805. Integrated Pest Management Systems  
Fall. Spring. 3(2-12)  
Biological, ecological and sociological factors which can be exploited for integrated pest management. Design and management of environmental systems for pest prevention and non-chemical control.

812. Graduate Seminar  
Fall. Spring. 1(1)  
A student may earn a maximum of 10 credits in all enrollments for this course.  
Current research topics. Student presentation required.

815. Insect Behavior  
Fall of odd-numbered years. 3(2-13)  
P: ENT 404.  
Fundamentals of insect behavior with emphasis on mechanisms. Quantitative methods.  
QP: ENT 301, ENT 302 QA: ENT 415

818. Systematics, Morphology, Biology:  
Adults  
Spring of odd-numbered years. 3(1-17)  
P: ENT 404.  
Classification, identification, morphology, biology and evolutionary relationships of adults insects. Specimens provided.  
QP: ENT 301, ENT 302 QA: ENT 418

838. Systematics, Morphology, Biology:  
Immatures  
Fall of even-numbered years. 3(3-17)  
P: ENT 404.  
Classification, identification, morphology, biology and evolutionary relationships of immature insects. Emphasis on terrestrial holometabolans. Collection required.  
QP: ENT 418 QA: ENT 438

844. Insect Ecology and Evolution  
Spring of even-numbered years. 3(3-0)  
P: ENT 404.  
Unique characteristics and principles of insect ecology and evolution including trophic relationships, community structure, speciation and coevolution.  
QP: ENT 301 or ENT 302 or ENT 425 QA: ENT 444

850. Insect Physiology  
Spring of even-numbered years. 4(3-12)  
P: ENT 404.  
System by system description of insect form and function. Examples of how physiological systems are coordinated for complex biological functions.  
QP: ENT 301, ENT 302 QA: ENT 450

851. Molecular Entomology  
Fall of odd-numbered years. 3(3-0)  
Interdepartmental with Genetics.  
Analysis of molecular processes unique to insects, and their potential for genetic engineering.  
QA: ENT 851

870. Plant Nematology  
Spring of odd-numbered years. 3(2-13)  
Interdepartmental with Botany and Plant Pathology.  
P: BOT 405.  
Biology, host-parasite relationships and management of selected nematode diseases of economic plants.  
QP: BOT 405 QA: ENT 871

890. Independent Study  
Fall. Spring. Summer. 1 to 3 credits.  
A student may earn a maximum of 8 credits in all enrollments for this course.  
R: Open only to graduate students.  
Individual study on a field or laboratory research topic or review of published literature on a topic of interest.

899. Master's Thesis Research  
Fall. Spring. Summer. 1 to 12 credits.  
A student may earn a maximum of 24 credits in all enrollments for this course.  
R: Open only in masters students in Entomology.  
QA: ENT 899

905. Analytical Techniques for Bioactive Compounds: Separation  
Spring of even-numbered years. 4(2-16)  
Extraction and chromatographic separations of compounds from environmental matrices.  
QA: ENT 940

911. Analytical Techniques for Bioactive Compounds: Confirmation  
Spring of odd-numbered years. 4(2-16)  
Instrumental confirmation of compounds from environmental matrices.  
QA: ENT 941

999. Doctoral Dissertation Research  
Fall, Spring, Summer. 1 to 12 credits.  
A student may earn a maximum of 99 credits in all enrollments for this course.  
R: Open only to Ph.D. students in Entomology.  
QA: ENT 999

ENVIRONMENTAL ENGINEERING  
ENE

Department of Civil and Environmental Engineering College of Engineering

809. Environmental Engineering Seminar  
Fall, Spring. 1(1-0)  
R: Open only to Environmental Engineering majors.  
Current research in environmental engineering.  
QA: ENE 800

801. Dynamics of Environmental Systems  
Spring. 3(3-0)  
Principles of mass balance, reaction kinetics, mass transfer, reactor theory in environmental engineering.  
QA: CE 481 QA: ENE 801

802. Physicochemical Processes in Environmental Engineering  
Fall. 3(3-0)  
P: ENE 801.  
Physical and chemical principles of air and water pollution control and environmental contaminants in water, air and soils.  
QP: CE 483 QA: ENE 802

803. Physicochemical Process Laboratory  
Spring. 1(0-3)  
P: ENE 801. C: ENE 802  
Experiments involving physicochemical processes such as air stripping, coagulation and flocculation, activated carbon and chemical oxidation.  
QP: ENE 801 QA: ENE 802

