

# MEDICAL LABORATORY TECHNOLOGY (MLT)

## MLT-1001 Introduction to Medical Laboratory Science 3 Credits

This foundational laboratory science course will explore some of the key disciplines, including hematology, urinalysis, immunology, clinical chemistry, and microbiology. Students will gain hands-on experience with essential laboratory skills and low-complexity testing. Through a case study approach, students will follow a patient's journey from initial symptoms to diagnosis, treatment, and monitoring. During this class, students will understand the critical role of the medical laboratory in research, patient care, healthcare systems, and our communities.

*Lecture: 2 hours. Laboratory: 3 hours*

*Prerequisite(s): ENG-0995 Applied College Literacies, or appropriate score on English Placement Test, and MATH-0955 Beginning Algebra, or qualified math placement.*

*OAN Approved: Transfer Assurance Guide OHL008. CTAN Approved: CTMLT001.*

## MLT-1352 Problem Solving Techniques for the Medical Laboratory 1 Credit

This course explores the vital role of quality assurance in the medical laboratory. Students will gain experience in formula evaluation, unit analysis, conversions, dilutions, and concentration calculations specific to clinical usage. Through problem-solving exercises and case studies, students will develop the skills to apply statistical methods to quality control and data analysis in a medical laboratory setting.

*Lecture: 1 hour*

*Prerequisite(s): MLT-1001 Introduction to Medical Laboratory Science and MATH-1410 Elementary Probability and Statistics I or higher level mathematics course.*

## MLT-1491 Urinalysis and Body Fluids 3 Credits

This course explores urinalysis and body fluid analysis, crucial diagnostic tools for patient care. It covers accurately performing and interpreting laboratory tests on urine, CSF, and other body fluids. The physiology of the renal system is covered in-depth so students can correlate urinalysis results with disease states.

*Lecture: 2 hours. Laboratory: 3 hours*

*Prerequisite(s): BIO-1500 Principles of Biology I and HTEC-1060 Medical Terminology I; or BIO-2341 Anatomy and Physiology II; and MLT-1001 Introduction to Medical Laboratory Science.*

*OAN Approved: Transfer Assurance Guide OHL010.*

## MLT-1820 Independent Study/Research in Medical Laboratory Technology 1-3 Credits

Directed individual study. Study/research title and specific content arranged between instructor and student. May be repeated for a maximum of six credits of different topics.

*Lecture: 1-3 hours*

*Prerequisite(s): Departmental approval, and instructor approval, and ENG-0995 Applied College Literacies, or appropriate score on English Placement Test. Note: ENG-0990 Language Fundamentals II taken prior to Fall 2021 will also meet prerequisite requirements.*

## MLT-2461 Hematology 3 Credits

An introduction to the theory, principles and procedures used in hematology and coagulation (hemostasis). Hematopoiesis, enumeration, differentiation and evaluation of blood formed elements and the basic process of coagulation are discussed. Manual and automated techniques are explained, demonstrated, and performed. Anemias, leukemias and other hematological disorders are studied, correlating test results with disease states. Problem solving skills are applied in related case studies and unknowns.

*Lecture: 2 hours. Laboratory: 3 hours*

*Prerequisite(s): BIO-1500 Principles of Biology I and HTEC-1060 Medical Terminology I; or BIO-2341 Anatomy and Physiology II; and MLT-1001 Introduction to Medical Laboratory Science.*

*OAN Approved: Transfer Assurance Guide OHL009.*

## MLT-2472 Immunohematology 4 Credits

This course explores immunohematology's fundamental principles and practices. Students will delve into the intricacies of antigen-antibody interactions within major blood group systems, acquire proficiency in compatibility testing, and develop an understanding of component therapy. Additionally, the course will address donor selection criteria, transfusion-transmitted diseases, and the diagnostic applications of serological tests in the blood bank setting. Through hands-on laboratory exercises and case study analyses, students will gain essential technical skills and critical thinking abilities vital to transfusion medicine.

*Lecture: 2 hours. Laboratory: 6 hours*

*Prerequisite(s): MLT-1001 Introduction to Medical Laboratory Science, and MLT-1352 Problem Solving for the Medical Lab, and MLT-2461 Hematology, and MLT-2490 Immunology and Serology.*

## MLT-2482 Clinical Microbiology 5 Credits

Application of the principles and procedures utilized in clinical microbiology, mycology, parasitology and virology in the collection, identification and serological detection of organisms. Pathogenesis and prevention of disease. Media, methods of culture and isolation, biochemical and susceptibility testing, aseptic and staining techniques, sterilization and safety protocols are studied. Analysis of case studies, problem solving and clinical significance of results in diagnosis.

