MEDICAL LABORATORY SCIENCE (MLS)

MLS 3150 - Urinalysis and Immunology Laboratory
Credit(s): 1 Credit
A laboratory course designed to provide hands-on laboratory experiences in the analysis of urine and an introduction to the analysis of other body fluids to include spinal fluid using real patient samples. Students will learn and perform the three phases of urine analysis to include the physical, chemical and microscopic evaluation of a urine sample. The principles of urinalysis testing will be discussed along with the clinical significance of the various procedures used in testing urine and their role in disease diagnosis.
Corequisite(s): BLS 3110
Restrictions:
Enrollment is limited to students with a major in Investigative Medical Science or Medical Laboratory Science.

MLS 3210 - Clinical Education & Laboratory Management
Credit(s): 2 Credits
This course provides an overview of basic principles of education and concepts of management and their application in the clinical laboratory setting.
Restrictions:
Enrollment is limited to students with a major in Investigative Medical Science or Medical Laboratory Science.

MLS 3400 - Laboratory Operations
Credit(s): 1 Credit (Repeatable for credit)
This course introduces students to the general operation of a clinical laboratory. Content focuses on laboratory organization, laboratory safety, basic laboratory equipment, laboratory math, pre-analytical, analytical and post-analytical variables, method validation, quality control procedures, calibration, and regulatory requirements.
Prerequisite(s): MATH 1300 with a grade of C- or higher
Restrictions:
Enrollment is limited to students with a major in Investigative Medical Science or Medical Laboratory Science.

MLS 4150 - Analytical Chemistry
Credit(s): 2 Credits
A hybrid lecture/laboratory course which introduces analytical principles and instrumentation used in a clinical chemistry laboratory. Topics include: photometry, electrochemistry, immunoassays, chromatography, mass spectrometry, osmometry, automation, and point-of-care-testing. Experiments are designed to demonstrate basic principles and laboratory techniques.
Corequisite(s): BLS 4110
Restrictions:
Enrollment is limited to students with a major in Investigative Medical Science or Medical Laboratory Science.

MLS 4161 - Molecular Biology Laboratory
Credit(s): 1 Credit
A laboratory course which presents concepts of molecular biology and experiences in a variety of molecular techniques to include the use of restriction enzymes, isolation of genomic DNA, evaluation of DNA purity, hybridization techniques, amplification techniques, gel electrophoresis, recombinant DNA techniques, microarray assays, and use of bioinformatics websites for sequence searching.
Corequisite(s): BLS 4130
Restrictions:
Enrollment is limited to students with a major in Investigative Medical Science or Medical Laboratory Science.

MLS 4250 - Hematology Laboratory
Credit(s): 1 Credit
Performance, interpretation, and troubleshooting of a variety of basic hematology procedures will be accomplished using clinical specimens. Cell counts and differentials and other hematology procedures will be performed on blood. Physical analysis and cell counting procedures will be discussed and performed on various body fluids. Principles and reactions involved in the testing procedure will be emphasized as well as the interpretation of results. Students will also receive an introduction to phlebotomy.
Corequisite(s): BLS 4210
Restrictions:
Enrollment is limited to students with a major in Investigative Medical Science or Medical Laboratory Science.

MLS 4350 - Immunohematology Lab
Credit(s): 1 Credit
Practice in routine testing procedures utilized in the blood bank such as blood typing, antibody identification, and crossmatching using clinical samples. Theoretical principles, troubleshooting procedures and interpretation of results will be discussed.
Corequisite(s): BLS 4310
Restrictions:
Enrollment is limited to students with a major in Investigative Medical Science or Medical Laboratory Science.

MLS 4520 - Medical Bacteriology
Credit(s): 2 Credits
Content focuses on prokaryotic microbes of pathologic importance. Included are discussions on structure, molecular biology, molecular diagnostics, metabolism, growth, replication, current topics and emerging concerns. Pathogenicity, epidemiology, diagnosis and laboratory identification of important groups of human pathogenic bacteria are emphasized. Modes of action of selected antimicrobics and chemotherapeutic agents are also discussed.
Prerequisite(s): BLS 4510 with a grade of C or higher
Corequisite(s): MLS 4550
Restrictions:
Enrollment is limited to students with a major in Investigative Medical Science or Medical Laboratory Science.
MLS 4541 - Medical Mycology and Parasitology
Credit(s): 2 Credits
Course will focus on the clinically relevant parasites and fungi and the diseases they produce in man. Terminology, taxonomy, aspects of epidemiology, modes of transmission, pathogenesis, morphology, life cycles, specimen processing, and techniques of laboratory identification are discussed.
Prerequisite(s): MLS 4511 with a grade of C or higher
Corequisite(s): MLS 4571
Restrictions:
Enrollment is limited to students with a major in Investigative Medical Science or Medical Laboratory Science.

