

MEDICAL LABORATORY SCIENCE, B.S.

Career Description and Opportunities

Medical laboratory scientists perform a variety of specialized tests in the clinical laboratory that provide information used by the physician to determine the extent and cause of disease. The tests performed by or supervised by the medical laboratory scientist are completed in such areas as hematology, blood banking, serology, immunology, clinical chemistry, bacteriology, and parasitology. The graduate medical laboratory scientist is prepared with the knowledge and abilities needed for certification by nationally recognized professional agencies. Certified medical laboratory scientists are accorded the status of professionals in the medical team. They often have responsibilities for supervision of laboratory sections, exercise independent judgement, and evaluate the work of others.

Most medical laboratory scientists are employed in hospital laboratories, while others find employment in physician's offices, the armed forces, and state and federal health agencies. CLS BS-MLS graduates have gone on to become physicians, dentists, physical therapists, health care computer specialists, hospital administrators, pharmaceutical salespersons, college professors, biomedical researchers, attorneys, and scientific device reviewers. Upon successful completion of the Bachelor of Science degree in Medical Laboratory Science, the student is eligible for the certification examination offered by the American Society of Clinical Pathologists (ASCP).

Curriculum Overview

The MU Medical Laboratory Science program is offered through online course delivery and follows a "2+2 ladder" model. The first two years include the MLT associate degree curriculum. Year three involves completion of advanced science and other university academic requirements, and the fourth year involves one semester of didactic courses followed by advanced clinical practicum courses. A student who has completed required general studies and prerequisite courses could progress through the CLS sequence from MLT to MLS programs consecutively (see admission, below).

Students transferring from other NAACLS accredited programs must complete equivalent prerequisite courses to those listed in the MU B.S. in Medical Laboratory Science program in order to obtain a B.S. from Marshall University, which includes meeting Core Curriculum standards.

In addition, MLT courses from other NAACLS accredited programs will be evaluated and course substitution credit will be recorded for 100 and 200 level CLS courses where appropriate by the MU CLS department chair/program director. Under special circumstances where an individual has graduated from an MLT program greater than five years previous, and has not worked as an MLT, proficiency exams may be required in order for substitution credit to be granted for 100 and 200 level CLS courses.

The CLS 300- and 400-level courses of the Bachelor of Science in Medical Laboratory Science Program are offered through online

course delivery. All general prerequisite courses in the junior year are also offered online through Marshall University if preferred. All CLS-designated courses must be taken from Marshall University; no transfer courses will be accepted for these.

Admission

The application period for the online program is continual, however applications are reviewed and admission is granted once per semester, normally in October and March each year in preparation for advising for student registration. To be considered for admission into the Marshall University Online Bachelor of Science in Medical Laboratory Science program, applicants must meet the following criteria:

1. Successful completion of an associate degree in Medical Laboratory Technology from a NAACLS-accredited MLT/CLT program. Students applying from NAACLS-accredited programs other than Marshall University must either submit a letter of satisfactory completion from the MLT program director, or submit documentation of MLT/CLT national certification through NCA or ASCP.
2. Minimum cumulative GPA of 2.0 prior to admission.
3. Candidates from a NAACLS accredited MLT program other than Marshall University: must submit two letters of reference prior to admission; the letter of satisfactory completion from the MLT program director stated above may substitute for one of the letters. Candidates from other NAACLS accredited programs must also submit an official transcript documenting coursework for the MLT program. Candidates from other NAACLS accredited MLT/CLT programs must submit a letter of application along with the references above.
4. Candidates from the Marshall University MLT program: Because students from other institutions are accepted into the online BSMLS program each year, MU MLT students must submit notification, either via email or letter in the last year of their MLT program of their desire to continue on into the BS in Medical Laboratory Science program; failure to do so could jeopardize securing a placement slot in MLS-level courses.


Admission will be granted to current Marshall University BS-MLS students who have had continuous enrollment each semester in the program coursework and who have provided written notification of their desire to continue during the final year of their MLT program.


Advanced Clinical Practicum/ Applied Learning Experiences

As part of assessing clinical proficiency, students will be required to take cumulative online examinations in each discipline and pass with a minimum score of 70%. Students who do not have the minimum 70% on cumulative exams will participate in online remediation projects as part of Advanced Clinical Practicum courses at the end of the program. There is not a full clinical rotation for the on line B.S. in MLS program at Marshall University, rather, students complete required clinical tasks in courses taken in the final semester of the program. Most students in the program are working either full or part-time and can manage the required tasks while working. All students will complete requirements of the CLS 464 Lab Instrumen Inform Sys and CLS 468 Clinical Lab Research Senior Research courses in the clinical practicum setting during the final semester of the B.S. in MLS program. All students will also be required to complete an on-campus, one day hands-on workshop in Molecular Diagnostics as part of their Advanced Clinical

Practicum experience, or provide documentation of hands-on clinical experience in this area in a clinical hospital laboratory during the final semester in the program.





















