MEDICAL LABORATORY SCIENCE (MLS)

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MLS 401 Laboratory Fundamentals (2 Credit Hours)
Introduction to life in the clinical laboratory. Safety practices, laboratory mathematics, statistical analysis, and fundamental laboratory training in phlebotomy, pipetting, microscopy and calibrations.
Outcomes:
Demonstrate and identify safe and professional knowledge consistent with the field of Medical Laboratory Science, including use of universal precautions and ability to decipher Safety Data Sheets; Accurately perform skills needed in medical laboratory science including phlebotomy, processing of specimens, pipetting, microscopy, and calibrations\\n; Demonstrate competency in use of laboratory calculations\\n; Understand the history and role Medical Laboratory Scientists play in health care

MLS 410 Clinical Immunology (2 Credit Hours)
This course focuses on principles and procedures of immunology and serology. Emphasis will be on the role of the immune system in health and disease and developing an understanding of the role of both humoral and cellular immunity. Admission to M.S. in Medical Laboratory Science program. Upon completion, students will demonstrate understanding of the discipline of immunology and apply theoretical concepts to differentiate patient health and disease states.

MLS 415 Urinalysis and Body Fluids (2 Credit Hours)
Theoretical and applied concepts related to the formation, collection, processing, and evaluation of urine and body fluids. Study of urine and body fluids including chemical, physical, and microscopic properties. This course also encompasses the evaluation of normal fluid characteristics, and those that reflect abnormality or disease. Restricted to students in the M.S. in Medical Laboratory Science program. Upon completion, students will be able to explain the formation of fluids in the human body and correlate normal and pathological states associated with chemical, physical and microscopic findings.

MLS 420 Molecular Diagnostics (2 Credit Hours)
This course is will provide students with an understanding of the processes which have been collectively referred to as molecular biology as they relate to laboratory medicine. Instruction emphasizes molecular methodologies and current applications of molecular diagnostics utilized in the clinical laboratory. Upon completion of this course students will gain a background in molecular biology which will promote critical thinking and problem solving as it relates to clinical molecular diagnostics.

MLS 430 Clinical Chemistry I (3 Credit Hours)
Pre-requisites: Admission to M.S. in Medical Laboratory Science program
This course is designed for medical laboratory science students to gain an understanding of the analytical principles and components of instrumentation utilized in clinical chemistry laboratories.
Outcomes:
Upon completion of this course, students will describe chemical constituents of bodily fluids, their regulation and laboratory methods of analysis for compounds including electrolytes, carbohydrates, lipids and proteins

MLS 440 Clinical Chemistry II (2 Credit Hours)
Advanced course in clinical chemistry/biochemistry which continues study of measurement and interpretation of chemical constituents in human blood and body fluids. Topics include endocrinology, organ systems, therapeutic drug monitoring, toxicology, tumor markers and nutritional chemistry. This course will prepare students for their clinical practicum in Clinical Chemistry. Enrollment Condition: Admission to the M.S. in Medical Laboratory Science program
Outcomes:
Upon completion, students will be able to identify interrelated human metabolic functions in normal and disease states, analyze laboratory data, interpret results, and utilize information to determine a diagnosis

MLS 450 Hematology (4 Credit Hours)
Study of formed elements of blood including normal and abnormal conditions. Recognition and correlation of pathological changes in cells of the peripheral blood and bone marrow to disease states. This course will prepare students for a clinical practicum in Hematology. Admission to the M.S. in Medical Laboratory Science program required. Identification of morphological characteristics for normal and abnormal cellular elements of blood and associations to disease states.
Outcomes:
Students will describe the physiology, development of cells, and process of hematopoiesis

MLS 455 Hemostasis (2 Credit Hours)
This course will cover the mechanisms by which blood coagulates. Topics explored include the pathophysiology of hemostatic disorders and the antithrombotic therapies utilized to manage them. Focus on examination of the coagulation system and correlations of laboratory results to clinical findings in the classification of disorders. Admission to the M.S. in Medical Laboratory Science program. Upon completion of this course students will apply knowledge of the process of coagulation to interpret laboratory results as they relate to hemostatic dysfunctions and treatment of clinical disease.

