Medical Laboratory Science (MLS)

MLS 3100: Laboratory Operations and Techniques
Provides the essential components of laboratory operations, technical competency, and quality assurance in the laboratory setting through integration of theoretical knowledge with practical skills. Students will gain a thorough understanding of quality assessment, troubleshooting techniques, safety protocols, laboratory mathematics, methodology, instrumentation, and laboratory procedures through a combination of lectures, demonstrations, and hands-on activities. Graded on A-F basis only.

Credit Hours: 3
Prerequisites: Restricted to Medical Laboratory Science Program students

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MLS 3200: Fundamentals of Clinical Immunology
Offers a comprehensive exploration of the principles of clinical immunology, encompassing the physiology of the immune system, mechanisms of immune response, diseases affecting the immune system, transplantation biology, infectious disease serology, serologic procedures, and interpretation of test results. This course equips students with a thorough understanding of immunological principles and their clinical applications. Through case-based learning, students will develop the skills necessary to analyze immune system function, diagnose immunological disorders, and interpret serologic test results accurately. Graded on A-F basis only.

Credit Hour: 1
Prerequisites: Restricted to Medical Laboratory Science Program students

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MLS 3250: Molecular Diagnostics
A comprehensive exploration of molecular biology principles, techniques, and applications, preparing students for the intersection of molecular techniques and disease correlation. Students will explore nucleic acid structure and function, genetics, DNA chemistry, nucleic acid isolation techniques, identification and amplification methods, and quality control and assurance procedures, utilized in diagnosing infectious diseases in clinical settings. Students will be proficient in utilizing a variety of molecular techniques for the detection, analysis, and interpretation of nucleic acids in clinical laboratories. Graded on A-F basis only.

Credit Hour: 1
Prerequisites: Restricted to Medical Laboratory Science Program students

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MLS 3300: Clinical Hematology and Coagulation I
This introductory course provides a thorough exploration of hematology and hemostasis, covering the fundamental principles, diagnostic techniques, and clinical applications in these fields. Through lectures, student lab experiences, and interactive discussions, students will gain a solid understanding of blood-related disorders and clotting processes. Participants will have the knowledge and skills to recognize, interpret, and manage hematological and hemostatic conditions commonly encountered in clinical practice. Graded on A-F basis only.

Credit Hour: 1
Prerequisites: Restricted to Medical Laboratory Science program students

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MLS 3400: Clinical Microbiology I
This introductory course provides a foundational understanding of clinical microbiology laboratory practices, emphasizing the pre-analytical, analytical, and post-analytic phases essential for accurate diagnosis. Students learn principles of proper specimen handling, microbial identification, susceptibility testing, and effective documentation and reporting. Highlights the role of the microbiology laboratory in supporting infection control and public health. Through theoretical learning and practical exercises, students develop essential skills in microbiological testing to aid in the precise diagnosis and treatment of infectious diseases. Graded on A-F basis only.

Credit Hour: 1
Prerequisites: Restricted to Medical Laboratory Science Program students

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MLS 3500: Clinical Chemistry I
Students will learn the fundamental principles and practical applications of clinical chemistry. Through a combination of theoretical instruction and hands-on laboratory practice, students will develop the necessary skills to analyze biochemical components and interpret test results essential for diagnosing and monitoring diseases. Emphasizes critical thinking and analytical reasoning, providing students with the foundational knowledge and laboratory techniques needed to perform clinical chemistry tests accurately. Students will be proficient in basic clinical chemistry testing, enabling them to contribute effectively to the diagnosis and management of metabolic disorders and diseases. Graded on A-F basis only.

Credit Hour: 1
Prerequisites: Restricted to Medical Laboratory Science Program students

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MLS 3600: Clinical Immunohematology I
Students will learn the foundational principles of blood banking and transfusion science. The curriculum covers blood donation, processing, testing, blood group systems, immunology, and transfusion practices. Through integrated theoretical instruction and hands-on laboratory training, students will develop the skills needed to perform basic immunohematology testing and support the safe management of patients requiring transfusion services. Graded on A-F basis only.

Credit Hour: 1
Prerequisites: Restricted to Medical Laboratory Science Program students

MLS 4100: Urinalysis and Body Fluids
A comprehensive overview of urinalysis and body fluid analysis, focusing on the evaluation of physical, chemical, and microscopic properties in various biological fluids. Students learn to interpret laboratory findings in the context of normal physiology and disease states. Students gain proficiency in body fluids, contributing to the accurate testing and understanding of fluid physiology and pathology in clinical laboratory practice. Graded on A-F basis only.

Credit Hour: 1
Prerequisites: Restricted to Medical Laboratory Science Program students

MLS 4200: Parasitology, Mycobacteria, Mycology and Virology
Explores specialized areas of microbiology including parasites, mycobacteria, mycology and virology. Will cover specimen collection, identification methods, and associated diseases. Students will be equipped with the knowledge and skills necessary to contribute effectively to the diagnosis and management of specialized infectious agents. Graded on A-F basis only.

