Endeavor Health

Department of Pathology & Laboratory Medicine

Medical Laboratory Science

Program Handbook

Endeavor Health
Medical Laboratory Science Program

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Locations

Endeavor Health is an academic healthcare system comprised of multiple entities. The system includes nine hospitals; Evanston, Glenbrook, Skokie, Highland Park, Swedish, Northwest Community, Elmhurst, Edward, and Linden Oaks Hospitals, along with an Emergency Room in Plainfield. As an integrated delivery system, the Corporation also includes Endeavor Health Medical Group, Endeavor Health Home Services, Endeavor Health Research Institute, and Endeavor Health Immediate Care Centers. Illinois' third-largest health system, Endeavor Health services residents across seven northeastern Illinois counties. Areas of clinical strength in this system include cancer, cardiac and gastrointestinal services, neurology, psychiatry, orthopedics, and maternity services, including high-risk obstetrics.

Endeavor Health, a member of Pritzker School of Medicine of the University of Chicago, provides a stimulating environment for teaching and learning within all departments. In addition to the Medical Laboratory Science Program, the hospital has training programs for radiology technologists, medical students, interns, residents and nurses.

You will be learning in a supportive, fast-paced, and collaborative urban community, with downtown Chicago less than an hour away by car or public transportation. Once you've arrived on Lake Michigan's shores, you'll find Chicago is second to none in the variety of cultural events, educational opportunities and entertainment it has to offer.

Evanston Hospital
2650 Ridge Avenue
Evanston, IL 60201

Glenbrook Hospital
2100 Pfingston Road
Glenview, IL 60026

Highland Park Hospital
777 Park Avenue W
Highland Park, IL 60035

Skokie Hospital
600 Gross Point Rd
Skokie, IL 60076

Northwest Community
800 W. Central Road
Arlington Heights, IL 60005

Swedish Hospital
5140 N. California Ave
Chicago, IL 60625

Elmhurst Hospital
155 E. Brush Hill Rd
Elmhurst, IL 60126

Edward Hospital
801 S. Washington St.
Naperville, IL 60540

Department of Pathology & Laboratory Medicine

Endeavor Health's laboratories are among the most progressive in the country and are accredited by the Joint Commission, College of American Pathologists and the AABB (formerly known as the American Association of Blood Banks). Specialized testing is performed for Evanston, Glenbrook, Skokie, Highland Park, Swedish, Northwest Community, Elmhurst, and Edwards Hospitals along with countless physician medical practices both within and outside the system.

Mission

In accordance with the goals set forth by the Endeavor Health and the Department of Pathology and Laboratory Medicine, it is the mission of the Medical Laboratory Science (MLS) Program to educate students to become qualified, responsible, healthcare professionals in clinical laboratory medicine. The MLS program is dedicated to the education and empowerment of future laboratory professionals through rigorous academic instruction, hands-on clinical training, and a commitment to excellence in diagnostic medicine. This program strives to develop ethical, knowledgeable, and skilled scientists prepared to contribute accurate laboratory testing, timely results, and quality patient care.

Goals

In order to achieve this mission, the following goals are set:

1. Provide education programs that prepare students in professional knowledge, theory, and psychomotor skills in the disciplines of medical laboratory science.
2. Educate students in a manner to ensure quality laboratory results and thus quality patient care.
3. Integrate ethical principles into the curriculum, model ethical behavior and foster a culture of accountability.
4. To cultivate critical thinking skills that will enable students to interpret laboratory data.
5. Encourage continuing education by providing additional learning opportunities to all lab personnel.
6. Recruit, retain and provide career counseling for students who have a high level of professional promise.
7. Review and address the needs of the healthcare community by providing graduates prepared to meet those needs.

Outcome Measures

Endeavor Health's MLS program continually achieves its mission and goals and this is reflected by the success of our outcome measures. Within the last 3 academic years, our program has a:

☑ **100% Graduation Rate**

☑ **86% Board of Certification Pass Rate (Class of 2022)**
61% Board of Certification Pass Rate (Class of 2023)
70% Board of Certification Pass Rate (Class of 2024)

☑ **100% Job Placement Rate**

Faculty

The high faculty to student ratio provides an excellent opportunity for learning. The Program remains an important part of the Department of Pathology and Laboratory Medicine. Each laboratory at all 8 hospitals is directed by a doctoral level clinical scientist or physician. In addition, each major laboratory has a technical specialist or supervisor who delivers direct instruction and coordinates the involvement of other local experts. Students have ample opportunity for contact with the pathologists and technologists during their clinical rotations. This provides additional stimulus and opportunity to learn between classroom and laboratory assignments.

