FAMILY AND CHILD ECOLOGY

FAMILY PRACTICE  FMP

FMP 515. Health Care in Underserved Areas Fall of even-numbered years. 2 to 3 credits. Interdepartmental with the Department(s) of Family Medicine. R: Graduate-professional students in colleges of Human and Osteopathic Medicine. Professional, economic, and personal issues confronting the physician practicing in medically underserved areas. Impact of practice location, federal programs, changing patterns of practice, health maintenance organizations.

FMP 516. Migrant Worker Health Care Spring. 2 to 4 credits. May reenroll for a maximum of 8 credits. Interdepartmental with the Department(s) of Family Medicine. R: Graduate-professional students in colleges of Human and Osteopathic Medicine. Health beliefs, patient attitudes, economic situations and medical problems of migrant agricultural workers. Introduction to occupational medicine in the agricultural sector.

FMP 517. Introduction to Sports Medicine Fall, 2(2-0) Interdepartmental with the Department(s) of Osteopathic Medicine. R: Graduate-professional students in colleges of Human and Osteopathic Medicine. Causes, diagnosis, treatment, and prevention common sports injuries. Drugs, nutrition, exercise physiology and sports psychology. Emphasis on family practice approach to sports medicine.

FMP 518*. Sports Medicine II Spring. 1(0-2) P: FMP 517 R: Grad Prof.Stud in College of Human and Osteopathic Medicine Students in College of Nursing The course is intended to provide the medical student or graduate interdependent with an awareness of and experience in multidisciplinary aspects of sports medicine through direct observations and hands-on tutorials.

FMP 526. Primary Care in Developing Countries Fall of odd-numbered years. 2(2-0) R: Graduate-professional students in colleges of Human and Osteopathic Medicine. Practical skills for medical problem solving in developing countries: physician experiences, cross-cultural training, instruction of health workers, resource allocation; coping with special challenges, e.g., malnutrition.

FMP 588. Special Topics in Family Practice Fall, Spring, Summer. 2 to 3 credits. May reenroll for a maximum of 6 credits. R: Graduate-professional students in colleges of Human and Osteopathic Medicine. Exploration of special aspects of family practice. Possible examples include ethnicity and aging, clinical nutrition, sports medicine, death and dying, health care of women, research methods in primary care.

FMP 602. Clinical Medicine in the Community Fall, Spring, Summer. 6(6) P: Passed preclinical curriculum R: Grad Professional Students in College of Human Medicine Data gathering, medical formulation and presentation of plans for patients. Assessment of readiness for clinical clerkships. Exposure to community hospitals and out-patient settings.

FMP 607. Ambulatory Care Clerkship Fall, Spring, Summer. 1 to 3 credits. Interdepartmental with the Department(s) of Medicine, Pediatrics. P: FMP 602 R: Graduate Professional Students in College of Human Medicine Outpatient experience, lasting an equivalent of 36 half days and extending over a minimum of 26 weeks. Continuous care of ambulatory patient under supervision of appropriate physicians.

FMP 608. Family Practice Clerkship Fall, Spring, Summer. 6 to 12 credits in increments of 6 credits. May reenroll for a maximum of 6 credits. P: FMP 602 R: Graduate Professional students in College of Human Medicine Experience in family practice in diverse settings. Emphasis on primary, continuing and comprehensive care.

FMP 612. Inpatient Clerkship in Family Practice Fall, Spring, Summer. 6 to 12 credits in increments of 6 credits. May reenroll for a maximum of 6 credits. P: FMP 602 R: Grad Professional students in College of Human Medicine Inpatient experience in the hospital setting, including management of consultations and referrals.

FMP 615. Medical Care in Developing Countries Fall, Spring, Summer. 6 to 12 credits in increments of 6 credits. May reenroll for a maximum of 6 credits. P: FMP 602 R: Grad Professional students in College of Human Medicine Supervised experience in hospitals, outpatient clinics, villages and medical research centers in developing countries.

FAMILY MEDICINE  FM

FM 590*. Special Problems in Family Medicine Fall, Spring, Summer. 1 to 8 credits. May reenroll for a maximum of 28 credits. R: Open only to graduate-professional students in the colleges of Osteopathic and Human Medicine. Approval of department. Each student works under faculty direction on an experimental, theoretical, or applied problem.

QA: FM 590

FM 601*. Clinical Practicum in Family Medicine Fall, Spring, Summer. 4 to 24 credits in increments of 2 credits. May reenroll for a maximum of 24 credits. R: Open only to graduate-professional students in the College of Osteopathic Medicine. Units I and II. Direct involvement in a family practice emphasizing patient, office, and personnel management.