804. Biological Processes in Environmental Engineering  
Fall. 3(3-0)  
P: ENE 801 or concurrently.  
Engineering of microbial processes used in wastewater treatment, in-situ bioreclamation, and solid waste stabilization.  
QP: ENE 801 QA: ENE 804

805. Biological Processes Laboratory  
Spring. 1(0-4)  
P: ENE 804.  
Principles of biological processes applied to wastewater treatment.  
QP: ENE 804 QA: ENE 805

807. Environmental Analytical Chemistry  
Fall. 3(3-0)  
R: Open only to Environmental Engineering majors.  
QA: CE 481

808. Environmental Analytical Chemistry Laboratory  
Spring. 1(0-3)  
P: ENE 805.  
R: Open only to Environmental Engineering majors.  
Laboratory work in environmental analytical chemistry.  
QP: CE 481

880. Independent Study in Environmental Engineering  
Fall. Spring. 1 to 6 credits.  
A student may earn a maximum of 6 credits in all enrollments for this course.  
R: Open only to Environmental Engineering majors.  
Solution of environmental engineering problems not related to student’s thesis.

890. Selected Topics in Environmental Engineering  
Fall, Spring, Summer. 3(3-0)  
A student may earn a maximum of 9 credits in all enrollments for this course.  
R: Open only to Environmental Engineering majors.  
Selected topics in new or developing areas of environmental engineering.  
QA: CE 890

899. Master's Thesis Research  
Fall, Spring, Summer. 1 to 8 credits.  
A student may earn a maximum of 24 credits in all enrollments for this course.  
QA: ENE 899

FAMILY AND CHILD ECOLOGY  
FCE

Department of Family and Child Ecology  
College of Human Ecology

145. The Individual, Marriage and the Family  
Fall. Spring. 3(3-0)  
R: Open only to freshmen and sophomores.  
Development of the young adult in the human ecological context. Issues of sexuality, gender, parenting, work and family interface, communication and resource use. Diversity in relationships and families.  
QA: FCE 145

211. Child Growth and Development:  
Conception Through Early Childhood  
Fall. Spring. 3(3-2)  
R: Not open to freshmen.  
Physical, cognitive, social, emotional and ecological aspects of human growth and development from conception through early childhood.  
QP: PSY 180 or PSY 170 QA: FCE 262A

212. Children, Youth and Family  
Fall. Spring. 3(3-0)  
P: FCE 145, SOC 100 or FCE 211.  
R: Not open to freshmen.  
An ecosystems perspective on development during childhood and adolescence emphasizing family and community contexts.  
QP: FCE 145 or FCE 262A QA: FCE 263

225. Ecology of Family and Human Development  
Fall. Spring. 3(3-0)  
R: Not open to seniors except seniors in the College of Human Ecology.  
Human development across the lifespan with an ecological perspective. Relationships between human resource professionals and family systems.

236. Personal Finance  
Fall. Spring. Summer. 3(3-0)  
Strategies, techniques and resources useful in the management of personal finance.  
QA: FCE 236
Descriptions—Family and Child Ecology

Courses

270. Human Services in the Community
Fall, Spring. 3(2-3)
R: Not open to freshmen. Open only to students in the Department of Family and Child Ecology.
Human services from an ecological perspective. Human service needs, resources, and methods of service delivery. Participation in community agency required.
QA: FCE 221

320. Interaction Processes with Children in Groups
Fall, Spring. 3(3-0)
QP: FCE 362A, FCE 362B, or FCE 221 QA: FCE 364A

320L. Interaction with Children-Laboratory
Fall, Spring. 1(0-3)
P: FCE 211, FCE 320 or concurrently. R: Not open to freshmen and sophomores. Practice applying principles of interaction to individuals and small groups in early childhood programs.
QP: FCE 362A, FCE 362B, or FCE 364A QA: FCE 364B

321. Curriculum for Early Childhood Programs
Fall, Spring. 3(3-0)
P: FCE 320, FCE 320L. R: Not open to freshmen and sophomores. Child development principles and accreditation standards for designing curricula for pre-primary age children. Plan and evaluation of unit activities and programs.
QP: FCE 364A, FCE 364B QA: FCE 369A

321L. Curriculum for Early Childhood Programs: Laboratory
Fall, Spring. 1(0-3)
P: FCE 320, FCE 320L, FCE 321 or concurrently. R: Not open to freshmen and sophomores. Supervised practice in providing learning activities for individual children and small groups. Planning, implementing, and evaluating activities.
QP: FCE 364A, FCE 364B QA: FCE 369B