*Lecture: 3 hours. Laboratory: 6 hours*

*Prerequisite(s): MLT-1001 Introduction to Medical Laboratory Science, and MLT-2490 Immunology & Serology, and BIO-2500 Microbiology.*

## MLT-2490 Immunology and Serology 2 Credits

This course explores the intricate mechanisms underlying the human immune system, from the rapid response of innate immunity to the adaptive capabilities conferring long-term protection. Students will delve into immunity's cellular, molecular, and tissue-level components, examining T and B cell function, antigen recognition pathways, and the delicate balance between protection and dysfunction. Key topics include hypersensitivity reactions, autoimmune diseases, immunodeficiency disorders, and the emerging field of tumor immunology. The course culminates with a focus on the laboratory applications of immunological principles, emphasizing the role of diagnostic techniques and quality assurance measures in the detection and management of infectious diseases.

*Lecture: 2 hours*

*Prerequisite(s): BIO-1500 Principles of Biology I and HTEC-1060 Medical Terminology I; or BIO-2341 Anatomy and Physiology II.*

### **MLT-2501 Clinical Chemistry**

#### **5 Credits**

Principles, procedures and application of basic and advanced diagnostic tests in clinical chemistry for all body fluids. Emphasis on correlation of results with clinical significance, interpreting quality control data, and mastering basic lab skills.

*Lecture: 3 hours. Laboratory: 6 hours*

*Prerequisite(s): MLT-1000 Introduction to Medical Laboratory Technology, and MLT-1351 Problem Solving Techniques for the Medical Laboratory, and departmental approval.*

### **MLT-2820 Advanced Independent Study/Research in Medical Laboratory Technology**

#### **1-3 Credits**

Directed individual advanced study. Study/research title and specific content arranged between instructor and student. May be repeated for a maximum of six credits of different topics.

*Lecture: 1-3 hours*

*Prerequisite(s): Departmental approval, and instructor approval, and ENG-0995 Applied College Literacies, or appropriate score on English Placement Test. Note: ENG-0990 Language Fundamentals II taken prior to Fall 2021 will also meet prerequisite requirements.*

### **MLT-282H Advanced Honors Independent Study/Research in Medical Laboratory Technology**

#### **1-3 Credits**

Advanced Honors-level directed individual study. Must meet criteria set forth in the Honors Course Checklist used to approve regular honors courses. Study/research title and specific content arranged between instructor and student. May be repeated for a maximum of six credits of different topics.

*Lecture: 1-3 hours*

*Prerequisite(s): Departmental approval and instructor approval, and ENG-0995 Applied College Literacies, or appropriate score on English Placement Test; and must have earned an A or B in at least 3 honors courses. Note: ENG-0990 Language Fundamentals II taken prior to Fall 2021 will also meet prerequisite requirements.*

### **MLT-2940 Medical Laboratory Field Experience**

#### **3 Credits**

Capstone course in Medical Laboratory Technology. Supervised clinical experience. Students rotate through chemistry, microbiology, serology, immunohematology, hematology/coagulation, urinalysis, and phlebotomy departments for a minimum of 315 hours meeting performance objectives of medical laboratory personnel at the MLT level

*Other Required Hours: Field Experience: 40 hours per week.*

*Prerequisite(s): MLT-2991 Advanced MLT Applications; and concurrent enrollment in MLT-2980 Professional Development and Life Skills*

### **MLT-2980 Professional Development and Life Skills**

#### **1 Credit**

Integration of knowledge acquired in basic, technical and non-technical areas in preparation for professional roles and life-long professional growth and development. Seminar discussion of clinical experience.

*Other Required Hours: Seminar: 1 hour per week.*

*Prerequisite(s): MLT-2991 Advanced MLT Applications; and concurrent enrollment in MLT-2940 Medical Laboratory Field Experience.*

### **MLT-2991 Advanced MLT Applications**

#### **3 Credits**

Manual laboratory skills in clinical chemistry, hematology, coagulation, body fluids, microbiology, parasitology, mycology, and immunohematology/serology are refined—emphasis on organization, increased speed, accuracy, confidence, and independent performance. Case studies are analyzed, data interpreted, and findings are correlated to clinical significance and differential diagnoses. Advanced concepts in parasitology, mycology, immunohematology/serology, quality control, point of care, information systems and troubleshooting are introduced.

*Lecture: 2 hours. Laboratory: 3 hours*

*Prerequisite(s): MLT-1001 Introduction to Medical Laboratory Science, MLT-1352 Problem Solving Techniques for the Medical Laboratory, MLT-1491 Urinalysis and Body Fluids, MLT-2461 Hematology, MLT-2472 Immunohematology, MLT-2490 Immunology and Serology, MLT-2501 Clinical Chemistry, and concurrent enrollment in MLT-2482 Clinical Microbiology.*