Credit Hour: 1
Prerequisites: Restricted to Medical Laboratory Science Program students

MLS 4300: Clinical Hematology and Coagulation II
This comprehensive course covers topics in hematology and hemostasis, providing students with an understanding of the physiological processes, disease states, laboratory testing methods, and clinical implications within these fields. Students will learn through lectures, case studies, and class discussions, building upon prior basic knowledge of how blood and clotting systems function and how they are assessed in clinical settings. Students will be equipped with the knowledge and skills necessary to comprehend, evaluate, and test for a wide array of hematological and hemostatic disorders. Graded on A-F basis only.

Credit Hours: 2
Prerequisites: Restricted to Medical Laboratory Science Program students

MLS 4350: Clinical Hematology and Coagulation Laboratory
This comprehensive laboratory course explores hematology and hemostasis, offering students a strong understanding of physiological processes, disease states, laboratory testing methods, and clinical implications within these fields. Through a combination of laboratory sessions and discussions, students will engage in a multidimensional exploration of hematology and hemostasis. Emphasis will be placed on hands-on laboratory experiences, allowing students to apply theoretical knowledge to practical scenarios and develop essential laboratory skills. Participants will possess the knowledge and skills necessary to comprehend, evaluate, and manage a wide array of hematological and hemostatic disorders in clinical practice. Graded on A-F basis only.

Credit Hours: 2
Prerequisites: Restricted to Medical Laboratory Science Program students

MLS 4355: Clinical Hematology and Coagulation Practicum
This practicum course provides students with the opportunity to apply theoretical knowledge and laboratory skills in real-world clinical settings. Under the guidance of experienced laboratory professionals, students will engage in hands-on activities, perform laboratory tests, and participate in various aspects of laboratory operations. Emphasis will be placed on developing competency in specimen processing, quality control procedures, instrumentation and manual method operation, data analysis, result interpretation, and communication of laboratory findings. Additionally, students will have the opportunity to observe and interact with healthcare professionals, gaining insight into the role of the clinical laboratory in patient care. The practicum experience aims to prepare students for entry-level positions in medical laboratory science and provides a valuable opportunity for professional growth and development. Graded on A-F basis only.

Credit Hours: 2
Prerequisites: Restricted to Medical Laboratory Science Program students

MLS 4400: Clinical Microbiology II
Builds on foundational clinical microbiology knowledge, providing an in-depth focus on the analytical phase of clinical microbiology. Students study advanced techniques for microorganism identification, including molecular and biochemical methods, and develop the ability to interpret complex laboratory results. Emphasizes accurate and reliable analysis to support diagnosis, treatment, and public health initiatives. Through lectures and case-based discussions, students develop advanced understanding and critical thinking skills necessary for precise microorganism identification in clinical laboratory settings. Graded on A-F basis only.

Credit Hours: 2
Prerequisites: Restricted to Medical Laboratory Science Program students

MLS 4450: Clinical Microbiology Laboratory
This comprehensive laboratory course explores clinical microbiology, providing students with a strong understanding of microbial physiology, pathogenesis, laboratory testing methods, and clinical implications within this field. Through a combination of laboratory sessions and discussions, students will engage in a multidimensional exploration of clinical microbiology. Emphasis will be placed on hands-on laboratory experiences, allowing students to apply theoretical knowledge to practical scenarios and develop essential laboratory skills in microbial identification, susceptibility testing, and diagnostic techniques. Participants will possess the knowledge and skills necessary to comprehend, evaluate, and manage a wide array of microbial infections and infectious diseases in clinical practice. Graded on A-F basis only.

Credit Hours: 2
Prerequisites: Restricted to Medical Laboratory Science Program students

MLS 4455: Clinical Microbiology Practicum
This practicum course provides students with the opportunity to apply theoretical knowledge and laboratory skills in real-world clinical settings. Under the guidance of experienced laboratory professionals, students will engage in hands-on activities, perform laboratory tests, and participate in various aspects of laboratory operations. Emphasis will be placed on developing competency in specimen processing, quality control procedures, instrumentation and manual method operation, data analysis, result interpretation, and communication of laboratory findings. Additionally, students will have the opportunity to observe and interact with healthcare professionals, gaining insight into the role of the clinical laboratory in patient care. The practicum experience aims to prepare students for entry-level positions in medical laboratory science and provides a valuable opportunity for professional growth and development. Graded on A-F basis only.

Credit Hours: 2
Prerequisites: Restricted to Medical Laboratory Science Program students

MLS 4500: Clinical Chemistry II
Students understanding of clinical chemistry by exploring complex biochemical processes and their clinical significance. Emphasis is placed on the interpretation of laboratory results in the context of patient physiology and disease states, including metabolic, endocrine, and organ-specific disorders. Students develop skills in integrating multiple test results, recognizing patterns, and applying critical thinking to support accurate diagnosis and evidence-based management. Examines factors that influence test reliability and clinical decision-making, preparing students to analyze and evaluate biochemical data in a clinical context. Graded on A-F basis only.