QA: FM 600

FM 620*. Directed Studies Fall, Spring, Summer. 2 to 24 credits in increments of 2 credits. May reenroll for a maximum of 48 credits. R: Open only to graduate-professional students in the colleges of Osteopathic and Human Medicine. Approval of department.

Individual or group projects on special problems related to family medicine.

QA: FM 620

FM 640*. Principles of Family Medicine I Fall, 1(0-0-4) R: Open only to graduate-professional students in the College of Osteopathic Medicine. Unit I; Systems Biology course or concurrently. Preceptorship experience in family medicine taught by faculty and clinical preceptors at multiple sites.

QA: PBM 520 QA: FM 652 FM 662

FM 650*. Principles of Family Medicine II Spring, 1(0-0-4) R: Open only to graduate-professional students in the College of Osteopathic Medicine. Unit I: Systems Biology course or concurrently. Continuation of FM 640.

QA: FM 652 PBM 520 QA: FM 672 FM 682

FINANCE AND INSURANCE  FI

FI 311*. Financial Management Fall, Spring, Summer. 3(3-0) P: ACC 202 or ACC 250 or ACC 251H or HRI 302 R: Open only to juniors and seniors in the College of Business and in programs that list FI 311 as a catalog requirement. Optimal management of the firm's assets and financing requirement. Analysis of financial statements, financial markets, risk, valuation, long-term and short-term financing and investment. International and ethical implications.

QA: ACC 202 OR ACC 250 ACC 251H OR HRI 302 QA: FI 391

FI 320*. Introduction to Investments Fall, Spring, Summer. 3(3-0) P: SCI 311 R: Open only to majors in the College of Business. Introduction to asset pricing. 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.

QA: FI 391
FINANCE AND INSURANCE

331*. Principles of Risk Management and Insurance
Fall, Spring. 3(3-0)
F: STT 315. R: Open only to majors in the College of Business.
QP: STT 315 QA: Fl 350

413*. Management of Financial Institutions
Fall, Spring. 3(3-0)
F: Fl 311. R: Open only to majors in the College of Business.
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.
QP: Fl 391 QA: FI 492

417*. Financial Decision Models
Spring. 3(3-0) Interdepartmental with the Department(s) of Accounting.
F: P: PFI 868 R: Graduate or PPA Business MBA or PPA Development and application of computerized financial models in finance, accounting, and control activities. Use of financial planning software on personal and mainframe computers. Emphasis on models in case analysis.
QP: PFI 868 QA: PFI 817

550*. Risk Management for Commercial and Public Entities
Spring. 3(3-0)
R: Graduate Business
Application of risk management techniques to businesses and public entities. Analysis of exposures, risk management alternatives, and their social, legal and economic implications. Cost/benefit analysis of decisions.
QP: PFI 850

561*. International Financial Management
Fall. 3(3-0)
F: PFI 889 R: Graduate Business
Financial management in an international environment including capital budgeting, capital structure decisions, cash management, foreign currency markets and exchange rate risk management; ethical and tax considerations.
QP: PFI 888

570*. Financial Markets and Strategies
Spring. 3(3-0)
F: PFI 974 R: Graduate or PPA Business MBA or PPA Theories concerning domestic and international financial markets and instruments. Effects of risk and maturity on prices. Special focus on managing business and portfolio risk and returns with options and futures.
QP: PFI 871 QA: PFI 870

782*. Advanced Managerial Finance
Fall, Spring. 3(3-0)
F: PFI 889 R: Graduate Business
Advanced management and financing of corporate assets and long term financial policies. Financial planning and control using financial theory and management techniques and applied in an international setting. Use of business cases.
QP: PFI 888 QA: PFI 872 FI 873

784*. Introduction to Investments
Fall, Spring. 3(3-0)
F: PFI 889 or equivalent R: Graduate or PPA Business MBA or PPA Analysis and application to security risk and return concepts. Security analysis and concepts of market efficiency. Emphasis on equity investments. Bonds, options, futures, and international securities.
QP: PFI 888 QA: PFI 874

785*. Bank Management
Spring. 3(3-0)
F: PFI 889 R: Graduate Business
The nature, structure and management of commercial banks. Focus on production and services offered, risks, policies and strategies, both domestically and internationally.
QP: PFI 888 QA: PFI 875

