

958B. Seminar in Orchestral Conducting
Fall, Spring. 1 to 3 credits. A student may earn a maximum of 12 credits in all enrollments for this course.

R: Open only to doctoral students in School of Music. Approval of school; audition required. Advanced conducting techniques for the orchestral literature of all periods for string, chamber, and symphony orchestras.

958C. Seminar in Choral Conducting
Fall, Spring. 1 to 3 credits. A student may earn a maximum of 12 credits in all enrollments for this course.

R: Open only to doctoral students in School of Music. Approval of school; audition required. Advanced conducting techniques for choral and instrumental music of all periods.

960. Seminar in Measurement in Music Education

Spring of odd-numbered years. 2(2-0)

P: MUS 864, MUS 965 or approval of school. R: Open only to graduate students in Music Education or approval of school.

Theory and practice in measuring the outcomes of music instruction in the cognitive, affective and psychomotor domains.

961. Seminar in Music Teacher Education

Fall of odd-numbered years. 2(2-0)

R: Open only to graduate students in College of Arts and Letters and in College of Education.

Issues, techniques, and problems in the preparation of school music educators.

962. Seminar in Aesthetics in Music Education

Fall of even-numbered years. 2(2-0)

R: Open only to graduate students in College of Arts and Letters and in College of Education.

Historical foundations of aesthetics. Concept of aesthetic education and implementation in the music classroom.

963. Seminar in Administration of Music Programs

Spring of even-numbered years. 2(2-0)

R: Open only to graduate students in College of Arts and Letters and in College of Education.

Techniques and problems in administering music programs in schools, colleges, and universities.

964. Seminar in Music Education Trends

Fall of odd-numbered years. 2(2-0)

R: Open only to graduate students in College of Arts and Letters and in College of Education.

Trends in music education, 1950-present. Comparison with former trends in American music education, 1600-1950.

965. Advanced Research Methods in Music Education

Fall. 3(3-0)

P: MUS 864. R: Open only to graduate students in College of Arts and Letters and in College of Education. Music education research projects using computerized statistical analysis.

970. Pedagogy of Theory I

Fall of odd-numbered years. 2(2-0)

R: Open only to graduate students in School of Music. Organization, goals, and procedures for teaching music theory to undergraduates. Choice and sequencing of topics, pacing, supplementary materials, educational philosophies, and relevance to performance.

971. Pedagogy of Theory II

Spring of even-numbered years. 2(2-0)

R: Open only to graduate students in School of Music. Organization, goals, and procedures for teaching music theory to undergraduates. Ear training and sight singing, and their application to general musicianship.

972. Analytical Studies I

Fall. 3(3-0)

R: Open only to graduate students in School of Music. Melody, harmony, rhythm, color, texture, counterpoint, and structure in selected musical masterpieces from the 13th century to the early 19th century.

973. Analytical Studies II

Spring. 3(3-0)

R: Open only to graduate students in School of Music. Melody, harmony, rhythm, color, texture, counterpoint, and structure in selected musical masterpieces from the nineteenth and twentieth centuries.

974. Atonality, Serialism, and Set Theory

Spring. 2(2-0)

R: Open only to graduate students in School of Music. Atonal and paratonal music. Related compositional and analytical systems. Serialism, integral serialism, and set theory.

975. Readings in Music Theory

Spring of odd-numbered years. 2(2-0)

R: Open only to graduate students in School of Music. Current topics in music theory. Research paper required.

980. Composition

Fall, Spring. 2(2-0) A student may earn a maximum of 24 credits in all enrollments for this course.

R: Open only to graduate students in School of Music. Advanced guided projects in creative writing of music.

990. Doctoral Independent Study

Fall, Spring, Summer. 1 to 10 credits. A student may earn a maximum of 20 credits in all enrollments for this course.

R: Approval of school.

Special projects, directed reading, and research arranged by an individual doctoral candidate and a faculty member in areas supplementing the regular course offerings.

991. Special Topics

Fall, Spring, Summer. 1 to 10 credits. A student may earn a maximum of 25 credits in all enrollments for this course.

R: Approval of school.

Special topics supplementing regular course offerings proposed by faculty on a group study basis for doctoral students.

992. Seminar in Musicology

Spring. 3(3-0) A student may earn a maximum of 18 credits in all enrollments for this course.

