

MSNS Program Schedule Summer 2012 Course Descriptions and Times

June 11 – July 20, 2012

SCI 5002 – History of Science for Natural Science Teachers. (3-0-3) (TWR 6:00-8:05 pm). Instructor: Dr. Barbara Lawrence. This course examines the history of natural science from ancient to modern times, with emphasis on the dynamics of scientific investigation and the personalities and social context that shape initial acceptance or rejection of an idea. Case studies of the resolution of conflicting ideas and competing experiments are studied. The ultimate determination of the validity of any scientific theory is experiment. The conclusive experiments that resolved debates and led to major advances in Biology, Chemistry, Earth Science and Physics are examined.

SCI 5005 – Seminar for Natural Science Teachers (2-0-1) (M 6:00-8:05 pm). Instructor: Dr. Andrew Methven. Students will evaluate and present seminars based on the results and analysis of independent research, thesis research or special projects for the M.S. in Natural Sciences program. Attendance required of all M.S. in Natural Sciences degree candidates. Course will be repeated over three summers for a total of 3 semester hours of credit.

SCI 5006 – Independent Study for Natural Science Teachers. (Arranged course for 1, 2, or 3 semester hours). Selected problems based upon the student's background and interests.

SCI 5007 – Research for Natural Science Teachers. (Arranged course for 1, 2, or 3 semester hours). Original research in science or science teaching conducted in consultation with a thesis advisor. A maximum of 6 semester hours in a combination of SCI 5007 and SCI 5950 may be applied toward the research and thesis component of the M.S. in Natural Sciences degree.

SCI 5950 – Thesis for Natural Science Teachers. (Arranged course for 1, 2, or 3 semester hours). Thesis based on original research conducted in consultation with a thesis advisor. Intended for thesis option students conducting original research in consultation with a thesis advisor. A maximum of 6 semester hours in a combination of SCI 5007 and SCI 5950 may be applied toward the research and thesis component of the M.S. in Natural Sciences degree.

BIO 5051 - Biotechnology Techniques for Natural Science Teachers. (2-1-3) (TR 12:30-3:40 pm). Instructor: Dr. Gary Fritz. Instruction in laboratory applications of biotechnology in molecular genetics and immunology. Laboratory topics include recombinant DNA (cloning, electrophoresis) and molecular diagnostic techniques (polymerase chain reaction, western and southern blots).

BIO 5052 – Special Topics in Biology for Natural Science Teachers: Invertebrate Biology. (2-1-3) (TR 8:00-11:10 am). Instructor: Dr. Jeff Laursen. Natural history, including distribution and habitat utilization; reproduction, behavior, and life histories; identification, classification and evolution of terrestrial and aquatic invertebrates.

CHM 5050 – Organic Chemistry for Natural Science Teachers. (2-1-3) (MWF 12:40-2:45 pm). Instructor: Dr. Dan Sheeran. Designed to provide teachers with an understanding of the basic concepts of organic chemistry, especially as they apply to pre-college teaching. Everyday applications will be included.

ESC 5031 – The Earth for Natural Science Teachers. (2-1-3) (MWF 7:30-9:35 am). Instructor: Dr. Diane Burns. Examination of earth materials, nature and characteristics of minerals and rocks, soils, and agents that shape the face of the earth—rivers, glaciers, wind, waves and currents, subsurface waters; earth's internal structure and composition, earthquakes and volcanic activity and continental drift and plate tectonics. Field and laboratory work included.

PHY 5150 – Astronomy for Natural Science Teachers. (2-1-3) (MW 3:00-5:05 pm; TR 4:00-5:05 pm). Instructor: Dr. James Conwell. Topics from modern astronomy selected from three central areas: planetary astronomy, stellar astronomy and cosmology. Topics include general features of planetary systems, stellar evolution and collapse, black hole formation, galaxy classification, quasars, curved space-time, big bang cosmology, inflation, etc.

PHY 5160 – Modern Physics for Natural Science Teachers. (2-1-3) (MWF 9:45-11:50 am). Instructor: Dr. Steven Daniels. An introduction to the principles of modern physics using the principles of relativity and quantum mechanics. Topics include special relativity, black body radiation, atomic, nuclear and quark physics, strong, weak, electromagnetic and electro-weak forces, grand unified theories, general relativity.

Registration Begins March 19, 2012