

# MEDICAL LABORATORY SCIENCE (MLAB)

## 200 Level Courses

**MLAB 200:** *Introduction to Medical Laboratory Science*. 1 credit.  
Introduction to the profession of Medical Laboratory Science. Offered by Biology (<http://catalog.gmu.edu/colleges-schools/science/biology/>). Limited to three attempts.

**Schedule Type:** Lecture

**Grading:**

This course is graded on the Undergraduate Regular scale. (<http://catalog.gmu.edu/policies/academic/grading/>)

## 300 Level Courses

**MLAB 300:** *Science Writing*. 2 credits.  
Intensive practice in biological science writing. Science Writing will fulfill the university's writing intensive requirement as well as prepare Medical Laboratory Science students for the types of writing that they will encounter in the industry including, but not limited to: writing, resumes, grants, cover letters, etc. A transfer student who has previously taken an equivalent course to BIOL 308 that did not meet the writing intensive requirements in the major may pair this with the transferred BIOL 308 to L308 and meet the writing intensive experience in the Biology major. Offered by Biology (<http://catalog.gmu.edu/colleges-schools/science/biology/>). Limited to three attempts.

**Specialized Designation:** Writing Intensive in Major

**Schedule Type:** Lecture

**Grading:**

This course is graded on the Undergraduate Regular scale. (<http://catalog.gmu.edu/policies/academic/grading/>)

## 400 Level Courses

**MLAB 401:** *Orientation to the Problems and Practices of the Clinical Laboratory*. 1-15 credits.  
Orientation to clinical lab; specimen collection and record keeping; management principles and problems; educational theories as they apply to the teaching of clinical laboratory procedures; and quality control principles. Notes: Not offered on campus. Offered by Biology (<http://catalog.gmu.edu/colleges-schools/science/biology/>). May be repeated within the term.

**Specialized Designation:** Topic Varies

**Recommended Prerequisite:** Completion of requirements for BS with major in medical technology except for 30 credits of professional study, and admission to school of medical technology approved by National Accrediting Agency for Clinical Laboratories.

**Schedule Type:** IND/INT #1, IND/INT #2, IND/INT #3, IND/INT #4, IND/INT #5, IND/INT #6, IND/INT #7, IND/INT #8, IND/INT #9, Internship

**Grading:**

This course is graded on the Undergraduate Regular scale. (<http://catalog.gmu.edu/policies/academic/grading/>)

**MLAB 402:** *Clinical Hematology and Coagulation*. 1-15 credits.  
Morphology of blood cells in health and disease; theories of hematopoiesis and coagulation; techniques for measurement of hematologic parameters; and hematologic pathologies and their lab

evaluation. Notes: Not offered on campus. Offered by Biology (<http://catalog.gmu.edu/colleges-schools/science/biology/>). May be repeated within the term.

**Specialized Designation:** Topic Varies

**Recommended Prerequisite:** Completion of requirements for BS with major in medical technology except for 30 credits of professional study, and admission to school of medical technology approved by National Accrediting Agency for Clinical Laboratories.

**Schedule Type:** IND/INT #1, IND/INT #2, IND/INT #3, IND/INT #4, IND/INT #5, IND/INT #6, IND/INT #7, IND/INT #8, IND/INT #9, Internship

**Grading:**

This course is graded on the Undergraduate Regular scale. (<http://catalog.gmu.edu/policies/academic/grading/>)

**MLAB 403:** *Clinical Microscopy*. 1-15 credits.  
Methods for the routine examination of urine, feces, and certain other body fluids, especially the microscopic identification of normal and pathologic components. Includes a study of the kidney and theories of microscopy. Notes: Not offered on campus. Offered by Biology (<http://catalog.gmu.edu/colleges-schools/science/biology/>). May be repeated within the term.

**Specialized Designation:** Topic Varies

**Recommended Prerequisite:** Completion of requirements for BS with major in medical technology except for 30 credits of professional study, and admission to school of medical technology approved by National Accrediting Agency for Clinical Laboratories.

