Medical Laboratory Science

Taylor Health Science Bldg. (2nd Floor)
(435) 879-4971
http://health.dixie.edu/mls/

To find faculty & staff phone numbers and email addresses, please consult the University Directory (http://www.dixie.edu/directory/directory.php).

Program Director
Virginia C. Hughes, Ph.D.

Health Science Advisor
Esther Pugmire

Dean
Carole Grady, Ed.D.

Administrative Assistant
Colleen Hales

Program Description
The mission of the Medical Laboratory Science (MLS) program is to provide the community with certified medical laboratory scientists who can function as professional members of the clinical laboratory team and leaders in healthcare initiatives. Persons who have graduated from an accredited Medical Laboratory Technician (MLT) program can apply to the MLS Bachelor of Science program, which can be completed in five semesters. The curriculum consists of basic science, General Education, and laboratory science courses, with a semester of clinical rotations at one of our hospital affiliates.

Students can gear study toward a traditional MLS curriculum or toward further study in the medical profession or other graduate program. Beginning in 2014-2015, DSU will offer an MLT program. The MLS program at DSU values teamwork, community involvement, excellent teaching and quality resources, and is committed to providing students with a variety of professional opportunities.

Certification
Upon completion of program requirements, students are eligible to sit for the National Board of Certification Exam by the American Society for Clinical Pathology (ASCP). The MLS Capstone Course allows students to prepare for the national registry exam with practice mock exams which are computerized and mimic format and content of the ASCP exam.

Accreditation
The Bachelor of Science in MLS is accredited by the National Accrediting Agency for Clinical Laboratory Science (NAACLS). NAACLS can be contacted at:

NAACLS
5600 N. River Road, Suite 720
Rosemont, IL 60018
(773) 714-8880
naaclsinfo@naacls.org
www.naacls.org (http://www.naacls.org)

Facilities
The Dixie State University MLS Program is located on the second floor of the Russell C. Taylor Health Science Building, located at 1526 E. Medical Center Drive, St. George, UT. The labs are state of the art with chemistry, hematology, urinalysis, osmolality analyzers, twelve microscopes, two incubators, two fume hoods, autoclave, and two media projectors with Smart board capabilities for teaching.

Clubs
Students have the opportunity to belong to numerous professional societies with student membership. These include the American Society for Clinical Laboratory Science, American Association of Blood Banks, and the American Society of Clinical Pathology.

Course Prefixes
• MLS
# Medical Laboratory Science

## Degrees

- Bachelor of Science in Medical Laboratory Science (catalog.dixie.edu/programs/medicallaboratoryscience/bachelor_of_science_in_medical_laboratory_science)
- Associate of Applied Science in Medical Laboratory Science (catalog.dixie.edu/programs/medicallaboratoryscience/associate_of_applied_science_in_medical_laboratory_science)

## Admission Requirements

Students are admitted to the MLS program without discrimination regarding gender, age, creed, ethnic origin, or marital status. Persons who have graduated from an accredited MLT associate degree program are invited to apply to the DSU MLS baccalaureate program after first being fully admitted to Dixie State University.

After admission to DSU, students may apply to the MLS program. The application and reference form may be found at our website (http://www.dixie.edu/health/mls). The deadline for submission of the application to the MLS program is June 1st. Admission is competitive and based upon GPA (2.5 minimum, grade C or higher in all Mathematics and Science courses), references, laboratory experience, essay, and candidate interview. Students who are accepted will start coursework the following fall semester.

## Prerequisites

The following courses must be completed before applying to the MLS program:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>BIOL 1010</td>
<td>General Biology</td>
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<tr>
<td>&amp; BIOL 1015</td>
<td>and General Biology Lab</td>
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<tr>
<td>or BIOL 1610</td>
<td>Principles of Biology I</td>
<td></td>
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<tr>
<td>&amp; BIOL 1615</td>
<td>and Principles of Biology I Lab</td>
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<tr>
<td>BIOL 2060</td>
<td>Principles of Microbiology</td>
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<td>&amp; BIOL 2065</td>
<td>and Principles of Microbiology Lab</td>
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<tr>
<td>BIOL 2320</td>
<td>Human Anatomy</td>
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<td>&amp; BIOL 2325</td>
<td>and Human Anatomy Lab</td>
<td></td>
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<tr>
<td>BIOL 2420</td>
<td>Human Physiology</td>
<td>4</td>
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<tr>
<td>&amp; BIOL 2425</td>
<td>and Human Physiology Lab</td>
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<tr>
<td>BIOL 3460</td>
<td>Biology of Infectious Disease</td>
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<tr>
<td>CHEM 1110</td>
<td>Elem General/Organic Chemistry</td>
<td>5</td>
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<tr>
<td>&amp; CHEM 1115</td>
<td>and Elem General/Organic Chemistry Lab</td>
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<tr>
<td>CHEM 1120</td>
<td>Elem Organic / Bio Chemistry</td>
<td>5</td>
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<td>&amp; CHEM 1125</td>
<td>and Elem Organic/Bio Chemistry Lab (or)</td>
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<td>CHEM 1210</td>
<td>Principles of Chemistry I</td>
<td>4</td>
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<td>CHEM 1215</td>
<td>Principles of Chemistry I Lab</td>
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<td>CHEM 1220</td>
<td>Principles of Chemistry II</td>
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<td>CHEM 2310</td>
<td>Organic Chemistry I</td>
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<td>ENGL 2010</td>
<td>Interm Writing Selected Topics: (5)</td>
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<tr>
<td>MATH 1040</td>
<td>Introduction to Statistics (or)</td>
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<tr>
<td>STAT 2040</td>
<td>Business Statistics</td>
<td>3</td>
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<tr>
<td>MATH 1050</td>
<td>College Algebra / Pre-Calculus</td>
<td>4</td>
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After acceptance and prior to enrolling, students will be required to undergo a background check, drug screen, and provide documentation of a physical examination and proof of specific immunizations.