MLS 4550 - Medical Bacteriology Laboratory
Credit(s): 2 Credits
Laboratory course designed to give the student experience in the Gram staining, isolation, identification and susceptibility testing of microorganisms.
Prerequisite(s): MLS 4510 with a grade of C or higher
Corequisite(s): MLS 4520
Restrictions:
Enrollment is limited to students with a major in Investigative Medical Science or Medical Laboratory Science.

MLS 4571 - Medical Mycology and Parasitology Laboratory
Credit(s): 1 Credit
A laboratory course involving the analysis and identification of the clinically relevant fungi and parasites and the diseases they produce in man. Techniques of laboratory identification are discussed.
Prerequisite(s): MLS 4510 with a grade of C or higher
Corequisite(s): MLS 4541
Restrictions:
Enrollment is limited to students with a major in Investigative Medical Science or Medical Laboratory Science.

MLS 4611 - Advanced Topics and Case Correlations
Credit(s): 3 Credits
Key content areas of laboratory medicine will be reviewed and advanced topics and specialty areas in the clinical laboratory will be discussed. Clinical case studies addressing laboratory test/disease correlation, the selection of laboratory tests, interpretation of laboratory results, and problem resolution will be emphasized. Advanced theory and clinical practice issues are presented and reinforced through lectures, discussions, and case presentations.
Prerequisite(s): MLS 4701 with a grade of C or higher; MLS 4710 with a grade of C or higher; MLS 4821 with a grade of C or higher
Corequisite(s): MLS 4610 with a grade of C or higher
Restrictions:
Enrollment is limited to students with a major in Investigative Medical Science or Medical Laboratory Science.

MLS 4620 - Advanced Topics and Case Correlations - Clinical Chemistry
Credit(s): 1 Credit
Key content areas of clinical chemistry will be reviewed, advanced topics and specialty areas in the clinical chemistry laboratory will be discussed. Clinical case studies addressing laboratory test/disease correlation, the selection of laboratory tests, interpretation of laboratory results, and problem resolution will be emphasized. Advanced theory and clinical practice issues are presented and reinforced through lectures, discussions, and case presentations.
Prerequisite(s): MLS 4701 with a grade of C or higher; MLS 4710 with a grade of C or higher
Restrictions:
Enrollment is limited to students with a major in Investigative Medical Science or Medical Laboratory Science.

MLS 4630 - Advanced Topics and Case Correlations - Hematology
Credit(s): 1 Credit
Key content areas in clinical hematology will be reviewed, advanced topics and specialty areas in the clinical hematology laboratory will be discussed. Clinical case studies addressing laboratory test/disease correlation, the selection of laboratory tests, interpretation of laboratory results, and problem resolution will be emphasized. Advanced theory and clinical practice issues are presented and reinforced through lectures, discussions, and case presentations.
Prerequisite(s): MLS 4740 with a grade of C or higher; MLS 4750 with a grade of C or higher; MLS 4821 with a grade of C or higher
Restrictions:
Enrollment is limited to students with a major in Investigative Medical Science or Medical Laboratory Science.

MLS 4640 - Advanced Topics and Case Correlations - Microbiology
Credit(s): 1 Credit
Key content areas in clinical microbiology will be reviewed, advanced topics and specialty areas in the clinical microbiology laboratory will be discussed. Clinical case studies addressing laboratory test/disease correlation, the selection of laboratory tests, interpretation of laboratory results, and problem resolution will be emphasized. Advanced theory and clinical practice issues are presented and reinforced through lectures, discussions, and case presentations.
Prerequisite(s): MLS 4740 with a grade of C or higher; MLS 4800 with a grade of C or higher
Restrictions:
Enrollment is limited to students with a major in Investigative Medical Science or Medical Laboratory Science.

MLS 4671 - Clinical Chemistry Practicum
Credit(s): 3 Credits
Clinical rotation course focuses on clinical chemistry testing in a practicum setting. Concepts and techniques include: protein structure and function; enzyme kinetics; carbohydrate and lipid metabolism; hormonal regulation; pathophysiology of water, electrolyte, acid-base balance, and special techniques. Laboratory techniques, workflow management, quality control and evaluation of results in the interpretation of health/disease status are emphasized.
Prerequisite(s): BLS 4110 with a grade of C or higher; BLS 4120 with a grade of C or higher
Corequisite(s): MLS 4710
Restrictions:
Enrollment is limited to students with a major in Investigative Medical Science or Medical Laboratory Science.
MLS 4710 - Clinical Chemistry Testing  
**Credit(s): 1 Credit**  
Discussions, assignments and exams covering the theory, concepts and procedures used in the clinical chemistry practicum.  
**Prerequisite(s):** BLS 4110 with a grade of C or higher; BLS 4120 with a grade of C or higher; MLS 4150 with a grade of C or higher  
**Corequisite(s):** MLS 4701  
**Restrictions:**  
Enrollment is limited to students with a major in Investigative Medical Science or Medical Laboratory Science.

