

**Descriptions — Agriculture and Natural Resources
of
Courses**

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.

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
Winter. 4(4-0) Seniors; not open to forestry majors. 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(4-0) Approval of department. 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 political principles and techniques that govern the production and consumption of forest land products, including basic forest valuation procedures.

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.

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.

162. Writing: American Radical Thought

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 the literature of dissent in American society from 1850 to 1946. Emphasis on style and development of essays.

163. Writing: American Radical Thought

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 the literature and history of the New Left and contemporary dissent in America. Research project required.

171. Writing: America on Film

Fall, 3(3-2) Satisfactory performance on the placement test.

Writing course to improve composition abilities. Writings and readings based on American films and film adaptations of American literature. Emphasis upon unity and structure of essays.

172. Writing: America on Film

Winter, 3(3-2) Three credits in the first term of any ATL sequence numbered 121 or higher or approval of department.

Writing course to improve composition abilities. Writings and readings based on American film genres (e.g., Western, Gangster). Emphasis on style and development of essays.

173. Writing: America on Film

Spring, 3(3-2) 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 and readings based on analysis of major social issues as reflected in American film: e.g., war, women, minorities. Research project required.

181. Writing: Women in America

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

Writing course to improve composition and critical reading abilities. Writings based on critical works introducing contemporary and historic American feminist issues. Emphasis on unity and structure of essays.

182. Writing: Women in America

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 women from pre-Colonial times through First Wave Feminism. Emphasis on style and development of essays.

183. Writing: Women in America

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 critical reading abilities. Writings based on women in American life and literature from 1920 to the present. Research project required.

191H. Honors Writing: The American Experience

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

Writing course to improve composition and critical reading abilities. Writings based on analysis of selected material from Colonial to early nineteenth century topics.

Descriptions — American Thought and Language of Courses

192II. Honors Writing: The American Experience
Winter. 3(3-0) Satisfactory grade in the first term of any ATL sequence numbered ATL 121 or above.
 Writing course to improve composition and critical reading abilities. Writings based on analysis of selections from the late nineteenth and early twentieth centuries.

193II. Honors Writing: The American Experience
Spring. 3(3-0) Satisfactory grade in the second term of any ATL sequence numbered ATL 121 or above.
 Writing course to improve composition and research abilities. Writings based on analysis of twentieth century materials reflecting American issues.

205. Reading for University-Level Understanding
Fall, Winter, Spring. 2(0-4) May reenroll for a maximum of 4 credits.
 Individualized instruction in techniques for improving vocabulary, comprehension, rate, study skills and test taking skills in order to achieve a better understanding of university-level materials.

300. Supervised Individual Study
Fall, Winter, Spring, Summer. 2 to 4 credits. May reenroll for a maximum of 12 credits. 9 credits in a composition course; approval of department.
 Selected students requesting individual study of interdisciplinary problems. Variable elective credit will be determined when the student secures instructor, adviser, and department approval.

ANATOMY ANT

**College of Human Medicine
 College of Osteopathic Medicine
 College of Veterinary Medicine**

216. Applied Human Anatomy
Fall. 5(4-3) HPE major or coaching minor, approval of department. Interdepartmental with the Department of Health and Physical Education.
 Structural anatomy of the various systems of the human body. Concepts of kinesiological applications.

316. General Anatomy
Fall, Spring. 5(5-0) B S 211 or B S 212 or approval of department.
 Designed to impart the basic concepts of the broad field of anatomy. Special requirements of the various disciplines will be met in their respective laboratories.

420. Microscopic Anatomy
Winter. 5(2-8) Medical Technology students or approval of department.
 Microscopic study of the structure of cells, tissues and organs.

480. Special Problems
Fall, Winter, Spring, Summer. 1 to 5 credits. May reenroll for a maximum of 15 credits. Approval of department.
 Individual study or project under the direction of a faculty member in biomedical research, gross anatomy, histology, neurology, or embryology.

505A. Anatomy in Physical Diagnosis
Fall. 1 to 3 credits. H M 505 concurrently.
 Exercises in which students study systemic anatomy in a physical diagnosis context. Preparatory self-instruction precedes exercises.

510. Veterinary Gross Anatomy
Fall. 6(3-9) First-term Veterinary Medicine students.
 Gross anatomy of a representative animal, the dog, is studied. Lecture, dissection of embalmed specimen, study of prosections, slides, models and living animals.