889*. Managerial Finance
Fall, Spring. 3(3-0)
F: ACC 860 or equivalent R: Graduate or PPA Business MBA or PPA Managerial finance covering short-, intermediate- and long-term problems. Financial planning and control using financial theory and management techniques. Applications in both domestic and international settings.
QP: ACC 839 QA: PFI 889

990*. Special Problems
Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 6 credits.
R: Graduate Business Approval of Department
Independent study of special topics in finance or insurance.
QA: FI 890

999*. Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 24 credits. May reenroll for a maximum of 99 credits.
R: Ph.D. students Business and Finance
QA: FI 899

FISHERIES AND WILDLIFE

FW

190*. Introduction to Fisheries and Wildlife
Fall. 1(1-0)
Fisheries and wildlife history, philosophy and management in the context of conservation ethics.
QA: FW 190

203. Resource Ecology
Fall, Spring. 3(3-0)
Basic concepts of ecology which provide a foundation for examining environmental problems and their solutions.
QP: B27091 NS142

205. Principles of Fisheries and Wildlife Management
Spring. 3(3-0)
Characteristics of the fish and wildlife resources. Ecological and societal factors influencing the management of fish and wildlife. Management techniques.
QA: FW 305
### Descriptions of Courses

Courses are subject to revision and final approval.

#### FISHERIES AND WILDLIFE

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>207</td>
<td>Great Lakes: Biology and Management</td>
<td>Fall</td>
<td>Interdepartmental with the Department(s) of Zoology.</td>
</tr>
<tr>
<td>284</td>
<td>Natural History and Conservation in Michigan</td>
<td>Fall</td>
<td>Not open to freshmen.</td>
</tr>
<tr>
<td>324</td>
<td>Wildlife Biometry</td>
<td>Fall</td>
<td>Problems in fisheries and wildlife examined using formulas, methods, and applications of statistics and microcomputers.</td>
</tr>
<tr>
<td>328</td>
<td>Vertebrate Pest Control</td>
<td>Fall</td>
<td>Role of vertebrate animals as agents damaging to human interests. Damage evaluation. Control strategies and techniques.</td>
</tr>
<tr>
<td>364</td>
<td>Ecosystem Processes</td>
<td>Spring</td>
<td>Concepts of ecosystem structure and function developed from basic scientific laws and relationships.</td>
</tr>
<tr>
<td>410</td>
<td>Upland Ecosystem Management</td>
<td>Spring</td>
<td>Analysis and management of upland ecosystems to meet wildlife management and biodiversity objectives. Mitigation of human impact.</td>
</tr>
<tr>
<td>412</td>
<td>Wetland Ecosystem Management</td>
<td>Fall</td>
<td>Ecosystem components and processes applied to wetland management. Mitigation of human impact.</td>
</tr>
<tr>
<td>420</td>
<td>Stream and Aquatic Insect Ecology</td>
<td>Fall</td>
<td>Interdepartmental with the Department(s) of Entomology, Zoology.</td>
</tr>
<tr>
<td>424</td>
<td>Population Analysis and Management</td>
<td>Fall</td>
<td>Statistical, ecological and management concepts and methods needed to analyze and interpret demographic data and manage fish and wildlife populations.</td>
</tr>
<tr>
<td>430</td>
<td>Human Dimensions of Fisheries and Wildlife Management</td>
<td>Spring</td>
<td>Management of fish and wildlife.</td>
</tr>
<tr>
<td>444</td>
<td>Conservation Biology</td>
<td>Fall</td>
<td>Interdepartmental with the Department(s) of Zoology.</td>
</tr>
<tr>
<td>474</td>
<td>Fishery and Limnological Techniques</td>
<td>Fall</td>
<td>Techniques of limnology and fishery science used in field and laboratory investigations of physical, chemical, and biological parameters of lakes and streams.</td>
</tr>
<tr>
<td>475</td>
<td>Aquaculture</td>
<td>Spring</td>
<td>Aquaculture methods and applications for aquaculture fishery management.</td>
</tr>
<tr>
<td>479</td>
<td>Fisheries Management</td>
<td>Spring</td>
<td>Fisher management and fishery management methods and theory for teaching environmental change in aquaculture systems. Research methods and applications for aquaculture planning and management decisions.</td>
</tr>
<tr>
<td>484</td>
<td>Environmental Education</td>
<td>Spring</td>
<td>Environmental Education methods and theory for teaching environmental change in aquaculture systems. Research methods and applications for aquaculture planning and management decisions.</td>
</tr>
<tr>
<td>490</td>
<td>Independent Studies of Fisheries and Wildlife Problems</td>
<td>Fall/Spring</td>
<td>Independent Studies of Fisheries and Wildlife Problems methods and theory for teaching environmental change in aquaculture systems. Research methods and applications for aquaculture planning and management decisions.</td>
</tr>
<tr>
<td>810</td>
<td>Human Dimensions Research in Fisheries and Wildlife</td>
<td>Fall</td>
<td>Human Dimensions Research in Fisheries and Wildlife methods and theory for teaching environmental change in aquaculture systems. Research methods and applications for aquaculture planning and management decisions.</td>
</tr>
<tr>
<td>814</td>
<td>Environmental Chemodynamics</td>
<td>Fall</td>
<td>Environmental Chemodynamics methods and theory for teaching environmental change in aquaculture systems. Research methods and applications for aquaculture planning and management decisions.</td>
</tr>
<tr>
<td>824</td>
<td>Analysis of Wildlife Populations</td>
<td>Fall</td>
<td>Analysis of Wildlife Populations methods and theory for teaching environmental change in aquaculture systems. Research methods and applications for aquaculture planning and management decisions.</td>
</tr>
<tr>
<td>828</td>
<td>Ecology and Management of Waterfowl</td>
<td>Fall</td>
<td>Ecology and Management of Waterfowl methods and theory for teaching environmental change in aquaculture systems. Research methods and applications for aquaculture planning and management decisions.</td>
</tr>
<tr>
<td>831</td>
<td>Aquatic Toxicology</td>
<td>Spring</td>
<td>Aquatic Toxicology methods and theory for teaching environmental change in aquaculture systems. Research methods and applications for aquaculture planning and management decisions.</td>
</tr>
<tr>
<td>860</td>
<td>Wildlife Nutrition</td>
<td>Fall</td>
<td>Wildlife Nutrition methods and theory for teaching environmental change in aquaculture systems. Research methods and applications for aquaculture planning and management decisions.</td>
</tr>
</tbody>
</table>
Courses are subject to revision and final approval.

