441. Internal Morphology
Winter. 4(2-6) ENT 440 or approval of department.
Morphology of the internal structure of insects. Emphasis on the evolutionary development of organs and organ systems of various representative insects.

444. Insect Ecology
Fall of even-numbered years. 3(3-0)
One course in introductory entomology. Unique characteristics and principles of insect ecology. Trophic relationships, populations, climate, co-existence, competition, behavior, communities and distributions.

450. Insect Physiology
Spring. 5(3-4) ENT 441: 1 biochemistry or physiology course, 1 year of chemistry including 1 term of organic.
General and comparative physiology of insects, treating molecular, tissue and organ functions. Laboratory exercises emphasizing mastery of sound experimental procedures.

455. Toxicology of Insecticides
Winter of odd-numbered years. 4(4-0)
1 term organic chemistry.
Properties of insecticides. Mode of action, metabolism and movement in animals. Safety and potential hazards to man and wildlife. Fates of insecticides in the environment.

460. Medical Entomology
Spring. 4(3-3) ENT 301, ENT 302, or approval of department.
Distribution and biology of important arthropod vectors of diseases to man, disease symptoms, life cycle of the infectious agent, reservoirs, transmitting arthropods, anaphylactic reactions, myiasis, and prophylactic measures.

470. Nematode Diseases of Economic Plants
Winter. 4(3-3) B.S.219 or BOT 205. Interdepartmental with the Department of Botany and Plant Pathology.
Major nematode diseases of economically important plants, with emphasis on diagnostic symptoms, nematode biology and principles of control.

480. Insects in Relation to Plant Diseases
Fall of even-numbered years. 3(2-2)
ENT 302. Interdepartmental with the Department of Botany and Plant Pathology.
Relationships of insects, mites and nematodes to important plant diseases incited by bacteria, fungi, viruses and toxins. Mode of transmission and means of control. Transmission techniques and important plant-pathogen-insect relationships.

490. Topics in Entomology
Fall, Winter, Spring, Summer. Variable credits. Majors or approval of department.
Advanced work in medical entomology, acarology, advanced forest entomology, soil arthropods, behavior and biological control.

508. Advanced Taxonomy
Fall, Winter. 4(0-12) May reenroll for a maximum of 24 credits. ENT 418, ENT 440.
Classification in depth of a single order of insects, including comparative morphology of the group and survey of recent and classical literature.

812. Graduate Seminar Topics
Fall, Winter, Spring. 1(1-0) May reenroll if different topic is taken. Graduate students and approval of department.
Graduate level seminars on current research and philosophy. Student participation required.

815. Biological Control
Spring of even-numbered years. 3(2-3)
Approval of department.
Properties of insect biochemistry, relationships to population ecology and systematics, habitat evaluation, interactions with pesticides, analysis of successful programs, and future trends. Collection for taxonomic lab to be made the summer before.

820. Applied Insect Ecology
Winter of odd-numbered years. 3(2-3)
Approval of department.
Ecological factors in an insect's ecosystem that can be manipulated for the purpose of pest management. Critical evaluation of current and classical literature presented by students in both oral and written reports.

821. Advanced Stream Ecology
Summer. 3 credits. ENT 421 or approval of instructor. Given at W. K. Kellogg Biological Station, Interdepartmental with the Department of Fisheries and Wildlife.
Stream ecosystem energy budget models with emphasis on individual projects involving both laboratory and field experiments. Particular use will be made of artificial streams and locally abundant species of aquatic insects.

838. Principles of Taxonomy
Spring of odd-numbered years. 3(3-0)
Twenty credits in zoology and/or entomology, or approval of department.
Methods and principles of systematic zoology and entomology, including a historical survey of the pre-Linnean and post-Linnean systems of classification. International rules of zoological nomenclature and their emendations.

840. Insect Toxicology
Winter of odd-numbered years. 3(3-6)
ENT 301, ENT 302, organic chemistry.
Chemical and physical properties of insecticides, relationship of chemical structure to mode of action, and physiological basis of toxicological action.

871. Biology of Nematodes
Spring. 4(2-6) ENT 470 or approval of department. Interdepartmental with the Department of Botany and Plant Pathology.
Ontogeny, taxonomy, morphology, pathology and ecology of nematodes, with special reference to plant-parasitic and phytopathogenic species.

