NATURAL SCIENCE NSC

College of Natural Science

101. Preview of Science
Fall, 1(1-0) Interdepartmental with Agriculture and Natural Resources, Engineering, and Social Science.
R: Approval of College
Overview of natural sciences, transitional problems, communications and computer skills, problem-solving skills, diversity and ethics problems in science, science and society.

192. Environmental Issues Seminar
Fall, Spring, 1(1-0) A student may earn a maximum of 3 credits in all enrollments for this course.
R: Approval of College
Interdepartmental with Agriculture and Natural Resources, Engineering, and Social Science.
R: Open only to students in the College of Agriculture and Natural Resources, College of Engineering, College of Natural Science, and College of Social Science, Approval of College.
Environmental issues and problems explored from a variety of perspectives, including legal, scientific, historical, political, socio-economic, and technical points of view.

201. Science Problem Solving Seminar I
Fall, 2(2-0)
P: Drew Section of MTH 0823 or MTH 116 or MTH 132 concurrently.
R: Approval of college.
Problem solving principles and strategies used in the disciplines of science and mathematics. Activities reflecting the types of problems encountered.

202. Science Problem Solving Seminar II
Spring, 2(2-0)
P: NSC 201.
R: Approval of college.

293. Drew Laboratory Directed Studies
Fall, Spring, Summer, 1 to 2 credits.
A student may earn a maximum of 6 credits in all enrollments for this course.
R: Open only to Drew Laboratory students.
Using topics related to a faculty member's ongoing research, students explore the relationship between science and technology and social issues.

300. Special Problems
Fall, Spring, Summer, 1 to 3 credits.
A student may earn a maximum of 6 credits in all enrollments for this course.
R: Approval of department.
Faculty directed individualized study of an interdisciplinary problem.

301. Science Laboratories for Secondary Schools (W)
Fall, 2(2-0)
P: Open only to seniors in the College of Natural Science with a teacher certification option, Completion of Tier I writing requirement.
Laboratory equipment, supplies, demonstrations, exercises, and safety. Care of live organisms. Disposal of biological and chemical wastes. Field trips required.

400. Special Problems
Fall, Spring, Summer, 1 to 4 credits.
A student may earn a maximum of 8 credits in all enrollments for this course.
R: Approval of department.
Faculty directed individualized study of an interdisciplinary problem.

491. Selected Topics
Fall, Spring, Summer, 1 to 3 credits.
A student may earn a maximum of 6 credits in all enrollments for this course.
R: Approval of department.
Selected interdisciplinary topics not normally covered in other courses.

495. Capstone in Human Biology (W)
Fall, Spring, 3(2-0)
R: Open only to seniors in Biological Science, Interdepartmental: Human Biology option.
Completion of Tier I Writing Requirement.
Integration of human biology disciplines with a focus on health and disease.

499. Research
Fall, Spring, Summer, 1 to 4 credits.
A student may earn a maximum of 6 credits in all enrollments for this course.
R: Open only to juniors and seniors in the College of Natural Science with a teacher certification option.
Research in faculty laboratories. Oral and written presentations.

600. Special Problems for K-8 Teachers
Fall, Spring, Summer, 1 to 6 credits.
A student may earn a maximum of 10 credits in all enrollments for this course.
R: Elementary teacher certification, 3 years teaching experience. Approval of department.
Supervised study of problems in biological, physical, or earth sciences.

651. Physical Science I
Summer, 2 credits.
R: Elementary teacher certification, 3 years teaching experience. Approval of college.
The nature of matter and energy including energy transfer, density, and conservation of mass. Properties of elements, mixtures, and compounds.

652. Physical Science II
Summer, 2 credits.
R: Elementary teacher certification, 3 years teaching experience. Approval of college.
Electricity and magnetism, force and motion, heat and temperature, sound, and light.

653. Earth Science I
Summer, 2 credits.
R: Elementary teacher certification, 3 years teaching experience. Approval of college.
The solar system, including the sun, planets, earth, and its moon. Weather and the water cycle.

654. Earth Science II
Summer, 2 credits.
R: Elementary teacher certification, 3 years teaching experience. Approval of college.
Rocks, minerals, and fossils and the physical and geological processes that form them.

655. Life Science I
Summer, 2 credits.
R: Elementary teacher certification, 3 years teaching experience. Approval of college.
Structure, function, genetics, and classification of organisms, including protists, plants, animals, and decomposers.

656. Life Science II
Summer, 2 credits.
R: Elementary teacher certification, 3 years teaching experience. Approval of college.
Interrelationships among and between organisms and their surroundings. Ecosystems, habitats, food chains, cycles, and pollution.

800. Problems in Biological or Physical Science for Teachers
Fall, Spring, Summer, 2 to 8 credits.
A student may earn a maximum of 9 credits in all enrollments for this course.
R: Teacher Certification required. Approval of college.
Supervised study of problems in biological or physical science.
882. *Essentials of Electron Microscopy*
Fall, Spring. 2(2-0)
Principles of operation and uses of transmission and scanning electron microscopy. Related electron beam instruments. Specimen preparation and analytical methods.

810. *Transmission Electron Microscopy Laboratory*
Fall, Spring, Summer. 3(1-4)
P: NSC 802.
Use of transmission microscope and preparative equipment. Preparation techniques for specimens, photographic and darkroom use, and interpretation of micrographs.

