

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. Nature and Practice of Science
Fall, Spring, 1(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 Sciences. Administered by Crop and Soil Sciences.
R: Approval of department; application required.
Confocal imaging, theory and practice. Basic optics. Lasers. Light paths for transmission, fluorescence and reflection. Image quality, analysis and processing.

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.
P: Secondary certification in biology; 3 years teaching experience. C: NSC 850 concurrently. 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 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.
P: Secondary certification in biology, 3 years teaching experience. C: NSC 855 concurrently. 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, 1 to 8 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.
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 concurrently. 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 credits.
P: NUR 204. C: NUR 303 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.

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

**Descriptions —Nursing
of
Courses**

**306. Practicum in Nursing Care of the
Childbearing Family**
Fall, Spring, 3 credits.

P: NUR 204. C: NUR 305 concurrently. R: Open only to College of Nursing students.

Practicum in nursing care with culturally diverse child-bearing 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 concurrently. 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 credits.

P: NUR 204. C: NUR 307 concurrently. 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)

P: STT 200 or STT 201 R: Open only to sophomores or juniors or seniors in the College of Nursing. 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 credits.

C: NUR 409 concurrently. 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 credits.

C: NUR 409 concurrently. 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. Preceptored 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.

**501. Clinical Nurse Specialist in Primary
Care**

Fall, 2(2-0)

R: Open only to graduate students in College of Nursing.

Practice concepts, role characteristics, and definitions critical to implementation of clinical nurse specialist role in primary care.

**503. Primary Care: Organizational
Structures, Policy and Change**

Spring, 2(2-0)

P: NUR 501. R: Open only to graduate students in College of Nursing.

Health care organizations in primary care. Roles of federal and state government in health care policy and their influence on health care organizations.

505. Theoretical Foundations of Nursing

Fall, 2(2-0)

R: Open only to graduate students in College of Nursing and to R.N.s with approval of department.

Analysis and evaluation of nursing theories and conceptual models.

507. Research Methods in Health Care

Spring, 3(3-0)

R: Open only to graduate students in College of Nursing. Basic statistics course or concurrently.

Research methods commonly used in health research. Critique of applicability of research findings to practice.

509. Research Analysis in Health Care

Fall, 3(2-2)

P: NUR 507.

Review and application of research analyses commonly used in health care.

**511. Primary Care Clinical Therapeutics for
Advanced Nursing Practice**

Fall, 3(3-0)

R: Open only to graduate students in College of Nursing and to R.N.s with approval of department.

Concepts of pharmacology and pathophysiology applied to common primary health care problems.

**513. Advanced Independent Nursing
Interventions**

Spring, 3(3-0)

R: Open only to graduate students in College of Nursing and to R.N.s with approval of department.

Concepts underlying advanced nursing interventions in primary care.

**521. Family Health Seminar for the Clinical
Nurse Specialist**

Fall, 3(3-0)

R: Open only to graduate students in College of Nursing.

Family health and role of the clinical nurse specialist. Reciprocal influences of the client-family system, the health care delivery system, and other social systems in family health.

**522. Family Clinical Nurse Specialist
Practicum I**

Fall, 4(2-8)

P: NUR 500, NUR 503, NUR 505, NUR 511, NUR 513, NUR 521. R: Open only to graduate students in College of Nursing Family Clinical Nurse Specialist program.

Health and uncomplicated health problems in primary care. Collaborative practice model.

**524. Family Clinical Nurse Specialist
Practicum II**

Spring, 4(2-8)

P: NUR 522. R: Open only to graduate students in College of Nursing Family Clinical Nurse Specialist program.

Complex health problems in primary care. Collaborative practice model.

531. Aging, Environment and Health

Fall, 3(3-0)

R: Open only to graduate students.

Process of aging in context of family, the community, and contemporary American society. Impact on health status.

532. Gerontological Clinical Nurse Specialist Practicum I
Fall. 4(2-8)
P: NUR 500, NUR 503, NUR 505, NUR 511, NUR 513, NUR 531. R: Open only to graduate students in College of Nursing Gerontological Clinical Nurse Specialist program.
Care of aged clients with stable health and function. Collaborative practice model in primary care.

534. Gerontological Clinical Nurse Specialist Practicum II
Spring. 4(2-8)
P: NUR 532. R: Open only to graduate students in College of Nursing Gerontological Clinical Nurse Specialist program.
Care of aged clients with complex health problems and functional losses. Collaborative practice model in primary care.

541. Women and Health in the United States: A Sociological and Nursing Perspective
Spring. 3(3-0)
R: Open only to seniors and graduate students.
Health status of contemporary women. Role of women as consumers and providers of health care. Health care delivery in the U.S.

543. Human Sexuality and Health
Spring. 3(3-0)
R: Open only to seniors and graduate students.
Physiological and psychosocial components of sexual function. Clinical assessment and interventions for sexual problems common in primary care.

551. Impact of Chronic Illness on Young Children
Fall. 3(3-0)
R: Open only to seniors and graduate students.
Impact of chronic illness on growth and development of children from infancy through early childhood. Family and individual intervention strategies.

590. Special Problems
Fall, Spring. 1 to 4 credits. A student may earn a maximum of 24 credits in all enrollments for this course.
R: Open only to graduate students in College of Nursing. Approval of college.
Individual or group in-depth study of specific areas in nursing. Independent study.