## Career Information

### Career Opportunities*

Medical and clinical laboratory technologists (B.S. degree) and technicians (A.A.S. degree) are prepared to collect samples and perform tests to analyze body fluids, tissue, and other substances. An MLS bachelor’s degree can also provide preparation for professional graduate study in a number of health science fields. Technologists and technicians are employed in government, hospitals, medical and diagnostic laboratories, and physicians’ clinics/offices.
Job Outlook*
Between 2010 and 2020, employment for medical laboratory technologists is expected to grow about 11%, while medical laboratory technicians are expected to grow 15%, both of which are with the average for all occupations. However, regional variations in need can increase those percentages.

Salary Range*
The median annual wage of medical laboratory scientists is $56,130, and the median annual wage of medical laboratory technicians is $36,280.

* From the Occupational Outlook Handbook

Courses

MLS 1113. Intro to Medical Laboratory Science. 4 Hours.
Open to all students planning to apply for admission to the DSU Associate of Applied Science in Medical Laboratory Science program. Principles and applications to laboratory testing including safe practices for the laboratory practitioner, specimen quality assurance, phlebotomy, urinalysis, basic concepts in clinical immunology and serology testing. Students will also be introduced to urinalysis instrumentation. Course fee required. FA.

MLS 1123. Principles of Hematology and Hemostasis. 5 Hours.
Fundamental theories of hematopoiesis, hemostasis, routine laboratory evaluation of blood components using standard instrumentation and microscopic methods. Quality control is also discussed. Instrumentation, anemias, leukemias, and blood cell morphology are covered. Laboratory section will focus on hematology and coagulation tests using both manual and automated methods. Prerequisite: MLS 1113. SP.

MLS 2211. Clinical Chemistry I. 5 Hours.
Basic concepts and techniques in clinical chemistry and quality control utilizing manual and automated laboratory procedures. Emphasis on blood and body fluid assessments of carbohydrates, bilirubin, non protein nitrogen testing and electrolyte acid/base balance. Course fee required. Prerequisites: Admission to the AAS Program in Medical Laboratory Science; AND MLS 1113 AND MLS 1123. FA.

MLS 2212. Clinical Microbiology I. 5 Hours.
Introduces students to clinically significant bacteria including epidemiology, pathogenicity, and procedures for the traditional laboratory identification and antimicrobial testing. Course fee required. Prerequisites: Admission to the AAS Program in Medical Laboratory Science; AND MLS 1113 AND MLS 1123. FA.

MLS 2213. Clinical Chemistry II. 5 Hours.
Students will be given lectures on proteins, lipids, enzymology, therapeutic drug monitoring, toxicology, and basic endocrinology. Laboratory section will facilitate student learning by students applying theory to laboratory assays. Course fee required. Prerequisites: Admission to the AAS Program in Medical Laboratory Science; AND MLS 2211. SP.

MLS 2214. Clinical Microbiology II. 5 Hours.
Clinical mycology, virology, parasitology and miscellaneous clinical bacteria will be covered. The laboratory section will focus on traditional methods of identification of bacteria and parasites. Course fee required. Prerequisites: Admission to the AAS Program in Medical Laboratory Science; AND MLS 2212 (Grade C+ or higher). SP.

MLS 2215. Prin of Immunohematology. 4 Hours.
Covers the theory and principles of immunohematology relevant to blood group serology, antibody detection and identification, compatibility testing, component preparation and therapy in blood transfusion service, quality control, donor screening and phlebotomy, transfusion reactions and hemolytic disease of the newborn. Course fee required. Prerequisites: Admission to the AAS Program in Medical Laboratory Science; AND MLS 1113 AND MLS 1123. SP.