**Schedule Type:** IND/INT #1, IND/INT #2, IND/INT #3, IND/INT #4, IND/INT #5, IND/INT #6, IND/INT #7, IND/INT #8, IND/INT #9, Independent Study

**Grading:**

This course is graded on the Undergraduate Regular scale. (<http://catalog.gmu.edu/policies/academic/grading/>)

**MLAB 404:** *Serology and Immunohematology*. 1-15 credits.  
Clinical lab procedures involving antigen-antibody reactions, and theoretical bases of such procedures. Includes both diagnostic and blood bank techniques. Notes: Not offered on campus. Offered by Biology (<http://catalog.gmu.edu/colleges-schools/science/biology/>). May be repeated within the term.

**Specialized Designation:** Topic Varies

**Recommended Prerequisite:** Completion of requirements for BS with major in medical technology except for 30 credits of professional study, and admission to school of medical technology approved by National Accrediting Agency for Clinical Laboratories.

**Schedule Type:** IND/INT #1, IND/INT #2, IND/INT #3, IND/INT #4, IND/INT #5, IND/INT #6, IND/INT #7, IND/INT #8, IND/INT #9, Internship

**Grading:**

This course is graded on the Undergraduate Regular scale. (<http://catalog.gmu.edu/policies/academic/grading/>)

**MLAB 405: Clinical Microbiology.** 1-15 credits.

Biology and pathology of bacteria, rickettsia, fungi, parasites, and viruses of clinical importance and their culture and identification. Notes: Not offered on campus. Offered by Biology (<http://catalog.gmu.edu/colleges-schools/science/biology/>). May be repeated within the term.

**Specialized Designation:** Topic Varies

**Recommended Prerequisite:** Completion of requirements for BS with major in medical technology except for 30 credits of professional study, and admission to school of medical technology approved by National Accrediting Agency for Clinical Laboratories.

**Schedule Type:** IND/INT #1, IND/INT #2, IND/INT #3, IND/INT #4, IND/INT #5, IND/INT #6, IND/INT #7, IND/INT #8, IND/INT #9, Internship

**Grading:**

This course is graded on the Undergraduate Regular scale. (<http://catalog.gmu.edu/policies/academic/grading/>)

**MLAB 406: Clinical Chemistry.** 1-15 credits.

Chemical reactions and procedures used in clinical determinations on blood, urine, and cerebral spinal fluid. Includes manual, automated methods of chemical analyses. Notes: Not offered on campus. Offered by Biology (<http://catalog.gmu.edu/colleges-schools/science/biology/>). May be repeated within the term.

**Specialized Designation:** Topic Varies

**Recommended Prerequisite:** Completion of requirements for BS with major in medical technology except for 30 credits of professional study, and admission to school of medical technology approved by National Accrediting Agency for Clinical Laboratories.

**Schedule Type:** IND/INT #1, IND/INT #2, IND/INT #3, IND/INT #4, IND/INT #5, IND/INT #6, IND/INT #7, IND/INT #8, IND/INT #9, Internship

**Grading:**

This course is graded on the Undergraduate Regular scale. (<http://catalog.gmu.edu/policies/academic/grading/>)

**MLAB 407: Clinical Molecular Biology.** 1-15 credits.

Course presents advanced methods in nucleic acid testing to human medico-legal, forensic, and pathology applications. Topics include but are not limited to: Polymorphisms, Paternity Testing, Single Nucleotide Polymorphisms, Bone Marrow Engraftment, Mitochondrial DNA Polymorphisms and Disorders, Chromosomal Abnormalities, Single Gene Disorders, Lysosomal Storage Disorders, Cystic Fibrosis, and Quality Assurance in the Molecular Biology laboratory. Offered by Biology (<http://catalog.gmu.edu/colleges-schools/science/biology/>). May be repeated within the degree.

**Recommended Prerequisite:** Complete of requirements for BS with a major in Medical Laboratory Science except for the 30 credits professional study.

