of department.

Comparative study of fish and wildlife groups in North America, their significant life history stages, morphology, migrations, habitats and populations. Common species are identified in the laboratory.

302. Ecosystem Processes

Spring, 3(3-0) CEM 143, PHY 238, B S 212, CSS 210, CIC 203, MTH 109 or MTH 111.

Concepts of ecosystem structure and function developed from basic scientific laws and relationships.

305. Principles of Fisheries and Wildlife Management

Winter, 3(3-0) IDC 200 or approval of department. Not open to majors in fisheries-ecology or wildlife-ecology options.

Ecological concepts in management. Effects of regulations, refuges, stocking, species introduction, habitat manipulation, artificial feeding, genetic improvement, land use and control of predators, diseases and competitors on the production of fish and game.

328. Vertebrate Pest Control

Winter. 3(3-0) B S 212 or approval of department.

Role of vertebrate animals as agents damaging to human interests: the concepts of damage control; damage control techniques, optional field trip.

340. Wildlife Biometry

Winter, 4(3-2) MTH 111, six credits in fisheries and wildlife.

Survey of statistical formulas, methods and applications of statistics to problems in fisheries and wildlife.

374. Biological Oceanography

Winter, 3(3-0) B S 212 or approval of department.

Biology of marine animals, with emphasis on physical, chemical and biological factors affecting their abundance and distribution.

376 Introductory Limnology

Winter, 3(3-0) B S 212; students may not receive credit for both F W 376 and F W 476.

Lake and stream ecology including effects of natural and human-induced perturbations on freshwater ecosystems.

402. Environmental Conservation Education

Fall, 4(3-2) Education majors or approval of department.

Nature, distribution, identification, and interrelationships of Michigan's flora and fauna which influence natural resource use. Includes techniques of teaching about the environment. Field trips required.

404. Fisheries and Wildlife Problems

Fall, Winter, Spring, Summer. 1 to 5 credits. May reenroll for a maximum of 12 credits. B S 212: 6 credits of fisheries and wildlife, approval of department.

To give undergraduate majors an opportunity to study special topics in fisheries and wildlife.

410. Upland Wildlife Management

Fall, 3(3-0) F W 302 or FOR 304, FOR 204 or BOT 318.

Wildlife management based on upland ecological principles of population and management of habitat. Mitigation of human impact.

412. Wetland Ecosystem Management

Fall, 3(3-0) F W 302, F W 346.

Ecosystem components and processes applied to wetland management. Mitigation of human impact.

413. Upland and Wetland Ecosystem Laboratories

Fall, 2(0-6) F W 410 or F W 412 or concurrently.

Wildlife habitat analysis and management in upland and wetland ecosystems. Field trips required.

415. Parasitic Diseases of Animals: Ecosystem Approach

Spring, 4(3-2) F W 301 or ZOL 306 or approval of instructor.

Diseases of fish and wildlife caused by selected viruses, bacteria, helminths, and arthropods. Biology of infectious agents and their interrelationships with animal populations.

424. Wildlife Population Analyses

Spring, 4(3-2) BOT 420 or ZOL 359, or concurrently.

Population mensuration; reproductive and survival rates, sex and age determination, handling and marking methods. Field trips.

434. Wildlife Resource Policy and Management

Winter, 4(3-2) F W 410, F W 412, F W 424.

The impact of public policy on wildlife management. Objectives of and approaches to wildlife management. Planning, implementing, and evaluating wildlife management programs.

450. Natural Resource Administration

Winter, 4(3-0) Seniors, not open to forestry majors. Interdepartmental with Agriculture and Natural Resources and the departments of Forestry, Park and Recreation Resources, and Resource Development. Administered by the Department of Forestry.


455. Natural Resource Economics

Fall, 4(4-0) Approval of department. Interdepartmental with Agriculture and Natural Resources and the departments of Forestry, Park and Recreation Resources, and Resource Development. Administered by the Department of Forestry.