350. Management and Decision Making in the Family
Fall. 3(3-0)
Not open to freshmen and sophomores.
Management for the realization of values and goals through decision making about resources in the family.
QA: FCE 331, FCE 332

370. Educational Systems in Human Ecology
Fall, Spring. 3(0-3)
P: FCE 270. R: Not open to freshmen.
The human ecologist as educator in formal, nonformal, and informal educational systems. Instructional methods appropriate for these environments.
QP: FCE 221 QA: FCE 340

405. Work and Family
Spring. 3(3-0)
R: Not open to freshmen and sophomores.
Historical perspectives on work and family. Effects of work on family members across life cycle, and employer and public policy response.
QA: FCE 405

411. Developmental Study of a Child
Fall, Spring. 2(1-15)
P: FCE 111 or PSY 244. R: Not open to freshmen and sophomores.
Ecological analysis of developmental behavior. Application of research findings to observations of a child.
QP: FCE 282, PSY 244 QA: FCE 441

413. Adult Development and the Family: Middle and Later Years
Spring, Summer. 4(3-18)
R: Not open to freshmen and sophomores.
Social, psychological and biological development within the family. Field study approach.
QP: PSY 305/306 QA: FCE 480, FCE 479

414. Parenting
Fall of odd-numbered years. 3(3-0)
R: Not open to freshmen and sophomores.
Childrearing in modern society. Adult parenting roles in various family structures. Support roles of families and communities.

421. Parenting
Fall, Spring, Summer. 6 to 8 credits.
P: FCE 321, FCE 321L. R: Open only to seniors or graduate students in Child Development, Child Development and Teaching, Community Services or Family and Child Ecology. Approval of department. A supervised teaching practicum. Planning, implementing, and evaluating an ecological, educational program for children and their families.
QP: FCE 365A, FCE 464, FCE 464A, FCE 464B, FCE 468

441. Home Economics Education Programs
Fall. 2(2-0)
R: Not open to freshmen and sophomores.
Types, functions, and purposes of home economics education programs, and operational issues.
QA: TE 412, TE 331

442. Ethnic Minority Families in America
Fall, Spring. 3(3-0)
P: FCE 320, FCE 320L. R: Open to and open to freshmen and sophomores.
Historical, structural, and functional components of selected ethnic minority family systems in America. Life styles, pressures, adaptations, viability, and continuity.
QA: FCE 442

444. Interpersonal Relationships in the Family
Fall, Spring. 3(3-0)
R: Not open to freshmen and sophomores.
Personal awareness and interpersonal relationships within the family system. Small group discussions.
QA: FCE 444

452. Consumer Issues
Spring. 3(3-0)
P: FCE 258 or approval of department. R: Not open to freshmen and sophomores.
Issues in contemporary consumer ecosystems.
EC 201, EC 202 QA: FCE 458

454. Financial Management
Spring. 3(3-0)
P: FCE 258 or approval of department. R: Not open to freshmen and sophomores.
Financial management strategies of families during the life cycle. Income support programs.
QP: FCE 258, EC 202 QA: FCE 458

458. Family Financial Advising
Fall of odd-numbered years. 2(2-0)
P: FCE 456 concurrently. R: Not open to freshmen and sophomores.
Advising strategies for working with families with financial concerns.
QP: FCE 483 QA: FCE 494

470. Current Issues in Family and Child Ecology
Spring. 3 to 6 credits in increments of 3 credits.
A student may earn a maximum of 9 credits in all enrollments for this course.
R: Not open to freshmen and sophomores. Legislative, current events, and issues affecting families and children. Implications for professional decision and actions.
QA: FCE 470

472. Evaluation of Human Service Programs
Spring. 3(3-0)
P: FCE 370. R: Not open to freshmen and sophomores.
Models of program evaluation for human service-related programs.
QP: FCE 340 QA: FCE 491

473. Administration of Child and Family Programs
Spring. 3(3-0)
P: FCE 370 or FCE 424. R: Open only to juniors, seniors, or graduate students in the Department of Family and Child Ecology.
Administrative and ecological principles. Program linkages with agencies and their regulations.
QA: FCE 495

490. Independent Study
Fall, Spring, Summer. 1 to 5 credits.
A student may earn a maximum of 9 credits in all enrollments for this course.
R: Not open to freshmen and sophomores. Approval of instructor; application required.
Individual study of selected topics under faculty guidance.
QA: FCE 495