**Schedule Type:** Laboratory

**Grading:**

This course is graded on the Undergraduate Regular scale. (<http://catalog.gmu.edu/policies/academic/grading/>)

**MLAB 408: Clinical Histology.** 1-15 credits.

Introduction to the field of Histotechnology including lectures on tissue fixation, processing and embedding, microtomy, and staining. Offered

by Biology (<http://catalog.gmu.edu/colleges-schools/science/biology/>). May be repeated within the term.

**Specialized Designation:** Topic Varies

**Recommended Prerequisite:** completion of requirements for BS with major in Medical Laboratory Science except for the 30 credits of professional study.

**Schedule Type:** IND/INT #1, IND/INT #2, IND/INT #3, IND/INT #4, IND/INT #5, Internship

**Grading:**

This course is graded on the Undergraduate Regular scale. (<http://catalog.gmu.edu/policies/academic/grading/>)

**MLAB 409: Clinical Histology Practicum.** 1-15 credits.

Hands-on rotations in histologic fixations, tissue processing, slide preparation and staining. Offered by Biology (<http://catalog.gmu.edu/colleges-schools/science/biology/>). May be repeated within the term.

**Specialized Designation:** Topic Varies

**Recommended Prerequisite:** Completion of requirements for BS with major in Medical Laboratory Science except for the 30 credits of professional study.

**Schedule Type:** IND/INT #1, IND/INT #2, IND/INT #3, IND/INT #4, IND/INT #5, Internship

**Grading:**

This course is graded on the Undergraduate Regular scale. (<http://catalog.gmu.edu/policies/academic/grading/>)

**MLAB 410: Medical Virology.** 1-2 credits.

This course is a survey of the characteristics, pathogenicity, and laboratory diagnosis of important human viruses. Topics include viral taxonomy and classical virology. Special emphasis is placed on the epidemiology and the laboratory's role in influenza pandemics. Offered by Biology (<http://catalog.gmu.edu/colleges-schools/science/biology/>). May be repeated within the degree for a maximum 10 credits.

**Schedule Type:** Lecture

**Grading:**

This course is graded on the Undergraduate Regular scale. (<http://catalog.gmu.edu/policies/academic/grading/>)

**MLAB 411: Board Exam Preparation.** 1-4 credits.

This course is a structured review and practice in preparation for the American Society for Clinical Pathology Technologist in Microbiology Board of Certification Exam. Practice tests and questions from a variety of published and authoritative sources are used to reinforce the content of the Technologist in Microbiology program. Offered by Biology (<http://catalog.gmu.edu/colleges-schools/science/biology/>). May be repeated within the degree for a maximum 10 credits.

**Schedule Type:** Lecture

**Grading:**

This course is graded on the Undergraduate Regular scale. (<http://catalog.gmu.edu/policies/academic/grading/>)

**MLAB 412: Medical Mycology.** 1-2 credits.

This course is a comprehensive presentation of medically important fungi. Emphasis is placed on clinical presentation and laboratory

identification of pathogenic species and opportunistic pathogens. Topics include general mycology methods, yeasts, susceptibility testing, molds (Hyaline, Mucor, Dematiaceous), Dermatophytes, Systemic infections, and Pneumocystis. Offered by Biology (<http://catalog.gmu.edu/colleges-schools/science/biology/>). May be repeated within the degree for a maximum 10 credits.

**Schedule Type:** Laboratory

**Grading:**

This course is graded on the Undergraduate Regular scale. (<http://catalog.gmu.edu/policies/academic/grading/>)

**MLAB 413: *Medical Parasitology*.** 1-4 credits.

This course is a comprehensive presentation of human parasites. Emphasis is placed on clinical presentation and laboratory identification. Topics include Flagellates, Ciliates, Coccidians, Malaria and Babesia, Other Blood Born and Tissue Born parasites, Nematodes, Cestodes, Trematodes, and Arthropods. Offered by Biology (<http://catalog.gmu.edu/colleges-schools/science/biology/>). May be repeated within the degree for a maximum 10 credits.