881. Biology of the Arthropods
Winter. 5(3-6) ZOL 481 or approval of department. Interdepartmental with and administered by the Department of Zoology.
Ecology, life cycles, morphology, taxonomy, and distribution of arthropods other than insects.

890. Problems
Fall, Winter, Spring, Summer. 1 to 6 credits. May reenroll for a maximum of 12 credits. Majors or approval of department.
Advanced individual work in: agriculture, aquatic insects, insect biochemistry, biosystematics, economic insects, insect ecology, forest insects, morphology, nematology, insect physiology, plant disease transmission, insect toxicology, araneida, acarina, medical entomology, chemistry of insecticides, insect biology, extension entomology, systems.

899. Master's Thesis Research
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

940. Analytical Techniques for Biological Compounds I
Fall. 4(2-6) Organic chemistry, approval of department.
Application, extraction, cleanup and purification techniques employed in analysis of biologically active compounds. Stresses use of radioisotopes, and column, paper, thin-layer, and molecular sieve chromatography.

941. Analytical Techniques for Biological Compounds II
Winter. 4(2-6) ENT 940.
Analytical techniques used for identification and quantification of biologically active compounds. Emphasis on spectroscopy and gas-liquid chromatography.

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

FAMILY AND CHILD SCIENCES

College of Human Ecology

145. The Individual, Marriage and the Family
Fall, Winter, Spring. 4(4-0) Students may not receive credit in both FCS 145 and SW 299.

255. Family and Individual Development: Life Cycle
Winter, Spring. 3(3-0) Three terms of natural science; sophomores.
Overview of family development. Predictable individual developmental changes over the life span. Cognitive, moral, physical, psychological and social aspects. Interface between individual and family development.

262A. Child Growth and Development: Conceptus through Early Childhood
Fall, Winter, Spring. Summer of odd numbered years. 3(3-0); Sophomores, FSY 160 or FSY 170 or ED 200; FCS 262B concurrently.
Physical, cognitive, and emotional aspects of human growth and development from conception through early childhood.

262B. Child Growth and Development Laboratory
Fall, Winter, Spring. Summer of odd numbered years. 1(0-3); FCS 262A concurrently or approval of department.
Observation of human development in infants and young children.

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263. Children, Youth and the Family
(245.) Fall, Winter, Spring. 3(3-0)
Sophomores, SOC 241 or FCS 145 or FCS 262A; or approval of instructor.
A family systems perspective of middle childhood, adolescence, and youth development is presented, incorporating childhood through launching stages of family development. Interactions of parents, children and socio-cultural factors are analyzed.

364A. Interacting with Young Children in Child Development Centers
(364A.) Fall, Winter, Spring. 3(3-0) FCS 262A, FCS 262B each with a minimum grade of 2.0; FCS 364B concurrently.
Application of principles of human growth and development to personal interaction with children ages three to six individually and in small groups in schools of early childhood.

364B. Interacting with Young Children-Laboratory
(364B.) Fall, Winter, Spring. 10-0 FCS 364A concurrently. FCS 262A, FCS 262B each with a minimum grade of 2.0. Experience in interaction with children ages two to six years, individually and in groups in a child development center.

369A. Learning Activities for Early Childhood Programs
Fall, Winter, Spring. 3(3-0) Majors: FCS 262A and FCS 262B, FCS 364A and FCS 364B each with a minimum grade of 2.0. Others: approval of department. Planning learning activities and teaching strategies for children ages 3 to 6 in early childhood education programs.

369B. Learning Activities for Early Childhood Programs-Laboratory
Fall, Winter, Spring. 10-0 FCS 369A concurrently and approval of department. Experience in planning and carrying out learning activities with young children in an early childhood program.

400H. Honors Work
Fall, Winter, Spring. Summer. Variable credit. May reenroll for a maximum of 18 credits. Seniors; approval of department.

442. Minority Families in America
(442.) Winter. 3(3-0) Juniors. Historical, structural, functional components of minority family systems in white America. Centers on a particular minority family system each term. Life styles, pressures, adaptations, viability and continuity of minority family subculture.

444. Interpersonal Relationships in the Family
Fall, Winter, Spring. Summer of even-numbered years. 3(3-0) FCS 145 or FCS 263 or approval of department. Relationships between and among family members as they are affected by other systems, and by physical, cultural, social-psychological forces within the family eco-system. Contemporary family life issues.