FISHERIES AND WILDLIFE

877*. Fish Population Dynamics Fall of even numbered years. 3(3-0)
P: FW 479
Quantitative analysis of fish populations. Evaluation, causes and impact of the rate 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 even numbered years. 5(3-4)
P: Calculus, Computer Science
Chemical and environmental parameters which control the movement and disposition in aquatic environments. Use of fate models.
QA: FW 878

879*. Advanced Limnology Spring of odd numbered years. 3(3-0)
Physical, chemical and biological processes that affect productivity of aquatic ecosystems.
P: FW 477
QA: FW 874 FW 875

891*. Advanced Topics Fall, Spring, Summer. 2 to 4 credits. May reenroll for a maximum of 10 credits.
In depth study of advanced topics in fisheries and wildlife
QA: FW 802

892*. Seminar in Fisheries and Wildlife Fall, Spring. 1-1(0)
May reenroll for a maximum of 7 credits.
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. May reenroll for a maximum of 10 credits.
Master's degree Plan B research paper
R: 6 19 25

899*. Master's Thesis Research Fall, Spring, Summer. 1 to 24 credits. May reenroll for a maximum of 48 credits.
P: Admission to doctoral program in Fisheries and Wildlife R: Doctoral level: 7 College of Agriculture and Natural Resources: 19 Fisheries and Wildlife 23
QA: FW 899

FOOD ENGINEERING FE

329*. Fundamentals of Food Engineering Spring. 3(4-0) Interdepartmental with the Department(s) of Food Science, P: MTH 124, PHY 231, FSC 211 R: Juniors and above
Unit operations in the food industry including: fluid mechanism, heat transfer, rate processes, refrigeration, freezing, and dehydration. Thermal process calculations.
QP: PHY 237 FSC 211MTH 1090MTH 111 QA: ATM 329 FSC 439

381*. Food Process Engineering I Fall. 3(3-0)
P: CHE 311 or CE 321 or ME 332 R: Juniors and above Engineering
Rhodological behavior of fluid and semi-solid foods. Applications in mixing, pipeline design, extraction, calendering, and coating.
QP: MTH 310 CHE 340RCE 321OR CEM 343 QA: FE 475

433*. Food Dehydration Spring. 3(3-0)
P: CHE 321 or ME 410 R: Engineering majors
Dehydration of food and agricultural products, including bin, belt, rotary, spray, microwave, and solar drying of food products.
QP: AE 352 CHE 343 QA: FE 433

