

252 Gasoline and Diesel Engine Technology
 Fall. 3(2-2) SA: AE 052
 Operating principles of gasoline and diesel engines and their systems. Operation and maintenance requirements.

254 Fluid Power Technology
 Spring. 2(2-2) R: Open only to students in Agriculture and Natural Resources. SA: AE 054

Fluid power in mobile equipment. Operation and characteristics of system components and circuits. Component disassembly. System testing and diagnosis. Offered first ten weeks of semester.

261 Principles of Animal Environments
 Spring. 2(1-2) Interdepartmental with Animal Science. SA: AE 061, ATM 326

Animal environment requirements. Heat and moisture production rates. Psychrometrics of air and building materials. Heat loss and ventilation systems. Offered first ten weeks of semester.

431 Irrigation, Drainage and Erosion Control Systems
 Fall. 3(2-2) RB: (MTH 116 and CSS 210) R: Not open to freshmen or sophomores.

Principles of soil and water conservation engineering including: land and soil surveying, basic hydraulics, hydrology, soil moisture, and soil and water conservation practices with applications to irrigation, drainage and erosion control systems.

490 Independent Study
 Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course. RB: (ATM 240 or BCM 311) R: Open only to majors in Agricultural Technology and Systems Management. Approval of department; application required.

Supervised individual student research and study in agricultural technology and systems management.

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.

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 master's students in Agricultural Technology and Systems Management.

Masters thesis research.

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.

Doctoral dissertation research.

AGRICULTURE AND NATURAL RESOURCES

ANR

College of Agriculture and Natural Resources

101 Preview of Science
 Fall. 1 credit. Interdepartmental with Natural Science; Engineering; Social Science. Administered by College of Natural Science. R: Approval of college.

Overview of natural sciences. Transitional problems. Communications and computer skills. Problem-solving skills. Diversity and ethics problems in science. Science and society.

101A Academic and Career Decision Making
 Fall, Spring. 2(2-0)
 Exploration of the career possibilities in agriculture, natural resources and related areas.

110 New Student Seminar: Issues and Ideas in Agriculture and Natural Resources
 Fall. 1(0-2) R: Open only to freshmen or sophomores or juniors in the College of Agriculture and Natural Resources
 Issues in agriculture and natural resources. Personal and professional development through discussion and interactive experiences.

192 Environmental Issues Seminar
 Fall, Spring. 1 credit. A student may earn a maximum of 4 credits in all enrollments for this course. Interdepartmental with Natural Science; Engineering; Social Science; Communication Arts and Sciences. Administered by College of Natural Science. R: Open only to students in the College of Agriculture and Natural Resources or College of Engineering or College of Natural Science or College of Communication Arts and Sciences or College of Social Science. Approval of college.

Environmental issues and problems explored from a variety of perspectives, including legal, scientific, historical, political, socio-economic, and technical points of view.

202 Michigan's Agricultural and Natural Resources Heritage
 Fall. 2(2-0) Interdepartmental with ANR Education and Communication Systems. P: Completion of Tier I writing requirement.

Michigan's historical agricultural and natural resources. Orientation to sources for research and learning. Self-directed study integrating agricultural and natural resources heritage to family, community and careers.

210 Pathways in Connected Learning
 Fall, Spring. 3(2-2) R: Approval of college.
 Active, self-directed, and reflective learning associated with agriculture and natural resource issues, self and social development, and ethical choice making. Development of a learning plan and design of a learning portfolio. Individual and group presentations.

292 Applications in Environmental Studies
 Fall. 2(1-2) Interdepartmental with Natural Science; Engineering; Communication Arts and Sciences; Social Science. Administered by College of Natural Science. P: (NSC 192) R: Open only to students in the Specialization in Environmental Studies.

Community engagement project. Projects vary depending on student's major and area of environmental interest.

310 Connected Learning Seminar I
 Fall, Spring, Summer. 3(3-0) P: (ANR 210)
 Learner-directed critical analysis of contemporary issues in agriculture and natural resources. Communication of outcomes to professional communities. Collaborative learning integrated with individual experiences.

311 Connected Learning Seminar II
 Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 3 credits in all enrollments for this course. P: (ANR 310)
 Advanced analysis and presentation of contemporary issues in agriculture and natural resources.

392 Agriculture and Natural Resources Seminar
 Spring. 1(2-0) R: Not open to freshmen or sophomores.
 Current agricultural, natural resources and environmental problems and solutions. Discussion leaders from various disciplines.

410 Connected Learning Transitions
 Fall, Spring. 3(3-0) P: (ANR 310)
 Synthesis and analysis of structured experiences in agriculture and natural resources. Personal and interpersonal development, personal and professional integrity, communication competence, and critical and reflective thinking.

