903. Proseminar in Music Education
Fall, Winter, Spring, Summer. 3(3-0)
May reenroll for a maximum of 9 credits. Approval of department.
Problems of music education with study of and readings from aesthetics, philosophy, measurement evaluation, and teacher training.

915. Medieval Music
Fall. 3(3-0) Approval of department.
Investigation of various developments in European music to middle of fifteenth century. Some attention given to Gregorian chant as well as to various types of secular Monody but greater stress is laid on the forms and styles of Polyphonic music.

916. Renaissance Music
Winter. 3(3-0) Approval of department.
Investigation of developments in European music from 1450 to 1600, tracing developments in both sacred and secular music.

917. Music of the 17th Century
Spring. 3(3-0) Approval of department.
Instrumental and vocal music of Early Baroque period.

918. Music of the 18th Century
Fall. 3(3-0) Approval of department.
Intensive study of selected topics in 18th century music.

919. Music of the 19th Century
Winter. 3(3-0) Approval of department.
Intensive study of selected topics in 19th century music.

920. Music of the 20th Century
Spring. 3(3-0) Approval of department.
Intensive study of selected topics in 20th century music.

924. Seminar in Musikology
Fall, Winter, Spring. 3 credits. May reenroll for a maximum of 15 credits. Approval of department.

943. Survey of the History of Theory
Winter. 2(2-0) Approval of department.
Significant theoretical treatises from the 6th century B.C. to the early 20th century.

954. Administration of Music Education Programs
Spring of even-numbered years. 3(3-0) Approval of department.
Techniques for administering school music and higher education music programs.

955. Current Tendencies in Music Education
Winter of even-numbered years. 3(3-0) Approval of department.
Current trends and practices in public school music education.

956. Advanced Research Techniques in Music
Winter. 3(3-0) Approval of department.
Selected research techniques in music education with emphasis on experimental design and computerized data analysis.

960. Analytical Studies
Fall. 3(3-0) Approval of department.
Analysis of melody, harmony, rhythm, color, texture, counterpoint, and form in part-music from the thirteenth century through the late sixteenth/early seventeenth century.

961. Analytical Studies
Winter. 3(3-0) Approval of department.
Analysis of melody, harmony, rhythm, color, texture, counterpoint, and form in music of the sixteenth century.

962. Analytical Studies
Spring. 3(3-0) Approval of department.
Analysis of melody, harmony, rhythm, color, texture, counterpoint, and form in music of the eighteenth century.

963. Schenker Analysis
Fall. 2(2-0) Approval of department.
Analytical techniques and concepts of Heinrich Schenker. Examination of his sketches and writings, reading about him, and analysis of music using his techniques.

964. Set-Theory Analysis of Atonal Music
Spring. 2(2-0) Approval of department.
Set-Theory principles and their application to the analysis of atonal music.

970. Contrapuntal Techniques
Fall of odd-numbered years. Summer. 3(3-0) MUS 482 or approval of department.
Advanced contrapuntal practice from the sixteenth century to the present.

971. Contrapuntal Techniques
Winter of even-numbered years. Summer. 3(3-0) MUS 970.
Continuation of MUS 970.

972. Contrapuntal Techniques
Spring of even-numbered years. Summer. 3(3-0) MUS 971.
Continuation of MUS 971.

999. Doctoral Dissertation Research
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

Natural Science — Descriptions of Courses

College of Natural Science

115. The Nature and Continuity of Life (N)
Fall, Winter, Spring, Summer. 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 structure of life and the universe of which it is a part. Examination of contemporary problems associated with defining life and death.
C—Consideration of social and ethical issues relating to our increasing control of reproduction and heredity, reproduction, and here from molecular, cellular and organismic perspectives, including human structure and function.

D—The nature of living things, contrasting various scientific and non-scientific views. The implications of the modern scientific understanding of life for our belief about value.

122. Human Biosocial Evolution (N)
Fall, Winter, Spring. 4(3-2)
Current understanding of human beings and their beliefs 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 life sciences and earth sciences. Stresses the role of controversy in science and the nature of scientific evidence.
B—Hereditary, 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 vital and related problems. Emphasis on problem-solving in science and impact of evolutionary concepts on human societies.

127. The Biocology of Health
Fall, Winter, Spring. 4(3-2)
Human health examined from evolutionary and ecological viewpoints. Emphasis will be on the impact of a technological environment on our health.

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, Summer. 4(3-2)
Students may not receive credit for more than one of the following: AST 119, AST 217, AST 229, N S 135, N S 155.
A—The origin and development of scientific explanations of the physical 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.
C—Growth of theories of celestial motion and a matter. Their interrelationship. Impact of scientific knowledge on society. The contribution of science to clarification and solution of social problems.

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)**  
   (NS 135D) Fall, Winter, Spring, Summer. 3(3-2) Students may not receive credit in more than one of the following: NST 119, NST 217, AST 229, N 135, N 155.  
   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) Students may not receive credit in more than one of the following: NST 119, AST 217, AST 229, N 135, N 155.  
   Human races and evolution. The biological concept of race based on theories of the gene, culture in which they are proposed.

