

BACHELOR OF SCIENCE IN APPLIED SCIENCE IN MEDICAL LABORATORY SCIENCE

Medical Laboratory Programs

Laboratory analysis plays an important role in the detection, diagnosis, and treatment of many diseases. Laboratory professionals perform a myriad of such tests to aid the physician in the management of disease.

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MLS Internship Guidelines

Students should apply for Medical Laboratory Science Internship upon completion of the second year of the program or after completing approximately 60-65 semester hours. Application packets containing information on clinical affiliations and the application process are available from the program director or in the Department of Health Professions. Students should apply for graduation at the beginning of the junior year so their transcripts may be evaluated by an academic advisor in the Bitonte College of Health and Human Services. This application will help ensure that all of the requirements for internship and graduation have been fulfilled.

The University **does not** guarantee acceptance into the fourth year of hospital clinical internship. Selection and acceptance into a particular hospital program is based on that program's admission and selection process. Thus, students are selected by the hospital programs, which are very competitive. Students are urged to maintain a minimum 3.0 GPA, especially in all science and medical laboratory courses. To enhance their chances of acceptance into a medical internship, students are encouraged to apply to several accredited programs. A list of these programs is available through the program director. Students should notify the program director upon their acceptance by a professional program.

Medical Laboratory Science (BS-MLS) Curriculum

The medical laboratory science program is a four-year program leading to a Bachelor of Science in Applied Science degree with a major in Medical Laboratory Science. Students in the program must have a physical examination and provide records of their immunizations, including the hepatitis B immunization series.

All course work in the MLS program must be completed with a minimum grade of "C". Students must maintain an overall GPA of 2.5 and a GPA of 2.5 in all MLS courses. Students receiving a total of 6 semester hours of "D" or "F" grades in MLS, biology or chemistry courses will be dismissed from the program. Readmission to the program is based on GPA and on the availability of space in the class.

The program follows the "3+1" format with the student completing a pre-professional phase of courses in clinical laboratory technology, general chemistry, biological sciences, organic and biochemistry, microbiology, immunology, and mathematics during the first three years of the program. The final year of the program is completed at an accredited MLS hospital program. Upon successful program completion, graduates are qualified to take the certification examinations offered through ASCP and become certified as MLS (ASCP). Additionally, a MLT-to-MLS completion program is available.

Medical laboratory scientists perform hundreds of scientific procedures that have been devised to detect subtle changes that occur in disease. The MLS performs a full range of laboratory tests, ranging from complete blood counts, to more complex tests to uncover diseases such as leukemia, and

diabetes. Studying blood cells under the microscope, the analysis of the chemical composition of blood, the isolation and identification of disease causing bacteria, and blood grouping and cross matching for transfusions are examples of the high complexity procedures performed by medical laboratory scientists. Positions are available as bench-level technologists, supervisors, and laboratory managers.

In addition to traditional laboratory careers, there are opportunities in education, research, and in industry as technical and sales representatives. In their quest to aid the physician and other health care providers, laboratory professionals do much more than look through a microscope. They operate complex analytical equipment, perform computations, and utilize precision instruments. Medical laboratory scientists act as an integral part of the health care team. Because of their academic and diverse clinical experience, graduates are well qualified for post-graduate programs in medicine, clinical chemistry, and biology.

Advanced Placement Option -Medical Laboratory Science

The Advanced Placement Option in the Medical Laboratory Science program provides a pathway for ASCP certified Medical Laboratory Technicians (MLT) to become Medical Laboratory Scientists (MLS). The program is designed to meet the needs of the working medical laboratory technician so that they can pursue their degree while still employed as a laboratory professional and to address the growing local, regional and national shortage of medical laboratory scientists.

Applicants must meet the following criteria for acceptance into the program:

- Have graduated from a NAACLS accredited MLT/CLT program
- Have completed prerequisite course work in biology, chemistry, and mathematics and also meet Biology and Chemistry guidelines for eligibility for the ASCP MLS Certification examination.
- Be certified as a MLT(ASCP)
- Be employed in an accredited laboratory that is able to provide training in all required MLS disciplines.

Students may transfer courses from approved institutions with prior approval from the program director or department chairperson. Students may be granted experiential credit for a clinical course and, if so, will not be required to register for that course.