R: Open only to graduate students in School of Music. Topics in musicology such as early notations, music editing, or historical performance practices.

996. Doctoral Recital Performance

Fall, Spring, Summer. 1 to 12 credits. A student may earn a maximum of 30 credits in all enrollments for this course.

R: Open only to doctoral students in Music Performance.

Directed experience in recital performance in partial fulfillment of requirements for the Doctor of Musical Arts degree.

997. Doctoral Concert Conducting

Fall, Spring, Summer. 1 to 12 credits. A student may earn a maximum of 30 credits in all enrollments for this course.

R: Open only to doctoral students in Music Performance.

Directed experience in concert conducting in partial fulfillment of requirements for the Doctor of Musical Arts degree.

999. Doctoral Dissertation Research

Fall, Spring, Summer. 1 to 40 credits. A student may earn a maximum of 40 credits in all enrollments for this course.

R: Open only to doctoral students in School of Music.

Approval of school.

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 4 credits in all enrollments for this course.

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.

Continuation of NSC 201.

203. 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.

P: NSC 202. 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.

320. Introduction to Theory and Applications of Modern Microscopy

Spring. 2(1-2)

P: Completion of University mathematics requirement. R: Open only to juniors and seniors.

General principles of operation of electron, laser, and scanning probe microscopes. Applications of microscopy. Specimen preparation for microscopy.

**Descriptions — Natural Science
of
Courses**

390. 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.

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

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.
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.

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 5 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 8 credits in all enrollments for this course.
R: Teacher Certification required. Approval of college.
Supervised study of problems in biological or physical science.

802. 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.
Use of scanning electron microscope and energy dispersive x-ray microanalysis. Machine variables, artifacts, quantitative analysis, specimen preparation, darkroom procedures.

825. Special Problems in Electron Microscopy
Fall, Spring, Summer. 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. Ethical Issues in Biomedical Research
Fall. 1(1-0)
R: Open only to graduate students in the colleges of Agriculture and Natural Resources, Human Medicine, Natural Science, Osteopathic Medicine, or Veterinary Medicine.
Ethical issues and dilemmas related to the conduct of biomedical research.

850. Cell and Molecular Biology
Summer. 2 credits.
P: Secondary certification in biology, 3 years teaching experience. C: NSC 851. 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.
P: Secondary certification in biology; 3 years teaching experience. C: NSC 850. R: Approval of college.
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. 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.
P: Secondary certification in biology, 3 years teaching experience. C: NSC 855. R: Approval of college.
Laboratory and field examinations of lake, stream and forest ecosystems.

860. Problem Solving Techniques in Physical Science
Summer. 3 credits.
P: NSC 861, 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. 2 credits.
P: NSC 860. 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.
Philosophies of education. Ethnic, gender, and cultural issues. Designing a laboratory course. Problems of class size. Instructional technologies. Assessment and evaluation.

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.
R: Open only to inservice K-12 teachers with baccalaureate degrees.
Research in faculty laboratories. Oral and written presentations.

899. Master's Thesis Research
Fall, Spring, Summer. 3 to 8 credits. A student may earn a maximum of 10 credits in all enrollments for this course.
R: Open only to Master's candidates in 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.
R: 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.
R: 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

College of Nursing

202. Introduction to Nursing Practice I
Fall. 3(2-3)
R: College of Nursing majors only. Not open to Registered Nurses.
Theoretical concepts of nursing necessary for professional practice. Assessment, interpersonal communication, documentation and decision-making.

204. Introduction to Nursing Practice II
Spring. 4(2-6)
P: NUR 202. R: Open only to College of Nursing students. Not open to Registered Nurses.
Application of introductory nursing practice concepts in simulated and clinical practice settings. Development of introductory nursing practice psychomotor skills.

303. Concepts of Nursing Care of the Adult
Fall, Spring. 4(4-0)
P: NUR 204. C: NUR 304. R: Open only to College of Nursing students.
Family centered nursing care for adults at various levels of health and illness. Prototype health states with emphasis on associated nursing diagnosis and professional standards of care.

304. Practicum in Nursing Care of the Adult
Fall, Spring. 4(0-12)
P: NUR 204. C: NUR 303. 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.

