

**Descriptions — Agricultural Engineering
of
Courses**

477. Thermal Process Engineering
Winter. 3(2-2) F E 475.

Thermal processing of biological materials. Thermal death kinetics, pasteurization and sterilization. Thermobacteriology. Food reaction kinetics. Food reactor design. Thermal process evaluation. Aseptic processing.

487. Food Engineering Design
Winter. 3(3-0) F E 477 or concurrently; A E 486.

Design and scale-up of food processes and equipment. Process and product specifications. Engineering feasibility studies. Prediction of process performance, quality, efficiency, and manufacturing cost.

**AGRICULTURAL
TECHNOLOGY AND
SYSTEMS MANAGEMENT**

See Agricultural Engineering.

**AGRICULTURE AND NATURAL
RESOURCES ANR**

**College of Agriculture and Natural
Resources**

220. Plants and Their Environment
Winter. 3(3-0) Interdepartmental with and administered by the Department of Forestry.

Relationships between plants and fundamental climatic, edaphic, and biotic factors; structure and function of different ecosystems in relation to environmental factors.

**275. Exploring International
Agriculture**
Spring. 3(3-0)

Exploration of overseas assignments with international agencies; potential world food actualities and potentialities; special problems of the tropics compared with those in temperate regions.

280. Selected Topics
Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 6 credits if different topics are taken. Approval of department.

**350. Leadership Development for
Agriculture and Natural Resources**
Winter, Spring: 3(3-0) Given at W. K. Kellogg Biological Station Fall, Spring: 3 credits. May reenroll for a maximum of 6 credits. Approval of department.

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. Field trips required.

**399. Professional Internships in
Agriculture and Natural Resources**
Fall, Winter, Spring, Summer. 6 to 12 credits. May reenroll for a maximum of 12 credits. Juniors and approval of department.

Professionalized experiences in a student's major. Supervision and evaluation by faculty and cooperating agencies.

410. Environmental Toxicology
Winter. 4(4-0) B S 212, BCH 401. Interdepartmental with and administered by the College of Natural Science.

Fate and effects of toxic chemicals in soil, plants, wildlife, and aquatic systems. Interactions between chemicals and the environment which influence their fate and ecological importance. Approved through Fall 1989.

**425. Agriculture and Natural Resources
Seminar**
Spring. 2(2-0)

Current agricultural, natural resources, and environmental problems and solutions as presented by discussion leaders from various disciplines, arranged by undergraduate students.

**445. Pest Management: Pesticide
Chemistry and Application
Systems for Plant Protection**
Fall. 5(3-4) CEM 143, ENT 425, HRT 402 or CSS 402, BOT 405 or concurrently or approval of instructor. Interdepartmental with and administered by the College of Natural Science.

A broad overview of pesticide chemistry, efficient usage, environmental fate, legislation and application techniques.

**446. Pest Management: Biological
Systems for Plant Protection**
Fall. 3(3-0) ENT 425, HRT 402 or CSS 402, BOT 405 or concurrently or approval of instructor. Interdepartmental with and administered by the College of Natural Science.

Management of plant pests utilizing host resistance, cultural practices, legislation, and biological systems.

**447. Pest Management: Systems
Management for Plant Protection**
(ANR 444.) Winter. 4(3-2) NSC 445, NSC 446 or approval of instructor. Interdepartmental with and 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.

450. Natural Resource Administration
Spring. 4(4-0) Seniors. Interdepartmental with the departments of Fisheries and Wildlife, Forestry, Park and Recreation Resources and Resource Development. Administered by the Department of Forestry.

Concepts and methods of administering wildland properties. The legal, economic and social environment. Benefit-cost analysis of management changes. Unit organization, personnel management and accounting. Presents a systems view of administration.

455. Natural Resource Economics
Fall. 4(3-2) EC 200 or EC 201. Interdepartmental with the departments of Fisheries and Wildlife, Forestry, Park and Recreation Resources and Resource Development. Administered by the Department of Forestry.

Basic economic and institutional principles and techniques that govern the production and consumption of renewable natural resources. Natural resource evaluation, project analysis, and distributional considerations.