591. Selected Topics
Fall, Spring. 1 to 4 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
R: Open only to graduate students in College of Nursing. Approval of college.
Selected issues, trends, programs, or theories in nursing.

898. Master's Scholarly Project
Fall, Spring. 1 to 6 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
P: NUR 507. R: Approval of college.
A planning, implementing, and evaluating project that addresses a significant clinical nursing problem relevant to primary care and advanced practice.

899. Master's Thesis Research
Fall, Spring. 1 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course.
P: NUR 507. R: Open only to graduate students in College of Nursing. Approval of college.

OBSTETRICS, GYNECOLOGY AND REPRODUCTIVE BIOLOGY OGR

**Department of Obstetrics,
Gynecology and Reproductive
Biology
College of Human Medicine**

608. Obstetrics and Gynecology Required Clerkship
Fall, Spring, Summer. 6 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
P: FMP 602. R: Open only to graduate-professional students in College of Human Medicine.

Obstetrics and gynecology in inpatient and ambulatory settings. Clinical experiences, didactic sessions, hospital rounds discussions. Case writeups and presentations.

609. Advanced Obstetrics and Gynecology Clerkship
Fall, Spring, Summer. 4 to 6 credits.
P: OGR 608. R: Open only to graduate-professional students in College of Human Medicine.
Additional exposure to obstetrics or gynecology in the preceptor mode. Participation in ambulatory and inpatient care including surgery. May include maternal and fetal medicine

610. Perinatology Clerkship
Fall, Spring, Summer. 4 to 6 credits.
P: OGR 608. R: Open only to graduate-professional students in College of Human Medicine.
Additional exposure to high risk obstetrics including prenatal diagnosis and counseling, antepartum evaluation, and care of the high risk patient. Management of the intrapartum high risk patient.

611. Reproductive Endocrinology and Infertility Clerkship
Fall, Spring, Summer. 4 to 6 credits.
P: OGR 608. R: Open only to graduate-professional students in College of Human Medicine.
Added exposure to clinical problems in reproductive endocrinology and female infertility primarily in ambulatory setting. Occasional participation in inpatient experiences. Assisted reproductive technologies.

612. Gynecologic Oncology Clerkship
Fall, Spring, Summer. 4 to 6 credits.
P: OGR 608. R: Open only to graduate-professional students in College of Human Medicine.
Added clinical experience in inpatient and ambulatory gynecologic oncology, breast disease, and complicated benign gynecology in the preceptor mode. Pre-treatment evaluation and cancer management, including surgery.

637. Core Competencies III
Spring, Summer. 2 credits. A student may earn a maximum of 6 credits in all enrollments for this course. Interdepartmental with Human Medicine, Medicine, Pediatrics and Human Development, Family Practice, and Surgery. Administered by Human Medicine.
P: FMP 602. R: Open only to graduate-professional students in College of Human Medicine.
A weekly seminar addressing core knowledge and skills from an interdisciplinary perspective.

640. Advanced Comprehensive Care
Fall, Spring, Summer. 6 credits. A student may earn a maximum of 18 credits in all enrollments for this course. Interdepartmental with Human Medicine, Pediatrics and Human Development, Medicine, and Family Practice. Administered by Human Medicine.
P: FMP 608, PHD 600, MED 608. R: Open only to graduate-professional students in College of Human Medicine.
Clinical experience in community-oriented primary care. Emphasis on urban and rural underserved populations.

OSTEOPATHIC MANIPULATIVE MEDICINE OMM

**Department of Osteopathic
Manipulative Medicine
College of Osteopathic Medicine**

590. Special Problems in Biomechanics
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 48 credits in all enrollments for this course.
R: Approval of department.
Each student works under faculty direction on an experimental, theoretical, or applied problem.

601. Osteopathic Manipulative Medicine Clerkship
Fall, Spring, Summer. 1 to 20 credits. A student may earn a maximum of 30 credits in all enrollments for this course.
R: Open only to graduate-professional students in the College of Osteopathic Medicine upon completion of Units I and II.
Advanced training in the diagnosis of musculoskeletal dysfunction and application of osteopathic manipulative techniques.

620. Directed Studies
Fall, Spring, Summer. 1 to 30 credits. A student may earn a maximum of 30 credits in all enrollments for this course.
Individual or group work on special problems related primarily to the biomechanics of the musculoskeletal system.

800. Special Topics
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 3 credits in all enrollments for this course.
Directed study in topics of biomechanics.

830. Biomechanical Analysis of Physical Activity
Fall. 3(2-2) Interdepartmental with Physical Education and Exercise Science. Administered by Physical Education and Exercise Science.
Kinematic analysis of mechanical and anatomical characteristics in physical activity and sport skills.

831. Advanced Biomechanics of Physical Activity
Spring of even-numbered years. 3(2-2) Interdepartmental with Physical Education and Exercise Science. Administered by Physical Education and Exercise Science.
P: PES 830.
Kinetic analyses of the performance of physical activity and sport.

841. Theory of Neuromuscular Mechanics
Fall of even-numbered years. 2(2-0)
Neurological control of joint mechanics.

861. Clinical Biomechanics
Spring of odd-numbered years. 3(3-0)
Application of biomechanics to medicine.