NATURAL SCIENCE

College of Natural Science

115. The Nature and Continuity of Life (N)
Fall, Winter, Spring, 4(3-2)
A—The development and testing of scientific concepts as examples of our attempts to understand the world. Selected topics from the life sciences illustrate the nature of scientific investigation.

B—Theories of the origin, development and modification of explanation systems. The nature of cells and sexual reproduction as background for Mendelian gene theory and its modern modifications. Scientific impact on biology and human problems.

C—Growth of theoretical concepts about human nature and society.

122. Human Biocultural Evolution (N)
Fall, Winter, Spring, 4(3-2)
Current understanding of human beings and their belief as products of biological and cultural evolution. Implications for the future of humanity.

125. Time and Change in Nature (N)
Fall, Winter, Spring, 4(3-2)
A—Our attempts to explain the present in terms of past events are explored through selected topics from the physical, earth and life sciences. Stresses the role of controversy in science and the nature of scientific evidence.
B—Heredity, evolution and diversity of life are examined from the viewpoint of the biological and cultural development of the human species. Evolutionary relationships between humans and their environment.
C—The origin and evolution of earth and living things are studied as a vital and related problems. Emphasis on problem-solving in science and impact of evolutionary concepts on human societies.

129. Biotechnology and Human Values (N)
Winter, Spring, 4(4-0)
Consideration of social and ethical issues which arise from our increasing control of the human body through biotechnology.

135. Changing Concepts of the Universe (N)
Fall, Winter, Spring, 4(3-2)
Students may not receive credit in more than one of the following: AST 119, AST 217, AST 229, N S 135, N S 155 or N S 1834.

A—The origins and development of scientific explanations of the world. The origins of modern science and scientific revolutions.

B—The role of science in the development of western ideas about reality. The origin and development of mechanistic concepts of the physical world and their part in intellectual dialogue.


142. Life, Its Environment (N)
Fall, Winter, Spring, 4(3-2)
Natural ecological systems and the impact of human biological and cultural development on them. Examination of specific ecological problems and the role of science in seeking solutions.

152. Science and Culture in the 20th Century (N)
Fall, Winter, Spring, 4(4-0)
Controversies concerning interpretation of modern scientific concepts such as evolution, uncertainty and relativity are discussed in terms of developing a personal philosophy.

155. Cosmology, Humanity's Place in the Universe (N)
Fall, Winter, Spring, 4(3-2)
Students may not receive credit in more than one of the following: AST 119, AST 217, AST 229, N S 135, N S 155, N S 1834.

A—Our attempts to understand the universe and our place within it. The interaction between scientific concepts and the beliefs and values of the culture in which they are proposed.

162. Race, The Evolution of an Idea (N)
Fall, Winter, Spring, 4(3-2) N S 115 or approval of department.
Human races and evolution. The biological concept of race based on the theories of the gene, evolution, and natural selection.
292. **Selected Topics**  
Fall, Winter, Spring, 3 to 5 credits. May reenroll for a maximum of 6 credits if different topic is taken. 
Interdisciplinary study of topics in the natural sciences or the natural sciences as related to the humanities and social sciences.

300. **Supervised Individual Study**  
Fall, Winter, Spring, Summer, 2 to 4 credits. May reenroll for a maximum of 12 credits. 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.

325. **Biological and Social Aspects of Human Reproduction**  
Fall, Winter, Spring, 4.4-4 credits. May reenroll for a maximum of 12 credits. Approval of department. 
Anatomy and physiology of human reproduction will be integrated with consideration of such current social concerns as contraception, abortion, venereal disease and drugs.

380. **Issues in Science and Religion**  
Winter, 4.4-4 credits. Juniors or approval of department. 
Interdepartmental with and administered by the Department of Religious Studies. 
History of relationships between science and religion. Methods of science and religion. Attempts at resolution of conflicts and formation of new syntheses.

401. **Engineering and Public Policy**  
Spring, 3.3-3 credits. Seniors, or approval of department. Interdepartmental with and administered by Engineering. 
Sociotechnical assessment of impact of technology on society, with analysis of the role of engineering and natural science in contributing to public policy formulation.

456. **Foundations of Developmental Biology**  
Winters of even-numbered years, 3.3-3 credits. ZOL 317, ZOL 417 recommended. Interdepartmental with and administered by the Department of Zoology. 
Reading and discussion of original research which pose significant problems of modern developmental biology.

### NATURAL SCIENCE (COLLEGE OF)

**201. Science Problem Solving Seminar I**  
Fall, 2.2-2 credits. MTH 108 concurrently, approval of instructor. 
Problem solving principles and application of strategies to the disciplines of science and mathematics. Activities reflecting the types of problems encountered in these disciplines emphasized.

