SCIENCE AND MATHEMATICS EDUCATION SME

College of Natural Science

120 Seminar in Integrated Science for Elementary Schools
Spring. 1(1-1) Interdepartmental with Teacher Education. Administered by Science and Mathematics Education. P: (BS 161 or BS 162 or BS 181H or BS 182H or LB 144 or LB 145) or (CEM 141 or PHY 231 or PSL 250 or GLG 201 or GEO 203) R: Open to students in the College of Education or in the Education major or in the Special Education major or approval of college.
Exploration of major connecting themes in life sciences, earth science, and physical science as evidenced in the K-8 science curriculum and college science courses.

301 Science for Elementary Schools
Fall, Spring. 3(2-2) RB: Completion of an ISB and ISB laboratory or ISP and ISP laboratory course. Completion of the majority of complementary studies coursework in science and math. R: Open only to students in the Elementary Teacher Education Program. SA: NSC 301
Topics in earth science, life science, and physical science explored through discussion, demonstrations, readings, presentations, and field trips.

320 Integrated Science for Elementary Schools
Spring. 3(2-2) Interdepartmental with Teacher Education. Administered by Science and Mathematics Education. P: SME 120 and (BS 161 or BS 162 or BS 181H or BS 182H or LB 144 or LB 145 or PSL 250 or ZOL 355) and (PHY 231 or PHY 231C or CEM 141 or LB 171) and (GLG 201 or GEO 203 or AST 207) R: Open to students in the Integrated Science Elementary Teaching Major. Not open to students with credit in SME 301.
Analysis of the concepts integrating science across life sciences, earth sciences, and physical sciences. Applications to the K-8 science curriculum.

401 Science Laboratories for Secondary Schools (W)
Fall. 4(2-6) P: Completion of Tier I writing requirement. R: Open only to seniors in the Bachelor of Arts degree in Chemistry, or Biological Science-Interdepartmental major or Earth Science-Interdepartmental major or General Science-Interdepartmental major or Physical Science-Interdepartmental major or their associated LBS majors. SA: NSC 401
Laboratory equipment, supplies, demonstrations, exercises, and safety. Care of live organisms. Disposal of biological and chemical wastes. Field Trips required.

420 Integrated Science Research
Fall, Spring. 3(2-2) Interdepartmental with Teacher Education. Administered by Science and Mathematics Education. R: Open to seniors in the General Science Secondary Teaching Major and open to seniors in the Integrated Science Elementary Teaching Major.
Research design and data analysis of individual research projects relevant to the K-12 science curriculum, integrating topics in life, earth, and physical science.

430 History of Mathematics
Spring. 3(3-0) P: MTH 133 and MTH 301
Development of mathematical thought from ancient times to the present, selected from Egyptian, Babylonian, Mayan, Greek, Indian, and Arab contributions to mathematics and to the context of today's school mathematics curriculum.

490 Special Problems
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Approval of college.
Faculty directed individualized study of an interdisciplinary problem.

600 Special Problems for K-8 Teachers
Fall, Spring, Summer. 1 to 5 credits. A student may earn a maximum of 10 credits in all enrollments for this course. RB: Elementary teacher certification, 3 years teaching experience. R: Approval of college. SA: NSC 600
Supervised study of problems or issues in biological sciences, physical sciences, earth sciences or mathematical sciences.

800 Problems in Science or Mathematics for Teachers
Fall, Spring, Summer. 1 to 5 credits. A student may earn a maximum of 15 credits in all enrollments for this course. RB: Secondary certification in biological sciences, physical sciences or chemistry; secondary certification in Mathematics or Mathematics Education. R: Approval of college. SA: NSC 800
Supervised study of problems or issues in biological science, or physical sciences, or mathematical sciences.

820 College Student Cognition in Science
Spring. 3(3-0) RB: At least 3 undergraduate courses in science
Introduction to research methodologies and findings relevant to college student cognition in science disciplines. Material from education, psychology, cognitive sciences, and the science disciplines will be used to reveal college student cognitive processes as they relate to science fields.

828 Physical Science I
Summer. 3(2-1) RB: Elementary teacher certification, 1 year teaching experience. R: Open to graduate students in the Master of Arts for Teachers in General Science. Approval of college. SA: SME 651
The nature of matter and energy including energy transfer, density, and conservation of mass. Properties of elements, mixtures, and compounds.

829 Physical Science II
Summer. 3(2-1) RB: Elementary teacher certification, 1 year teaching experience. R: Open to graduate students in the Master of Arts for Teachers in General Science. Approval of college. SA: SME 652
Electricity and magnetism, force and motion, heat and temperature, sound, and light.

