

MEDICAL LABORATORY SCIENCES

Halenz Hall, Room 326
 269-471-3336
mls@andrews.edu
www.andrews.edu/mls/

Faculty

Marcia A. Kilsby, *Chair, MLS Program Director*
 Tim A. Newkirk
 Karen A. Reiner, *Graduate Program Coordinator*
 Richard D. Show

Academic Programs	Credits
BS in Medical Laboratory Science (BSMLS)	124
BS: Allied Health Administration	65
MS in Medical Laboratory Science (MSMLS)	36
Emphasis Areas	
Laboratory Sciences	
Laboratory	
Leadership and Administration	
Education	
Laboratory Mission Outreach & Development	

Mission

The mission of the Department of Medical Laboratory Sciences, in harmony with Andrews University and the Seventh-day Adventist Church, is to prepare students for Christian service as medical laboratory scientists.

The MLS **department** encourages faculty in professional, educational and spiritual growth.

The MLS **faculty** educates students to develop excellence in the skills necessary for a life work of service in quality health care and dedication to improving the human condition.

MLS **graduates** will minister to the needs of others by practicing and promoting standards of excellence as medical laboratory science professionals.

Medical Laboratory Science

The degree program includes three years of undergraduate (pre-clinical) studies plus one year (3 semesters) of clinical (professional) education.

Pre-clinical Program. The first three years of undergraduate study include General Education, cognate science, and pre-clinical degree requirements. Program options feature directed elective course work selected in consultation with the faculty advisor according to the student’s career goals and interests.

Clinical (Professional) Program. The year of clinical studies is comprised of lectures and student laboratories on the Berrien Springs campus and clinical practica at an affiliated hospital or clinical laboratory site.

Clinical Experience (Practica). Students work side-by-side with practicing professionals in patient health care during the

final portion of the clinical year. Andrews University maintains a number of affiliations with clinical institutions across the country. Student preferences for clinical site assignments are solicited and granted when possible. Final site assignments are made at the discretion of the faculty. Each student is responsible for providing his/her own transportation for the clinical practica. We strongly advice that each student have his/her own car for that purpose.

Clinical Year Admission Requirements. An independent admissions process is required for university students who wish to enter clinical studies. The application form may be obtained from the Department of Medical Laboratory Sciences office. Students should complete the application and return it to the departmental office by January 31 prior to their anticipated clinical-study year.

Admission requires an overall GPA of 2.50. In the admissions process, the GPAs for the cognate science courses and medical laboratory science content courses are computed together. This combined GPA must also be a minimum of 2.50. Preference is given to students with the higher GPAs. Students may only repeat the fundamentals courses once to be eligible for admission consideration for the program.

Applicants must be able to meet the program’s published *Essential Functions*, copies of which are incorporated into the application packet, and express a willingness to comply with the principles, rules, regulations, and policies of both the university and the program as they relate to the ideals and values of the Seventh-day Adventist Church and the medical laboratory science profession.

All prerequisite course work, including General Education, cognate science, and pre-clinical courses, must be completed prior to entry into the clinical year. A personal interview may be required at the discretion of the Admissions Committee.

In exceptional circumstances, the Admissions Committee may accept students outside the stated policy.

Student Progression in Clinical Year. The clinical year is highly structured and sequential. Enrolled students may not drop a class, audit a class, or earn a grade lower than C- in any class. Students may enter clinical practica only upon satisfactory completion of on-campus course work. Satisfactory completion is defined as a senior-year minimum cumulative GPA of 2.50 and the recommendation of the faculty. A student receiving a cumulative GPA of less than 2.50 may be allowed to advance if the program faculty identifies exceptional circumstances and recommends that the student continue in the program.

Student continuance in the clinical practica is conditional upon acceptable ethical department and exemplary patient-care practices. The clinical affiliate supervisors and program faculty are final arbiters in determining student continuance.

Professional Certification. Students who complete the degree program are eligible to write the national certification examination sponsored by the ASCP (American Society for Clinical Pathology) Board of Certification.

Program Accreditation. The Andrews University Program for Medical Laboratory Sciences holds accreditation from the National Accrediting Agency for Medical Laboratory Sciences (NAACLS), 5600 N River Rd, Suite 720, Rosemont, IL 60018, (773) 714-8880 fax (773) 714-8886, e-mail at info@naacls.org, or the Web at www.naacls.org.