475 International Studies in Agriculture and Natural Resources
 Fall, Spring, Summer. 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. Contemporary problems affecting agriculture and natural resources in world, national and local communities. Case studies and interviews with officials, community leaders and leading professionals.

490 Independent Study in Agriculture and Natural Resources
 Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open only to sophomores or juniors or seniors or graduate students in the College of Agriculture and Natural Resources.

Supervised individual study in topics related to agriculture and natural resources.

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 or 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 or seniors in the College of Agriculture and Natural Resources. Approval of department; application required. A student may earn a maximum of 6 credits in all enrollments for any or all of these courses: ABM 493, AEE 493, ANR 493, ANS 493, CSS 493, EEP 493, FIM 493, FW 493, HRT 493, PKG 493, PLP 493, PRR 493, and RD 493.

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

810 International Food Laws and Regulations
Fall, Spring, Summer. 3(3-0) RB: Food science, law, food safety or related disciplines.

Survey of food laws of various countries and regions.

811 U.S. Food Laws and Regulations
Fall, Spring, Summer. 3(3-0) RB: (ANR 810) Food science, law or food safety. Not open to students with credit in FSC 421.

Food laws and regulations of the United States.

828 Food Safety Seminar Series

Fall, Spring. 1(1-0) Interdepartmental with Veterinary Medicine; Natural Science; Social Science. Administered by College of Veterinary Medicine. RB: Enrollment in graduate program in related discipline

Selected current topics covering the broad areas of food safety as they relate to production, processing, transport, microbiology, toxicology, and social and human dimensions.

829 Problems in Food Safety

Fall. 1(1-0) Interdepartmental with Veterinary Medicine; Natural Science; Social Science. Administered by College of Veterinary Medicine. RB: Enrollment in graduate program in related discipline

In-depth discussion of selected problems in food safety.

265 Transcultural Perspectives

Spring. 3(3-0) P: Completion of Tier I writing requirement.

Comparative study of contemporary and historical cultural discourses of and about the Americas and their place in the global commons. Implications of cultural identities, especially as shaped by age, race, ethnicity, gender and sexuality. Borders and tourism and the import and export of technologies, media and commodities.

280 Major Themes in American Studies

Fall. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course. P: Completion of Tier I writing requirement.

Major themes pertaining to the history, culture and study of the United States. Historiography and methods of the interdisciplinary study of the United States in relation to other cultures and countries.

290 Independent Study

Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: (AMS 265 or AMS 210) and (AMS 280 or 250) and (HST 202 or HST 203) R: Approval of department.

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

310 Topics in American Studies

Spring. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course. P: (AMS 210 or AMS 265) and (AMS 280 or AMS 250) Completion of Tier I writing requirement.

Significant theoretical, methodological and bibliographical issues in American studies. Techniques for analyzing cultural texts such as literature, film, paintings, photographs, music and architecture.

332 Technology and Culture

Fall. 4(4-0) Interdepartmental with Lyman Briggs School. Administered by Lyman Briggs School. P: Completion of Tier I writing requirement. R: Open only to juniors or seniors in the American Studies major in Lyman Briggs School.

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: Completion of Tier I writing requirement. R: Open only to sophomores or juniors or seniors in the American Studies major or in Lyman Briggs School.

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

453 American Art, 1875-1940

Fall of even years. 3(3-0) Interdepartmental with History of Art. Administered by Department of Art and Art History. P: (HA 120 or HA 121 or HA 250) and completion of Tier I writing requirement. SA: HA 458, HA 358

Artistic production in North America from 1875 to 1940, in its cultural context.

480 Seminar in American Material Folk Culture

Spring of odd years. 3(3-0) RB: Coursework in arts, humanities and cultural studies.

Understanding American material folk culture and folklife as sources for analysis and appreciation. Methodological approaches and fieldwork techniques.

492 Seminar in American Studies

Spring. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course. RB: (AMS 265 or AMS 210) and (AMS 280 or AMS 250) and (AMS 310 and ENG 481 and HST 480 and HST 202 and HST 203) R: Open only to American Studies majors.

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

855 Seminar in American Art

Spring of odd years. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course. Interdepartmental with History of Art. Administered by Department of Art and Art History. R: Approval of department.

Intensive investigation of a topic in the history of American art.

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. 3(3-0) A student may earn a maximum of 12 credits in all enrollments for this course.

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.

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: Approval of college.

Doctoral dissertation research.

AMERICAN STUDIES

AMS

College of Arts and Letters

210 American Popular Culture

Fall. 4(4-0) P: Completion of Tier I writing requirement.

Significant social issues in American popular culture. American studies theory and methods employed to analyze thematic and historical cultural representations in popular culture.

250 American Art

Spring. 3(3-0) Interdepartmental with History of Art; American Studies. Administered by Department of Art and Art History.

Major developments and themes in non-indigenous American art (painting, sculpture, architecture, material culture) from its colonial origins through the 20th century.