MLS 460 Immunohematology (5 Credit Hours)
Focus on principles of the antigen/antibody reactions and their relevance to Immunohematology. ABO/Rh and major blood group systems, regulation, procedures, adverse reactions, and donation of blood components are all studied as integral parts to the practice of transfusion medicine. This course prepares students for a clinical practicum in Immunohematology. Enrollment Condition: Admission to the M.S. in Medical Laboratory Science program.
Outcomes:
Upon completion of this course students will be able to apply theoretical concepts and techniques to analyze and determine Immunohematology results

MLS 465 Laboratory Leadership I (1 Credit Hour)
Pre-requisites: Admission to the M.S. in Medical Laboratory Science program
This first of three courses in the leadership series, prepares the student for an entry-level laboratory position by developing skills in basic laboratory management practices including principles of leadership, functions of a manager, and personnel management.
Outcomes:
Upon completion of this course students will be able to utilize leadership theories to evaluate and demonstrate effective management through evaluation of common clinical laboratory issues

MLS 466 Laboratory Leadership II (1 Credit Hour)
The second installment in the three course Leadership series prepares the student for a laboratory position by developing skills in basic laboratory management practices including financial considerations, laboratory regulations, and laboratory operations. Admission to the M.S. in Medical Laboratory Science program. Upon completion of this course students will exhibit knowledge of the financial requirements needed for effective laboratory management and the role of laboratorians in regulation and accreditation of laboratories.

MLS 467 Laboratory Leadership III (1 Credit Hour)
The final installment in the Leadership series of courses prepares the student for a laboratory position by developing skills in career planning, introduction to professional development, grant writing, and process improvement planning. Completion of MLS 466 Laboratory Leadership II and good academic standing as defined by the M.S. in Medical Laboratory Science handbook. Upon completion of this course students will exhibit skills needed for effective laboratory management including departmental improvement planning, professional development and performance feedback.

MLS 470 Bacteriology and Virology (5 Credit Hours)
Pre-requisites: Admission to the M.S. in Medical Laboratory Science program
Introduction to bacteria and viruses, with a focus on organisms that are medically relevant to humans. Specimen collection, processing, identification techniques, and recognition of key diagnostic features will be emphasized. Students will correlate clinical features to laboratory findings. This course will prepare students for their clinical practicum in Microbiology.
Outcomes:
Upon completion, students will be able to identify bacterial or viral organisms by characteristic clinical features of infections through laboratory testing

MLS 475 Clinical Parasitology and Mycology (2 Credit Hours)
Study of parasites and fungi that are medically relevant to humans. This course introduces students to the taxonomy and identification of morphologic and microscopic characteristics of parasites and fungi. Diagnosis of disease states based upon laboratory findings will be emphasized. Admission to the M.S. in Medical Laboratory Science program. Upon completion of this course, students will be able to identify the pathogenesis, symptomatology, laboratory diagnosis, and treatment for the parasites and fungi included in the course.

MLS 481 Clinical Practice in Hematology (3 Credit Hours)
Pre-requisites: Completion of MLS 410, MLS 415, MLS 450, MLS 466 and good academic standing as defined by the M.S. in Medical Laboratory Science Handbook
Clinical experience in Hematology under the guidance of qualified medical laboratory professionals. Students will apply knowledge and clinical skills gained in their first year courses. This course focuses on the acquisition of manual and automated laboratory skills, laboratory safety, understanding the principles of test procedures, instrumentation, and quality control.
Outcomes:
Upon completion of this course students will provide evidence of possessing the knowledge and skills necessary to perform Hematology testing in a medical laboratory

MLS 482 Clinical Practice in Chemistry (3 Credit Hours)
Pre-requisites: Completion of MLS 440, MLS 466, and good academic standing as defined by the M.S. in Medical Laboratory Science Handbook
Clinical experience in Chemistry under the guidance of qualified medical laboratory professionals. Students will apply knowledge and clinical skills gained in their first year courses. This course focuses on the acquisition of manual and automated laboratory skills, laboratory safety, understanding the principles of test procedures, instrumentation, and quality control.
Outcomes:
Upon completion of this course students will provide evidence of possessing the knowledge and skills necessary to perform Chemistry testing in a medical laboratory