The MLS Advanced Placement Option is accredited through the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS): 5600 N. River Rd. Suite 720 Rosemont, IL 60018-5119, Phone: 773.714.8880, www.naacls.org, info@naacls.org

| COURSE | TITLE | S.H. |
|---|--|------|
| Writing | | 6 |
| ENGL 1550 | Writing 1 | |
| ENGL 1551 | Writing 2 | |
| Speech | | 3 |
| CMST 1545 | Communication Foundations | |
| Mathematics | | 4 |
| STAT 2625 | Stat Lit and Crit Reasoning | |
| Arts & Humanities (2 courses) | | 6 |
| Social Sciences (2 courses) | | 6 |
| Social & Personal Awareness (2 courses) | | 6 |
| General Education Elective | | 2 |
| HAHS 1500 | Introduction to the Bitonte College of Health and Human Services | |
| Major Courses | | 22 |
| MLS 1501 | Introduction to the Medical Laboratory Profession | |

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|--------------------------|--|------|--|--|----|
| MLS 1501L | Introduction to the Medical Laboratory Profession Laboratory | | BIOL 2602 & 2602L | General Biology: Organisms and Ecology and General Biology: Organisms and Ecology Laboratory | 4 |
| MLS 3700 | Clinical Chemistry 2 | | ENGL 1551 | Writing 2 | 3 |
| MLS 3700L | Clinical Chemistry 2 Laboratory | | General Education Requirement ¹ | | 3 |
| MLS 3701 & 3701L | Clinical Hematology 1 and Clinical Hematology 1 Laboratory | | Semester Hours | | 14 |
| MLS 3702 & 3702L | Clinical Hematology 2 and Clinical Hematology 2 Laboratory | | Year 2 | | |
| MLS 3703 | Clinical Immunology | | Fall | | |
| MLS 3703L | Clinical Immunology Laboratory | | CHEM 3719 & 3719L | Organic Chemistry 1 and Organic Chemistry 1 Laboratory | 4 |
| MLS 3787 | Diagnostic Microbiology | | BIOL 3702 & 3702L | Microbiology and Microbiology Laboratory | 4 |
| MLS 3787L | Diagnostic Microbiology Laboratory | | CMST 1545 | Communication Foundations | 3 |
| Internship Year | | 37 | STAT 2625 | Stat Lit and Crit Reasoning | 4 |
| MLS 4800 | Advanced Clinical Chemistry | | General Education Requirement ¹ | | 3 |
| MLS 4801 | Advanced Hematology | | Semester Hours | | 18 |
| MLS 4802 | Advanced Immunohematology | | Spring | | |
| MLS 4803 | Advanced Microbiology | | CHEM 3720 & 3720L | Organic Chemistry 2 and Organic Chemistry 2 Laboratory | 4 |
| MLS 4804 | Miscellaneous Clinical Experience | | General Education Requirement ¹ | | 3 |
| AHLT 4806 | Research Methods | | General Education Requirement ¹ | | 3 |
| Biology Courses | | 17 | BIOL 1545 & 1545L | Allied Health Anatomy and Physiology and Allied Health Anatomy and Physiology Laboratory | 5 |
| BIOL 2601 & 2601L | General Biology: Molecules and Cells and General Biology: Molecules and Cells Laboratory | | Semester Hours | | 15 |
| BIOL 2602 & 2602L | General Biology: Organisms and Ecology and General Biology: Organisms and Ecology Laboratory | | Summer | | |
| BIOL 1545 & 1545L | Allied Health Anatomy and Physiology and Allied Health Anatomy and Physiology Laboratory | | MLS 3701 & 3701L | Clinical Hematology 1 and Clinical Hematology 1 Laboratory | 3 |
| BIOL 3702 & 3702L | Microbiology and Microbiology Laboratory | | MLS 3700 & 3700L | Clinical Chemistry 2 and Clinical Chemistry 2 Laboratory | 4 |
| Chemistry Courses | | 16 | Semester Hours | | 7 |
| CHEM 1515 & 1515L | General Chemistry 1 and General Chemistry 1 Laboratory | | Year 3 | | |
| CHEM 1516 & 1516L | General Chemistry 2 and General Chemistry 2 Laboratory | | Fall | | |
| CHEM 3719 & 3719L | Organic Chemistry 1 and Organic Chemistry 1 Laboratory | | MLS 3702 & 3702L | Clinical Hematology 2 and Clinical Hematology 2 Laboratory | 3 |
| CHEM 3720 & 3720L | Organic Chemistry 2 and Organic Chemistry 2 Laboratory | | MLS 3787 & 3787L | Diagnostic Microbiology and Diagnostic Microbiology Laboratory | 5 |
| Total Semester Hours | | 125 | General Education Requirement ¹ | | 3 |
| | | | Semester Hours | | 11 |
| Year 1 | | | Spring | | |
| Fall | | S.H. | MLS 3703 & 3703L | Clinical Immunology and Clinical Immunology Laboratory | 4 |
| MLS 1501 & 1501L | Introduction to the Medical Laboratory Profession and Introduction to the Medical Laboratory Profession Laboratory | 3 | General Education Requirement ¹ | | 3 |
| CHEM 1515 & 1515L | General Chemistry 1 and General Chemistry 1 Laboratory | 4 | Semester Hours | | 7 |
| BIOL 2601 & 2601L | General Biology: Molecules and Cells and General Biology: Molecules and Cells Laboratory | 4 | Summer | | |
| ENGL 1550 | Writing 1 | 3 | AHLT 4806 | Research Methods | 3 |
| HAHS 1500 | Introduction to the Bitonte College of Health and Human Services | 2 | MLS 4804 | Miscellaneous Clinical Experience | 4 |
| Semester Hours | | 16 | MLS 4804L | Miscellaneous Clinical Practice | 2 |
| Spring | | | Semester Hours | | 9 |
| CHEM 1516 & 1516L | General Chemistry 2 and General Chemistry 2 Laboratory | 4 | Year 4 | | |
| | | | Fall | | |
| | | | MLS 4801 | Advanced Hematology | 4 |
| | | | MLS 4801L | Advanced Hematology Clinical Practice | 3 |
| | | | MLS 4802 | Advanced Immunohematology | 4 |
| | | | MLS 4802L | Advanced Immunohematology Clinical Practice | 3 |
| | | | Semester Hours | | 14 |