511. Veterinary Histology
Fall. 5(3-6) First-term Veterinary Medicine students.
 A general histology course for veterinary students which includes a survey of the tissue of the animal body.

512. Veterinary Neuro Anatomy
Winter. 2(2-0) Second-term Veterinary Medicine students.
 Gross anatomy of the central nervous system in animals emphasizing functional and dysfunctional aspects of pathways and nuclei in dogs as a foundation for clinical neurology.

513. Veterinary Microscopic Anatomy
Winter. 4(2-4) Second-term Veterinary Medicine students.
 Microscopic anatomy of the digestive, urinary, respiratory, male and female reproductive systems, integumentary system, central nervous system and special sense organs of domesticated animals.

514. Veterinary Comparative Anatomy (523.)
Winter. 5(4-4) Second-term Veterinary Medicine students.
 Lecture, dissection of embalmed specimens and the study of prosections, models and live animals related to the anatomy of the domestic animals.

540. Gross Biomedical Structure
Winter. 1 to 15 credits. May reenroll for a maximum of 15 credits. Admission to a college of medicine; graduate students with approval of department.
 Regional gross anatomy of the back, thorax, abdomen, pelvis and perineum.

541. Gross Biomedical Structure
Spring. 1 to 15 credits. Admission to a college of medicine; graduate students with approval of department.
 Regional gross anatomy of the head and neck.

543. Human Histology
Fall. 4(2-4) Human Medicine students; approval of department for graduate students.
 The structure and function of human cells, tissues, and organs.

544. Human Ontogenesis
Fall. 3(3-0) Admission to a college of medicine; graduate students with approval of department.
 Formal lectures, class conferences and student reports on the normal and abnormal organogenesis of the human embryo and fetus with emphasis on clinical correlations.

545. Neuroanatomy
Winter. 3(4-0) Admission to medical school or approval of Neuroscience Committee.
 Introduction to gross and microscopic anatomy of the human nervous system, to related basic neurophysiologic concepts and to a problem-solving approach to the diagnosis of nervous system disease.

560. Medical Histology
Fall. 4(3-4) Admission to a college of medicine or approval of department.
 Structural and functional characteristics of basic cells, tissues and organ systems. Emphasis on core concepts and visual discrimination.

563. Osteopathic Medical Neuroanatomy
Spring. 4(3-4) Admission to a college of medicine; graduate students with approval of department.
 Medically oriented problem-solving neuroanatomy with laboratory. Structure of the human nervous system is correlated with normal function, clinical testing and classical lesions encountered in medical practice.

565. Introduction to Human Gross Anatomy
Fall. 6(4-6) Admission to a college of medicine or approval of department.
 Core concepts in regional, systemic and topographical human gross anatomy: Prosection, discussion and lecture methods using audiovisual aids and frequent review.

580. Special Problems
Fall, Winter, Spring, Summer. 1 to 5 credits. May reenroll for a maximum of 15 credits. Admission to professional program in the College of Human Medicine, College of Osteopathic Medicine or the College of Veterinary Medicine, and approval of department.
 Biomedical research, gross anatomy, histology, neurology, immunology or embryology.

813. Problems in Anatomy
Fall, Winter, Spring, Summer. 1 to 5 credits. May reenroll for a maximum of 15 credits. Basic disciplines in various areas and approval of department.
 Various anatomical fields such as gross anatomy, histology, hematology, tissue culture, cytology, neurology and embryology will be studied.

815. Anatomy of the Nervous System
Fall. 5(3-5) Approval of department.
 Developmental, gross and microscopic anatomy of the nervous system. Organizational and functional aspects of the peripheral and central nervous system are stressed. Gross demonstrations include brain and dog dissections.

820. Advanced Neuroanatomy: Structure and Function of Cells of CNS
Spring. 3 credits. ANT 815 and approval of instructor.
 Correlated anatomy and physiology of CNS cells and their processes including current concepts and principles of cytology, ultrastructure, development and plasticity, axonal transport mechanisms, electrical properties and functional connections.

839. Systems Neuroscience
Winter. 5(4-2) PSL 801 or approval of course coordinator. Interdepartmental with the departments of Pharmacology and Toxicology, and Physiology. Administered by the Department of Physiology.
 Physiology, anatomy and pharmacology of sensory, somatomotor and autonomic neural systems.