Academic Calendar 2011–2012

2011

July 22	Fri	Senior summer term (clinical) ends
July 25	Mon	Registry review week begins
July 30	Sat	Certification ceremony

2012

Mar 12	Mon	Clinical Practica begins
May 4	Fri	Senior spring semester (clinical) ends
May 7	Mon	Senior summer semester (clinical) begins
July 27	Fri	Senior summer term (clinical) ends
July 30	Mon	Registry review week begins
Aug 4	Sat	Certification ceremony

Undergraduate Programs

BS in Medical Laboratory Science (124)
(BSMLS)

General Education Requirements—32

See professional program requirements, p. 43, and note the following **specific** requirements:

Religion: professional degree requirements

Language/Communication: professional degree requirements

History or Fine Arts/Humanities: professional degree requirements

Life/Physical Sciences: See cognate sciences below

Mathematics: Statistics preferred. Students transferring into clinical program—any college level course.

Computer Literacy: fulfilled through MLSC470

Service: fulfilled through clinical practica

Social Sciences: professional degree requirements

Fitness Education: 2 courses. Recommend freshmen take HLED120 Fit for Life and one additional course from personal fitness, outdoor skills or team activity. Transfer students take two from the three categories above. Must also pass a physician-administered physical exam before advancement to clinical practica.

Cognate Science Requirements—26

BIOL165: BIOL166 or 221; CHEM131, 132, 231, 232, 241, 242
(Fulfills General Education Life/Physical Science requirement)

Major Requirements—61

Prerequisites—11

MLSC105, 110, 210, 230, 240, 350

Major courses—50

MLSC320, 400, 401, 405, 411, 412, 413, 421, 423, 431, 432, 433, 441, 442, 443, 451, 452, 453, 461, 463, 470, 475, 493

Directed electives—5–8

Students select courses in consultation with and by the consent of their advisors in a planned program to enhance professional preparation. Courses are chosen from biology, business, chemistry, computer science, electronics, and education. Pre-medical/pre-dental students must include PHYS141, 142 General Physics or PHYS241, 242, 271, 272 (8 cr)

BS: Allied Health Administration (65)

This degree is designed for health-care professionals seeking to enhance the knowledge they already have and to help them prepare for future career employment requirements. The degree format features a strong general education and administrative/business component and provides an academic foundation for health-care administrative positions. It is open only to individuals holding an associate degree or a two-year certificate in an allied-health professional area with earned certification where applicable in such areas as diagnostic ultrasound, nuclear medicine, physician assistant, radiation therapy, radiologic technology, respiratory therapy, and special procedures in radiologic technology. Admission to the program is by permission of the Department of Medical Laboratory Sciences chair.

General Education Requirements—46

See professional program requirements, p. 43, and note the following **specific** requirements:

Religion: professional degree requirements

Language/Communication: professional degree requirements

History: professional degree requirements

Fine Arts/Humanities: professional degree requirements

Life/Physical Sciences: completed through the associate/certificate program transfer credits

Mathematics: Statistics preferred. Transfer students—any college level course.

Computer Literacy: professional degree requirements

Service: fulfilled through clinical practica

Social Sciences: PSYC101 and BHSC220 or BHSC235

Fitness Education: professional degree requirements

Transfer credits accepted from an AS degree or certificate program—34

Business/Administration Courses—27

ACCT 121, 122, BSAD341, 355, 384, ECON226, MKTG310 and management courses selected in consultation with and approval of the advisor.

ALHE480 Practicum in Administration—4

Graduate Programs

MS in Medical Laboratory Science (MSMLS)
(36)

The Department of Medical Laboratory Sciences offers a graduate program leading to the Master of Science in Medical Laboratory Science. In response to the diversity of skills required by the medical laboratory scientist, the degree features a variety of program emphases, including laboratory sciences, laboratory leadership and administration, education, and laboratory mission and development

Admission requirements. In addition to the general requirements for admission to a graduate program listed in the graduate admission section of this bulletin, the following are departmental requirements:

- Applicants' previous course work must include 16 semester credits of biological sciences, 16 semester credits of chemistry, and one college-level course in mathematics. Deficiencies must be removed prior to admission to the graduate program.

