

MEDICAL LABORATORY SCIENCE

Medical laboratory scientists use analytical procedures and complex instruments to perform tests on blood and body fluids that assist physicians in patient diagnosis and treatment, disease monitoring and prevention. Because the tests performed are so vital in medical treatment, the medical laboratory scientist must know how to perform these tests with scientific precision and accuracy, but also be well educated in the underlying scientific principles and clinical significance of the results.

Background Information

Laboratory work plays a vital role in the daily routine of the medical laboratory scientist and, while usually not having direct contact with patients, the MLS enjoys being a vital member of the health care team. Clinical chemistry, hematology, microbiology, urinalysis, immunohematology and immunology are the principle areas of practice in the medical laboratory. In addition to laboratory testing and analysis, a medical laboratory scientist may also monitor test quality, supervise personnel, conduct research and develop new tests and methodologies.

Career Opportunities

Certified medical laboratory scientists may readily find employment throughout the country in hospitals, medical and diagnostic laboratories, and other healthcare services. According to the U.S. Department of Labor Bureau of Labor Statistics, employment of clinical laboratory workers is expected to grow faster than average for all occupations through 2026. This increase is attributed to growth in the aging population leading to a greater need to diagnose medical conditions through laboratory procedures, as well as, prenatal testing for various genetic conditions which has become increasingly common. Mean annual wages for medical laboratory scientists/technologists was \$62,440 in 2016 (www.bls.gov/oes/2016/may/oes292011.htm).

The Program

North Dakota State University's Bachelor of Science degree, major in medical laboratory science, includes three years of academic courses on campus followed by an 11- to 12-month full-time professional-level internship in an affiliated hospital-based school of medical laboratory science. Graduates are eligible to take a national certification exam administered by the American Society for Clinical Pathology Board of Certification. NDSU graduates have enjoyed excellent employment opportunities and pass rates on the ASCP BOC exam. To remain certified, medical laboratory scientists must earn continuing education credits.

Students interested in pursuing medical laboratory science should have an interest and aptitude in the sciences, particularly chemistry and biology. College courses include college algebra, biological sciences, microbiology, general, organic and biochemistry and statistics, along with general education courses. Transfer students need to successfully complete a minimum of 20 resident credits at NDSU prior to beginning an internship. The full-time internship consists of classroom and clinical bench instruction in clinical chemistry, hematology, immunohematology, microscopy/urinalysis, microbiology, serology, phlebotomy, education, management, and research methods.

Internship Admission

Internship application occurs annually in the fall. Pre-MLS students who will have completed all courses on campus by start of the internship and meet grade and grade point average (GPA) requirements may be eligible to apply for the professional-level internship. This internship occurs onsite within an affiliated hospital-based MLS program. NDSU maintains affiliation with seven medical laboratory science programs. These include: Sanford Medical Center (Fargo, ND), Mercy Medical Center (Sioux City, IA), Mercy College of Health Sciences (Des Moines, IA), Methodist Hospital (Omaha, NE), St. Luke's College (Sioux City, IA), St. Luke's Hospital (Cedar Rapids, IA), and Colorado Center for Medical Laboratory Science (Aurora, CO). All affiliated programs are accredited by the National Accrediting Agency for Clinical Laboratory Science.

Internship admission is selective. Admission criteria are established by each hospital program and generally includes the student's cumulative and science GPA (a minimum of 2.50-3.00 is required and varies by hospital program), courses completed, related experience, references and an interview. In addition, students must comply with criminal background and student conduct requirements. In order to participate in an MLS internship, students must be able to comply with program-designated essential functions or request reasonable accommodations to meet these essential functions. Requirements include a sound intellect, good motor skills, eye-hand coordination and dexterity, effective communication skills, visual acuity to perform macroscopic and microscopic analyses, or read procedures and graphs, and behavioral skills such as organization, time management and good judgment, even in emergency situations.