Basic economic and political principles and techniques that govern the production and consumption of forest land products, including basic forest valuation procedures.

471. Ichthyology

Spring, 3(3-3) F W 301 or ZOL 307 or ZOL 428. Interdepartmental with the Department of Zoology.

Classification and natural history of fishes. Emphasis on food, game, and forage fishes.

473. Fish Biology and Management

Fall, 3(3-4) F W 471.

Biology of fishes with special reference to distribution and natural history, and application of this knowledge to problems of obtaining maximum return from fishery resources.

475. Fish Culture

Spring, 3(3-0) F W 473.

Artificial propagation of freshwater fish including hatchery management, nutritional and environmental requirements. Disease control and intensive fishery management. Utilization of hatchery stock in fisheries management.

476. Limnology

Winter, 3(3-0) CEM 141B, CEM 161; BOT 450 or ZOL 359. Students may not receive credit for both F W 376 and F W 476. Interdepartmental with the Department of Zoology.

Ecology of lakes and streams with special reference to physical, chemical and biological factors affecting their productivity.

477. Limnological Methods

Winter, 3(3-0) F W 476 concurrently; ENT 301, ENT 302 recommended. Interdepartmental with the Department of Zoology.

Methods and instruments of limnological field investigation on lakes and streams.

478. Stream Ecology

Fall, 3(3-0) ENT 430, ZOL 359 or BOT 450 or F W 301 or approval of department. Students may not receive credit for both F W 475 and ENT 421. Interdepartmental with the departments of Entomology and Zoology.

Biological, chemical, physical, and geological processes which determine the structure and function of stream ecosystems.

484. Outdoor Environmental Education

Fall, 4(3-2) Juniors or approval of department.

Using the outdoors as a teaching laboratory for ecological studies of plant and animal communities. Designed primarily for secondary teachers.

485. Environmental Conservation Program Design

Winter of even-numbered years. 3(3-0) Seniors or approval of department.

Materials and methods for integrating environmental conservation into educational programs in schools, nature centers, youth groups and communities.

801. Seminar in Fisheries and Wildlife Controls

Fall, Winter, Spring. 1 to 6 credits. May reenroll for a maximum of 15 credits. Approval of department.

Study of selected advanced topics in detail and depth.

Fisheries and Wildlife — Descriptions of Courses
810. Human Dimensions of Fish and Wildlife Management  
Fall of even-numbered years. 3(3-0)  
Approval of department.  
Methods of surveying, educating, and involving the public to achieve fish and wildlife management goals. Human dimensions research. Case studies of current management issues.

830. Environmental Requirements of Fish  
Winter of odd-numbered years. 3(3-0)  
Approval of department.  
Analysis of growth processes of fish to environmental changes; research methods for evaluating environmental limitations and effects of pollutants on fish growth, reproduction and survival. Applications for developing water quality criteria.

831. Aquatic Toxicology  
Spring of odd-numbered years. 3(3-0)  
F W 580 or approval of department.  
Acute and chronic toxicity of compounds and elements on aquatic organisms. Monitoring and predicting structural and functional changes: biochemical, histological, physiological, organismal, behavioral, population, community, ecosystem.

860. Wildlife Nutrition  
Winter of odd-numbered years. 4(3-2)  
Approval of department.  
Application of nutritional concepts to wildlife management. Design of nutritional investigations including methods of sampling and analysis. Improvement of the nutritional status of wildlife habitats.

871. Ecology of Fishes  
Summer of even-numbered years. 3 credits.  
Approval of department.  
Exploration of ecological problems with particular emphasis on growth, food and habitat selection, population biology and niche relations. Field and experimental investigations of fish communities.

872. Fish Communities and Aquatic Ecosystems  
Winter of even-numbered years. 3(3-0)  
Approval of department.  
Processes by which fish influence the structure and function of aquatic ecosystems.