483*. Food Process Engineering II Fall. 3(3-0)
P: FE 391 or concurrent, MTH 205, CHE 332 or concurrent, CEM 382 or concurrent R: Juniors and above Engineering
Kineties of biological and food reactions, design and analysis of biological reactors, thermal processing, microbial death kinetics, sterilization and pasteurization, thermal process evaluation, kinetic processing.
QP: CEM 341 FE 475 CEM 385MHP 200 QA: FE 477

485*. Food Process Engineering III Fall. 3(3-0)
P: FE 391 or concurrent, MTH 205, CHE 332 or concurrent, CEM 382 or concurrent R: Juniors and above Engineering
Diffusion, mass transfer coefficients, separations, freezing, dehydration, process integration and design concepts.
QP: CEM 340 FE 475 ME 411FE 477 QA: FE 373

487*. Food Engineering Design Project Spring. 3(4-0)
P: FE 483, FE 485 R: Seniors and above
QP: AE 346 FE 477 QA: FE 497

490*. Directed Study Fall, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 8 credits.
P: FSC 211 or MTH 221 or MTH 225 R: Open only to Engineering majors. Approval of department. Application required. Supervised individual student research and study in food engineering.
QP: MTH 310 OR FSC 241 QA: FE 480

491*. Special Topics in Food Engineering Fall, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 8 credits.
P: FSC 211 or MTH 221 or MTH 225 R: Open only to Engineering majors. Approval of department. Special topics in food engineering.
QP: FE 490

FOOD SCIENCE FSC

211*. Principles of Food Science Fall. 3(3-0)
P: CEM 141 R: None None None
Scientific principles, historical perspective and current status of technology related to food composition, safety, toxicology, processing, preservation and distribution.
QP: CEM 141B QA: FSC 211

330*. Food Processing: Fruits and Vegetables Fall, 2(3-0)
P: MTH 116, FSC 211 R: Sophomores and above
Fruit and vegetable composition and quality indices. Harvest and postharvest technology. Preservation systems: canning, freezing and specialized techniques.
QP: MTH 108 AND MTH 1090MTH 111 QA: FSC 490

331*. Food Processing: Cereals Fall. 2(3-0)
P: MTH 116, FSC 211 R: Sophomores and above
Classification and composition of cereals, milling processes, and cereal product manufacture.
QP: FSC 211 MTH 108 AND MTH 1090R QA: FSC 470

332*. Food Processing: Dairy Foods Spring. 2(3-0)
P: MTH 116, FSC 211 R: Sophomores and above
QP: MTH 108 AND MTH 1090MTH 111 QA: FSC 490 FSC 406

333*. Food Processing: Meat, Poultry and Poultry Products Spring. 2(3-0)
P: MTH 116, FSC 211 R: Sophomores and above
Meat animal, muscle foods and egg processing technology, product formulation and quality control, Manufacturing practices and principles of fresh, frozen and cured meats, sausage and processed products.
QP: MTH 108 AND MTH 1090MTH 111 QA: FSC 446

401*. Food Chemistry Fall. 3(3-0)
P: FSC 211, CEM 251 R: Not open to freshmen and sophomores. Not open to students with credit in HNF 300.
Chemical properties of food constituents. Chemical changes in foods during processing and storage affecting texture, color, flavor, stability, and nutritive quality.
QP: FSC 211 CEM 241 QA: FSC 433 FSC 402

402*. Food Chemistry Laboratory Fall. 1(0-3)
P: FSC 401 or concurrent, R: Open only to majors in Food Science, Foods: Technology and Management, and Food Engineering.
Chemical changes in food constituents which affect stability of food products and properties such as color, flavor and texture.
QP: FSC 333 QA: FSC 333L

421*. Food Laws and Regulations Spring. 3(3-0)
P: HNF 150 or HNF 311 or FSC 211 R: Not open to freshmen and sophomores.
Adoption, interpretation and enforcement of laws and regulations governing food processing and food service systems. Impact of regulation on food production, availability, marketing and safety.
QP: HNF 102 OR FSC 210HNF 411 QA: FSC 205

433*. Advanced Food Processing: Dairy Foods Fall of odd numbered years. 3(3-3)
P: FSC 332 R: Juniors and above
Theoretical and practical principles of the manufacture of cheese, frozen desserts, butter and powders. Cleaning and functionaliization techniques for producing dairy based ingredients for food systems.
QP: FSC 400 QA: FSC 405

Courses with an asterisk (*) have not been approved by the University Committee on Curriculum.