- Applicants must have an overall GPA of at least 3.0 in undergraduate courses and at least 3.0 in the undergraduate cognate science (chemistry, biology, math and medical laboratory science) courses.
- Applicants must hold United States professional certification and/or licensure in medical laboratory science acceptable to the admissions committee. Certification may be either general or in one of the recognized areas of specialization. Acceptable certification is typically defined as that offered by the ASCP (American Society for Clinical Pathology) Board of Certification.
- The required Graduate Record Examination (GRE) for admission is a minimum of 800 Composite (Verbal + Quantitative). Students who do not achieve 800 on their GRE may be considered for acceptance under provisional status. Individuals lacking United States professional certification may request to be admitted on a provisional basis while they pursue the course work required for eligibility to write the national certification examinations. These clinical courses and their prerequisites require a minimum of four academic semesters. The courses include MLSC210, 230, 240, 320, 350, 400, 401, 405, 411, 412, 413, 421, 423, 431, 432, 433, 441, 442, 443, 451, 452, 453, 461, 463, 470, 475 and 493. Students must receive United States professional certification before completing more than 9 graduate credits, and must meet the GPA requirements as stated above.

Degree Requirements

In addition to meeting the general requirements for graduate degree programs, students must meet the following departmental requirements:

- Complete a minimum of 36 semester credits including the core of 20 semester credits and 16 semester credits selected from the chosen emphasis.
- Have the graduate program coordinator approve course selections and course sequencing. Students may substitute alternate courses listed in this Bulletin with the consent of the graduate program coordinator and the approval of the dean of the College of Arts & Sciences.
- No grade lower than C is acceptable.
- Maintain a minimum cumulative GPA of 3.00 for the graduate portion of the program.

Core courses—20

ACCT500; BSAD500 or BSAD515; MLSC500, 501, 561, 562, 585; plus a minimum of 2–3 graduate religion credits selected in consultation with graduate program coordinator. Competency in statistics is required and is determined by the graduate program coordinator.

Emphasis—16

A minimum of 16 semester credits from one of the following emphases:

Laboratory Sciences Emphasis*: Required courses are BCHM421, 422, 430 and BIOL 445. Additional courses to select from*: BIOL444, 446, 475, BOT450, 525, ZOOL464, 465, 475

Laboratory Leadership and Administration Emphasis*: Required courses are ACCT625 and LEAD638. Additional courses to select from*: BSAD 525, 530, 545, 560, 615, 620, EDAL670, INF5510, LEAD638

Education Emphasis*: Required courses are EDAL520, EDCI545, 650. Additional courses to select from*: EDAL670, 677, EDCI606, 610, EDPC514, 520, 554, LEAD638

Laboratory Mission & Development Emphasis: Required courses BSAD545 or 560, BSAD620 or MSSN615. Additional courses to select from*: ANTH517, BSAD 545, 560, 620 (if not taken as part of the required courses), LEAD525, MSSN615 (if not taken as part of the required courses), PSYC515, SOCI508, 535, 545, 640

*A relevant course not listed in this emphasis may be selected in consultation with and approved by the graduate program coordinator.

Enrollment Continuation Requirements. A student may not enroll in MLSC561, MLSC562 or MLSC585 prior to obtaining certification.

A student whose cumulative graduate GPA falls below 3.00 in any given semester is placed on academic probation. Academic probation students are not allowed to register for or continue participation in MLSC585.

In consultation with the graduate program coordinator, the medical laboratory sciences graduate faculty determines the student’s proposed course load for the following semester. The faculty’s recommendation is referred to the dean for graduate programs or assistant dean for graduate programs of the College of Arts & Sciences for final approval.

A student who does not raise his/her graduate GPA to 3.00 within one full-time equivalent semester is terminated from the program. Exceptions require the approval of the medical laboratory sciences graduate faculty and the dean for graduate programs or assistant dean for graduate programs of the College of Arts & Sciences.

Courses (Credits)

See inside front cover for symbol code.

ALHE440 (1-4)

Topics in _____

Repeatable in different areas. Prerequisite: permission of program director.

ALHE480 (4)

Practicum in _____

Prerequisite: permission of program director.