490H. Honors Independent Study
Fall, Spring, Summer. 1 to 5 credits.
A student may earn a maximum of 9 credits in all enrollments for this course.
R: Not open to freshmen and sophomores. Approval of instructor; application required.
Honors individual study of selected topics with faculty guidance.
QA: FCE 495

492. Internship Seminar
Fall, Spring. 2(2-0)
P: FCE 370. R: Open only to juniors or seniors in the Department of Family and Child Ecology. Approval of department. Preparation for professional internship.
QP: FCE 340 QA: FCE 497

493. Internship
Fall, Spring, Summer. 3 to 9 credits in increments of 3 credits. A student may earn a maximum of 9 credits in all enrollments for this course.
P: FCE 492. R: Open only to seniors in the Department of Family and Child Ecology. Approval of department. Professional experience in a community organization.
QP: FCE 221, FCE 340, FCE 492 QA: FCE 498

891. Family Ecosystems
Fall, Spring. 3(3-0)
Family viewed from ecosystems perspective. Assessment tools used to analyze family systems.
QA: FCE 832

810. Theories of Human Development
Fall, Spring. 3(3-0)
Major theories of development; research findings and the validity of theoretical positions.
QA: FCE 819

811. Child Development: Ecological Perspectives
Fall of even-numbered years. 3(3-0)
Ecological factors that influence family functioning and child outcomes.
P: FCE 819, FCE 891

812. Adolescence in the Family: Ecological Perspectives
Spring of odd-numbered years. 3(3-0)
Ecological factors that influence family functioning and adolescent outcomes.
P: FCE 819, FCE 891

813. Adulthood and Aging in the Family: Ecological Perspectives
Fall of odd-numbered years. 3(3-0)
Ecological factors that influence family functioning and adolescent outcomes.
P: FCE 819, FCE 891

814. Parenthood and Parent Education
Spring of even-numbered years. 3(3-0)
Influences on parenting; growth and factors that influence parenting; approaches to providing education and support for parents.
P: FCE 891, FCE 819, FCE 857 QA: FCE 845, FCE 846

A-60
821. Early Childhood Education: Curricular Approaches
Spring, 3(3-0)
P: FCE 810.
Theoretical background, content, and evaluation of early childhood curricula and programs. Influence of research and practice policy.
QP: FCE 819. QA: FCE 841

822. Assessment of the Young Child
Fall of even-numbered years. 3(3-0)
Assessment instruments and procedures for children from birth to age seven. Techniques for assessing physical, social, emotional, and cognitive development of young children.
QA: FCE 842

823. Infant Programs and Practices
Spring of even-numbered years. 3(2-3)
P: FCE 810 or PSY 847.
Concepts of early childhood education applied to children from birth to age three. Evaluation of research, learning materials, and activities for infants at home and in small group settings. Field work required.
QP: FCE 819 or APR DEPT. QA: FCE 848, FCE 849

830. Survey of Marriage and Family Therapy Theories
Fall. 3(3-0)
Contemporary ecosystem theories of marriage and family therapy.
QA: FCE 859

831. Treatment Processes in Marriage and Family Therapy
Spring, 3(3-0)
P: FCE 830, R: Open only to Marriage and Family Therapy majors.
Case management and treatment processes for problems affecting system change and family functioning.
QP: FCE 822

832. Ethics, Law, and Professional Development
Spring of even-numbered years. 3(3-0)
Ethics and laws affecting family life professionals. Developing a professional identity. Management of private practice and consulting services.
QA: FCE 859

845. Foundations of Family Study
Fall. 3(3-0)
Historical and cultural perspectives of the family; conceptual approaches to family study; sensitivity to family diversity; key issues related to the life cycle. Field observation required.

847. Theories of the Family
Spring. 3(3-0)
P: FCE 845.
Perspectives on the family. Relationships of theory, research, and practice.
QA: FCE 854

848. Divorce and Remarriage Interventions
Fall of even-numbered years. 3(3-0)
Impact of changing marital status on the individual, family, and society. Current research, laws, educational programming for clinical treatment strategies.
QA: FCE 856

850. Theories of Management and Decision Making in the Family
Fall. 3(3-0)
Theories of decision making in the context of family management. Application to human resource development in the family. Integrated ecological approach.
QA: FCE 804, FCE 832

851. Family Economics
Fall of odd-numbered years. 3(3-0)
P: One course in economics.
The household as an economic unit in consumer and producer roles. Economic functions and processes.
QA: FCE 837, FCE 838

871. Methods of Teaching Adults
Fall of odd-numbered years. 3(3-0)
Uses of human and family ecological perspectives in teaching adults audiences.
QA: FCE 825

872. Program Design and Development
Fall of even-numbered years. 3(3-0)
Processes involved in program design and development for human service organizations and agencies.