Section and Titles		Names	e-mail
MLS Program Faculty	Program Director	Tyrie Gardner, MS, MT(ASCP)	tgardner@northshore.org
	Medical Director	Karen Kaul, MD, PhD	kkaul@northshore.org
	MLS Educator	Stephanie Mendoza, MS, MLS (ASCP)^{CM}	smendoza2@northshore.org
	MLS Educator	Brailey Nudera, MSc, MLS(ASCP)	bnudera@northshore.org

Curriculum

The MLS Program has been in existence at Evanston Hospital since 1940 and has recently expanded to include 8 of the 9 Endeavor's hospitals. The goal of the Program is to prepare competent students for the profession of Medical Laboratory Scientist. This goal is accomplished through the student's participation in a curriculum that includes a 5-week introduction to basic laboratory sciences as well as clinical rotations and didactic instruction in each laboratory specialty.

Students are carefully guided through each basic laboratory course and each clinical rotation by experts in each laboratory specialty. The clinical liaisons will orient the student to the laboratory setting, schedules the student to work with a qualified Medical Laboratory Scientist in each area of the laboratory, conducts review sessions, administers quizzes and examinations and holds primary responsibility for student wellbeing. Following are descriptions of each sequence and some of the clinical laboratories through which the student will rotate.

Final grades are broken down into 4 main sections; basic laboratory, workshops, clinical rotations and lecture series. Basic lab is considered a probationary period and must be passed with a minimum of 75%, this includes all quizzes and exam grades. All other workshops, rotations and lecture series must be passed with a minimum of 70%, this includes all quizzes and exam grades. Failure to meet a deadline for any assignment will result in an automatic 0%.

Basic Laboratory and Workshops

Basic Laboratory is designed to be an intensive, 5-week period where students will learn basic knowledge regarding the importance of the clinical labs and how they function. This period is designed to give students a first look at what a medical lab scientist does, teaches them theory behind the science and gives them the opportunity to practice their psychomotor skills in areas such as Hematology, Blood Bank, and Microbiology. Workshops will be held throughout the course of the program. Students will be given a 1-week crash course for each of the following subjects; Urinalysis & Body Fluids, Mycology, and Parasitology.

Clinical Rotations

Students rotate through clinical sections of the lab in a ***Core Laboratory*** and ***Non-Core Laboratory*** block format. These clinical rotations follow the basic laboratory courses and stress the applications of manual and automated laboratory skills, understanding the principals of test procedures, instrumentation, and quality control and approved safety practices. Students will be assigned to one of the 8-hospitals for the ***Core Laboratory*** component of the clinical rotation. All of the ***Non-Core Laboratory*** clinical rotations will take place at Evanston, NCH, or Elmhurst Hospitals. The entire clinical rotation experience is approximately 32 weeks long. Students will rotate through each of the following sections.

The ***Core Laboratory*** rotation includes: Blood Bank, Chemistry, Hematology, Coagulation, Urinalysis, and Immunology

The ***Non-Core Laboratory*** rotation includes: Microbiology, Molecular Diagnostics, and Phlebotomy.

Didactic Lectures

The didactic portion of the program will take place in a hybrid learning environment. The lectures and additional learning materials are created by pathologists, PhD scientists and experienced Medical Laboratory Scientists. Lectures will be split into subject units with emphasis placed on theory, calculations and pathophysiology with the advanced application of theory taught. All quizzes, assignments, and exams will take place on *Canvas Instructor*, an online educational platform. All quizzes and exams must be passed with a 70% or greater.

Courses

Immunohematology/Transfusion Medicine

Immunohematology, or Blood Bank, is the study of the immune system as it relates to blood and how to safely administer units for transfusion. The student will learn the techniques of ABO blood grouping, Rh testing, crossmatching and identification of atypical antibodies. In addition, the student learns about the preparation and use of blood components and, when available, observes blood collection procedures including whole blood and apheresis donations, as well as hematopoietic progenitor cell collection. Blood bank activities require close coordination with the clinical care units; during rotation students will gain a sense of direct involvement in patient care.

Clinical Chemistry

In almost every illness, changes occur in the chemical constituents of blood and other body fluids. Through the analysis of patient samples, physicians rely on the Clinical Chemistry Laboratory to help in the diagnosis and treatment of disorders such as diabetes, kidney disease, electrolyte imbalance and cardiac dysfunction. State-of-the art automation and robotics enable the laboratory to provide critical diagnostic information quickly and accurately to care teams in such areas as the emergency department, intensive care, surgery and the neonatal intensive care unit. In addition, the Clinical Chemistry Laboratory offers testing for the assessment of many metabolic systems that can include cholesterol measurement, thyroid and reproductive hormone levels, and therapeutic drug monitoring. Students will work with computer-assisted technology to provide both routine and STAT testing for effective patient care.

