

**831. Water, Technology and International Development**

Spring of even-numbered years. 3(3-0)

P: AE 481 or ANR 489 or ATM 431 or CSS 210. R: Open only to graduate students in College of Agriculture and Natural Resources or College of Engineering.

Water resources planning and development for irrigated agriculture. Technological, agronomic, environmental, social and political constraints. Case studies.

**836. Microclimate and Its Measurement**

Spring. 4(3-3) Interdepartmental with Geography.

The climate near the Earth's surface. Energy balance, thermal radiation exchange, heat fluxes, temperature sensors, wind speed and direction, humidity and evapotranspiration and their measurement.

**840. Analysis of Physical Systems**

Fall. 3(3-0)

P: ATM 440 or BCM 311 or MGT 306. R: Open only to graduate students in College of Agriculture and Natural Resources.

Identification and definition of systems problems in agricultural and construction industries. Model formulation and estimation.

**845. Process Network Theory Applied to Agroecosystems**

Spring of odd-numbered years. 4(4-0)

R: Open only to graduate students in College of Agriculture and Natural Resources or College of Engineering. Numerical framework for the technical, economic and environmental analysis of agricultural and biological systems.

**890. Special Problems**

Fall, Spring, Summer. 1 to 4 credits. A student

may earn a maximum of 4 credits in all enrollments for this course.

R: Approval of department.

Individual study of selected topics.

**891. Advanced Topics in Agricultural Technology and Systems Management**

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 College of Agriculture and Natural Resources or College of Engineering. New developments in agricultural technology and systems management.

**899. Master's Thesis Research**

Fall, Spring, Summer. 1 to 10 credits. A student

may earn a maximum of 99 credits in all enrollments for this course.

R: Open only to graduate students in Agricultural Technology and Systems Management.

**999. Doctoral Dissertation Research**

Fall, Spring, Summer. 1 to 24 credits. A student

may earn a maximum of 99 credits in all enrollments for this course.

R: Open only to Ph.D. students in Agricultural Technology and Systems Management.

**AGRICULTURE AND NATURAL RESOURCES ANR**

**College of Agriculture and Natural Resources**

**350. Leadership Development for Agriculture and Natural Resources**

Spring. 2(2-0)

R: Not open to freshmen and sophomores. Approval of college; application required.

Preparation for community leadership. Field observation of social, economic and political problems. Emphasis on awareness, action and involvement. Seminars and interviews.

**392. Agriculture and Natural Resources Seminar**

Spring. 1(2-0)

R: Not open to freshmen and sophomores.

Current agricultural, natural resources and environmental problems and solutions. Discussion leaders from various disciplines.

**475. International Studies in Agriculture and Natural Resources**

Fall, Spring, Summer. Given at various off campus sites. 2 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course.

R: Approval of college; application required.

Study-travel experience emphasizing contemporary problems affecting agriculture and natural resources in the world, national and local communities. Case studies and interviews with officials, community leaders and leading professionals.

**481. Agricultural Research Systems in Developing Countries**

Summer. 2(2-0) Interdepartmental with Agricultural Economics, Animal Science, and Crop and Soil Sciences.

R: Open only to seniors and graduate students in the College of Agriculture and Natural Resources.

Planning, organizing and managing agricultural research systems. Problems and alternative reforms to improve research productivity. Adapting new agricultural technology in developing countries.

**489. Integrated Approaches to Agriculture and Natural Resources Problems**

Fall, Spring. 3(2-2)

P: MTH 110 or MTH 116; EC 201 or EC 202. R: Open only to seniors in the College of Agriculture and Natural Resources.

Holistic solutions to resource management and allocation: an integrated, multidisciplinary team approach to case study problems.

**491. Selected Topics**

Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course.

R: Not open to freshmen and sophomores.

Special topics in agriculture and natural resources.

**493. Professional Internship in Agriculture and Natural Resources**

Fall, Spring, Summer. 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course.

R: Open only to juniors and seniors in the College of Agriculture and Natural Resources. Approval of department; application required.

Supervised professional experiences in agencies and businesses related to a student's major field of study.

**AMERICAN STUDIES AMS**

**College of Arts and Letters**

**332. Technology and Culture**

Fall. 4(4-0) Interdepartmental with Lyman Briggs School. Administered by Lyman Briggs School. P: LBS 133. R: Not open to freshmen and sophomores. History of technology with special emphasis on the interaction of technical innovation and other elements of culture.

**335. The Natural Environment: Perceptions and Practices**

Spring. 4(4-0) Interdepartmental with Lyman Briggs School. Administered by Lyman Briggs School. P: LBS 133 or another Tier I writing course. R: Not open to freshmen. Open only to students in American Studies and in Lyman Briggs School.

American attitudes toward the natural environment and related public and private institutions.

**491. Perspectives in American Studies**

Fall. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course.

R: Not open to freshmen and sophomores.

Methods and significant works in American Studies. Topics vary.

**492. Seminar in American Studies**

Spring. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course.

R: Open only to majors in Arts and Letters, James Madison College, and Lyman Briggs School.

Selected topics in American life emphasizing interdisciplinary approaches. Topics vary.

**881. American Studies Theory, Methods, and Bibliography**

Fall. 3(3-0)

Methods and bibliographical sources of American Studies research. Interdisciplinary approaches to studying American culture.

**890. Independent Study**

Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 12 credits in all enrollments for this course.

R: Approval of college.

Special projects, directed reading, and research arranged by an individual graduate student and a faculty member in areas supplementing regular course offerings.

**891. Special Topics in American Studies**

Fall, Spring, Summer. 4(4-0) A student may earn a maximum of 12 credits in all enrollments for this course.

R: Approval of college.

Special topics supplementing regular course offerings proposed by faculty for graduate students on a group study basis.

**899. Master's Thesis Research**

Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course.

R: Approval of college.

Directed research leading to a master's thesis in partial fulfillment of Plan A master's degree requirements.