MLS 4740 - Clinical Hematology Practicum  
**Credit(s): 2 Credits**  
Clinical rotation course focuses on the counting, identification and analysis of the cellular components of blood in a clinical laboratory setting using advanced techniques and state of the art computer integrated instruments. Laboratory techniques, workflow management, quality control and evaluation of results in the interpretation of health/disease status are emphasized.  
**Prerequisite(s):** BLS 4210 with a grade of C or higher; MLS 4250 with a grade of C or higher  
**Corequisite(s):** MLS 4750  
**Restrictions:**  
Enrollment is limited to students with a major in Investigative Medical Science or Medical Laboratory Science.

MLS 4750 - Clinical Hematology  
**Credit(s): 1 Credit**  
Discussions, assignments and exams covering the theory, concepts and procedures used in the clinical hematology practicum.  
**Prerequisite(s):** BLS 4210 with a grade of C or higher; MLS 4250 with a grade of C or higher  
**Corequisite(s):** MLS 4740  
**Restrictions:**  
Enrollment is limited to students with a major in Investigative Medical Science or Medical Laboratory Science.

MLS 4760 - Clinical Hemostasis Practicum  
**Credit(s): 1 Credit**  
Clinical rotation course involving specialized hemostasis testing in a practicum setting. Concepts and techniques include the evaluation of bleeding and thrombotic disorders. Laboratory techniques, workflow management, quality control and evaluation of results in the interpretation of health/disease status are emphasized.  
**Prerequisite(s):** BLS 4220 with a grade of C or higher  
**Restrictions:**  
Enrollment is limited to students with a major in Investigative Medical Science or Medical Laboratory Science.

MLS 4770 - Clinical Immunohematology Practicum  
**Credit(s): 2 Credits**  
Clinical rotation course providing laboratory experience in routine and specialized blood bank techniques such as antibody identification, crossmatching and component preparation. Laboratory techniques, workflow management, quality control and evaluation of results in the interpretation of health/disease status are emphasized.  
**Prerequisite(s):** BLS 4310 with a grade of C or higher; MLS 4350 with a grade of C or higher  
**Corequisite(s):** MLS 4790  
**Restrictions:**  
Enrollment is limited to students with a major in Medical Laboratory Science.

MLS 4780 - Clinical Immunohematology  
**Credit(s): 1 Credit**  
Discussions, assignments and exams covering the theory, concepts and procedures used in the clinical immunohematology practicum.  
**Prerequisite(s):** BLS 4310 with a grade of C or higher; MLS 4350 with a grade of C or higher  
**Corequisite(s):** MLS 4780  
**Restrictions:**  
Enrollment is limited to students with a major in Medical Laboratory Science.

MLS 4790 - Clinical Immunohematology  
**Credit(s): 1 Credit**  
Discussions, assignments and exams covering the theory, concepts and procedures used in the clinical immunohematology practicum.  
**Prerequisite(s):** BLS 4310 with a grade of C or higher; MLS 4350 with a grade of C or higher  
**Corequisite(s):** MLS 4780  
**Restrictions:**  
Enrollment is limited to students with a major in Medical Laboratory Science.

MLS 4800 - Clinical Microbiology Practicum  
**Credit(s): 3 Credits**  
Clinical rotation course applying principles and procedures used in the isolation, identification and susceptibility testing of microorganisms in a clinical setting. Laboratory techniques, workflow management, quality control and evaluation of results in the interpretation of health/disease status are emphasized.  
**Prerequisite(s):** BLS 4510 with a grade of C or higher; MLS 4520 with a grade of C or higher  
**Corequisite(s):** MLS 4811  
**Restrictions:**  
Enrollment is limited to students with a major in Investigative Medical Science or Medical Laboratory Science.

MLS 4811 - Clinical Microbiology  
**Credit(s): 1 Credit**  
Assignments and exams covering the theory, concepts and procedures used in the clinical microbiology practicum.  
**Prerequisite(s):** BLS 4510 with a grade of C or higher; MLS 4520 with a grade of C or higher  
**Corequisite(s):** MLS 4800  
**Restrictions:**  
Enrollment is limited to students with a major in Investigative Medical Science or Medical Laboratory Science.

MLS 4821 - Clinical Urinalysis and Phlebotomy  
**Credit(s): 1 Credit**  
Clinical rotation course focuses on the physical, chemical and cellular components of urine and the principles and procedures of blood collection in a clinical laboratory setting. Professional and interpersonal communication with patients along with accurate selection and handling of equipment/collection are emphasized. Laboratory techniques, workflow management, quality control and evaluation of results in the interpretation of health/disease status are emphasized.  
**Prerequisite(s):** BLS 3110 with a grade of C or higher; MLS 3150 with a grade of C or higher  
**Restrictions:**  
Enrollment is limited to students with a major in Investigative Medical Science or Medical Laboratory Science.