Hematology and Coagulation

In the Hematology Laboratory students learn to count and classify the various types of red and white blood cells. They also learn how to determine whether the oxygen-carrying red blood cells are in a healthy state in order to assess for possible anemias. In addition, the students will be

shown how to classify the cells in the peripheral blood as well as the bone marrow to assist the pathologist in the identification of leukemia and other blood disorders.

Tests are conducted in the Coagulation section of the Hematology Laboratory to determine the presence or absence of factors essential to normal blood clotting. Special procedures are performed to identify acquired and inherited deficiencies of the coagulation proteins.

Urinalysis and Body Fluids

Urinalysis involves testing for pH, color, specific gravity, sugars and excessive amounts of protein within the urine. Specimens are also examined for the presence of bacteria and parasites, as well as crystals and casts formed by the kidneys. It is in this laboratory that both quantitative and qualitative testing of urine is done. In the Body Fluids section of this rotation, body fluids are examined to determine the various kinds and numbers of cells present.

Microbiology

The Microbiology Laboratory has the responsibility of isolating and identifying potentially pathogenic microorganisms. In many cases the laboratory also determines the susceptibility of these organisms to a variety of antibiotics. This laboratory is divided into Bacteriology, Mycology, Mycobacteriology and Parasitology

Bacteriology is concerned with the various bacteria that may cause direct destruction of tissue or harmful sequelae. Throat, urine, stool, blood, wound, and sputum cultures are some of the types of specimens received for processing. Mycobacteriology is the study of acid-fast organisms, such as that which causes tuberculosis.

Mycology deals with fungi that may infect humans on the surface of the skin (i.e., ringworm) or cause systemic complications (i.e., histoplasmosis). In Parasitology specimens are examined for the presence of amoebae, malarial organisms, flagellates, worms and their ova. Arthropod parasites, such as mites, fleas, or ticks are also identified so the appropriate disease diagnosis can be made.

Immunopathology

The Immunopathology Laboratory performs state-of-the art testing in Flow Cytometry and Diagnostic Immunology. In Flow Cytometry special emphasis is placed on diagnosis of leukemia and lymphomas and monitoring of immunologic pathologies. Rotation through the Immunology section includes performance of protein chemistry and infectious disease serology, detection of tumor markers, as well as pregnancy and prenatal testing.

Molecular Diagnostics

The Molecular Diagnostics Laboratory is the fastest growing laboratory in our institution, reflecting the explosion in knowledge about the human genome and the availability of new tools to

examine DNA and RNA. Highly sensitive nucleic acid amplification methods, including real-time PCR, are used to detect low concentrations of infectious agents such as *Herpes simplex* virus. Quantitative (viral load) tests for hepatitis C and HIV nucleic acid are used to monitor response to therapy. Analysis of mutated genes is performed to evaluate patients with clotting disorders, and clonal gene rearrangement studies are used in the diagnosis of lymphomas.

Phlebotomy

Phlebotomy is the medical procedure of drawing blood directly from a patient's vein. It is important for students to understand the preanalytical variables that accompany phlebotomy and how they can affect patient testing. Students will be given lectures and demonstrations to learn the proper collection and processing of blood for routine and special tests. Both venipuncture and dermal puncture techniques are presented. Medical Laboratory Science students will gain competence drawing blood for laboratory testing in the Outpatient Laboratory and hospital patient care units.

Laboratory Operations, Education, and Management

Laboratory Mathematics, group dynamics, basic educational theory, the five functions of management and a variety of related topics are presented through lecture and group activities. The laboratory operations course focuses on the overall management of the laboratories along with the importance of safety and quality assurance. Students will learn about the various healthcare delivery systems and their impact on the services offered by the laboratory. This course introduces the students to the various federal laws and accrediting bodies that impact laboratory practices and the requirements to maintain compliance with these agencies. Students will also learn basic principles of laboratory equipment and instrumentation in this section.

Review Weeks and Final Exams

The final weeks of the program will include a series of comprehensive review days along with exams from each of the above topics. These review weeks are designed to assemble a complete body of knowledge in preparation for the certification exam. A minimum passing score of 70% is required for each exam.

Mock Certification Exam

The Program administers a non-credit comprehensive examination based on the format of the American Society for Clinical Pathology certification examination. A minimum passing rate of 70% is required. This exam is designed to simulate the national board exam and is a good predictor of student's likelihood of successfully passing the exam. One retake of the Exam is granted.