It is highly recommended that students interested in the MLS major meet with a medical laboratory science advisor to discuss degree and major requirements, internship admission and create an individualized plan of study at least one year prior to their anticipated internship application. Information about the profession, curriculum, internship, and advising contacts are available from the NDSU Department of Allied Sciences.

Medical Laboratory Science Plan of Study

Please note this is a sample plan of study and not an official curriculum. Actual student schedules for each semester will vary depending on start year, education goals, applicable transfer credit, and course availability. Students are encouraged to work with their academic advisor on a regular basis to review degree progress and customize an individual plan of study.

First Year					
Fall	Credits	Spring	Credits		
BIOL 150 General Biology I	3	CHEM 122 General Chemistry II	3		
BIOL 150L General Biology I Laboratory	1	CHEM 122L General Chemistry II Laboratory	1		
CHEM 121 General Chemistry I	3	COMM 110 Fundamentals of Public Speaking	3		
CHEM 121L General Chemistry I Laboratory	1	CSCI 114 Microcomputer Packages	3		
CHP 190 Critical Thinking and Academic Success	2	ENGL 120 College Composition II	3		
ENGL 110 College Composition II	4	Gen Ed Humanities & Fine Arts/Gend Ed Global Perspectives	3		
MATH 103 College Algebra	3				
	17		16		
Second Year					
Fall	Credits	Spring	Credits		
BIOL 220 Human Anatomy and Physiology I	3	BIOL 221 Human Anatomy and Physiology II	3		
BIOL 220L Human Anatomy and Physiology I Laboratory	1	BIOL 221L Human Anatomy and Physiology II Laboratory	1		
CHEM 341 Organic Chemistry I**	3	CHEM 342 Organic Chemistry II**	3		
CHEM 341L Organic Chemistry I Laboratory**	1	MICR 460 Pathogenic Microbiology	3		
MLS 200 Introduction to Medical Laboratory Science	1	MICR 460L Pathogenic Microbiology Laboratory	2		
MICR 350 General Microbiology	3	STAT 330 Introductory Statistics	3		
MICR 350L General Microbiology Laboratory	2				
Gen Ed Wellness	2				
	16		15		
Third Year					
Fall	Credits	Spring	Credits		
BIOC 460 Foundations of Biochemistry and Molecular Biology I	3	Gen Ed Humanities & Fine Arts	3		
BIOC 460L Foundations of Biochemistry I Laboratory	1	MLS 435 Hematology	2		
BIOL 315 Genetics	3	MICR 463 Clinical Parasitology	2		
BIOL 315L Genetics Laboratory	1	Gen Ed Social & Behavioral Sciences/Gen Ed Cultural Diversity	3		
MICR 470 Basic Immunology	3	Gen Ed Upper Division Writing (300-400 level)	3		
MICR 471 Immunology and Serology Laboratory	2				
Gen Ed Social & Behavioral Sciences	3				
	16		13		
Fourth Year					
Fall	Credits	Spring	Credits	Summer	Credits
MLS 496 Field Exp/Internship ***	12	MLS 496 Field Exp/Internship ***	12	MLS 496 Field Exp/Internship ***	6
	12		12		6
Total Credits: 123					

** Students have the option to complete Chem 240, Bioc 460, Bioc 460L, & Bioc 461 in place of Chem 341, Chem 341L, Chem 342, Bioc 460 & Bioc 460L.

*** Credits earned in an affiliated, NAACLS accredited hospital program; one year in length, including one summer session.

View NDSU equivalencies of transfer courses at: www.ndsu.edu/transfer/equivalencies

For Further Information

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DEPT LOCATION: Sudro Hall
DEPT PHONE: (701) 231-8713
DEPT WEBSITE: www.ndsu.edu/alliedsciences/

This publication will be made available in alternative formats upon request. Contact the Office of Admission (701) 231-8643 or 800-488-NDSU or ND Telecommunications Relay Service 800-366-6888 (TTY) or 800-366-6889 (voice).

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