MEDICAL LABORATORY SCIENCE - CLINICAL CONCENTRATION

Faculty Coordinating Committee: Campbell (Chemistry and Biochemistry), Faulkner (Biology, Chair), Stover (Biology), Fry (Chemistry and Biochemistry, Chair)

Adjunct Faculty: Affiliate Instructors Carlson and Jobst.

Medical Laboratory Science is an interdepartmental major jointly sponsored by the Department of Biology and the Department of Chemistry and Biochemistry. The objective of the program is to provide the student with the appropriate background for admission to an accredited medical laboratory science hospital program. Students electing the Medical Laboratory Science program will be assigned an advisor in the Department of Chemistry and Biochemistry and must complete either the Clinical or General concentrations to fulfill the program requirements.

Students must submit a petition to advance to candidacy in the program following completion of the following courses with a C or better.

Code	Title	Hours
Required BIO Hours		
BIO 151	Molecules to Cells	3.0
BIO 152	Molecules to Cells Laboratory	1.0
BIO 230	Human Anatomy and Physiology I (Lecture)	3.0
BIO 232	Human Anatomy and Physiology II (Lecture)	3.0
BIO 231	Human Anatomy and Physiology Laboratory I	1.0
BIO 233	Human Anatomy and Physiology Laboratory II	1.0
BIO 406	General Microbiology	4.0
BIO 468	Immunology of Host Defense	3.0-4.0
Required CHM Hours		
CHM 122	Introduction to Medical Laboratory Science	1.0
CHM 110 & CHM 111	General Chemistry I and General Chemistry I Lab	4.0
CHM 116 & CHM 117	General Chemistry II and General Chemistry II Laboratory	4.0
CHM 252 & CHM 253	Organic Chemistry I and Organic Chemistry Laboratory I	5.0
CHM 256 & CHM 257	Organic Chemistry II and Organic Chemistry Laboratory II	4.0
CHM 422	Clinical Chemistry	2.0
CHM/BIO Elective		
CHM 360 or BIO 310	Biochemistry Genetics	3.0
MTH 111	Elementary Statistics	3.0
Total Hours		**45-46**

At the completion of 60 hours of coursework, a 3.0 cumulative gpa and a 3.0 science gpa are required for advancement to candidacy in the Medical Laboratory Science -Clinical concentration. Majors who are eligible for the Clinical concentration (a 3+1 program) usually complete their University coursework in the third year and spend their final year in a clinical internship at an affiliated hospital program. Students in this concentration traditionally apply to one or more of the affiliated hospital practicum programs by December 1st of their junior year. Admission to the clinical practicum is competitive and determined by a selection committee external to Bradley. Continuation in the Clinical concentration of the Medical Laboratory Science program is contingent upon acceptance into an affiliated hospital clinical practicum. All affiliated clinical programs are accredited by the National Accrediting Agency for Clinical Laboratory Science (NAACLS). After successful completion of a clinical practicum, the student will be granted a bachelor's degree from Bradley. Upon receipt of the B.S., graduates are eligible to sit for the national certification exams in Medical Laboratory Science.

Students who are not selected for a senior year clinical practicum are eligible to transition into the Medical Laboratory Science-General concentration. In addition, students may elect the General concentration instead of the Clinical concentration to fulfill the Medical Laboratory Science program requirements. After successful completion of the General concentration coursework and all University requirements, the student will be granted a bachelor's degree from Bradley.

Students may also opt for a 4+1 program by completing a four-year degree at the University to allow them to apply to any accredited medical laboratory science clinical practicum in the nation. Majors in Chemistry, Biochemistry, Biology, Medical Laboratory Science-General concentration or the Liberal Arts and Sciences.

Students desiring a major in Medical Laboratory Science will be required to complete a minimum of 45 hours of science and math courses distributed as follows:

- 19 hours of biology
- 20 hours of chemistry
- 3 hours of biology/chemistry elective
- 3 hours of elementary statistics

Descriptions of biology, chemistry, and math courses required for the degree in Medical Laboratory Science are listed by subject here (https://catalog.bradley.edu/undergraduate/course-descriptions/). These requirements are met by taking the following courses:

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Required BIO Hours		
BIO 151	Molecules to Cells	3.0
BIO 152	Molecules to Cells Laboratory	1.0
BIO 230	Human Anatomy and Physiology I (Lecture)	3.0
BIO 232	Human Anatomy and Physiology II (Lecture)	3.0
BIO 231	Human Anatomy and Physiology Laboratory I	1.0
BIO 233	Human Anatomy and Physiology Laboratory II	1.0
BIO 406	General Microbiology	4.0
BIO 468	Immunology of Host Defense	3.0-4.0
Required CHM Hours		
CHM 122	Introduction to Medical Laboratory Science	1.0
CHM 110 & CHM 111	General Chemistry I and General Chemistry I Lab	4.0
CHM 116 & CHM 117	General Chemistry II and General Chemistry II Laboratory	4.0
CHM 252 & CHM 253	Organic Chemistry I and Organic Chemistry Laboratory I	5.0
CHM 256 & CHM 257	Organic Chemistry II and Organic Chemistry Laboratory II	4.0

CHM 422	Clinical Chemistry	2.0
CHM/BIO Elective		
CHM 360 or BIO 310	Biochemistry Genetics	3.0
MTH 111	Elementary Statistics	3.0
Total Hours		**45-46**

Required math and science hours (minimum) in the Medical Laboratory Science major- 45 hrs.

