

BACHELOR OF SCIENCE IN MEDICAL LABORATORY SCIENCES

Web Site: <https://twu.edu/biology/undergraduate-programs/bachelor-of-science-in-medical-laboratory-sciences/>

The Medical Laboratory Sciences Program is offered through the Division of Biology. The medical laboratory scientist becomes increasingly important as new and more effective techniques of laboratory diagnosis are developed. In addition, positions are frequently available in medical research. Career opportunities are found throughout the country in large and small communities.

Our program is designed to prepare the student as a member of the health services team and leads to a Bachelor of Science degree. The student completes the pre-clinical phase during the first three years in the program and begins the clinical sequence in the senior year. This clinical rotation consists of both formal classes (hematology, parasitology, etc.) and hands-on laboratory training. Clinical rotation sites are approved by TWU and the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS). TWU currently has four affiliate sites for completion of clinical training:

- Tarleton State University, Fort Worth, TX (<http://www.tarleton.edu/medicallab/>)
- United Regional, Wichita Falls, TX (<http://www.unitedregional.org/become-a-medical-laboratory-scientist-mls/>)
- Methodist Hospital, Houston, TX (<http://www.houstonmethodist.org/mlsprogram/>)
- Baylor Scott & White, Temple, TX (<https://www.bswhealth.med/education/Pages/allied-health/temple/clinical-laboratory-science.aspx>)

Certification

Completion of the program qualifies the Medical Laboratory Sciences student to take the National Registry Examination (<https://www.ascp.org/content/board-of-certification/get-credentialed/>) for certification as MLS (ASCP).

Marketable Skills

Defined by the Texas Higher Education Coordinating Board's 60x30 Strategic Plan (<https://reportcenter.highered.texas.gov/agency-publication/miscellaneous/theccb-60x30-strategic-plan/>) as, "Those skills valued by employers that can be applied in a variety of work settings, including interpersonal, cognitive, and applied skills areas. These skills can be either primary or complementary to a major and are acquired by students through education, including curricular, co-curricular, and extracurricular activities."

- Written and oral communication skills.
- Demonstrate critical thinking by using logic and reasoning to interpret scientific results.
- Ability to design and conduct properly controlled experiments.
- Utilize modern scientific instruments and methods.

- Work collaboratively as part of a team to perform, analyze, interpret, and present research.
- Ability to understand and comply with laboratory safety guidelines.

Admissions

All applicants must meet the general undergraduate admission requirements (<https://catalog.twu.edu/undergraduate/admission-information/>).

Admission to Clinical Rotations

In the third year of the program, Medical Laboratory Sciences students must submit an application and be accepted for clinical rotations at an affiliate site. TWU currently has four affiliate sites for completion of clinical training:

- Tarleton State University, Fort Worth, TX (<http://www.tarleton.edu/medicallab/>)
- United Regional, Wichita Falls, TX (<http://www.unitedregional.org/become-a-medical-laboratory-scientist-mls/>)
- Methodist Hospital, Houston, TX (<http://www.houstonmethodist.org/mlsprogram/>)
- Baylor Scott & White, Temple, TX (<https://www.bswhealth.med/education/Pages/allied-health/temple/clinical-laboratory-science.aspx>)

Degree Requirements

Total Semester Credit Hours (SCH): 122-123

Major: 34 SCH; **Required Minor:** 20-21 SCH (Chemistry)

Program Code: MEDTECH.BS; **CIP Code:** 51.1005.00

Lecture and lab must be taken concurrently. A minimum grade of C is mandatory in all required courses for Medical Laboratory Sciences majors.