171H. **Our Biological Nature (N)**  
   Fall. 4(4-0) Honors College students or approval of department.  
   Various issues confronting us in our attempt to understand our biological selves. Emphasis on the role that science can play in helping to resolve these issues.

172H. **Our Place in Nature (N)**  
   Winter. 4(4-0) Honors College students or approval of department.  
   Various issues confronting us in our attempt to understand our place in and relation to the environment. Emphasis on the role of science in helping to resolve these issues.

173H. **Science-Technology and Human Values (N)**  
   Spring. 4(4-0) Honors College students or approval of department.  
   The nature and significance of science and technology in Western culture, with emphasis on their relationship to other creative activities, particularly those within the arts.

1814. **Natural Science (N)**  
   Fall. 4(4-2) Not open to students with credit in NS 115. Enrollment in Remedial-Developmental Writing Program or approval of department.  
   Scientific methods emphasizing development and modification of explanation systems. The nature of cells and sexual reproduction as background for Mendelian gene theory and its modern applications. Social implications are emphasized.

1924. **Natural Science (N)**  
   Winter. 4(3-2) Not open to students with credit in N 125, N 1814 or approval of department.  
   Scientific methods with emphasis on evolutionary ideas regarding origin of earth features as related to modern problems. Human origins and development are considered, with a number of modern problems.

1934. **Natural Science (N)**  
   Spring. 4(3-2) Not open to students with credit in N 135, N 1824 or approval of department.  
   Nature of science as exemplified by ideas from physical science. The Copernican Revolution is used as an example of the science-society interaction. Modern concepts of cosmology are also introduced.

200. **Technology, Society and Public Policy**  
   Winter. 3(3-0) Twelve credits from natural science or engineering, Interdepartmental with approval of Engineering.  
   Description and analysis of certain current technologies and their consequences, exploration of avenues for assessing such consequences as an aid to formulation of public policy.

209. **Humans and Disease (N)**  
   Fall, Winter, Spring. 4(4-0)  
   Disease as a natural biological phenomenon and how it has influenced the human race from a worldwide perspective. Environmental and cultural factors and how these influence and interrelate with disease.

242. **Wilderness Environmental Field Studies (N)**  
   Winter, Summer. 3(3-0) Approval of instructor.  
   Study of ecosystem balance between physical, biological and human elements while hiking in selected wilderness areas. Requires out-of-state travel.

292. **Selected Topics**  
   Fall, Winter, Spring. 3 to 5 credits. May reenroll for a maximum of 9 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 topics and individual study of interdisciplinary problems. Variable elective credits will be determined by the student, an instructor, or advisor, and department approval.

325. **Biological and Social Aspects of Human Reproduction**  
   Fall, Winter, Spring. 4(4-0) Juniors or 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 drug abuse.

350. **Issues in Science and Religion**  
   Winter. 4(4-0) 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(3-0) 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 engineer­ning and natural science in contributing to public policy formulation.

450. **Foundations of Developmental Biology**  
   Winter. 3(3-0) ZOL 317, ZOL 417 recommended. Interdepartmental with and administered by the Department of Zoology.  
   Reading and discussion of original research which posed significant problems of modern developmental biology.

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**NATURAL SCIENCE (COLLEGE OF)**

201. **Science Problem Solving Seminar I**  
   Fall, Winter. 3(3-0) May reenroll for a maximum of 2 credits. Approval of instructor.  
   Problem solving strategies 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. 3(3-0) May reenroll for a maximum of 2 credits. Approval of instructor.  
   Continuation of NSC 201. Emphasis upon problem solving in science disciplines and principles of research design.

203. **Science Problem Solving Seminar III**  
   Spring. 3(3-0) May reenroll for a maximum of 3 credits. 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(3-0) 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 representations from physics, biology, medicine, mathematics, and engineering.

394H. **Current Topics in Science (MTC)**  
   Fall, Winter, Spring. 3(3-0) May reenroll for a maximum of 3 credits if different topics are taken. Approval of Honors College or course coordinator.  
   Topics of current scientific interest to the key concepts, the analytic approaches, the processes and the constraints of their respective disciplines.

410. **Environmental Toxicology**  
   Winter. 4(4-0) B 112, BCH 401. Interdepartmental with Agriculture and Natural Resources.  
   Fate and effects of toxic chemicals in soil, plants, wildlife, and aquatic systems. Consequences, interactions between chemicals and the environment which influence their fate and ecological importance.

445. **Pest Management: Pesticide Chemistry and Application Systems**  
   Fall. 3(3-4) CEM 143, ENT 425, HRT 402 or CSS 405, ENT 405 or concurrent 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(3-0) ENT 425, HRT 402 or CSS 405, ENT 405. Interdepartmental with Agriculture and Natural Resources.  
   Management of plant pests utilizing host resistance, cultural practices, legislation, and biological systems.