College of Natural Science

SCIENCE AND SME
MATHEMATICS
EDUCATION

120 Seminar in Integrated Science for Elementary Schools
Spring. 1(1-1) Interdepartmental with Teacher Education. Administered by Science and Mathematics Education. P:M: BS 110 or BS 111 or CEM 141 or PHY 231 or PSL 250 or GLG 201 or GEO 203 R: Open only to students in the Integrated Science Teaching major, the Special Education major, the Child Development major, the Elementary Teacher Education program, the 5th-year teacher certification program, 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 core science courses.

301 Science for Elementary Schools
Fall, Spring. 3(2-2) RB: Completion of an ISP and ISP 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.

401 Science Laboratories for Secondary Schools (W)
Fall. 4(2-6) P:M: 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.

420 Integrated Science Research for Elementary Schools
Fall. 3(2-2) Interdepartmental with Teacher Education. Administered by Science and Mathematics Education. P:M: SME 320 and (STT 200 or STT 201) R: Open only to students in the Integrated Science Elementary Teaching major. Research design and data analysis of individual research projects relevant to the K-8 science curriculum, integrating topics in life, earth, and physical science.

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

630 Bridges to Science
Summer. 2(2-1) R: Open to masters students in the Master of Arts for Teachers in General Science. Approval of college. SA: NSC 630 Scientific principles and concepts in integrative life, earth, and physical science.

800 Problems in Biological or Physical Science for Teachers
Fall, Spring. 1 to 8 credits. A student may earn a maximum of 8 credits in all enrollments for this course. R: Teacher Certification required. R: Approval of college. SA: NSC 800 Supervised study of problems in biological or physical science.

828 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 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

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.

879 Teaching College Mathematics
Fall. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course. Interdepartmental with Counseling, Educational Psychology and Special Education and Mathematics and Teacher Education. Administered by Science and Mathematics Education. RB: Past or concurrent mathematics teaching experience.
Curriculum materials, case studies, approaches to teaching and student learning of particular mathematics topics.

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 baccalaureate 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.

903 Topics in Mathematics Education Research
Fall of odd years. 3(3-0) RB: MTH 802A or MTH 802B SA: MTH 903
Research in mathematics education and its effect on policy, curriculum, and the teaching and learning of mathematics.

926 Proseminar in Mathematics Education I
Fall. 3(3-0) Interdepartmental with Counseling, Educational Psychology and Special Education and Mathematics and Teacher Education. Administered by Science and Mathematics Education.
Research on the learning and teaching of mathematics. Teaching, teacher and student learning, curriculum, and educational policy. Historical, philosophical, empirical, and theoretical perspectives.

927 Proseminar in Mathematics Education II
Spring. 3(3-0) Interdepartmental with Counseling, Educational Psychology and Special Education and Mathematics and Teacher Education. Administered by Science and Mathematics Education. P.M: SME 926
Continuation of SME 926.

954 Design and Methods in Mathematics Education Research
Fall of odd years. 3(3-0) Interdepartmental with Counseling, Educational Psychology and Special Education and Mathematics and Teacher Education. Administered by Science and Mathematics Education. RB: SME 926 and SME 927
History, current trends, and issues pertaining to research design and methods in mathematics education research. Mathematics education research in the areas of policy, teaching, teacher learning, and student learning with particular attention to how features of research designs influence research findings.

997 Special Topics in Mathematics Education
Fall, Spring. Summer. 3 to 6 credits. A student may earn a maximum of 18 credits in all enrollments for this course. RB: SME 903 or TE 950 or CEP 913 SA: MTH 997
Advanced topics in mathematics education.

999 Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 24 credits in all enrollments for this course. RB: SME 926 and SME 927 and SME 954
Doctoral dissertation research.