Spring

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|----------------------|---|-----|
| MLS 4803 | Advanced Microbiology | 5 |
| MLS 4803L | Advanced Microbiology Clinical Practice | 3 |
| MLS 4800 | Advanced Clinical Chemistry | 4 |
| MLS 4800L | Advanced Clinical Chemistry Clinical Experience | 2 |
| Semester Hours | | 14 |
| Total Semester Hours | | 125 |

¹ General education courses must fulfill the requirements for the baccalaureate degree. Students must take two courses from Arts & Humanities, two courses from Social Science, and two courses from Social and Personal Awareness.

Learning Outcomes

The student learning outcomes for the medical laboratory programs (MLS-BSAS and MLT-AAS) are as follows:

- Graduates will be prepared to function as entry-level health care professionals in the medical laboratory as medical laboratory technicians and medical laboratory scientists. At entry level, the medical laboratory graduate will be able to demonstrate the ability to comprehend, apply and evaluate information relative to the medical laboratory profession.
- These learning outcomes include comprehension of the theory and the ability to apply and evaluate the didactics of hematology, clinical chemistry, immunohematology, microbiology, immunology, coagulation, molecular diagnostics, and other emerging diagnostics.
- Graduates will be prepared to function as entry-level health care professionals in the medical laboratory as medical laboratory technicians and medical laboratory scientists. Upon completion of the program, graduates will demonstrate technical proficiency in laboratory applications.
- These psychomotor learning outcomes include the performance of laboratory procedures in hematology, clinical chemistry, immunohematology, microbiology, immunology, coagulation, molecular diagnostics, and other emerging diagnostics. The graduate will demonstrate proficiency in the functions of all phases of laboratory analysis (pre-analytical, analytical, and post-analytical processes).
- Graduates will demonstrate professional conduct and interpersonal communication skills consistent with the medical laboratory profession.
- Students will exhibit the ability to think critically across all 3700-level courses through the application of fundamental didactic and psychomotor skills to assess the medical relevance and significance of specific aspects of laboratory testing.