Credit Hours: 2
Prerequisites: Restricted to Medical Laboratory Science Program students

MLS 4550: Clinical Chemistry Laboratory
This comprehensive laboratory course explores the field of clinical chemistry, offering students a strong understanding of biochemical processes, disease states, laboratory testing methods, and clinical implications within this discipline. Through a combination of laboratory sessions and discussions, students will engage in a multidimensional exploration of clinical chemistry. Emphasis will be placed on hands-on laboratory experiences, allowing students to apply theoretical knowledge to practical scenarios and develop essential laboratory skills in biochemical analysis, instrumentation operation, and result interpretation. Participants will possess the knowledge and skills necessary to comprehend, evaluate, and manage a wide array of biochemical abnormalities and metabolic disorders in clinical practice. Graded on A-F basis only.

Credit Hours: 2
Prerequisites: Restricted to Medical Laboratory Science Program students

MLS 4555: Clinical Chemistry and Urinalysis Practicum
This practicum course provides students with the opportunity to apply theoretical knowledge and laboratory skills in real-world clinical settings. Under the guidance of experienced laboratory professionals, students will engage in hands-on activities, perform laboratory tests, and participate in various aspects of laboratory operations. Emphasis will be placed on developing competency in specimen processing, quality control procedures, instrumentation and manual method operation, data analysis, result interpretation, and communication of laboratory findings. Additionally, students will have the opportunity to observe and interact with healthcare professionals, gaining insight into the role of the clinical laboratory in patient care. The practicum experience aims to prepare students for entry-level positions in medical laboratory science and provides a valuable opportunity for professional growth and development. Graded on A-F basis only.

Credit Hours: 2
Prerequisites: Restricted to Medical Laboratory Science Program students

MLS 4600: Clinical Immunohematology II
Covers advanced topics in immunohematology, including complex antibody identification, special blood group systems, compatibility testing challenges, transfusion reactions, and hemolytic disease of the fetus and newborn. Foundational concepts from the introductory course will be reviewed to support understanding of more complex material. Students will learn approaches for troubleshooting unusual serologic results and review the standards and regulations that guide blood bank practices. By the end of the course, students should understand how to evaluate complex cases and apply appropriate methods to support safe transfusion services. Graded on A-F basis only.

Credit Hours: 2
Prerequisites: Restricted to Medical Laboratory Science Program students

MLS 4650: Clinical Immunohematology Laboratory
This comprehensive course utilizes a combination of theoretical instruction and laboratory sessions to facilitate the application of blood banking concepts and principles in the laboratory setting. Emphasis will be placed on hands-on laboratory experiences, allowing students to apply theoretical knowledge to practical scenarios and develop essential laboratory skills in blood typing, antibody identification, compatibility testing, and transfusion reaction investigations. Students will possess the knowledge and technical skills necessary to comprehend, interpret, and evaluate immunohematological conditions and transfusion-related complications in clinical practice. Graded on A-F basis only.

Credit Hours: 2
Prerequisites: Restricted to Medical Laboratory Science Program students

MLS 4655: Clinical Immunohematology Practicum
This practicum course provides students with the opportunity to apply theoretical knowledge and laboratory skills in real-world clinical settings. Under the guidance of experienced laboratory professionals, students will engage in hands-on activities, perform laboratory tests, and participate in various aspects of laboratory operations. Emphasis will be placed on developing competency in specimen processing, quality control procedures, instrumentation and manual method operation, data analysis, result interpretation, and communication of laboratory findings. Additionally, students will have the opportunity to observe and interact with healthcare professionals, gaining insight into the role of the clinical laboratory in patient care. The practicum experience aims to prepare students for entry-level positions in medical laboratory science and provides a valuable opportunity for professional growth and development. Graded on A-F basis only.

Credit Hours: 2
Prerequisites: Restricted to Medical Laboratory Science Program students

MLS 4800W: Laboratory Management, Education and Professionalism - Writing Intensive
A comprehensive examination of laboratory management, education and professionalism principles. Students will learn topics of laboratory management, including compliance and regulatory issues, human resource management, education, method evaluation, professionalism, and quality practices. Through theoretical study, case studies, practical exercises, and writing assignments, participants will gain the knowledge and skills necessary to effectively navigate and manage modern laboratory settings. Students will be equipped with the tools to implement best practices, ensure regulatory compliance, optimize human resource utilization, assess education methods, evaluate laboratory methods, uphold professionalism, and maintain high-quality standards in laboratory operations. Graded on A-F basis only.

Credit Hours: 3
Prerequisites: Restricted to Medical Laboratory Science Program students

MLS 4900: Clinical Laboratory Correlations and Review
A comprehensive review of clinical laboratory procedures, and theoretical concepts spanning all phases of laboratory testing and areas. With a focus on theory recall, practical application, correlation, and evaluation, students will reinforce their understanding of various areas in medical laboratory science. Designed to prepare students for the national certification examination, ensuring they are equipped with the knowledge and skills needed for success as a medical laboratory scientist. Graded on A-F basis only.

Credit Hours: 5
Prerequisites: Restricted to Medical Laboratory Science Program students