874. Advanced Biological Limnology  
Fall of odd-numbered years. 3(4-0)  
F W 477, or approval of department.  
Historical and current contributions to concepts of community structure, energy flow and materials cycling in aquatic eco-systems.

875. Chemical Limnology  
Winter. 4(3-3) F W 476, F W 477 or approval of department.  
Application of analytical chemistry concepts and technologies to fundamental chemical mechanisms in natural and polluted water systems. Special consideration given to selected heterogeneous equilibria.

876. Applied Limnology  
Spring. 3(3-0) F W 874 or F W 875 or approval of department.  
Aquatic ecology: quantitative relationship between physical, chemical and biological parameters in polluted and unpolluted lakes and streams.

877. Fish Population Dynamics  
Winter of odd-numbered years. 3(3-0)  
Approval of department.  
Quantitative analysis of fish populations; rates of change and their underlying causes.

878. Dynamics of Aquatic Contaminants  
Spring of even-numbered years. 4(2-4)  
F W 476, F W 477 or approval of department.  
Movement of contaminants through aquatic ecosystems. Chemical and physical processes controlling decomposition and disposition of contaminants. Behavior of chemical forms to bioavailability and toxicity. Statistical and deterministic predictive simulation models.

897. Ecosystem Ecology  
Fall. 3(3-0) ZOL 389 or BOT 450.  
Interdepartmental with and administered by the Department of Zoology.  
Concepts of ecosystem structure, energy flow, and nutrient cycling in representative terrestrial and aquatic ecosystems.

999. Doctoral Dissertation Research  
Fall, Winter, Spring, Summer. Variable credit.  
Approval of department.

300. Dairy Products  
Spring. 3(2-2) CEM 143 or approval of department.  
Chemical and physical properties of milk and milk products. Survey of dairy products and the technologies involved in their manufacture.

310. Food Safety and Microbiology  
Fall. 4(3-3) CEM 143 or concurrently or approval of department. Not open to students with credit in FSG 440. Interdepartmental with the Department of Microbiology and Public Health.  
Effects of food handling, preparation and service on food safety. Microorganisms in foods, sanitization, food borne disease and food service regulations.

328. Food Plant Sanitation  
(FSC 332.) Winter. 3(3-0) FSC 211, MPH 200, CEM 141B.  
Sanitary aspects of food processing operations, water quality, equipment design, bacteriological agents, pest control, personnel hygiene, biological hazards, and regulatory agencies. Field trips required.

328L. Laboratory in Food Plant Sanitation  
Winter. 1(0-2) FSC 328 or concurrently.  
Sanitary aspects of food processing operations water quality, and related hygienic aspects. Field trips required.

329. Unit Operation and Food Processing I  
Fall. 4(3-3) PHY 237, MTH 109. Interdepartmental with and administered by Agricultural Engineering Technology.  
Engineering concepts related to the unit operations found in the food industry. Fluid mechanics, heat transfer and rate processes including psychrometrics and refrigeration.

330. Food Processing Operations  
(FSC 331.) Winter. 3(3-0) PHY 237, FSC 211, or approval of department.  
Unit operations for food preservation by low temperature, heat, dehydration, evaporation and separation processes.

330L. Laboratory in Food Processing Operations  
Winter. 1(0-2) FSC 330 or concurrently.  
Demosntrations, workshops, and pilot-scale processing illustrating selected unit operations in food manufacture.

333. Food Chemistry  
Spring. 3(3-0) FSC 211 and CEM 241 or approval of department.  
Chemical changes in foods that affect the texture, color, flavor, odor, stability, and nutritive quality during processing and storage.

333L. Laboratory in Food Chemistry  
Spring. 1(0-3) FSC 211, CEM 241 and FSC 333 or concurrently.  
Chemical changes in food that affect quality and stability.

400. Milk Processing Technology  
Fall. 4(3-3) CEM 241 or approval of department.  
The fluid milk industry. Composition, quality, sanitation, nutritive value, processing, packaging and distribution of milk and milk products.