MEDICAL LABORATORY SCIENCE (MLS)

MLS 3150 - Urinalysis and Immunology Laboratory
Credit(s): 1 Credit
Students will learn and perform serological and immunological laboratory testing, an introduction to body fluid analysis, as well as a how to perform and interpret a complete urinalysis (physical, chemical, and microscopic exams). Related lab math, correlation to disease states, and safety is discussed as well as the pre-analytical, analytical, and post-analytical factors impacting test results.
Corequisite(s): BLS 3110
Restrictions:
Enrollment is limited to students with a major in Investigative Med Sciences 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 Med Sciences 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 Med Sciences or Medical Laboratory Science.

MLS 3930 - Special Topics
Credit(s): 1-3 Credits (Repeatable for credit)

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 Med Sciences 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 Med Sciences 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 Med Sciences or Medical Laboratory Science.

MLS 4515 - Medical Microbiology Laboratory
Credit(s): 1 Credit
Medical Microbiology Laboratory is a one-semester course that offers student an opportunity to exercise medical microbiological principles, including plating, workup, identification, and reporting of organisms in the clinical setting. (Offered in Fall)
Corequisite(s): BLS 4510
Restrictions:
Enrollment limited to students in the following programs:
- BS ES, Athletic Train(Pre-PA)
- BS NutritionDiet-PrePA
- BS Health Info Mgmt-Pre PA
- BS Health Sciences-Pre-PA
- BS Invstgve Med Sci-PrePA
- BS Medical Lab Sci-Pre-PA
- BS Magnetic Res Img-Pre PA
- BS Nuclear Med Tech-Pre PA
- BS Radiation Thrpy-Pre PA

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 Med Sciences 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 4510 with a grade of C or higher  
**Corequisite(s):** MLS 4571  
**Restrictions:**  
Enrollment is limited to students with a major in Investigative Med Sciences 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 Med Sciences or Medical Laboratory Science.  

MLS 4561 - 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 4740 with a grade of C or higher; MLS 4750 with a grade of C or higher; MLS 4760 with a grade of C or higher; MLS 4770 with a grade of C or higher; MLS 4780 with a grade of C or higher; MLS 4790 with a grade of C or higher; MLS 4800 with a grade of C or higher; MLS 4811 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 Medical Laboratory Science.  

MLS 4600 - 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 Med Sciences or Medical Laboratory Science.  

MLS 4601 - 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 4800 with a grade of C or higher; MLS 4811 with a grade of C or higher  
**Restrictions:**  
Enrollment is limited to students with a major in Investigative Med Sciences 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 4740 with a grade of C or higher; MLS 4750 with a grade of C or higher; MLS 4760 with a grade of C or higher; MLS 4770 with a grade of C or higher; MLS 4780 with a grade of C or higher; MLS 4790 with a grade of C or higher; MLS 4800 with a grade of C or higher; MLS 4811 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 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; MLS 4821 with a grade of C or higher  
**Restrictions:**  
Enrollment is limited to students with a major in Investigative Med Sciences 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 Med Sciences 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 4800 with a grade of C or higher; MLS 4811 with a grade of C or higher  
**Restrictions:**  
Enrollment is limited to students with a major in Investigative Med Sciences or Medical Laboratory Science.  

MLS 4701 - 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; MLS 4150 with a grade of C or higher  
**Corequisite(s):** MLS 4710  
**Restrictions:**  
Enrollment is limited to students with a major in Investigative Med Sciences or Medical Laboratory Science.  

MLS 4710 - Clinical Chemistry  
**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 Med Sciences 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 Med Sciences 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 Med Sciences 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 Med Sciences or Medical Laboratory Science.

MLS 4770 - Clinical Phlebotomy Practicum  
Credit(s): 1 Credit  
Clinical rotation course where experience is gained in the principles and procedures of blood collection. Professional and interpersonal communication with patients along with accurate selection and handling of equipment/collection are emphasized. Following OSHA and standard clinical safety guidelines in the collection and handling of blood is required.  
Corequisite(s): MLS 4790  
Restrictions:  
Enrollment is limited to students with a major in Investigative Med Sciences or Medical Laboratory Science.

MLS 4780 - 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 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; MLS 4550 with a grade of C or higher  
Corequisite(s): MLS 4811  
Restrictions:  
Enrollment is limited to students with a major in Investigative Med Sciences 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; MLS 4550 with a grade of C or higher  
Corequisite(s): MLS 4800  
Restrictions:  
Enrollment is limited to students with a major in Investigative Med Sciences 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 Med Sciences or Medical Laboratory Science.