Texas Core Curriculum

Code	Title	SCHs
ENG 1013	Composition I	3
ENG 1023	Composition II	3
Mathematics		3
Life & Physical Sciences		6
Language, Philosophy, & Culture		3
Creative Arts		3
HIST 1013	History of the United States, 1492-1865	3
HIST 1023	History of the United States, 1865 to the Present	3
POLS 2013	U.S. National Government	3
POLS 2023	Texas Government	3
Social & Behavioral Sciences		3
CAO: Women's Studies		3
CAO: First Year Seminar, Wellness or Mathematics		3
Total SCHs		42

Courses Required for Major

Code	Title	SCHs
BACT 3113 & BACT 3111	General Microbiology and General Microbiology Laboratory	4

BACT 4113 & BACT 4111	Immunology and Immunology Laboratory	4
BIOL 4813 & BIOL 4811	Molecular and Cellular Biology: Gene Expression and Molecular and Cellular Biology: Gene Expression Laboratory	4
ZOOL 4243 & ZOOL 4241	Medical Physiology and Medical Physiology Laboratory	4
BIOL 4681	Biology Seminar	1
Biology Elective from BACT, BIOL, or ZOOL		9
Biology Elective hours must include coursework appropriate for science majors. The following courses are not acceptable electives: BACT 1003/BACT 1001, BIOL 1013, BIOL 1023, BIOL 1033, BIOL 1223, ZOOL 2013/ZOOL 2011, and ZOOL 2023/ZOOL 2021.		
Total SCHs		26

Departmental Requirements

Code	Title	SCHs
BIOL 1113 & BIOL 1111	Principles of Biology I and Principles of Biology I Laboratory	4
BIOL 1123 & BIOL 1121	Principles of Biology II and Principles of Biology II Laboratory	4
Choose one of the following:		4
CHEM 1113 & CHEM 1111	General Chemistry I and General Chemistry Laboratory I	
CHEM 1213 & CHEM 1211	Principles of Chemistry I and Principles of Chemistry Laboratory I	
Choose one of the following:		4
CHEM 1123 & CHEM 1121	General Chemistry II and General Chemistry Laboratory II	
CHEM 1223 & CHEM 1221	Principles of Chemistry II and Principles of Chemistry Laboratory II	
CHEM 2213 & CHEM 2211	Organic Chemistry I and Organic Chemistry Laboratory I	4
CHEM 3223 & CHEM 3221	Organic Chemistry II and Organic Chemistry Laboratory II	4
Choose one of the following:		4-5
CHEM 3333 & CHEM 3331	Quantitative Chemical Analysis and Quantitative Chemical Analysis Laboratory	
CHEM 3633 & CHEM 3632	Biochemistry I and Biochemistry I Laboratory	
MATH 1303 or MATH 2014	College Algebra Calculus I	3-4
MATH 1703	Elementary Statistics I	3
Choose one of the following:		4
PHYS 1133 & PHYS 1131	Principles of Physics I and Principles of Physics Laboratory I	
PHYS 2153 & PHYS 2151	General Physics I and General Physics Laboratory I	
Total SCHs		38-40

Electives

Code	Title	SCHs
	Medical Laboratory Sciences Clinical Rotation	27
Total SCHs		27

Students must satisfy the 3 SCH global perspectives graduation requirement.

During the first three years of this program, students complete Core and degree requirements toward preparation for clinical training at an approved affiliate site. Students may need to complete some of this coursework during summer sessions in order to finish classes within a three year period. The senior year will be spent at an affiliate hospital with a contractual agreement with TWU.

General types of courses in the senior year include studies in the areas of microbiology, parasitology, clinical chemistry, hematology, serology, urinalysis, mycology, and histology.

Clinical year arrangements are made with the Director of the Medical Laboratory Sciences Program. Medical Laboratory Sciences majors must submit a cross-registration form to the Division of Biology for each semester of the clinical program. The clinical component semester credit hours will be transferred to Texas Woman's University as 30 or more advanced semester hours credit.

Minor

No minor is offered in Medical Laboratory Sciences. The minor in chemistry is incorporated within the medical technology curriculum.

