

- 323. Mechanical Systems in Agriculture and Natural Resources**  
Winter. 4(4-0) PHY 237, 257.  
Phenomenological aspects of the laws of mechanics and their influence on the design of mechanical and structural systems encountered in agriculture and natural resources.
- 324. Processing Systems for Biological Products**  
Spring. 4(4-0) MTH 109 or 111, PHY 238.  
Physical processes which influence biological products during production, handling, processing and distribution. Mass and heat balances, fluid flow, steam generation, psychrometrics, heat exchange, refrigeration and dehydration will be discussed.
- 416. Light Structural Systems**  
(A E 416.) Fall. 4(4-0) PHY 237 or approval of department.  
Functional planning of animal structures. Properties of building materials and selecting building components to satisfy requirements of light structures.
- 421. Electrical Energy Utilization**  
(A E 421.) Spring. 4(3-2) PHY 238 or approval of department.  
Efficient utilization of electrical energy; selection, operation and control of electrical equipment. Design of electrical systems.
- 431. Irrigation, Drainage and Erosion Control Systems**  
(A E 431.) Spring. 4(3-2) SLS 210 or approval of department.  
Use of surveying, design, construction and cost estimates of drainage, irrigation and water control systems.
- 443. Machinery and Tractor Systems**  
(A E 443.) Fall, Spring. 4(3-2) A E 243 or approval of department.  
Characteristics of basic agricultural field machinery. Diesel engine, fuel injection and combustion chamber characteristics. Torque and power transmission, tractor stability and implement hitching.

**AGRICULTURE** **AG**

**College of Agriculture and Natural Resources**

- 124A. Introduction to Careers in Vocational and Practical Arts Education—Agriculture**  
Fall. 2(1-2) Interdepartmental with and administered by Education.
- 275. Exploring International Agriculture**  
Spring. 3(3-0) Interdepartmental with Natural Resources.  
Exploration of overseas assignments with international agencies; potential world food actualities and potentialities; special problems of the tropics compared with those in temperate regions.

- 350. Leadership Development for Agriculture and Natural Resources**  
Winter, Spring. 3(3-0) May re-enroll for a maximum of 6 credits. Approval of department. Interdepartmental with Natural Resources.  
Leadership development. Preparation for community leadership. Firsthand look at social, economic, and political problems. Series of seminars, interviews, field trips. Emphasis on awareness, action, and involvement.
- 399. Agriculture Internship**  
Fall, Winter, Spring, Summer. Zero to 10 credits. [10 credits.]† Juniors and approval of department. Interdepartmental with Natural Resources.  
Professionalized experiences in a student's major. Supervision and evaluation by faculty and co-operating agencies.
- 401. Agriculture and Natural Resources Communications**  
Winter, Spring. 3(2-2) JRN 201 or other writing course and approval of department.  
Techniques, strategies and practices in development of agricultural and natural resources information programs. Including writing, public relations, TV and radio production for specialized and general audiences.
- 402. Agriculture and Natural Resources Communications Internship**  
Fall, Winter, Spring, Summer. 1 to 6 credits. May re-enroll for a maximum of 6 credits. 401, approval of college.  
Internship with professionals in communications field with emphasis on student's areas of interest—writing, radio, TV, publications, etc.
- 425. Agriculture and Natural Resources Seminar**  
Spring. 2(2-0) Interdepartmental with Natural Resources.  
Current agricultural, natural resources, and environmental problems and solutions as presented by discussion leaders from various disciplines, arranged by undergraduate students.
- 435. Pest Management I: Pesticide Chemistry and Application Systems for Plant Protection**  
Fall. 5(3-4) CEM 132. Interdepartmental with Natural Resources and the College of Natural Science. Administered by the College of Natural Science.  
A broad overview of pesticide chemistry, efficient usage, environmental fate, legislation and application techniques.
- 436. Pest Management II: Biological Systems for Plant Protection**  
Winter. 3(3-0) ENT 430, BOT 405, HRT 402 or CSC 402. Interdepartmental with Natural Resources and the College of Natural Science. Administered by the College of Natural Science.  
Management of plant pests utilizing host resistance, cultural practices, legislation, and biological systems.
- 437. Pest Management III: Systems Management for Plant Protection**  
Spring. 4(3-2) NSC 435 and 436, FSM 200 or EC 201. Interdepartmental with Natural Resources and the College of Natural Science. Administered by the College of Natural Science.  
Designed to integrate knowledge and improve ability in arriving at pest management decisions of varying complexity involving the fields of agronomy, wildlife, horticulture, entomology, and plant pathology.

†See page A-2, item 3.

- 462. Agricultural and Rural Development in Developing Nations**  
Fall. 3(3-0) PAM 201 or EC 201; PAM 260 recommended. Interdepartmental with Public Affairs Management and Food Systems Economics and Management and administered by Food Systems Economics and Management.  
Traditional agricultural systems and the incentive environment for economic growth in rural areas. Adjustment to technological, institutional and human change. Strategies for rapid agricultural transformation.
- 471. Environmental Topics in Nonmetropolitan Regions**  
Fall. 4(4-0) Nomination of students by own department and approved by participating faculty. Interdepartmental with the College of Natural Science and Natural Resources and administered by Natural Resources.  
Environmental topics in nonmetropolitan regions including issues on: production agriculture, service industries, non-agricultural uses, rural urban balance, discussion topics and case studies.
- 475. International Studies in Agriculture and Natural Resources**  
Spring, Summer. 3 to 9 credits. Approval of the college. Interdepartmental with Natural Resources.  
Study-travel experience emphasizing contemporary problems affecting agriculture in the world, national, and local communities. Field trips, case studies, interviews with leading experts, government officials, community leaders. Supervised individual study.
- IDC. The Impact of Animal Resource Management Upon the World's Developing Nations**  
For course description, see Interdisciplinary Courses.

**AMERICAN STUDIES** **AMS**

**College of Arts and Letters**

- 301. Issues in American Civilization**  
Fall, Winter, Spring. 3(3-0) May re-enroll for a maximum of 9 credits. Not applicable to major requirements.  
Selected issues in American life past and present, with materials drawn from such disciplines as history, social sciences, philosophy, literature and the arts. Topics vary.
- 410. Perspectives in American Studies**  
Fall. 3 credits. Juniors in American Studies or approval of American Studies Committee.  
Methods and significant works, for majors in the American Studies program. Offered by members of the relevant departments.
- 411. Problems in American Civilization**  
Winter, Spring. 3 credits. Majors must re-enroll for a maximum of 6 credits. 410, Juniors in American Studies or approval of American Studies Committee.  
Seminar approach to selected problems in American life employing the objectives and approaches of interdisciplinary studies. Offered by members of relevant departments, for majors in the American Studies program.