**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. 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.

**475. International Studies in
Agriculture and Natural Resources**
Spring, Summer. 3 to 9 credits. Approval of college.

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.

480. Selected Topics
Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 9 credits if different topics are taken. Approval of department. Juniors.

Exposition of special topics in agriculture and natural resources.

**491. Natural Resources and Modern
Society**
Spring. 3(3-0) Juniors. Interdepartmental with the departments of Forestry, and Resource Development. Administered by the Department of Forestry.

A survey of the social and economic significance of natural resources in modern industrial and urban society. Current problems of natural resources management and use are examined in terms of the society in which they exist.

AMERICAN STUDIES AMS
College of Arts and Letters

301. Issues in American Civilization
Fall. 3(3-0) May reenroll for a maximum of 9 credits. Sophomores.

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.

**377. The Natural Environment:
Perceptions and Practices**
Fall. 4(4-0) Sophomores. Interdepartmental with Lyman Briggs School. Administered by Lyman Briggs School.

Factors which have influenced U.S. environmental attitudes as reflected in art and literature. Ways in which changing attitudes have led to changes in legislation and practice.

**378. Popular Culture and Technical
Change**
Winter. 4(4-0) Juniors or approval of department. Interdepartmental with and administered by Lyman Briggs School.

Interrelationships among elements of mass culture and technical change. Introduction to relevant research methods.

410. Perspectives in American Studies
Winter. 3(3-0) Juniors, approval of American Studies adviser.

Methods and significant works, for majors in the American Studies program. Offered by members of the relevant departments.

411. Problems in American Civilization
Spring. 3(3-0) May reenroll for a maximum of 6 credits if different topic is taken. Juniors, approval of American Studies adviser.
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.

AMERICAN THOUGHT AND LANGUAGE ATL

College of Arts and Letters

To satisfy the University General Education requirement, a student must take one course in each of the following groups. No courses may be taken for elective credit.

1. 1144, 121, 131, 141, 151, 161, 171, 181, 191H
2. 1154, 122, 132, 142, 152, 162, 172, 182, 192H
3. 1164, 123, 133, 143, 153, 163, 173, 183, 193H

0142. Writing Laboratory I

Fall, Winter, Spring. 0(0-2) [2(2-0) See page A-1 item 3.] ATL 0991 or admission by placement test; ATL 1144 concurrently.

An individualized program to develop composition skills by aiding students to discover how language functions in communication and by helping them to accept responsibility for learning to write correctly.

0152. Writing Laboratory II

Fall, Winter, Spring. 0(0-2) [2(2-0) See page A-1 item 3.] ATL 0142, ATL 1144 or approval of department; ATL 1154 concurrently.

Continuation of ATL 0142.

0162. Writing Laboratory III

Fall, Winter, Spring. 0(0-2) [2(2-0) See page A-1 item 3.] ATL 0152, ATL 1154 or approval of department; ATL 1164 concurrently.

Continuation of ATL 0152.

0991. Preparatory Writing Skills

Fall, Winter, Spring, Summer. 0(3-0) [3(3-0) See page A-1 item 3.] Admission by placement test.

Instruction and practice in writing. Emphasis on mastery of fundamental skills needed for a variety of writing assignments.

104. Writing for Science Majors

Fall. 3(3-0) Satisfactory grade in English proficiency exam; College of Natural Science majors. Interdepartmental with and administered by the Department of English.

Writing workshop for science students that develops and refines composition ability.

105. The Scientist as Writer

Winter. 3(3-0) ENG 104. Interdepartmental with and administered by the Department of English.

Study of various types of writing by scientists—fiction, poetry, and autobiography as well as professional papers and books. Students will write frequently about the readings.

106. Introductory Scientific Writing

Spring. 3(3-0) ENG 105. Interdepartmental with and administered by the Department of English.

Writing of popular essays, scientific papers and reports, and other papers related to science.

1144. Developmental Writing I

Fall, Winter, Spring. 3(3-0) ATL 0991 or admission by placement test; ATL 0142 concurrently.

Students engage in expressive writing to respond to reading in clear and direct prose. Students write personal essays and read autobiographical materials, making use of college-level readings.