305. Concepts of Nursing Care of the Childbearing Family
Fall, Spring. 2(2-0)
P: NUR 204. C: NUR 306. 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 client care situations.

306. Practicum in Nursing Care of the Childbearing Family
Fall, Spring. 3(0-9)
P: NUR 204. C: NUR 305. R: Open only to College of Nursing students.
Practicum in nursing care with culturally diverse childbearing families during the prenatal, intrapartum and postpartum periods. Implementation of nursing process in various settings. Levels of risk reduction and health promotion.

307. Concepts of Nursing Care of Children and Their Families
Fall, Spring. 2(2-0)
P: NUR 204. C: NUR 308. R: Open only to College of Nursing students.
Theory and concepts related to the holistic care of children (infancy through adolescence) and their families.

308. Practicum in Nursing Care of Children and Their Families
Fall, Spring. 3(0-9)
P: NUR 204. C: NUR 307. R: Open only to College of Nursing students.
Clinical application of the theoretical concepts presented in NUR 307. Variety of health settings will be utilized for clinical practice.

314. Transition to Professional Nursing
Fall, Spring. 4(3-3) Given only at various off-campus sites.
R: Open only to College of Nursing Registered Nurses.
Concepts and practicum for role transition for Registered Nurse seeking degree completion. Assessment, documentation, interpersonal skills and concepts of aging with emphasis on clinical decision making and socialization to professional role.

319. Introduction to Nursing Theory and Research
Spring. 3(3-0)
R: Open only to College of Nursing majors. Completion of Tier I writing requirement.
Major nursing theories and their application to practice. The research process, terminology and investigations undertaken in nursing.

341. Clinical Problems in Adaptation
Spring. 3(3-0)
R: Open only to College of Nursing majors.
Theoretical concepts related to individual's adaptive-maladaptive responses to stress. Emphasis on pathophysiology.

409. Concepts of Psychiatric, Mental, and Community Health Nursing
Fall, Spring. 4(4-0)
R: Open only to College of Nursing majors. Completion of Tier I writing requirement.
Health care trends and issues in public and mental health. Role, responsibilities, and activities of nurses in the provision of care in public and mental health.

410. Practicum in Community Health Nursing
Fall, Spring. 3(0-9)
C: NUR 409. R: Open only to College of Nursing majors. Completion of Tier I writing requirement.
Clinical experience in community health nursing focusing on application of public health and nursing principles in the care of individuals, families and aggregates in a variety of settings.

412. Practicum in Psychiatric and Mental Health Nursing
Fall, Spring. 3(0-9)
C: NUR 409. R: Open only to College of Nursing majors.
Theoretical perspectives of behavior applied to mental health nursing in a practice setting. Advanced concepts of communication. Use of self, group and milieu are used to define the nurse's role.

413. Issues in Professional Nursing
Fall, Spring. 2(2-0)
R: Open only to College of Nursing majors. Completion of Tier I writing requirement.
Past, current, and future impact of selected legal, economic, educational, social, political, ethical, and professional forces on health care and nursing practice at local, national, and international levels.

420. Senior Practicum in Nursing
Fall, Spring. 4(1-9)
R: Open only to College of Nursing majors.
Synthesis and application of nursing concepts as they relate to health care delivery in a variety of health care settings.

422. Nursing in Great Britain
Summer. 5(5-0) Given only in London, England.
R: Approval of College.
Historical evolution of nursing in the National Health Service: British nursing education, hospital and community health nursing, standards of care, research, and management. Influence of professional nursing upon British national health policies.

430. Nursing Care of the Critically Ill Client
Fall. 3(2-3)
P: NUR 304, NUR 306, NUR 308. R: College of Nursing majors only.
Advanced medical-surgical nursing concepts. Preceptor practicum.

490. Independent Study in Nursing
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course.
R: Open only to College of Nursing seniors. Approval of college.
Individualized area of study in Nursing.

491. Special Topics
Fall, Spring, Summer. 2 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course.
R: Open only to College of Nursing majors.
Exploration of selected issues in nursing.

500. Health Assessment for Advanced Nursing Practice
Spring. 3(1-6)
R: Open only to College of Nursing graduate students.
Collecting subjective and objective data to describe the client's health history, health problems, coping mechanisms, belief and value orientation, and physical status. Interviewing techniques and physical examination skills stressed.