820. *Scanning Electron Microscopy: Energy Dispersive X-ray Microanalysis*
Fall, Spring. 3(1-4)
P: NSC 802 or concurrently.

825. *Special Problems in Electron Microscopy*
Fall, Spring. 1 to 3 credits.
A student may earn a maximum of 40 credits in all enrollments for this course.
P: NSC 802, NSC 810 or NSC 820.
Use of electron microscopy techniques for selected research topics.

830. *Nature and Practice of Science*
Fall, Spring. 3(1-0)
Foundations of scientific inquiry. Recommended scientific best-practices including principles and practices of research integrity and professionalism. Evaluation of scientific quality and productivity.

837. *Confocal Microscopy*
Fall, Spring. 2 credits.
Interdepartmental with Crop and Soil Science. Administered by Crop and Soil Sciences.
R: Approval of department; application required.

850. *Cell and Molecular Biology*
Summer. 2 credits.
P: Secondary certification in biology, 3 years teaching experience. C: NSC 851 concurrently. R: Secondary certification in biology, 3 years teaching experience; approval of college.
Molecular basis of structure and function of cells. Protein structure and function, cell physiology, metabolic energy and transmission of genetic information.

851. *Cell and Molecular Biology Laboratory*
Summer. 3 credits.
Generation of laboratory exercises appropriate for secondary students.

852. *Interdisciplinary Seminar in Biological Science*
Fall, Spring, Summer. 1 credit.
P: Secondary certification in biology, 3 years teaching experience. R: Approval of college.
Interrelationships of biological science and technology. Role of society in regulation of research and technological innovations.

855. *Environmental and Behavioral Biology*
Summer. 3 credits. Given only at W.K. Kellogg Biological Station.
P: Secondary certification in biology, 3 years teaching experience. C: NSC 856 concurrently. R: Approval of college.
Biotic and abiotic features of lakes, streams, forest ecosystems, and microbial ecosystems.

856. *Environmental and Behavioral Biology Laboratory*
Summer. 3 credits. Given only at W.K. Kellogg Biological Station.
Laboratory and field examinations of lake, stream and forest ecosystems.

860. *Problem Solving Techniques in Physical Science*
Summer. 3 credits.
P: NSC 816, NSC 862, NSC 863. R: Secondary certification in chemistry or physics or earth science or physical science, 3 years teaching experience. Approval of college.
Measurement and analysis of chemical, physical, and geological phenomena.

861. *Chemistry for Teachers*
Summer. 2 credits.
P: Secondary certification in chemistry or physics or earth science or physical science, 3 years teaching experience. R: Approval of college.
Intensive lecture and laboratory study of basic chemistry from a modern viewpoint.

862. *Physics for Teachers*
Summer. 2 credits.
P: Secondary certification in chemistry or physics or earth science or physical science, 3 years teaching experience. R: Approval of college.
Intensive lecture and laboratory study of basic physics from a modern viewpoint.

863. *Earth Science for Teachers*
Summer. 2 credits.
P: Secondary certification in chemistry or physics or earth science or physical science, 3 years teaching experience. R: Approval of college.
Intensive lecture and laboratory study of basic earth sciences from a modern viewpoint.

864. *Interdisciplinary Seminar in Physical Science*
Summer. 3 credits.
P: NSC 869. R: Approval of college.
Interrelationships of the physical sciences. The role of society in regulation of science to technology transfer.

870. *Teaching College Science*
Spring. 2 credits.
R: One year of graduate study in a biological or physical science. Approval of college.

889. *Research for Inservice Teachers*
Fall, Spring, Summer. 1 to 6 credits.
A student may earn a maximum of 10 credits in all enrollments for this course.
R: Open only to inservice K-12 teachers with bacca­lo­rate degrees.
Research in faculty laboratories. Oral and written presentations.

899. *Master's Thesis Research*
Fall, Spring, Summer. 1 to 6 credits.
A student may earn a maximum of 10 credits in all enrollments for this course.
R: Open only to master's students in the College of Natural Science. Approval of college.

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.
P: Secondary certification in chemistry or physics or earth science or physical science or biology, 3 years teaching experience. Approval of college.
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.
P: Secondary certification in chemistry or physics or earth science or physical science or biology, 3 years teaching experience. Approval of college.
Weekend workshops with research faculty exploring background and latest findings in their area of research.

NURSING

NUR 202. *Introduction to Nursing Practice I*
Fall, Spring. 1 to 4 credits.
R: College of Nursing majors only. Not open to Registered Nurses.
Theoretical concepts of nursing necessary for professional practice. Communication, interpersonal communication, documentation and decision-making.

NUR 204. *Introduction to Nursing Practice II*
Fall, Spring. 2 credits.
P: NUR 202. R: Open only to College of Nursing students. Not open to Registered Nurses.

NUR 302. *Concepts of Nursing Care of the Adult*
Fall, Spring. 4(4-0)
P: NUR 204. C: NUR 304 concurrently. R: Open only to College of Nursing students.
Nursing care of the adult client with an emphasis on health promotion, disease prevention, care in acute and chronic illness, and rehabilitation.

NUR 303. *Concepts of Nursing Care of the Childbearing Family*
Fall, Spring. 2(2-0)
P: NUR 304. C: NUR 306 concurrently. R: Open only to College of Nursing students.
Concepts of holistic nursing care with culturally diverse childbearing families during the prenatal, intrapartum, and postpartum periods. Concepts of health promotion and risk factors in child care situations.