445. Human Sexuality in the Family
(305.) Fall, Winter, Spring. 3(3-0) Juniors. Credit may not be earned in both FCS 445 and PSY 290. Personal, interpersonal, societal meanings of human sexuality, utilizing ongoing small peer group interaction. Nonlecture, value clarification approach, integrating reflection on research findings, family, peer and cultural influences.

466. Approaches to the Study of the Family
Fall, Winter. Summer of odd-numbered years. 4(4-0) FCS 145 or FCS 263, FCS 444.
The family is studied from several approaches. Case studies, films, literary materials, research studies and observations of living situations are included.

467. Administration of Child Development Centers
Spring. 3(3-0) FCS 464A, FCS 464B or concurrently; or approval of department. Application of child care philosophy, management and communication skills to operation of early childhood education programs. Federal, state, and local regulations and support services.

468. Teacher-Parent Interaction
Fall, Winter, Spring. 3 credits. Majors: FCS 464A, FCS 464B or concurrently; others: FCS 262A or ED 412. Analysis of parent-teacher communication and interaction, parent involvement, and parent education related to early childhood education programs operated by schools, churches, or community agencies. Field experience when feasible.

470. Current Issues in Family and Child Sciences
Winter, Spring. 3(3-0) FCS 464A, or Seniors, or approval of department. Analysis of current events, issues, of legislation which bears on homes, families and children’s programs. Implications for professional decisions and actions.

490. Human Development and Interpersonal Relationships: The Middle and Later Years
Spring. Summer of odd-numbered years. 4(3-1) Introductory sociology and psychology. FCS 145 or FCS 263, FCS 444. Social-psychological-biological development and socialization for roles in middle and later years. Generational relationships; societal influences. Case study approach involving interaction with an adult or family in middle or later years.

495. Independent Study
Fall, Winter, Spring. 4 to 12 credits. May reenroll for a maximum of 12 credits. Approval of department. Study of a selected topic under the guidance of a faculty adviser in the area of specialty.

498. Field Study
Fall, Winter, Spring. Summer. 1 to 12 credits. May reenroll for a maximum of 12 credits. Approval of department. Study in off-campus situations in a variety of ways using involvement in volunteer, governmental or business-sponsored community service agencies to further insights into interaction among the individual, the family and the community.

501. Seminar in Family Life
(501.) Fall, Winter, Spring. 3(3-0) May reenroll for a maximum of 12 credits. Approval of department.

502. Seminar in Child Development
(502B.) Fall, Winter, Spring. 3(3-0) May reenroll for a maximum of 12 credits. Approval of department.

510. Workshop
Summer. Variable credit. Approval of department.
Content varies depending on nature of workshop.

513. Special Studies in Family Life
(513B.) Fall, Winter, Spring. Summer. 1 to 4 credits. May reenroll for a maximum of 12 credits. Approval of department.

519. Theories of Child Development
(519.) Fall. 3(3-0) FCS 262A or child psychology. Comparative study of conceptual frameworks utilized in child development.

520. Human Development in the Family: Psychological Development
Fall. 4(4-0) Six credits in child development or approval of department. Selected aspects of family members' psychological potential, development, status explored. Family's contributions to members' psychological potential for growth and development and to realization of human potential are seen as fundamental.

521. Human Development in the Family: Personality
Winter. 4(4-0) Six credits in child development or approval of department. Influence of child-rearing practices and parent-child relationships on developing human personality. Application of research findings and theoretical approaches to psychological development in the family and family-related situations.
822. Human Development in the Family: Socialization
Spring. (4-6) Basic course in sociology. 6 credits in child development or family life or approval of department.
Influence of family structure and interaction upon socialization from infancy to adulthood. Relationship of family to processes in larger social environment, and influence of these on human social development.

830. Individual Readings
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

831. Death, Dying, and the Family
Spring. 3(3-0)
Provides students with an understanding of various theoretical frames of reference developed for viewing death within the family and strategies designed to assist them to deal with it.

840. Topics in Child Development
Fall, Winter, Spring. Variable credit. 3(3-0) to 6(6-0) FCS 262A or a child growth and development course.
In-depth analysis of a selected topic pertinent to the care and education of young children in child development centers.

