

# NATURAL SCIENCES (NSCI)

## Natural Sciences Undergraduate Courses

### NSCI 1050 SCIENCE AND CRITICAL THINKING (3 credits)

Introduction to the fundamental laws and principles of science and practice using the scientific method in everyday life to distinguish between scientific evidence and pseudoscientific thinking. Students will examine the science underlying popular pseudoscientific subjects such as ghosts, psychics, Bigfoot and other monsters, and space aliens. Offered every fall semester.

**Distribution:** Natural/Physical Science General Education course

### NSCI 1060 INTRODUCTION TO URBAN HEALTHCARE (2 credits)

Students will explore current topics such as biological, environmental, sociological, and psychological determinants of health and disease, and health issues as they relate to healthcare in urban environments. This course is designed to prepare students to enter health professions and successfully apply these concepts in an urban underserved healthcare setting.

**Prerequisite(s):** Instructor permission required.

### NSCI 3940 WRITING IN CHEMISTRY (2 credits)

Techniques and practices for writing in chemistry. Fulfills 2 credit hours of the third writing course requirement for students with a major in chemistry. (Spring)

**Prerequisite(s):** ENGL 1160, and CHEM 2400 or 2500 with a grade of C- or better.

**Distribution:** Writing in the Discipline Sequenced Course

### NSCI 4060 BASIC LABORATORY CONCEPTS (1 credit)

This course introduces basic clinical laboratory practices and techniques, principles of laboratory safety and infection control, professional ethics, specimen collection, handling, and processing, laboratory math concepts, and phlebotomy.

**Prerequisite(s):** Enrollment in the Nebraska Methodist Hospital Medical Laboratory Science Program.

### NSCI 4080 CLINICAL IMMUNOLOGY & SEROLOGY (1 credit)

The course introduces the study of the immune system and the laboratory tests used to identify its disorders with practical application of immunologic and serologic principles to aid in the diagnosis of infectious and autoimmune diseases. The theory and application of basic molecular diagnostic tools are also addressed. A laboratory component is included in this course.

**Prerequisite(s):** Enrollment in the Nebraska Methodist Hospital Medical Laboratory Science Program.

### NSCI 4100 CLINICAL CHEMISTRY I (4 credits)

This is the first semester of a two semester series on clinical chemistry. This course introduces the theory, technical performance, and evaluation of clinical chemistry laboratory procedures. Basic physiology of organ systems and clinically significant analytes are emphasized. Correlation of clinical laboratory data with the diagnosis and treatment endocrine disorders is also introduced. The course will include instrumentation, methodologies and quality control. A laboratory component is included in this course.

**Prerequisite(s):** Enrollment in the Nebraska Methodist Hospital Medical Laboratory Science Program.

### NSCI 4110 CLINICAL CHEMISTRY II (3 credits)

This is the second semester of a two semester series on clinical chemistry. This course expands on the theory, technical performance, and evaluation of chemistry laboratory procedures introduced in NSCI 4100 Clinical Chemistry I. Practical application and correlation of clinical laboratory data with disease states and treatment is emphasized, with a thorough examination of methodologies and problem-solving concepts. Advanced analytical skills, improved laboratory testing efficiency, workload management, and the resolution of unexpected laboratory results are covered in this course. Quality management which includes quality control, quality assurance, and instrument maintenance will also be included. A laboratory component is included in this course.

**Prerequisite(s):** Enrollment in the Nebraska Methodist Hospital Medical Laboratory Science Program; NSCI 4100.

### NSCI 4120 CLINICAL HEMATOLOGY I (4 credits)

This is the first semester of a two semester series on clinical hematology and hemostasis. The course involves the study and testing of red blood cells, white blood cells, and blood clotting factors. In addition, the function of blood and the blood-forming organs is taught in this course. The course includes an overview of basic microscopy. Practical application and correlation of clinical laboratory data with disease states is emphasized. A laboratory component is included in this course.

**Prerequisite(s):** Enrollment in the Nebraska Methodist Hospital Medical Laboratory Science Program.

### NSCI 4130 CLINICAL HEMATOLOGY II (3 credits)

This is the second semester of a two semester series on clinical hematology and hemostasis; the course builds on the material introduced in NSCI 4120 Clinical Hematology I. Theoretical aspects of specialized hematology and coagulation techniques are reviewed, with a thorough examination of testing methodologies and problem-solving concepts. Hematology and coagulation disease states are thoroughly studied and correlated to the clinical laboratory data. Emphasis is placed on advanced analytical skills, improved laboratory testing efficiency, workload management, and the resolution of unexpected laboratory results. Quality management which includes quality control, quality assurance, laboratory techniques, and instrument maintenance will also be included. A laboratory component is included in this course.

**Prerequisite(s):** Enrollment in the Nebraska Methodist Hospital Medical Laboratory Science Program; NSCI 4120.

### NSCI 4140 CLINICAL IMMUNOHEMATOLOGY I (3 credits)

This is the first semester of a two semester series on immunohematology. This course introduces the study of blood group antigens and antibodies as applied to the transfusion of blood and blood components. The course involves the study of the principles, procedures, and clinical significance of transfusion medicine. Included will be a brief overview of genetics, immunology, and regulations governing blood banks. Recognition of unexpected laboratory results will be emphasized. Quality testing which includes quality control, basic transfusion medicine laboratory techniques and procedures, and safety will also be included.