Admission & Qualification

Application Process

When an application is received, it is processed using the following procedure:

1. The application is held until transcripts from all universities attended and two reference letters are received. If the applicant is an international graduate, the external transcript evaluation must also be a part of the student's file and must come directly from the external agency.
2. If the grade point average meets minimum requirements, the student is contacted to schedule an interview.
3. An interview with the applicant is scheduled and conducted by the Program faculty. A ranking system is used to assist in the selection process.
4. Utilizing the stated criteria, the class is selected and clinical assignments along with start dates are determined by the Program Faculty.

The program begins in late summer.

The deadline for receipt of applications is November 30; applications received after this date will be considered as time and space allow.

Academic Credit

Since this is a hospital-based certification program we do not confer academic credit for courses taken here. **Applicants must have a bachelor's degree or equivalent before being accepted into our program. Alternately, students from affiliated universities may spend their final year in our program completing their coursework and obtaining clinical experience.**

Requirements for both routes are as follows:

- Students from Affiliated Universities:

Completion of all pre-requisite medical laboratory science courses required by the university that will render a student eligible for a baccalaureate degree at the completion of the clinical program. Total credits earned in the program are equivalent to 32 semester hours.

- Post-baccalaureate Students:

The baccalaureate degree should include the following:

1. 16 semester hours (24 quarter hours) of biological science (with one semester in microbiology)
2. 16 semester hours (24 quarter hours) of chemistry (with one semester in organic or biochemistry)
3. 3 semester hours (4 quarter hours) of an Immunology course
4. 1 semester (one quarter) of mathematics

Grade Point Average

A cumulative grade point average of greater than 3.0 (4-point system) with a cumulative 2.8 in all science courses is required.

Selection Criteria

Admission to the medical laboratory science program is made without discrimination on the basis of race, color, gender, sexual orientation, religious beliefs, disability, national or ethnic origin.

Once admission eligibility has been established, students are selected using the following criteria:

1. Cumulative and science grade point averages
2. Reference letters from biology, chemistry and laboratory instructors or employment managers or supervisors.
3. Evaluation of the personal interview

Essential function

Essential functions represent the non-academic ability of the applicant or student to accomplish the essential requirements of the MLS Program. These standards are based on the essential skills of the medical laboratory science student. They must be mastered in order to obtain credit for the educational program.

Vision	The student must be able to identify sizes and shapes and discriminate colors or shades both macroscopically and microscopically.
Communication	The student must be able to communicate fluently in English by written and oral and/or alternate means. This includes the ability to successfully receive and transmit information. The student must also be able to read and follow instructions.
Movement	The student must have the ability to freely maneuver around the assigned laboratory work areas and patient care settings.
Motor Skills	The student must be able to safely and accurately perform diagnostic laboratory procedures. This includes, but is not limited to, lifting, operating instruments, performing manual tests, and performing phlebotomy.
Emotional Stability	The student must be able to accurately perform laboratory duties in a stressful environment. This includes, but is not limited to, maintaining a professional and respectful demeanor, and identifying/responding to emergency situations.

Academic Affiliations

Elmhurst College	**Purdue University**	**Roosevelt University**
Erica Ashauer	Lisa Hilliard	Jelena Maric-Antonijevic
Associate Director	Director	Director of Health Professions
190 Prospect Avenue	550 Stadium Mall Drive	425 S. Wabash, WB 914J
Elmhurst, IL 60126-3296	West Lafayette, IN 47907	Chicago, IL 60605
(630) 617-6482	(765) 494-8102	(312) 322-7107
ashauere@elmhurst.edu	lhilliar@purdue.edu	jmaricantonijevic@roosevelt.edu

Tuition

Tuition is $8,000.00 for the clinical experience *(university 3+1 candidates see below)*. All students are expected to secure their spot at the time of acceptance with a $200.00 nonrefundable fee. This fee will go towards the student's tuition. Tuition is payable in 4 installments due on or before the following dates:

First Day of Class	**- $1,800.00** (if $200.00 acceptance fee is applied)
December 1st	**- $2,000.00**
March 1st	**- $2,000.00**
June 1st	**- $2,000.00**

University Affiliates

The student will pay the fee designated by the university to the university. From the amount paid to the university, the university will remit 75% of the general service fees to Endeavor for the clinical internship term. If the amount remitted by the university is less than $8,000, the student is responsible for paying the difference directly to Endeavor. This difference may be distributed as listed above.