Total required math and science hours (minimum) in the Medical Laboratory Science program – 66 to 78 hrs.

Note: Those students who have not attained an overall grade point average and a science gpa of at least 3.0 after completion of 60 semester hours will complete the General concentration to fulfill the major requirement.

The hours required for a major in Medical Laboratory Science are distributed as follows:

- Biology – 19 to 23 hrs.
- Chemistry - 20 to 23 hrs.
- Statistics - 3 hrs.
- English - 6 hrs.
- Speech Communication - 3 hrs.
- Core Curriculum Electives– 21 hrs.
- Concentration (Clinical or General)-21 to 32 hrs.

Total (minimum) – 120 hrs.

Students in the Clinical concentration of the Medical Laboratory Science program must successfully complete the 32 hours off-campus Clinical Practicum (OCP 388 Clinical Practicum) at one of the affiliated hospital programs. The clinical year will include the following courses taken at an affiliated hospital program. The student registers at Bradley for OCP 388 Clinical Practicum. A one-time fee of $100 is charged for OCP 388 Clinical Practicum.

Clinical Chemistry I 4-6 hrs.
Theory and practice of analytical biochemistry as applied to pathologic states, methodology, and instrumentation. Statistics as applied to reagent preparation, result determination, and quality control.

Clinical Chemistry II 2-4 hrs.
Theory and practice of analytical biochemistry as applied to specialized tests for drugs, endocrine function, and urine and body fluid analysis.

Clinical Hematology 5 hrs.
Study of the origin, development, morphology, physiology, and pathophysiology of the formed elements of the blood and bone marrow. Manual and automated methods of cell counting, differentiation, and other special hematological procedures on blood and body fluids used in disease diagnosis are included.

Clinical Hemostasis 1 hr.
Study of the platelet, vascular, coagulation, and fibrinolytic systems. Testing procedures and the application of the principles of hemostasis as related to disease states and therapeutic monitoring are also included.

Clinical Immunohematology 4 hrs.
Study of red cell antigen-antibody systems, antibody screening and identification, compatibility testing, and immunopathologic conditions. Also included are donor requirements and blood component preparation and therapy.

Clinical Immunology 3 hrs.
Study of the principles of the protective and adversive aspects of the cellular and humoral immune responses. Theory and performance of test procedures based on antigen-antibody reactions and clinical significance of test results are included.

Clinical Microbiology I 4-6 hrs.
Theory and practice of the isolation and identification of pathogenic bacteria and mycobacteria in clinical specimens through cultures, morphology, biochemical, and/or serological reactions and their drug susceptibility. The relation of clinical testing to disease states is also included.

Clinical Microbiology II 2-4 hrs.
Theory and practice of the isolation and identification of fungi, parasites, rickettsia, and viruses utilizing morphological, cultural, biochemical, and serologic methods. The relation of clinical testing to disease states and epidemiology as it applied to microbiology is also included.

Special Topics in Clinical Laboratory Science 1 hr.
An overview of medical ethics, patient approach, the theory and practice of phlebotomy techniques, laboratory safety, applications of laboratory computer systems, and independent clinical research and development.

Clinical Management and Education 1 hr.
A basic introduction to the principles and theory of management and education as related to the clinical laboratory. The special job responsibilities of the medical laboratory scientist in management and education are addressed.

Upon receipt of the baccalaureate degree and successful completion of the hospital clinical practicum, graduates are eligible to sit for the national certification exams in Medical Laboratory Science.

The following schedule of courses is suggested for the first year.

Course	Title	Hours
First Year		
Semester 1		
CHM 110	General Chemistry I	3.0
CHM 111	General Chemistry I Lab	1.0
MTH 111	Elementary Statistics	3.0
ENG 101 or COM 103	English Composition or The Oral Communication Process	3.0
Core Curriculum Electives		6.0
	Hours	**16**
Semester 2		
BIO 151	Molecules to Cells	3.0
BIO 152	Molecules to Cells Laboratory	1.0
CHM 116	General Chemistry II	3.0
CHM 117	General Chemistry II Laboratory	1.0
CHM 122	Introduction to Medical Laboratory Science	1.0
COM 103 or ENG 101	The Oral Communication Process or English Composition	3.0
Core Curriculum Elective		3.0
	Hours	**15**
	Total Hours	**31**