MLS 483 Clinical Practice in Immunohematology (3 Credit Hours)
Clinical experience in Immunohematology under the guidance of qualified medical laboratory professionals. Students will apply knowledge and clinical skills gained in their first year courses. This course focuses on the acquisition of manual and automated laboratory skills, laboratory safety, understanding the principles of test procedures, instrumentation, and quality control. Completion of MLS 455, MLS 460, MLS 466, and good academic standing as defined by the M.S. in Medical Laboratory Science Handbook. Upon completion of this course students will provide evidence of possessing the knowledge and skills necessary to perform Immunohematology testing in a medical laboratory.

MLS 484 Clinical Practice in Hemostasis and Body Fluids (1-2 Credit Hours)
Pre-requisites: MLS 415, MLS 455, MLS 466, and good academic standing as defined by the M.S. in Medical Laboratory Science Handbook
Clinical experience in Hemostasis, Urinalysis, and other Body
Fluid analyses under the guidance of qualified medical laboratory professionals. Application of knowledge and clinical skills gained from first year courses. Focus on acquisition of manual and automated laboratory skills, laboratory safety, principles of test procedures, instrumentation, and quality control.
Outcomes:
Upon completion of this course students will demonstrate evidence of possessing the knowledge and skills necessary to perform Hemostasis, Urinalysis, and Body Fluid analyses testing in a medical laboratory

MLS 485 Clinical Practice in Microbiology (3 Credit Hours)
Pre-requisites: Completion of MLS 470, MLS 475, and good academic standing as defined in the M.S. in Medical Laboratory handbook
Clinical experience in Microbiology under the guidance of qualified medical laboratory professionals. Students will apply knowledge and clinical skills gained in their first-year courses. This course focuses on the acquisition of manual and automated laboratory skills, laboratory safety, understanding the principles of test procedures, instrumentation, and quality control.
Outcomes:
Upon completion of this course students will provide evidence of possessing the knowledge and skills necessary to perform Microbiologic testing in a medical laboratory

MLS 486 Clinical Practice - MLS Special Topics (1-2 Credit Hours)
Clinical experience in specialty areas of laboratory medicine under the guidance of qualified medical laboratory professionals. Students will actively engage in applying the medical knowledge and clinical skills gained in the didactic and student training laboratory courses in Molecular Diagnostics, Flow Cytometry, HLA testing, and laboratory administration. Completion of MLS 420, MLS 466, and good academic standing as defined in the M.S. in Medical Laboratory Science handbook. Upon completion of this course students will provide evidence of possessing the knowledge and skills needed to enter into specialty areas of a medical laboratory.

MLS 490 MLS Educational Practice and Review (2 Credit Hours)
Pre-requisites: Completion of MLS 466 and good academic standing as defined by the M.S. in Medical Laboratory Science handbook
This course will prepare students for taking a Medical Laboratory Science certification exam. Students will gain basic educational and pedagogical approaches needed to train others in the field of Medical Laboratory Science. Application of theories demonstrated through presentation of review lectures and assisting in kinesthetic instruction for laboratory sessions.
Outcomes:
Upon completion of this course students will be able to utilize effective teaching strategies to plan and present a lecture unit, including writing objectives and assessment strategies

MLS 495 Medical Laboratory Science Capstone (1-2 Credit Hours)
Pre-requisites: Completion of MLS 466 and good academic standing as defined by the M.S. in Medical Laboratory Science handbook
The MLS Capstone exposes students to leadership and ancillary niche aspects beyond those of a standard Medical Laboratory Science curriculum. Students will create a Capstone project to reflect on their unique experience in the field and demonstrate the capacity to utilize knowledge and make evidence-based decisions regarding laboratory medicine.
Outcomes:
This course will provide students the opportunity to demonstrate knowledge and skills acquired in the academic coursework, professional practice, and their Capstone Experience