873. Administration and Management of Human Services Programs
Spring of odd-numbered years. 3(3-0)
P: FCE 872.
Processes and procedures related to the management and administration of human service programs.

874. Volunteer Development and Management
Fall of odd-numbered years. 3(3-0)
Recruitment, development, and guidance of volunteers for human service programs. Administration of programs involving volunteers.

875. Curriculum and Evaluation in Home Economics Education
Spring of odd-numbered years. 3(3-0)
Relationships between curriculum and evaluation. Procedures used in developing curriculum and evaluation models.
QA: FCE 823, FCE 827

880. Research Methods in Family and Child Ecology
Fall, Spring, 3(3-0)
Methods applied to problem definition, research design, and analysis.
QA: FCE 891

890. Independent Study
Fall, Spring, Summer. 1 to 5 credits.
A student may earn a maximum of 9 credits in all enrollments for this course.
Individual study of selected topics with faculty guidance.
QA: FCE 897

891. Topics in Family and Child Ecology (MTC)
Fall, Spring, 2 to 3 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
Family science, early childhood development, problems in programs, or services for families.
QA: FCE 840

892. Seminar in Family and Child Ecology
Fall, Spring, 1 to 4 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
Selected content in family relationships, family economics, human development in the family, community services, or programs for children and families.
QA: FCE 801, FCE 802

894. Laboratory and Field Experience
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course.
R: Open only to graduate students in the Department of Family and Child Ecology.
Supervised observation, practice, or internships.
QA: FCE 888

899. Master's Thesis Research
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
R: Open only to graduate students in the Department of Family and Child Ecology.
QA: FCE 899

902. Advanced Marriage and Family Therapy Theories
Spring of odd-numbered years. 3(3-0)
A student may earn a maximum of 12 credits in all enrollments for this course.
P: FCE 830
Selected theoretical perspectives in marriage and family therapy and related therapy techniques.
QP: FCE 859

904. Family Ecology Theory Construction
Fall of odd-numbered years. 3(3-0)
P: FCE 801; FCE 819; FCE 830 or FCE 847 or FCE 850. R: Open only to doctoral students.
Integration and application of concepts in constructing family ecology theory. Theory development strategies.
QP: FCE 830, FCE 819 or FCE 847 or FCE 850
QA: FCE 935

980. Advanced Research Methods (MTC)
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 5 credits in all enrollments for this course.
P: FCE 801, FCE 880. R: Open only to doctoral students.
Research design, measurement and implementation.
QP: FCE 893 QA: FCE 894

991. Topics in Family and Child Ecology (MTC)
Fall, Spring, 2 to 3 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
R: Open only to doctoral students.
Topics and problems in programs and services for families.

993. Internship
Fall, Spring, Summer. 1 to 9 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
R: Open only to Family and Child Ecology graduate students.
Approval of department.
Supervised practicum, or internship.
QA: FCE 801

999. Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 60 credits in all enrollments for this course.
R: Open only to majors in Family Ecology.
QA: FCE 999

FAMILY MEDICINE

Department of Family Medicine
College of Osteopathic Medicine

590. Special Problems in Family Medicine
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 48 credits in all enrollments for this course.
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

601. Clinical Practicum in Family Medicine
Fall, Spring, Summer. 1 to 9 credits. A student may earn a maximum of 9 credits in all enrollments for this course.
R: Open only to graduate-professional students in the College of Osteopathic Medicine upon completion of Units I and II.
Direct involvement in a family practice emphasizing patient, office, and personnel management.
QA: FM 600

620. Directed Studies
Fall, Spring, Summer. 1 to 30 credits. A student may earn a maximum of 30 credits in all enrollments for this course.
R: Open only to graduate-professional students in the colleges of Osteopathic Medicine and Human Medicine upon completion of Units I and II.
Individual or group projects on special problems related to family medicine.
QA: FM 620

640. Principles of Family Medicine I
Fall, 10-4
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.
QP: PHM 520 QA: FM 652, FM 662