MLS 2256. Clinical Practice Internship. 5 Hours.
Students will rotate through various sections of the clinical laboratory of an affiliate of Dixie State University. They will perform patient testing and enter laboratory results in a laboratory information system as well as perform quality control and quality assurance procedures. Prerequisites: Admission to the AAS Program in Medical Laboratory Science; AND MLS 1113 AND MLS 1123. SU.

MLS 3310. Advanced Immunohematology. 4 Hours.
Required course for students in the Bachelor of Science Medical Laboratory Science Program. Students will revisit theory and applications of Immunohematology as well as clinical correlations regarding donor and patient transfusion history, blood groups, transfusion reactions, disease and treatments as related to transfusion medicine. Prerequisite: Admission to the Dixie State University Bachelor of Science Program in Medical Laboratory Science. FA.

MLS 3314. Advanced Clinical Microbiology. 4 Hours.
Required course for students in the Bachelor of Science Program in Medical Laboratory Science. Comprehensive study of clinical microbiology using the culture site approach including laboratory identification of pathogens by traditional manual methods. Molecular diagnostics will also be covered using current and evolving techniques. Prerequisite: Admission to the Dixie State University Bachelor of Science Program in Medical Laboratory Science. FA.
MLS 3323. Adv Hematology/Hemostasis. 4 Hours.
Required course for students in the Bachelor of Science program in Medical Laboratory Science. Students will correlate hematology and hemostasis parameters and patient history with related disease processes. Theory and methodology will also be covered. Prerequisite: Admission to the Dixie State University Bachelor of Science Program in Medical Laboratory Science. SP.

MLS 3330. Advanced Clinical Chemistry. 4 Hours.
Required course for students in the Bachelor of Science Medical Laboratory Science program. Students will perfect problem-solving skills in the correlation of clinical chemistry test results to organ-related diseases such as renal, hepatic, and endocrine diseases. Students will learn how to use clinical correlation as a quality assurance tool to detect patient testing errors while also matching patient history and laboratory results to disease processes. Therapeutic drug monitoring and toxicology studies are also covered. Prerequisite: Admission to the Dixie State University Bachelor of Science Program in Medical Laboratory Science. SP.

MLS 3555. Research Seminar. 2 Hours.
Required course for students in the Bachelor of Science program in Medical Laboratory Science. Addresses research methods in the clinical sciences and reviews accepted policies from the National Institutes of Health on informed consent, institutional review boards, and clinical trials. Students will read and interpret studies in the clinical laboratory sciences, comment on problems with studies, and note the further work needed in the respective area of research. Students will present a study, highlighting the research questions answered, methods employed, and relevance to other studies. Prerequisite: Admission to the Dixie State University Bachelor of Science Program in Medical Laboratory Science. SP.

MLS 4020. MLS Capstone. 1 Hour.
Students will learn resume writing and take a mock registry examination in preparation for Board of Certification Exam by the American Society for Clinical Pathology. Prerequisite: Admission to the Dixie State University Bachelor of Science Program in Medical Laboratory Science. SP.

MLS 4110. Laboratory Management/Edu. 2 Hours.
Students will learn managerial problem solving, finance, and budgeting, Lean and Six Sigma techniques, leadership styles, and education/training relevant to the clinical laboratory. Prerequisite: Admission to the Dixie State University Bachelor of Science Program in Medical Laboratory Science. FA.

MLS 4330. Clinical Chemistry Practice. 4 Hours.
Students will rotate through the chemistry laboratory of a hospital and perform analyses and quality control on a variety of automated instruments. Students will also enter results on a laboratory information system. Prerequisite: Admission to the Dixie State University Bachelor of Science Program in Medical Laboratory Science. SP.

MLS 4410. Clinical Immunohematology Prac. 4 Hours.
Students will rotate through a hospital blood bank performing blood typing, antibody identification, crossmatching, fetal screens, elutions and will observe blood components being issued for transfusion. Students will enter results into a laboratory information system. Quality control tasks will also be performed. Prerequisite: Admission to the Dixie State University Bachelor of Science Program in Medical Laboratory Science. SP.

MLS 4414. Clinical Microbiology Practice. 4 Hours.
Students will rotate through a medical center/hospital microbiology department performing identification of organisms from a variety of specimens and body fluids. Students will enter results into a laboratory information system and perform quality control tasks. Prerequisite: Admission to the Dixie State University Bachelor of Science Program in Medical Laboratory Science. SP.

MLS 4423. Clinical Hematology Practice. 4 Hours.
Students will rotate through a hematology laboratory in a hospital where they will analyze samples using both automated and manual methods. Analyses in coagulation will also be covered. Students will enter results into a laboratory information system. Quality control tasks will also be carried out by students. Prerequisite: Admission to the Dixie State University Bachelor of Science Program in Medical Laboratory Science. SP.