**Prerequisite(s):** Enrollment in the Nebraska Methodist Hospital Medical Laboratory Science Program

### NSCI 4150 CLINICAL IMMUNOHEMATOLOGY II (3 credits)

This is the second semester of a two semester series on immunohematology. The course continues the study of the principles, procedures, and clinical significance of transfusion medicine introduced in NSCI 4140 Clinical Immunohematology I. Advanced immunohematology theory and laboratory techniques are taught, with a thorough examination of methodologies and problem-solving concepts. These include, but are not limited to: compatibility testing, adverse transfusion events, hemolytic anemia, differentiating multiple blood group antibodies, and the resolution of unexpected laboratory results. Emphasis is placed on advanced analytical skills, improved laboratory testing efficiency, and workload management. Quality management which includes quality control, quality assurance, laboratory techniques, and instrument maintenance will also be included.

**Prerequisite(s):** Enrollment in the Nebraska Methodist Hospital Medical Laboratory Science Program; NSCI 4140

**NSCI 4160 CLINICAL MICROBIOLOGY I (4 credits)**

This is the first semester of a two semester series on clinical microbiology. This course introduces the study and laboratory identification of bacteria of clinical significance using culture, biochemical, molecular, and microscopic methods, as well as, the performance and interpretation of bacterial antibiotic susceptibility testing. The course introduces the study of viruses and their detection and identification. Instrumentation and quality control are also included in this course.

**Prerequisite(s):** Enrollment in the Nebraska Methodist Hospital Medical Laboratory Science Program

**NSCI 4170 CLINICAL MICROBIOLOGY II (4 credits)**

This is the second semester of a two semester series in clinical microbiology; the course builds on the material introduced in NSCI 4160 Clinical Microbiology I and NSCI 4080 Clinical Immunology and Serology. This course advances the study and laboratory identification of bacteria of clinical significance, with a thorough examination of methodologies and problem-solving concepts, including the resolution of unexpected laboratory results. The course includes the study of viruses, parasites, and fungi, and their detection and identification. The course continues the study of serologic principles and methods to aid in the diagnosis of infectious diseases. Emphasis is placed on advanced analytical skills, improved laboratory testing efficiency, and workload management. Quality management which includes quality control, quality assurance, laboratory techniques, and instrument maintenance will also be included.

**Prerequisite(s):** Enrollment in the Nebraska Methodist Hospital Medical Laboratory Science Program; NSCI 4160; NSCI 4080.

**NSCI 4180 CLINICAL MICROSCOPY I (1 credit)**

This is the first semester of a two semester series on clinical urine and body fluid analysis. Study of urine includes physiology of renal function, as well as, the significance of cellular and chemical constituents of urine. Microscopic evaluation of other significant body fluids and clinical diagnoses are introduced. A laboratory component is included in this course.

**Prerequisite(s):** Enrollment in the Nebraska Methodist Hospital Medical Laboratory Science Program

**NSCI 4190 CLINICAL MICROSCOPY II (1 credit)**

This is the second semester of a two semester series on clinical urine and body fluid analysis. This course expands on the theory, technical performance, and evaluation of laboratory procedures introduced in NSCI 4180 Clinical Microscopy I. The physiology of renal function and the significance of cellular and chemical constituents of urine are reviewed, with a thorough examination of methodologies and problem-solving concepts. Practical application and correlation of clinical laboratory data along with patient diagnosis is emphasized. Students develop multi-tasking and trouble-shooting skills to aid in workload management. Quality management which includes quality control, quality assurance, laboratory techniques, and instrument maintenance will also be included. A laboratory component is included in this course.

**Prerequisite(s):** Enrollment in the Nebraska Methodist Hospital Medical Laboratory Science Program; NSCI 4180

**NSCI 4200 CLINICAL LABORATORY MANAGEMENT I (1 credit)**

This course introduces the study of the basic concepts and principles of the management process with particular emphasis on laboratory operations. Laboratory safety, quality control, professionalism, scope of practice, research applications, and educational methodologies are topics included in this course.

**Prerequisite(s):** Enrollment in the Nebraska Methodist Hospital Medical Laboratory Science Program

**NSCI 4210 CLINICAL LABORATORY MANAGEMENT II (1 credit)**

This course builds on the study of the basic concepts and principles of the management process introduced in NSCI 4200 Clinical Laboratory Management I. Laboratory compliance and regulatory issues, financial resource management, human resource management, method validation, professionalism, and quality management are topics included in this course.

**Prerequisite(s):** Enrollment in the Nebraska Methodist Hospital Medical Laboratory Science Program; NSCI 4200.

**NSCI 4230 MEDICAL LABORATORY SCIENCE CLINICAL CORRELATION (2 credits)**

This is a comprehensive course that uses lecture and case studies as an in-depth review of the theory and laboratory findings in all areas of the clinical laboratory including: immunology & serology, chemistry, hematology, immunochemistry, microbiology, and microscopy. Practical application and correlation of clinical laboratory data, disease states, and diagnoses are emphasized.

**Prerequisite(s):** Enrollment in the Nebraska Methodist Hospital Medical Laboratory Science Program; NSCI 4080; NSCI 4100; NSCI 4120; NSCI 4140; NSCI 4160; NSCI 4180