

INTEGRATED ISE SCIENCE EDUCATION

College of Natural Science

120 Seminar in Integrated Science for Elementary Schools

Spring. 1(1-1) Interdepartmental with Teacher Education. Administered by Integrated Science 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. SA: SME 120

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 to students in the elementary teacher certification program (admitted). SA: NSC 301, SME 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 Integrated Science Education. P: ISE 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. SA: SME 320 Not open to students with credit in ISE 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 to seniors in the Chemistry major or in the Earth Science major or in the Biological Science major or in the Physical Science major. SA: NSC 401, SME 401

Laboratory equipment, supplies, demonstrations, exercises, and safety. Care of live organisms. Disposal of biological and chemical wastes.

420 Integrated Science Research

Fall, Spring. 3(2-2) Interdepartmental with Teacher Education. Administered by Integrated Science Education. R: Open to seniors in the General Science Secondary Teaching Major and open to seniors in the Integrated Science Elementary Teaching Major. SA: SME 420

Research design and data analysis of individual research projects relevant to the K-12 science curriculum, integrating topics in life, earth, and physical science.

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 department. SA: SME 490

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, SME 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, SME 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 SA: SME 820

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, SME 828

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, SME 829

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, SME 832

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, SME 833

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, SME 838

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, SME 839

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, SME 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, SME 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, SME 863

Intensive lecture and laboratory study of basic earth sciences from a modern viewpoint.

865 Technology for Teachers

Summer. 2(1-1) 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: SME 865

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. SA: SME 866

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, SME 870

Philosophies of education. Ethnic, gender, and cultural issues. Designing a laboratory course. Problems of class size. Instructional technologies. Assessment and evaluation.

Integrated Science Education—ISE

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.
SA: SME 871

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.
SA: SME 874

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 baccalaureate degrees. R: Approval of college. SA: NSC 889, SME 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 to master's students in the College of Natural Science. Approval of college. SA: NSC 899, SME 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, SME 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, SME 902

Weekend workshops with research faculty exploring background and latest findings in their area of research.