1154. Developmental Writing II

Fall, Winter, Spring. 3(3-0) ATL 0142, ATL 1144 or approval of department; ATL 0152 concurrently.

Interpretive, analytical, and expository writing in response to college-level readings.

1164. Developmental Writing III

Fall, Winter, Spring. 3(3-0) ATL 0152, ATL 1154 or approval of department; ATL 0162 concurrently.

Students write analytical/critical/persuasive papers and undertake a research project. Reading of college-level materials.

117. Use of Libraries

Fall, Winter. 1(1-0)

The use of libraries, with emphasis on MSU Library. Course will stress knowledge and use of bibliographic and reference resources.

121. Writing: American Expression

Fall, Winter, Spring, Summer. 3(3-0) Satisfactory performance on the placement test.

Writing course to improve composition and critical reading abilities. Writings based on American literary and historical materials from Puritan times through the Enlightenment. Emphasis on unity and structure of essays.

122. Writing: American Expression

Fall, Winter, Spring, Summer. 3(3-0) Three credits in the first term of any ATL sequence numbered 121 or higher or approval of department.

Writing course to improve composition and critical reading abilities. Writings based on American literary and historical materials of the nineteenth century. Emphasis on style and development of essays.

123. Writing: American Expression

Fall, Winter, Spring, Summer. 3(3-0) Three credits in the second term of any ATL sequence numbered 121 or higher or approval of department.

Writing course to improve composition and research abilities. Writings based on American literary and historical materials of the twentieth century. Research project required.

131. Writing: Major Currents in American Experience

Fall. 3(3-0) Satisfactory performance on the placement test.

Writing course to improve composition and critical reading abilities. Writings based on materials concerning the individual's search for meaning in America. Emphasis on unity and structure of essays.

132. Writing: Major Currents in American Experience

Winter. 3(3-0) Three credits in the first term of any ATL sequence numbered 121 or higher or approval of department.

Writing course to improve composition and critical reading abilities. Writings based on materials concerning American dreams and realities. Emphasis on style and development of essays.

133. Writing: Major Currents in American Experience

Spring. 3(3-0) Three credits in the second term of any ATL sequence numbered 121 or higher or approval of department.

Writing course to improve composition and research abilities. Writings based on materials concerning cultural pluralism in America. Research project required.

141. Writing: American Humanities

Fall. 3(3-0) Satisfactory performance on the placement test.

Writing course to improve composition and critical reading abilities. Writings based on American literature, painting, music, and architecture before 1800. Emphasis upon unity and structure of essays.

142. Writing: American Humanities

Winter. 3(3-0) Three credits in the first term of any ATL sequence numbered 121 or higher or approval of department.

Writing course to improve composition and critical reading abilities. Writings based on American literature, painting, music, architecture and sculpture of the nineteenth century. Emphasis upon unity and development of essays.

143. Writing: American Humanities

Spring. 3(3-0) Three credits in the second term of any ATL sequence numbered 121 or higher or approval of department.

Writing course to improve composition and research abilities. Writings based on innovation in twentieth century American literature and the visual, plastic, musical, and dramatic arts. Research project required.

151. Writing: American Minorities

Fall. 3(3-0) Satisfactory performance on the placement test.

Writing course to improve composition and critical reading abilities. Writings based on minority literature from mythology to experiences of immigrants and ex-slaves. Emphasis upon unity and structure of essays.

152. Writing: American Minorities

Winter. 3(3-0) Three credits in the first term of any ATL sequence numbered 121 or higher or approval of department.

Writing course to improve composition and critical reading abilities. Writings based on minority literature from Reconstruction, Indian wars and end of European immigration. Emphasis upon style and development of essays.

153. Writing: American Minorities

Spring. 3(3-0) Three credits in the second term of any ATL sequence numbered 121 or higher or approval of department.

Writing course to improve composition and research abilities. Writings based on minority literature. Modern fiction and cultural pluralism emphasized; a research project is required.

161. Writing: American Radical Thought

Fall. 3(3-0) Satisfactory performance on the placement test.

Writing course to improve composition and critical reading abilities. Writings based on dissenting thought from the colonial to the early national period. Emphasis upon unity and structure of essays.