MLSC105 (1)

Introduction to Medical Laboratory Science

Lectures and/or demonstrations presented by each of the departmental faculty members covering the major disciplines in clinical laboratory science. A field trip to visit a clinical laboratory is also included. Weekly: one lecture.

MLSC110 (1)

Medical Terminology

An in-depth study of medical terms and abbreviations relating to diseases, disorders and drugs. (This course is also available to off-campus students through distance learning. Prerequisite: permission of instructor.)

MLSC210 \$ (2)

Fundamentals of Hematology and Hemostasis

Introduces the production, maturation, function of normal blood cells and hemostasis. Selected routine manual hematology and hemostasis procedures are performed. Weekly: Three lectures and one lab.

- MLSC230** \$ (3)
Fundamentals of Clinical Microbiology
 Orientation to clinical microbiology; specimen selection, collection, and transport; microscopic evaluation; stains and sterilization techniques; media and incubation selections; identification of routine and non-routine microorganisms; susceptibility testing; automation and quality assurance. Prerequisite: BIOL165. Weekly: Two lectures and two labs.
- MLSC240** \$ (1)
Fundamentals of Immunohematology
 Introduces blood group antigen systems, antibody screening, antibody identification, and compatibility testing. Selected routine procedures are performed. Weekly: Three lectures and one lab.
- MLSC320** (3)
Fundamentals of Immunology
 Innate and acquired immune systems of the human organism; immunoglobulin production, structure, function, and diversity; antigen characteristics, variety, and specific red cell groups; tolerance and memory; complement structure and function; cell mediated immunity function and regulation; autoimmune disorders; transplantation and tumor immunology; immunodeficiency disorders; principles and procedures of techniques used in modern immunology lab. Weekly: Three lectures.
- MLSC350** \$ (3)
Fundamentals of Clinical Chemistry
 Clinical lab procedures, safety, application of statistical procedures in quality control, and principles of clinical laboratory instrumentation. Topics include carbohydrates, lipids, electrolytes, and hepatic function with selected pathologies. Weekly: Three lectures and one lab. Prerequisites: completed or currently enrolled in CHEM131 or permission of instructor
- MLSC400** (1)
Specimen Procurement and Processing
 Clinical specimen collection and processing; point-of-care testing, professional ethics; phlebotomy practicum. Prerequisite: permission of the instructor.
- MLSC401** \$ (0)
Clinical Year Seminar and Research Methodology
 Introduction to educational methodology, multicultural communication, professionalism, medical laboratory sciences literature review, research design and practice. Attendance to all sessions is required. A pass/fail grade is assigned. Prerequisite: permission of program director.
- MLSC405** \$ (1)
Clinical Year Seminar and Research Project
 Introduction to team building, service outreach and professional development. Research in medical laboratory science under the direction of a departmental faculty member. Preparation and delivery of a written report and oral presentation on the research project. Attendance to all sessions is required. Prerequisite: permission of program director.
- MLSC411** (3)
Hematology
 Cellular elements of the blood, their maturation, functions, and morphologies; abnormal and disease state hematologies; principles and procedures of routine and special hematology assay methodologies; correlation of patient conditions with results of hematology assay results. Prerequisites: MLSC210 and permission of program director.
- MLSC412** (1)
Hemostasis
 Hemostasis systems, their function, interaction, and monitoring; correlation of hemostasis assay results with various disorders; thrombosis and anticoagulant therapy; principles and procedures of routine and special hemostasis assays. Prerequisites: MLSC411 and permission of program director.
- MLSC413** (4)
Clinical Hematology & Hemostasis Practicum
 Professional health-care laboratory practicum; emphasis in patient-care application of hematology and hemostasis procedures. Prerequisites: MLSC411, 412 and permission of program director.
- MLSC421** (2)
Clinical Immunology and Molecular Diagnostics
 Theory and application of immunologic/serologic and basic molecular techniques including detection, analyses and epidemiology. Emphasis on correlation of patient conditions with test results for viral and bacterial diseases and cancers. Prerequisites: MLSC320 and permission of program director.
- MLSC423** (1)
Clinical Immunology Practicum
 Professional health-care laboratory practicum: emphasizes patient-care applications of immunologic, serologic and molecular techniques. Prerequisites: MLSC421 and permission of program director.
- MLSC431** (4)
Clinical Bacteriology
 Emphasis on specimen collection, culture, identification and clinical significance of bacterial pathogens. Simulated clinical practice for the separation of normal flora from pathogenic microorganisms encountered in various body sites including the study of antimicrobial susceptibility testing. Prerequisites: MLSC230 and permission of program director.
- MLSC432** (2)
Clinical Mycology and Parasitology
 Study of fungi and parasites associated in human infections. Emphasis on specimen collection and preservation, culture and identification procedures. Prerequisites: MLSC431 and permission of program director.
- MLSC433** (5)
Clinical Microbiology Practicum
 Professional health-care laboratory practicum; emphasis in patient-care applications of bacteriology, mycology, parasitology, and virology. Prerequisites: MLSC431, MLSC432 and permission of program director.
- MLSC441** (3)
Immunohematology
 Blood grouping and typing; blood group antigen systems; compatibility testing; antibody identification; quality control and quality assurance; donor recruitment and selection; component preparation; blood-banking records; grouping and compatibility problem solving; patient clinical state correlations. Prerequisites: MLSC240, MLSC320 and permission of program director.