If a student is dismissed or voluntarily withdraws before the 15th of the month in which tuition is due, the tuition reimbursement for that period will be prorated.

Financial Assistance

With the exception of university affiliate candidates, there is no financial assistance that is available for this program. All tuition and fees must be paid by personal check or credit card. Federal student loan funding is not available for this program either. Individuals who seek assistance must utilize other resources such as personal loans to help satisfy tuition payments. Three +1 candidates may apply for financial aid in the usual fashion through the university.

Fees and Other Costs

The following fees will apply.

Application Fee	$25
Acceptance Fee	$200 (due prior to start of class, applied to tuition)
Books	$500 (approximately)
MLS Certification Exam	$250

Health Program

Students must submit proof of immunity to hepatitis B, measles, mumps, rubella and varicella (chicken pox) and complete a TB quantiferon blood test. Immunity must be proven with titer tests for MMR and varicella. Proof of vaccination records for HepB are sufficient. Typically, the student will visit the doctor and have lab samples collected to test for immunity along with the TB test.

Insurance

Proof of health insurance and professional liability coverage must be received before the first day of the clinical education. The hospital will provide emergency service for a student; charges incurred will be the responsibility of the student.

Dismissal

Academic

Students must complete all assignments by the predetermined due date, **with no exceptions. Failure to complete assignments/exams by the predetermined due date will result in a zero.** Students must maintain a minimum 70% average in all courses and performance evaluations to successfully complete the program. The grading system is:

100%	-	90%	=	A
89%	-	80%	=	B
79%	-	70%	=	C
<70%			=	No Credit

Grades will not be curved. Inability to maintain a 70% average will result in **academic probation**. When a student is on probation, she/he will be given remediation in which to improve the average along with a Performance Improvement Plan (PIP); this PIP will be established by the Program Director, Medical Director, and/or rotation instructors(s). Failure to obtain a 70% average with a PIP will result in dismissal from the program.

Psychomotor

Regardless of academic status, students who possess unsatisfactory psychomotor skills will be placed on probation. Opportunity will be given to improve this rating. If the probation is not removed, the student will be dismissed.

Affective

Based on the Program's ethical code, the student will be dismissed from the program **if one or more** of the following occurs:

1. Betrayal of patient's confidential information
2. Discussion of another student's academic progress
3. Practice of academic dishonesty
4. Repeated refusal to follow the program director, education coordinator, or supervisor's directions
5. Conduct unbecoming of a laboratory professional (rude or aggressive behavior)
6. Violation of **any** of the hospitals or program's policies
7. Violation of **any** customer service standards

The list of reasons for dismissal does not presume to be all inclusive. Evaluations in each laboratory section are made by the technologists who taught the student.

Appeal Process

A student may use the appeal process for disagreement with any evaluation or dismissal decision. The Appeal Committee is composed of the Medical and Program Directors, affected Teaching Supervisor, one student advocate selected by the individual appealing, a Senior Administrator and a member of the Senior Attending Staff. Details may be found in the Student Policy Manual.

Graduation and Certification

Students completing the clinical education earn a baccalaureate degree from affiliated universities, if applicable, and a certificate from Endeavor Health. Grades are accepted for credit by the degree-granting institution if applicable. Awarding of the degree is not contingent on passing a national certification examination.

Graduates are eligible to take the national certification examination for Medical Laboratory Science, administered by the American Society for Clinical Pathology Board of Certification. Our program experiences a 100% pass rate with greater than 95% of examinees passing the first time and 100% passing with one retake. In addition, our graduates typically score well above the national average.

Policies

All student enrolled in the program will receive a copy of the current policy manual. Policies may be given to applicants upon request.

For more information, contact us:

Program Officials

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Program Director
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mlsprogram@northshore.org

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Medical Director
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Correspondence

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Attn: Tyrie Gardner, MS, MT(ASCP)
Pathology & Laboratory Education
2650 Ridge Avenue, Evanston, IL 60201

For more information, visit our website or send us an email at mlsprogram@northshore.org.

Accreditation

The program is accredited by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS). Interested parties may contact NAACLS at:

National Accrediting Agency for Clinical Laboratory Sciences
5600 N. River Road, Suite 720
Rosemont, IL 60018
(773)-714-8880
For more information, visit the NAACLS website or send an email to info@naacls.org.

MLS Program Handbook Agreement

I have read the current Medical Laboratory Science Program Handbook. I will/have sought further information from the Program Director concerning any areas that I did not fully understand.

I agree to abide by the policies stated within. I also understand that I am subject to any actions indicated in the program handbook.

Print Your Name: _____

Signature: _____

Date: _____