**202. Science Problem Solving Seminar II**  
Winter, 2.2-2 credits. NSC 201, approval of instructor. 
Continuation of NSC 201. Emphasis upon problem solving in sciences disciplines and principles of research design.

### 203. Science Problem Solving Seminar III**  
Spring, 2.2-2 credits. May reenroll for a maximum of 4 credits. NSC 202, approval of instructor. 
Applied experience in research. Design and implementation of simple research problems. Relationship of science and society.

### 305. Women in Science**  
Spring, 3.3-3 credits. Introductory course in chemistry or physics or biological science or approval of instructor. 
The development of women scientists of the past, present, and future will be examined. Emphasis will be on representatives from physics, biology, medicine, mathematics, and engineering.

### 394H. Current Topics in Science (MTC)**  
Fall, Winter, Spring, 3.3-3 credits. May reenroll for a maximum of 9 credits if different topics are taken. Approval of Honors College or course coordinator. 
Scientists from several disciplines lecture on a common topic of current scientific interest, indicating the key concepts, the analytical approaches, the processes and the constraints of their respective disciplines.

### 410. Environmental Toxicology**  
Winter, 4.4-4 credits. BCH 201, 202, 203. 
Interdepartmental with Agriculture and Natural Resources. 
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.

### 445. Pest Management: Pesticide Chemistry and Application Systems for Plant Protection**  
Fall, 3.3-3 credits. ENT 285. HRT 402 or CSS 402, BOT 405 or concurrently or approval of instructor. 
Interdepartmental with Agriculture and Natural Resources. 
A broad overview of pesticide chemistry, efficient usage, environmental fate, legislation and application techniques.

### 446. Pest Management: Biological Systems for Plant Protection**  
Fall, 3.3-3 credits. ENT 285, HRT 402 or CSS 402, BOT 405 or concurrently or approval of instructor. 
Interdepartmental with Agriculture and Natural Resources. 
Management of plant pests utilizing host resistance, cultural practices, legislation, and biological systems.

### 447. Pest Management: Systems Management for Plant Protection**  
Winter, 4.3-4 credits. NSC 445, NSC 446 or approval of instructor. Interdepartmental with Agriculture and Natural Resources. 
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.

### 492. Integrative Studies**  
Fall, Winter, Spring, Summer, 3 to 5 credits. Juniors. 
In-depth study of topics which require an integration within or among the natural sciences or between the natural sciences and other major areas of human knowledge.

### 501. Special Problems in Electron Microscopy**  
Fall, Winter, Spring, Summer, 1 to 15 credits. Approval of instructor. 

### 802. Essentials of Electron Microscopy**  
Fall, Winter, 2.2-2 credits. Approval of instructor. NSC 810 or NSC 820 or NSC 830 concurrently. 
Principles of electron microscopy including optical theory, instrument design and construction and selected specimen preparatory procedures. Emphasis on current literature.

### 810. Methods in Transmission Electron Microscopy**  
Fall, Winter, Spring, 3.3-3 credits. Approval of instructor. NSC 810 or concurrently. 
Use of the transmission electron microscopes and professional nursing practice, Standards of practice for biological and nonbiological materials. Photographic principles including interpretation of micrographs.

### 820. Methods in Scanning Electron Microscopy**  
Fall, Winter, Spring, 3.3-3 credits. Approval of instructor. NSC 820 or concurrently. 
Use of the scanning electron microscope and preparation equipment. Preparative technique for biological and nonbiological materials. Interpretation of micrographs.

### 830. Analytical Electron Microscopy**  
Fall, Spring, 3.3-3 credits. Approval of instructor. NSC 820 or concurrently. 
Use of X-ray analysis of electron microscopes and electron microscopes with biological and physical materials. Methods of preparation and analysis of product data.

### NURSING (COLLEGE OF)

**200. Nursing I**  
Spring, 3.3-3 credits. 4.4-4 credits. Approval of college. 

**202. Introduction to Professional Nursing Practice**  
Winter, 3.3-3 credits. Approval of college. NSC 202 concurrently. Not open to Registered Nurses. 
Fundamental theoretical concepts necessary for the delivery of professional practice utilizing the nursing process. Development of interpersonal communication and documentation skills. Accountability in nursing practice.

**203. Introduction to Professional Nursing Practice Practicum**  
Winter, 3.3-3 credits. Approval of college. NSC 202 concurrently. Not open to Registered Nurses. 
Application of fundamental theoretical concepts in nursing utilizing nursing process in simulated and real life settings. Development of fundamental psychomotor nursing skills.

**212. Professional Nursing I: Basic Concepts**  
Winter, 2.2-2 credits. Approval of college. 
Introductory concepts forming foundation of professional nursing practice. Standards of practice, code of ethics. Relationship of nursing research to practice and health promotion.