It is the sole responsibility of all admitted MLS students to secure their own clinical site placement for required clinical tasks in the final semester of the program. A student will be required upon admission to the B.S. in MLS program to initiate the process of clinical site placement and/or the clinical affiliation process with a clinical laboratory in a hospital for advanced clinical experiences and obtain the necessary signed clinical affiliation documentation by mid-term of the semester preceding the student's anticipated advanced clinical practicum - signed clinical affiliations are an NAACLS accreditation requirement. All clinical affiliations must be approved by the Program Director. Failure of the student to complete these requirements would make the student ineligible for clinical site placement and would delay, or prevent, graduation from the BS in MLS program.











 - General Education Course

 - Milestone course: a key success marker for your major. See your advisor to discuss the importance of this course in your plan of study.

Major


The Core Curriculum is designed to foster critical thinking skills and introduce students to basic domains of thinking that transcend disciplines. The Core applies to all majors. Information on specific classes in the Core can be found at <https://www.marshall.edu/gened/>.


Code	Title	Credit Hours
Core Curriculum		
<i>Core 1: Critical Thinking</i>		
FYS 100	First Yr Sem Critical Thinking	3
CLS 105 	Medical-Lab Terminology (CT)	3
SOC 200  	Introductory Sociology (CT)	3
<i>Core 2</i>		
ENG 101  	Beginning Composition	3
ENG 201 	Advanced Composition	3
CMM 103 	Fund Speech-Communication	3
MTH 130 	College Algebra	3
BSC 228  	Human Physiology	4
Core II Humanities (WI)		
SOC 200  	Introductory Sociology (CT) (MC, WI)	3
Core II Fine Arts		
<i>Additional University Requirements</i>		
Writing Intensive (Core II Humanities)		
Writing Intensive (SOC 200 WI)		
SOC 200 	Introductory Sociology (CT) (Multicultural or International)	3
CLS 468 	Clinical Lab Research (Capstone)	3
Major-Specific		
CHM 211  	Principles of Chemistry I	3
CHM 217  	Principles of Chem Lab I	2
CLS 105 	Medical-Lab Terminology (CT)	3
CHM 212 	Principles Chemistry II	3

CHM 218 	Principles of Chem Lab II	2
BSC 227	Human Anatomy	4
CLS 200 	Clinical Biochemistry	4
CLS 230	Clinical Hematology	4
CLS 210 	Clinical Immunohematology	4
CLS 220	Clinical Microbiology	4
CLS 255 	Clinical Lab Problems	3
CLS 270	Clin Practicum Hematology (15 Week Hospital Based Practicum)	3
CLS 271	Clin Practicum Chemistry (15 Week Hospital Based Practicum)	3
CLS 272	Clin Pract Immunohematol (15 Week Hospital Based Practicum)	3
CLS 273	Clin Pract Microbiology (15 Week Hospital Based Practicum)	3
CHM 327 	Intro Organic Chemistry	3
ECN 200	Survey of Economics	3
or ECN 250	Principles Microeconomics	
STA 225  	Introductory Statistics (CT)	3
CLS 310 	Clin Immun & Mol Diag	3
CLS 320	Advanced Topics in CLS	3
CLS 400	Adv Clinical Chemistry	2
CLS 410 	Adv Clin Immunohematology	2
CLS 420	Adv Clinical Microbiology	2
CLS 430	Adv Clinical Hematology	3
CLS 460	Clinical Lab Mgt and Educ	3
CLS 464	Lab Instrumen Inform Sys	3
CLS 466	Diagnostic Physiology	3
CLS 472	Adv CLS Clinical Practicum I	1-3
CLS 473	Adv CLS Clinical Practicum II	1-3
CLS 468 	Clinical Lab Research (Capstone)	3
CLS 499	Seminar in Lab Medicine	2

Major Information




















- Students are required to know and track their degree requirements for graduation or for entrance to a professional school.
- Course offerings and course attributes are subject to change semesters. Please consult each semester's schedule of courses for availability and attributes.
- The MLT and BS-MLS programs are fully accredited by the National Accrediting Agency for Clinical Laboratory Sciences. Students who complete CLS programs through Marshall University will be eligible for national certification examinations.
- Medical Laboratory Technology Students complete the associate degree, graduate then progress into the Bachelor of Medical Laboratory Science.
- MLS online students from other institutions must have completed an AAS in MLT from a NAACLS accredited program and will be required to fulfill the core curriculum requirements through a combination of transfer credits and MU courses; each student will be evaluated on an individual basis.
- 15-week hospital-based clinical practicum sequence Summer or Fall prior to beginning online MLS classes.

 - General Education Course

 - Milestone course: a key success marker for your major. See your advisor to discuss the importance of this course in your plan of study.