841. Early Childhood Education: Curricular Approaches
Spring. 3(3-0) FCS 262A or a child growth and development course.

842. Assessment of Development of the Young Child
Fall. 3(3-0) A child growth and development course.
Survey of assessment instruments and procedures for children from birth to age seven. Techniques for practitioner or parent to use to assess physical, social, emotional and intellectual development.

843. Play and Human Development
Winter of odd-numbered years. 3(3-0)
One course in child development or human development.
Role of play in human development. Functions of play related to other aspects of development. Analysis of theory related to play behavior.

850. Aging in the Family
Fall. 3(3-0) FCS 450 or approval of instructor.
Provides students with a knowledge and understanding of the literature in aging in the family and develops an appreciation of the interrelationships involved in this multidisciplinary area.

852. Communication and Family Crisis
Winter. 3(3-0) Approval of department.
Dynamics of family communication and adjustment to crisis during the life cycle. Delination of major types of family crises and their consequences. Strategies for positive communication and resolution.

FAMILY ECOLOGY

College of Human Ecology

200. Ecological Approach to Family and Health
Fall, Winter. 2(2-0) Sophomores. Not open to HEC majors.
Use of the human ecosystem perspective to study people and their various environments with focus on family and health support systems.

221. The Role of the Helping Professions and Organizations in Community Services
(HDC 221) Fall, Winter, Spring. 4(4-0) Interdepartmental with and administered by the Department of Urban and Metropolitan Studies.
Analysis of human and community needs; review and examination of existing and emerging resources to meet those needs; role of professionals and volunteers in providing community and human services.

238. Personal Finance
Fall, Winter, Spring. 3(3-0)
Strategies, techniques and resources useful in the management of personal finance.

332. Theory and Application of Home Management
Fall, Winter, Spring. 3(3-2) Juniors and HEC 301 or concurrently; or approval of department.
Principles of effective home management and their application in a living situation.

340. Instruction in Human Ecology for Non-Formal Settings
Fall, Winter, Spring. 3(2-2) Juniors, HEC 301; Dietetic Majors; HNF 320 or concurrently.
Theory and practice of instruction in Human Ecology with specific application to non-formal environments. For majors in Dietetics and Community Services and other majors in human ecology.

400H. Honors Work
Fall, Winter, Spring, Summer. Variable credit. May reenroll for a maximum of 16 credits. Seniors; approval of department.

436. Consumer Economic Problems
Fall, Winter, Spring. Summer of even-numbered years. 3(3-0) EC 200 or EC 301.
Nature of current consumer problems. Sources of information and methods of evaluating information in the search for solutions to problems and for improved consumer protection.

437. Energy Utilization in the Household
Fall, Winter. Summer of even-numbered years. 3(3-0) HEC 301 or approval of department.
Human and fossil fuel energy use at the household level. Issues and policies regarding work accomplishment in the home.

438. Family Financial Management
Fall, Spring, Summer of odd-numbered years. 4(4-0) HEC 301; EC 201 or FAM 201.
Major financial alternatives available to families during the founding, active parenthood, and retirement stages. Implications for the community of the family’s financial decisions.

450. Selected Topics in Family Ecology
Fall, Winter, Spring. 3(3-0) or 4(4-0)
May reenroll for a maximum of 12 credits. Seniors. Current issues of concern to professional family ecologists.

495. Independent Study
Fall, Winter, Spring. Variable credit. May reenroll for a maximum of 12 credits. Approval of department.

498. Field Study
Fall, Winter, Spring. 3(3-3) or 4(4-4) Approval of department.
Prenprofessional experience in a community agency/organization engaged in activities related to student’s program. Weekly reports and seminar dealing with student learning experiences, professional development, and roles of selected agencies.

800A. Seminar in Family Ecology
Fall, Winter, Spring. Summer of even-numbered years. 3(3-0) May reenroll for a maximum of 12 credits. Approval of department.

804. Human Resource Development in Family
Spring. Summer of odd-numbered years. 3(3-0) EC 200, EC 201; FCS 444.

813A. Special Studies in Family Ecology
Fall, Winter, Spring. Variable credit. Approval of department.

814. Community Systems for Community Development
Winter. 3(3-0) Approval of department. Interdepartmental with and administered by the Department of Resource Development.
Basic systems of the community, their functions and interrelationships; the family, economic, government, education, and supportive service systems.