<p>MLSC442 (1) Transfusion Medicine In-depth study of immunohematology testing results, clinical patient manifestations, blood component therapy and blood product requirements. Prerequisites: MLSC441 and permission of program director.</p>	<p>MLSC490 (1-4) Topics in _____ An in-depth study of selected topics in the clinical laboratory sciences. Repeatable in different specialized areas. Prerequisite: permission of program director.</p>
<p>MLSC443 (4) Clinical Immunohematology Practicum Professional health-care laboratory practicum; emphasis in patient-care applications of immunohematology. Prerequisites: MLSC441, 442 and permission of program director.</p>	<p>MLSC493 \$ (1) Practicum Project Designed to be an integral component of the clinical year practica experience. Introduces students to the principles, practices, and performance of clinical laboratory projects expected of practicing professional clinical laboratory scientists.</p>
<p>MLSC451 (4) Clinical Chemistry I Carbohydrate, lipid, enzyme, electrolyte, acid-base balance, trace element, protein systems, and gastric functions. Correlations with normal physiology and selected pathological conditions. Analysis of relevant blood and body fluids constituents. Prerequisites: MLSC350 and permission of program director.</p>	<p>MLSC495 (1-4) Independent Project Topics may be from areas relevant to clinical laboratory practice and must be approved by the Program director. Repeatable in a different subject area. Independent readings earn S/U grades. Prerequisite: permission of program director.</p>
<p>MLSC452 (2) Clinical Chemistry II Liver function, renal function, endocrinology, toxicology, and therapeutic drug monitoring. Correlations with normal physiology and selected pathological conditions. Prerequisites: MLSC451 and permission of program director.</p>	<p>MLSC496 (1) Extended Clinical Practicum A twelve-week professional health-care laboratory practicum. Emphasis in patient-care applications. Subject areas are to be coordinated with the Clinical Site Education Coordinator and the Program director. Graded S/U. Prerequisites: successful completion of the 20-week clinical practica of the clinical-year program and permission of program director.</p>
<p>MLSC453 (4) Clinical Chemistry Practicum Professional health-care laboratory practicum. Emphasis on patient-care applications in clinical chemistry. Prerequisites: MLSC451, 452 and permission of program director.</p>	<p>MLSC500 (1) Foundations for Graduate Study in Medical Laboratory Science Orientation designed for students to refine the skills needed for successful graduate work. Focus on academic and professional proficiencies such as critical thinking, principles of research, and scholarly writing. Written and oral presentation required. Admission by permission of graduate program coordinator.</p>
<p>MLSC461 (1) Body Fluids Analysis of various body fluids such as serous fluids, synovial fluids, amniotic fluid, and urine. Correlations with normal physiology and selected pathological conditions. Prerequisites: MLSC451 and permission of the program director.</p>	<p>MLSC501 (1) Seminar in Medical Laboratory Science Literature review of current laboratory science topics. A service-based activity addressing a relevant issue in laboratory science required. Admission by permission of graduate program coordinator.</p>
<p>MLSC463 (1) Body Fluids Practicum Professional health-care laboratory practicum. Emphasis in patient-care applications of body fluids. Prerequisites: MLSC461 and permission of program director.</p>	<p>MLSC561 (3) Laboratory Management Issues and Strategies The health-care environment is rapidly changing, and will continue to change for the foreseeable future. In the clinical laboratory, ever-changing government regulations and reimbursement policies require a laboratory manager to be flexible and adopt new skills. Issues faced by the manager and styles and strategies used to deal with these issues are explored. Prerequisite: Permission of graduate program coordinator.</p>
<p>MLSC470 (1) Laboratory Information Systems Survey of current Laboratory Information Systems (LIS) including database design and maintenance, test requesting, result entry, result reporting, quality control application, peripheral devices and regulatory systems. Prerequisite: permission of the program director.</p>	<p>MLSC562 (3) Issues in Laboratory Regulations and Practice Clinical laboratories are increasingly regulated by state, federal and other agencies. Applicable regulations will be examined and their impact on laboratory operations evaluated. A selected number of laboratory quality assurance procedures, as specified by CLIA '88 regulations, will be performed in the laboratory. Prerequisites: Statistics and permission of graduate program coordinator.</p>
<p>MLSC475 (2) Medical Laboratory Management Concepts Discussion in selected areas that include health-care delivery systems; problem solving in the clinical laboratory; human resource management; supply and equipment acquisition; financial management; performance standards and assessment; ethics; and regulatory processes. Prerequisite: permission of the program director.</p>	