832 Earth Science I
Summer. 3(2-1) RB: Elementary teacher certification, 1 year teaching experience. R: Open to graduate students in the Master of Arts for Teachers in General Science. Approval of college. SA: SME 653
The solar system, including the sun, planets, earth, and its moon. Weather and the water cycle.

833 Earth Science II
Summer. 3 credits. RB: Elementary teacher certification, 1 year teaching experience. R: Open to graduate students in the Master of Arts for Teachers in General Science. Approval of college. SA: SME 654
Rocks, minerals, and fossils and the physical and geological processes that form them.

838 Life Science I
Summer. 3(2-1) RB: Elementary teacher certification, 1 year teaching experience. R: Open to graduate students in the Master of Arts for Teachers in General Science. Approval of college. SA: SME 655
Structure, function, genetics, and classification of organisms, including protists, plants, animals, and decomposers.

839 Life Science II
Summer. 3(2-1) RB: Elementary teacher certification, 1 year teaching experience. R: Open to graduate students in the Master of Arts for Teachers in General Science. Approval of college. SA: SME 656
Interrelationships among and between organisms and their surroundings. Ecosystems, habitats, food chains, cycles, and pollution.

861 Chemistry for Teachers
Summer. 3(2-1) RB: Secondary certification in chemistry or physics or earth science or physical science, 1 year of teaching. R: Open to graduate students in the Physical Science-Interdepartmental major. Approval of college. SA: NSC 861
Intensive lecture and laboratory study of basic chemistry from a modern viewpoint.

862 Physics for Teachers
Summer. 3(2-1) RB: Secondary certification in chemistry or physics or earth science or physical science, 1 year of teaching. SA: NSC 862
Intensive lecture and laboratory study of basic physics from a modern viewpoint.

863 Earth Science for Teachers
Summer. 3(2-1) RB: Secondary certification in chemistry or physics or earth science or physical science, 1 year of teaching. R: Open to graduate students in the Physical Science-Interdepartmental major. Approval of college. SA: NSC 863
Intensive lecture and laboratory study of basic earth sciences from a modern viewpoint.

865 Technology for Teachers
Summer. 2(2-1) RB: Secondary certification in chemistry or physics or earth science or physical science, 1 year of teaching. R: Open to graduate students in the Physical Science-Interdepartmental major. Approval of college.
Utilization and application of new technologies in secondary science classrooms.

866 Integrated Science for Secondary Teachers
Summer. 3(2-1) RB: Secondary certification in chemistry or physics or earth science or physical science, 1 year of teaching. R: Open to graduate students in the Physical Science-Interdepartmental major. Approval of college.
Development of class activities that integrate across the sciences: physics, chemistry, earth science, and biology.

870 Teaching College Science
Spring. 2 credits. RB: One year of graduate study in a biological or physical science. R: Approval of college. SA: NSC 870
Philosophies of education. Ethnic, gender, and cultural issues. Designing a laboratory course. Problems of class size. Instructional technologies. Assessment and evaluation.

871 Biochemistry and Cell Biology for Teachers
Summer of odd years. 7(4-6) RB: Undergraduate degree in the biological sciences R: Open to lifelong graduate students. Approval of department; application required.
Review of basic principles in biochemistry and cell biology, and their application to current topics.

874 Field Ecology for Teachers
Summer of even years. 7(4-6) RB: Undergraduate degree in the biological sciences R: Open to lifelong graduate students. Approval of department; application required.
Review of basic principles of ecology and their application in a field setting.

889 Research for Inservice Teachers
Fall, Spring, Summer. 1 to 8 credits. A student may earn a maximum of 10 credits in all enrollments for this course. RB: Open only to inservice K-12 teachers with baccaulaureate degrees. R: Approval of college. SA: NSC 889
Research in faculty laboratories. Oral and written presentations.

899 Master's Thesis Research
Fall, Spring, Summer. 1 to 8 credits. A student may earn a maximum of 36 credits in all enrollments for this course. R: Open only to master's students in the College of Natural Science. Approval of college. SA: NSC 899
Master's thesis research.

901 Frontiers in Biological Science
Fall, Spring. 1 to 4 credits. A student may earn a maximum of 36 credits in all enrollments for this course. RB: Secondary certification in chemistry or physics or earth science or physical science or biology, 3 years teaching experience. R: Approval of college. SA: NSC 901
Weekend workshops with research faculty exploring background and latest findings in their area of research.

902 Frontiers in Physical Science
Fall, Spring. 1 to 4 credits. A student may earn a maximum of 40 credits in all enrollments for this course. RB: Open only to students with secondary teacher certification in chemistry or physics or earth science or physical science or biology and 3 years of teaching experience. R: Approval of college. SA: NSC 902
Weekend workshops with research faculty exploring background and latest findings in their area of research.