Four Year Plan


Medical laboratory scientists perform a variety of specialized tests in the clinical laboratory that provide information used by the physician to determine the extent and cause of disease. The tests performed by or supervised by the medical technologist are completed in such areas as hematology, blood banking, serology, immunology, clinical chemistry, bacteriology, and parasitology. The graduate medical technologist is prepared with the knowledge and abilities needed for certification by nationally recognized professional agencies. Certified medical laboratory scientists are accorded the status of professionals in the medical team. They often supervise laboratory sections, exercise independent judgement, and evaluate the work of others.

Course	Title	Credit Hours
First Year		
First Semester		
CHM 211  	Principles of Chemistry I	3
CHM 217  	Principles of Chem Lab I	2
ENG 101  	Beginning Composition	3
FYS 100	First Yr Sem Critical Thinking	3
CLS 105 	Medical-Lab Terminology (CT)	3
UNI 100	Freshman First Class	1
Credit Hours		15
Second Semester		
CHM 212 	Principles Chemistry II	3
CHM 218 	Principles of Chem Lab II	2
CMM 103 	Fund Speech-Communication	3
SOC 200  	Introductory Sociology (CT) (MC, WI)	3
MTH 130 	College Algebra	3
Credit Hours		14
Second Year		
First Semester		
BSC 227	Human Anatomy	4
CLS 200 	Clinical Biochemistry	4
CLS 230	Clinical Hematology	4
ENG 201 	Advanced Composition	3
Credit Hours		15
Second Semester		
BSC 228  	Human Physiology	4
CLS 210 	Clinical Immunohematology	4
CLS 220	Clinical Microbiology	4
CLS 255 	Clinical Lab Problems	3
Credit Hours		15
Third Semester		
Summer Term		
CLS 270	Clin Practicum Hematology	3
CLS 271	Clin Practicum Chemistry	3
CLS 272	Clin Pract Immunohematol	3




CLS 273	Clin Pract Microbiology	3
Credit Hours		12

Third Year

First Semester


CHM 327 	Intro Organic Chemistry	3
CLS 320	Advanced Topics in CLS	3
ECN 200 or ECN 250	Survey of Economics or Principles Microeconomics	3
Core II Humanities (WI)		3
CLS 270	Clin Practicum Hematology (if not taken during summer)	
CLS 271	Clin Practicum Chemistry (if not taken during summer)	
CLS 272	Clin Pract Immunohematol (if not taken during summer)	
CLS 273	Clin Pract Microbiology (if not taken during summer)	
Credit Hours		12

Second Semester


CLS 310 	Clin Immun & Mol Diag	3
STA 225  	Introductory Statistics (CT)	3
Core II Fine Arts		3
CLS 466	Diagnostic Physiology	3
Free Elective		3
Credit Hours		15

Fourth Year

First Semester

CLS 400	Adv Clinical Chemistry	2
CLS 410 	Adv Clin Immunohematology	2
CLS 420	Adv Clinical Microbiology	2
CLS 430	Adv Clinical Hematology	3
CLS 460	Clinical Lab Mgt and Educ	3
CLS 499	Seminar in Lab Medicine	2
Credit Hours		14

Second Semester

CLS 464	Lab Instrumen Inform Sys	3
CLS 472	Adv CLS Clinical Practicum I	1-3
CLS 473	Adv CLS Clinical Practicum II	1-3
CLS 468 	Clinical Lab Research (Capstone)	3
Free Elective		3
Credit Hours		11-15
Total Credit Hours		123-127

Part Time Enrollment Plan

Full-time enrollment at Marshall University requires that students take a minimum of twelve credit hours. Prerequisite courses, other than CLS courses, that are listed in Year Three in the curriculum may be taken in any sequence and in any combination. Part-time enrollment in CLS courses at the BS-MLS level is permitted for working MLTs; however students must take the following courses together and in this sequence:

Course	Title	Credit Hours
First Year		
First Semester		
CLS 460	Clinical Lab Mgt and Educ	3
CLS 499	Seminar in Lab Medicine	2
Credit Hours		5
Second Semester		
CLS 310	Clin Immun & Mol Diag	3
CLS 466	Diagnostic Physiology	3
Credit Hours		6
Second Year		
First Semester		
CLS 400	Adv Clinical Chemistry	2
CLS 410	Adv Clin Immunohematology	2
CLS 420	Adv Clinical Microbiology	2
CLS 430	Adv Clinical Hematology	3
Credit Hours		9
Second Semester		
CLS 464	Lab Instrumen Inform Sys ¹	3
CLS 468 🌱	Clinical Lab Research (Capstone) ¹	3
CLS 472	Adv CLS Clinical Practicum I ¹	3
CLS 473	Adv CLS Clinical Practicum II ¹	3
Credit Hours		12
Total Credit Hours		32

¹ CLS courses in this final Spring Semester can only be taken immediately preceding anticipated commencement in May.

Once a student has been accepted into the BS-MLS online program, he/she will work together with the chair/program director to outline an acceptable curriculum completion plan.