MEDICAL LABORATORY SCIENCES

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

Faculty

Marcia A. Kilsby, *Chair, MLS Program Director* Aileen Hyde 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	
Education	
Laboratory Leadership and Administration	
Laboratory Mission & Development	
Laboratory Sciences	

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 preclinical 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. 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 deportment 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 <u>info@naacls</u>, or the Web at <u>www.naacls.org</u>.

Clinical Experience (Practica). Students work side-by-side

Academic Calendar 2012–2013

2012 July 27 July 30 August 4	Fri Mon Sat	Senior summer term (clinicals) ends Registry review week begins Certification ceremony
2013		
March 11	Mon	Clinical Practica begins
May 3	Fri	Senior spring semester (clinicals) ends
May 6	Mon	Senior summer semester (clinicals) begins
July 26	Fri	Senior summer term (clinicals) ends
July 29	Mon	Registry review week begins
August 3	Sat	Certification ceremony

Undergraduate Programs

BS in Medical Laboratory Science (124) (BSMLS)

General Education Requirements-32

See professional program requirements, p. 51, and note the following **specific** requirements:

Religion: Equivalent of one per year of full-time enrollment at AU. Courses taken at SDA institutions can be used to meet this requirement.

- 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 clinical practica **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, 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. Pre-medical/pre-dental students must include PHYS141, 142 General Physics or PHYS241, 242, 271, 272 (8 cr)

BS: Allied Health Administration

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. 51, and note the following **specific** requirements:

Religion: Equivalent of one per year of full-time enrollment at AU. Courses taken at SDA institutions can be used to meet this requirement.

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:** fulfilled through clinical practica **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 Graduate Record Examination (GRE) is not required for admission but is required for GRE Scholarship consideration.

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, 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 School of Health Professions.
- 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, INFS510, LEAD638

Education Emphasis*: Required courses are EDAL520, EDCI545, 650. Additional courses to select from*: EDAL670, 677, EDCI606, 610, GDPC514, 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 School of Health Professions 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 of the School of Health Professions.

(Credits) Courses

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See inside front cover for symbol code.

ALHE440 Topics in

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

ALHE480	(4)
Practicum in	
Prerequisite: permission of program director	

Prerequisite: permission of program director.

MLSC105			

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. Weekly: one lecture.

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MLSC110
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Medical Terminology

An in-depth study of medical terms and abbreviations relating to diseases, disorders and drugs. Prerequisite: permission of instructor.

MLSC110

Medical Terminology Online correspondence course-see content above.

MLSC210

Fundamentals of Hematology and Hemostasis

Introduces the production, maturation, function of normal blood cells and hemostasis. Selected routine manual hematology and

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hemostasis procedures are performed. Weekly: Three lectures and one lab.

MLSC230

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

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

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. Prerequisite: BIOL165.

MLSC350

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

Specimen Procurement and Processing

Clinical specimen collection and processing; point-of-care testing, professional ethics; phlebotomy practicum. Prerequisite: permission of the instructor.

MLSC401

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

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

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

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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

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

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

Clinical Immunology, Virology, and Molecular Diagnostics Practicum

Professional health-care laboratory practicum: emphasizes patient-care applications of immunology, serology, virology and molecular techniques. Prerequisites: MLSC421 and permission of program director.

MLSC431

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

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

Clinical Microbiology Practicum

Professional health-care laboratory practicum; emphasis in patient-care applications of bacteriology, mycology and parasitology. Prerequisites: MLSC431, MLSC432 and permission of program director.

MLSC441

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

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problem solving; patient clinical state correlations. Prerequisites: MLSC240, MLSC320 and permission of program director.

MLSC442

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.

MLSC443

Clinical Immunohematology Practicum

Professional health-care laboratory practicum; emphasis in patient-care applications of immunohematology. Prerequisites: MLSC441, 442 and permission of program director.

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.

MLSC452

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.

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.

MLSC461

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.

MLSC463

Body Fluids Practicum

Professional health-care laboratory practicum. Emphasis in patient-care applications of body fluids. Prerequisites: MLSC461 and permission of program director.

MLSC475

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; laboratory information systems; and regulatory processes. Prerequisite: permission of the program director.

MLSC490

Topics in

An in-depth study of selected topics in the clinical laboratory sciences. Repeatable in different specialized areas. Prerequisite: permission of program director.

MLSC493

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.

MLSC495

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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.

MLSC496

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.

MLSC500

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.

MLSC501

Seminar in Medical Laboratory Science

Literature review of current laboratory science topics. A servicebased activity addressing a relevant issue in laboratory science required. Admission by permission of graduate program coordinator.

MLSC561

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.

MLSC562

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.

MLSC585

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

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program coordinator. Clinical placement depends on clinical site availability.

MLSC595

Independent Study/Readings/Research Project

Topics may be from immunology, immunohematology, clinical chemistry, hematology, microbiology and other areas of patientcare 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

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

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. 56 in the bulletin. Registration does not indicate full-time status.

NURSING

Marsh Hall (Second Floor) 269-471-3311 or (800) 877-2863 <u>nursing@andrews.edu</u> <u>www.andrews.edu/nrsg/</u>

Faculty

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Karen A. Allen, Chair, and Director of Graduate Programs
Ruth D. Abbott
Nancy A. Carter, Director of Undergraduate Admissions and Progressions
Henrietta H. Hanna, Director of Undergraduate Curriculum
Gisele D. Kuhn
Mary N. Ngugi
Cynthia J. Papendick, Director of Clinical Practicum
Arlene M. Saliba
Gisela E. Schmidt

Academic Programs	Credits
BS: Nursing (NCLEX-preparatory)	65
BS: Nursing (completion)	33
MS: Nursing	
Nurse Education	38
Post-MS: Nursing Education Certificate	16

Mission

Based on a framework of Seventh-day Adventist precepts and restoration to the image of God, the Andrews University Department of Nursing prepares nurses at the baccalaureate and master's degree levels. This preparation is for life-long Christian work in nursing service, technology, practice, education, leadership and research to the local, national, and international communities.

The faculty create a learning environment within a culturally diverse context, which develops and enhances critical thinking, communication, therapeutic nursing interventions, professional development, and Christian service.

Vision

To prepare professional nurses to reflect Christian spirituality, caring attitudes, clinical excellence, and cultural competence for service in an ever-changing environment.

Program Accreditation

The Andrews University Nursing program is approved by the Michigan Board of Nursing and holds accreditation from the National League for Nursing Accrediting Commission* (NLNAC).

* NLNAC 3343 Peachtree Rd NE, Suite 500 Atlanta GA 30326 Phone: 800-669-1656