Code	Title	SCHs
Required Courses		
CHEM 1113 & CHEM 1111	General Chemistry I and General Chemistry Laboratory I	4
CHEM 1123 & CHEM 1121	General Chemistry II and General Chemistry Laboratory II	4
CHEM 2213 & CHEM 2211	Organic Chemistry I and Organic Chemistry Laboratory I	4
CHEM 3223 & CHEM 3221	Organic Chemistry II and Organic Chemistry Laboratory II	4
Choose one of the following		4-5
CHEM 3333 & CHEM 3331	Quantitative Chemical Analysis and Quantitative Chemical Analysis Laboratory	
CHEM 3633 & CHEM 3632	Biochemistry I and Biochemistry I Laboratory	
Total SCHs		20-21

Recommended Plan of Study

First Year		TCCN	SCHs
Fall			
BIOL 1113 & BIOL 1111	Principles of Biology I and Principles of Biology I Laboratory	BIOL 1406 & BIOL 1106	4
CHEM 1113 & CHEM 1111	General Chemistry I and General Chemistry Laboratory I	CHEM 1311 & CHEM 1111	4
MATH 1303	College Algebra	MATH 1314	3

ENG 1013	Composition I	ENGL 1301	3	Chose one of the following	4-5
UNIV 1231	Learning Frameworks: First-Year Seminar	EDUC 1100, EDUC 1200, EDUC 1300	1		
SCHs			15		
Spring			TCCN		
BIOL 1123 & BIOL 1121	Principles of Biology II and Principles of Biology II Laboratory	BIOL 1407 & BIOL 1107	4	CHEM 3333 Quantitative Chemical Analysis and Quantitative Chemical Analysis Laboratory & CHEM 3333 Laboratory	
CHEM 1123 & CHEM 1121	General Chemistry II and General Chemistry Laboratory II	CHEM 1312 & CHEM 1112	4	CHEM 3633 Biochemistry I and Biochemistry I Laboratory & CHEM 3632	
MATH 1703	Elementary Statistics I	MATH 1342	3	BIOL 4681 Biology Seminar	1
ENG 1023	Composition II	ENGL 1302	3	Biology Elective (in consultation with advisor)	3
Multicultural Women's Studies CAO Core			3	SCHs 12-13	
SCHs			17	Fourth Year	
Second Year				Fall	TCCN
Fall			TCCN		
BACT 3113 & BACT 3111	General Microbiology and General Microbiology Laboratory		4	Clinical Rotation - Upper Level	14
CHEM 2213 & CHEM 2211	Organic Chemistry I and Organic Chemistry Laboratory I	CHEM 2323 & CHEM 2123	4	SCHs 14	
POLS 2013	U.S. National Government	GOVT 2305	3	Spring	
HIST 1013	History of the United States, 1492-1865	HIST 1301	3	Clinical Rotation - Upper Level	13
Biology Elective (in consultation with advisor)			3	SCHs 13	
SCHs			17	Total SCHs: 122-123	
Third Year					
Fall			TCCN		
ZOOL 4243 & ZOOL 4241	Medical Physiology and Medical Physiology Laboratory		4		
CHEM 3223 & CHEM 3221	Organic Chemistry II and Organic Chemistry Laboratory II		4		
POLS 2023	Texas Government	GOVT 2306	3		
HIST 1023	History of the United States, 1865 to the Present	HIST 1302	3		
Creative Arts Core			3		
SCHs			17		
Spring			TCCN		
BIOL 4813 & BIOL 4811	Molecular and Cellular Biology: Gene Expression and Molecular and Cellular Biology: Gene Expression Laboratory		4		
PHYS 1133 & PHYS 1131	Principles of Physics I and Principles of Physics Laboratory I	PHYS 1301 & PHYS 1101	4		
Biology Elective (in consultation with advisor)			3		
Social/Behavioral Science Core			3		
Language, Philosophy & Culture Core			3		
SCHs			17		
Spring			TCCN		
BACT 4113 & BACT 4111	Immunology and Immunology Laboratory		4		