415. Insect Behavior
Winter of even-numbered years. 3(3-0)
ENT 301, ENT 302, ZOL 413 recommended.
Mechanisms and adaptive significance of communi-
cation, orientation, food and habitat selection
and behavioral rhythmicity in insects.

418. Systematic Entomology
Winter. 4(1-9) ENT 301, ENT 302.
General taxonomic course to acquaint the stu-
dent with the various groups of insects.

420. Aquatic Insects
Spring, 4(3-3) ENT 301, ENT 392.
Biological, ecology and systematics of aquatic in-
sects. Insect collection required.

425. Agricultural Entomology
Fall. 4(3-2) One year of biological or
agricultural sciences.
Natural processes of insect populations and as-
sociated techniques that are important to a-
griculture.

438. Taxonomy of Immature Insects
Spring of even-numbered years. 4(1-9)
ENT 418.
Identification of immature insects with particu-
lar emphasis on the Holometabola.

440. External Morphology of Insects
Fall, Spring 4(2-6) ENT 301, ENT 302, or
approval of department.
Morphological concepts of external skeletal
parts of insects. Emphasis on evolutionary de-
velopment of structures from the Apterygota
through the Pterygota.

444. Insect Ecology
Fall of odd-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
Fall of even-numbered years. 3(3-4)
ENT 301, ENT 302, 1 biochemistry or physi-
ology course, 1 year of chemistry including 1 term
of organic chemistry.
General and comparative physiology of insects,
treating molecular, tissue and organ function.
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 humans 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 humans, disease
symptoms, life cycle of the infectious agent, re-
servoirs, vectors, arthropods, anaplastic reac-
tions, myiasis, and prophylactic measures.

470. Nematode Diseases of Economic
Plants
Spring. 4(3-3) B S 212 or BOT 205.
Interdepartmental with the Department of
Botany and Plant Pathology.
Major nematode diseases of economically im-
portant plants, with emphasis on diagnostic
symptoms, nematode biology and principles of
control.

478. Stream Ecology
Spring, 3(3-0) ENT 420, ZOL 389 or
BOT 450 or FW 302 or approval of department.
Students may not receive credit in both FW 478
and ENT 401. Interdepartmental with the de-
partments of Fisheries and Wildlife and Zoology.
Administered by the Department of Fishes and Wildlife.
Biological, chemical, physical, and geological
processes which determine the structure and
function of stream ecosystems.

490. Topics in Entomology
Fall, Winter, Spring, Summer. 1 to 3
credits. May reenroll for a maximum of 12
credits. Majors or approval of department.
Advanced work in medical entomology, acarol-
ogy, advanced forest entomology, soil ar-
thropods, behavior and biological control.

812. Graduate Seminar Topics
Fall, Winter, 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 entomopathogenic species; relation-
ships to population ecology and systematics;
foreign exploration, colonization, manipulation,
and 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 man-
agement. Critical evaluation of current and clas-
sical literature presented by students in both
oral and written reports.

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

881. Biology of the Arthropoda
Winter, 5(3-0) ZOL 481 or approval of
department. Interdepartmental with and ad-
dministered by the Department of Zoology.
Ecology, life cycles, morphology, taxonomy, and
distribution of arthropods other than insects.

899. Master's Thesis Research
Fall, Winter, Spring, Summer. Vari-
able credit. Approval of department.
940. Analytical Techniques for Biological Compounds I
Winter of odd-numbered years. 3(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 of even-numbered years. 4(2-6)
ENT 940.
Analytical techniques used for identification and quantification of biologically active compounds. Emphasis on spectrosocpy and gas-liquid chromatography.

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

FAMILY AND CHILD ECOLOGY FCE

(Family changed effective July 1, 1980. Formerly the departments of Family and Child Sciences, and Family Ecology.)

College of Human Ecology

118. Family Resources (F E 118.) Fall, 3(2-2)
Skill development in identification, description and classification of human and non-human family resources on a historical and cross-cultural basis.

145. The Individual, Marriage and the Family (FCS 145.) Fall, Winter, Spring. 4(3-0)
Students may not receive credit in both FCE 145 and S W 228.

200. Ecological Approach to Family and Health (F E 200.) Fall, Winter. 3(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 (IDC 221, UMS 221.) Fall, Winter, Spring. 4(3-3)
Analysis of human and community needs; roles of professionals and volunteers in providing community and human services. Participation in community agency required.

238. Personal Finance (F E 238.) Fall, Winter, Spring. 3(2-0)
Strategies, techniques and resources useful in the management of personal finance.

255. Family and Individual Development: Life Cycle (FCS 255.) 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: Conception through Early Childhood (FCS 262A.) Fall, Winter, Spring. Summer of odd-numbered years. 3(3-0) Sophomores, PSY 150 or FST 170 or ED 200; FCE 252B concurrently.
Physical, cognitive, social, and emotional aspects of human growth and development from conception through early childhood.

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

263. Children, Youth and the Family (FCS 263.) Fall, Winter, Spring. 3(3-0) Sophomores, SOC 241 or FCE 145 or FCE 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.

331. Management and Decision Making in the Family (HEC 301.) Fall, Winter, Spring. Summer of even-numbered years. 3(3-0) HEC 201, Juniors.
Integrated nature of management in the family setting from an ecosystem perspective. Values and goals as reflected in decision making about family resources.

332. Application of Principles of Home Management (F E 332.) Fall, Winter, Spring. 3(0-5) FCE 331 or concurrently, TE 331 or FCE 340.
Principles of effective home management and their application in a living situation.

337. Energy Utilisation in the Household (F E 437, 437.) Fall. Summer of even-numbered years. 3(3-0) FCE 331 or approval of department.
Human and fossil fuel energy use at the household level. Issues and policies regarding work accomplishment in the home.

340. Instruction in Human Ecology for Non-Formal Settings (F E 340.) Fall, Winter, Spring. 3(2-2) Juniors, HEC 201; 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.

364A. Interacting with Young Children in Child Development Centers (FCS 364A.) Fall, Winter. 2(0-6) FCE 262B each with minimum grade of 2.0; FCE 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 (FCS 364.) Fall, Winter. 3(3-0) FCE 364A or concurrently. FCE 262A, FCE 262B each with a minimum grade of 2.0. Experience in interacting with children ages two to six years, individually and in groups in a child development center.

369A. Learning Activities for Early Childhood Programs (FCS 369A.) Fall, Spring. 3(3-0) Majors: FCE 262A and FCE 262B, FCE 364A and FCE 364B each with a minimum grade of 2.0; FCE 368B concurrently. 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 (FCS 369B.) Fall, Spring. 1(0-3) FCE 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 (FCS/FE 400H.) Fall, Winter, Spring. 1 to 16 credits. May reenroll for a maximum of 24 credits. Seniors; approval of department.

404. Home as a Learning Center (FCS/FE 404.) Fall, Winter. 3(3-0) Seniors or approval of department.
Learning processes and resource use in home settings. Exploration of linkages between the informal educational system and formal and non-formal systems.

405. Work and the Family (FCS/FE 405.) Winter. 3(3-0) Juniors.
Examines the kinds and interrelationship of decisions made by the family and the paid work force (business/labor) as they relate to interaction between the family and the paid work sphere.

436. Consumer Economic Problems (F E 436.) Fall, Winter. 3(3-0) EC 200 or EC 201.
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.

438. Family Financial Management (F E 438.) Fall, Spring. 3(3-0) FCE 238, EC 200.
Application of financial planning and budgeting strategies to families during various stages of the family life cycle. Current income support programs. Implications for the community of the family's financial decisions.