MLSC585 (5)
Applied Studies in Medical Laboratory Science
 Designed in consultation with and coordinated by the area specialty advisor. A proposal, cumulative report, presentation and defense required. Prerequisite: Certification and/or licensure as a clinical laboratory scientist and permission of graduate program coordinator. Clinical placement depends on clinical site availability.

MLSC595 (1-4)
Independent Study/Readings/Research Project
 Topics may be from immunology, immunohematology, clinical chemistry, hematology, microbiology and other areas of patient-care science, clinical laboratory science education, management, or applications specially relevant to clinical laboratories. Repeatable in a different subject area for a total of four (4) credits. Independent readings earn S/U grades. Prerequisite: permission of graduate program coordinator.

MLSC650 \$ (0)
Project Continuation
 Student may register for this title while clearing deferred grade (DG) and/or incomplete (I) courses with advisor approval only. Registration for this title indicates full-time status.

MLSC655 \$ (0)
Program Continuation
 Students may register for this non-credit continuation course to maintain active status. For additional information on active status, please refer to p. 49 in the bulletin. Registration does not indicate full-time status.

MUSIC

Hamel Hall, Room 207
 269-471-3555; FAX 269-471-6339
cflores@andrews.edu

Faculty
 Carlos A. Flores, *Chair*
 Lillianne Doukhan
 Claudio Gonzalez
 Julia S. Lindsay
 Kenneth D. Logan
 Alan F. Mitchell
 Trina Thompson
 Carla L. Trynchuk
 Chi Yong Yun
 Stephen P. Zork

Academic Programs	Credits
BA: Music	44
BMus: Music Education	80-84
Teacher Certification	35
BMus: Performance	84-92
Minor in Music	26
MA: Music	32
MMus: Conducting	34
MMus: Music Education	35
MMus: Music Ministry	35
MMus: Performance	34

Mission

To mentor students in artistic, intellectual, and character development. Faculty of the Department of Music are committed to providing a vibrant musical and learning environment to nurture artistic and creative growth in all students of music, to encourage and guide students through dynamic interaction in classroom and practical experiences as they mature into tomorrow's music professionals, and to mentor students in responsible use of their talents for service to Christ and to humanity.

Bachelor of Music curricula provide a comprehensive exposure to and experience with the performance, history, and theory of music. Students receive hands-on supervised teaching experience in studio or classroom teaching. Bachelor of Arts curricula are for students wishing to pursue concerted study in music within a liberal arts context.

Non-music majors may take courses in music or participate in music lessons or ensembles for credit or non-credit. See General Education section and course descriptions below for further clarification.

The Andrews University Department of Music has been a member of the National Association of Schools of Music since 1964. Music majors may choose to join the student chapter of Music Educators National Conference.

Enrollment

Status as an undergraduate music major is provisional until the student demonstrates academic and performance skills on an acceptable level. All first-year students must take the Freshman Theory Placement Exam and arrange for an audition with the