**Schedule Type:** Laboratory

**Grading:**

This course is graded on the Undergraduate Regular scale. (<http://catalog.gmu.edu/policies/academic/grading/>)

**MLAB 414: *Molecular Detection of Infectious Disease*.** 1-4 credits.

This course examines the advances in using molecular methods to detect human infectious disease. Careful attention is given to the comparison of molecular technologies with traditional microbiology methods. Topics include molecular methods and applications, including PCR, sequencing, TMA, and PEGE; specimens of choice, sample preparation, Quality Control, primer selection; Molecular methods in selecting antimicrobial agents; molecular epidemiology, and target organisms: fungi, bacteria, parasites, and viruses. Offered by Biology (<http://catalog.gmu.edu/colleges-schools/science/biology/>). May be repeated within the degree for a maximum 10 credits.

**Schedule Type:** Laboratory, Lecture

**Grading:**

This course is graded on the Undergraduate Regular scale. (<http://catalog.gmu.edu/policies/academic/grading/>)

**MLAB 415: *Medical Bacteriology*.** 1-10 credits.

This course is a comprehensive presentation of bacteria isolated in the clinical laboratory. Emphasis is placed on the laboratory identification of isolates from a variety of specimen sources, and pathogenic species. Topics include Instrumentation and MALDI, Gram Positive Cocci, Gram Positive Bacilli, Enterics, non-fermenters, Moraxella, Neisseria, Pasteurella, Haemophilus and HACEK, Campylobacter, Helicobacter, Legionella, CDC Select Agents, Chlamydia, Mycoplasma, Ureaplasma, Spirochetes, Anaerobes, Antibiotics and Susceptibility testing, and Acid Fast Bacilli. Offered by Biology (<http://catalog.gmu.edu/colleges-schools/science/biology/>). May be repeated within the degree for a maximum 10 credits.

**Schedule Type:** Laboratory

**Grading:**

This course is graded on the Undergraduate Regular scale. (<http://catalog.gmu.edu/policies/academic/grading/>)

**MLAB 417: *Advanced Methods in Clinical Molecular Biology*.** 1-11 credits.

This course applies the fundamentals of nucleic acid testing to advanced methods commonly used in the contemporary clinical and research laboratory. Topics include PCR, Transcription-Based Amplification, Probe Amplification, Branched DNA, Hybrid Capture; Amplification: Signal, Cleavage-Based, Cycling Probe; Sequencing: Direct, Next Gen, Pyrosequencing, Bisulfite, RNA Sequencing; and Bioinformatics; Human Genome Project. Offered by Biology (<http://catalog.gmu.edu/colleges-schools/science/biology/>). May be repeated within the degree for a maximum 11 credits.

**Schedule Type:** Laboratory, Lecture

**Grading:**

This course is graded on the Undergraduate Regular scale. (<http://catalog.gmu.edu/policies/academic/grading/>)

**MLAB 418: *Human Molecular and Chromosomal Applications and Pathology*.** 1-3 credits.

This course presents advanced methods in nucleic acid testing to human medico-legal, forensic, and pathology applications. Topics include: Polymorphisms, RFLP, Paternity Testing, Linkage, Single Nucleotide Polymorphisms, Bone Marrow Engraftment, Mitochondrial DNA Polymorphisms and Disorders, Chromosomal Abnormalities, Patterns of Inheritance, Single Gene Disorders, Lysosomal Storage Disorders, Cystic Fibrosis, Trinucleotide Repeats, Genomic Imprinting, Array CGH, Molecular Oncology, HLA and Transplantation. Offered by Biology (<http://catalog.gmu.edu/colleges-schools/science/biology/>). May be repeated within the degree for a maximum 10 credits.

**Schedule Type:** Laboratory, Lecture

**Grading:**

This course is graded on the Undergraduate Regular scale. (<http://catalog.gmu.edu/policies/academic/grading/>)