



SCHOOL OF MEDICAL LABORATORY SCIENCE

STUDENT HANDBOOK

Updated December 2024

**SCHOOL OF MEDICAL LABORATORY SCIENCE STUDENT HANDBOOK
2024 – 2025**

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PHILOSOPHY AND GOALS

Overview of Program and Institution

Pennsylvania Hospital, the nation's first hospital, was founded in 1751 by a group of public-spirited citizens led by Benjamin Franklin and Dr. Thomas Bond. The hospital is rich in history with a tradition of quality care and community service. The facility consists of a 515-bed acute care facility, accredited by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), and licensed by the Commonwealth of Pennsylvania.

The laboratory is CAP (College of American Pathologists) accredited and licensed by the Commonwealth of Pennsylvania Department of Health. Additionally, the Blood Bank is accredited by the AABB and the Food and Drug Administration (FDA). The laboratory is a fully computerized, progressive laboratory which performs over 1.5 million tests annually.

The School of Medical Laboratory Science (MLS) functions within the general structure of the Ayer Clinical Laboratory and is supported as a part of a commitment to provide health care and education to the community. The program currently accepts 15 students annually. Hospital administration continues to support the program in its commitment to provide scientists to educate students.

The School of Medical Laboratory Science at Pennsylvania Hospital is affiliated with the Hospital of the University of Pennsylvania and Penn Presbyterian Medical Center, a top ranked hospital in the US. Students will complete fifteen weeks of rotations at the Hospital of the University of Pennsylvania in the routine clinical laboratories and many of their specialty laboratories.

Program Mission Statement

The Pennsylvania Hospital School of Medical Laboratory Science has a responsibility to:

- Provide quality education for students seeking a profession in medical laboratory science
- To develop in its students an appreciation of the professional responsibility of rendering service to the sick and injured

Program Goals

In order to achieve its mission, the Pennsylvania Hospital School of Medical Laboratory Science will:

- Maintain accreditation under the National Accrediting Agency for Clinical Laboratory Science (currently accredited through October 2028)
- Provide state-of-the-art technology and a stimulating and challenging atmosphere for its students
- Immerse its students in the day to day responsibilities of laboratory staff who are committed to the mission, vision and values of Pennsylvania Hospital

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- Provide the community with laboratory practitioners who have a comprehensive knowledge of all aspects of clinical laboratory operation and management
- Prepare students for successful completion of national certification examination in Medical Laboratory Science

PENNSYLVANIA HOSPITAL

Mission Statement

We believe that Pennsylvania Hospital, the nation's first hospital, has a responsibility to:

- Ensure access to superior quality integrated health care for our community and expand access for underserved populations within the community
- Create a supportive team environment for patients, employees, and clinical staff
- Foster learning and growth through comprehensive academic and educational relationships
- Exhibit stewardship and creativity in the management of all available resources

Vision

Pennsylvania Hospital will serve as a catalyst and be a primary participant in the formation and operations of a geographically comprehensive, community based integrated health system, providing superior care and service to health care consumers, providers and payers at a very competitive cost. System members will respond to clinical and academic needs cooperatively, sharing opportunities and resources commensurate with capabilities, to provide seamless health care throughout the system and avoid unnecessary duplication and costs. Consistent with the goals of the integrated system, Pennsylvania Hospital will be the preferred source of health care services for our local community and serve the broader market as the preferred provider of specific specialized services.

Values

We Value Superior Quality Care

- We value superior quality health care, seek the best clinical outcomes and provide the highest level of service at a very competitive cost.

We Value Our Staff

- We realize that our employees and healthcare professionals are the source of our superior quality health care: we respond to their needs and foster team relationships among employees, clinical staff and the Board of Managers.

We Value Learning

- We recognize that our commitment to an academic environment attracts and retains superior employees and clinical staff, enhances our clinical quality, provides value to our community and is intrinsic to our identity.

We Value Our Community

- We actively participate with community partners in formulating collaborative approaches to improving the health of our community and solving other local needs.

We Value Our Heritage

- We treasure Pennsylvania Hospital's history and remain true to our tradition of serving the entire community, including underserved populations.

We Value Stewardship

- We are committed to prudent management of our economic resources and to providing services efficiently.

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PROGRAM OFFICIALS

MLS Program Director	Derick Lim, MS, SC(ASCP) ^{CM} , MLS(ASCP) ^{CM}
Senior Director Clinical Services	William Hunt, MBA, SH, MLS (ASCP) ^{CM}
Medical Director of MLS School	Michael Husson, MD
Chair, Department of Pathology	Franz Fogt, MD

PROGRAM FACULTY

DISCIPLINE	DIDACTIC FACULTY	CLINICAL INSTRUCTOR
Bacteriology Mycology Parasitology Mycobacteriology	Laurel Glaser, MD, PhD, D(ABMM) Kyle Rodino, PhD, MLS(ASCP), D(ABMM) Rebecca Harris, MD Kenneth KP Smith, PhD Mondraya Howard, PhD, D(ABMM)	Tracy Healy, MT(ASCP) Cristabel Ruiz, MLS(ASCP) James Nowoslawski, MLS(ASCP) ^{CM} Andrea Worrall, MS, BS
Central Receiving and Phlebotomy	Derick Lim, MS, SC(ASCP) ^{CM} , MLS(ASCP) ^{CM}	Sharhonda Willis, BS
Chemistry Toxicology Point of Care Testing Endocrinology	Michael Husson, MD Derick Lim, MS, SC(ASCP) ^{CM} , MLS(ASCP) ^{CM}	Jonathan Meyer, MLS(ASCP) ^{CM} Judith Edling-Owens, MT(ASCP) Casey Steward, MS, MLS(ASCP) Nancy Mayer, MT (ASCP)
Hematology Hematology (HUP) Special Coagulation Special Hematology	Margaret Reinhart, M. Ma. Alison Steinmiller, MLS(ASCP) ^{CM} Travis Bicher, MLS(ASCP) ^{CM}	Travis Bicher, MLS(ASCP) ^{CM} Cecilia Espiritu, BSMT, H(ASCP) ^{CM} Emilie Rabut, BS, MS Tierra White, MS, MLS(ASCP) ^{CM}
Immunohematology HUP PPMC HLA	Marcia Marchese, MS, MLS(ASCP) ^{CM} Rodney Burton, MLS(ASCP) ^{CM} Nicholas Brown, PhD, F(ACHI)	Rodney Burton, MLS(ASCP) ^{CM} Roman Lowery, MLS BB(ASCP) ^{CM} Francis Mateo, MT(ASCP) Valerie Magee, CHT(ACHI)
Immunology, Serology, Flow Cytometry	Erin Henry, MLS(ASCP) ^{CM} Julia Angel, MD Andy Huynh, MLS(ASCP)	Andrew Gaano, MLS(ASCP) ^{CM} Erin Henry, MLS(ASCP) ^{CM} Noelis Prieto, MLS(ASCP)
Laboratory Operations	William Hunt, MBA, SH, MLS(ASCP) ^{CM} Derick Lim, MS, SC(ASCP) ^{CM} , MLS(ASCP) ^{CM}	-
Molecular Pathology	Jennifer Morrisette, PhD	Caren Gentile, MS Vania Aikawa, MD Patrick Candrea, MB(ASCP) ^{CM}
Urinalysis, Body Fluids	Derick Lim, MS, SC(ASCP) ^{CM} , MLS(ASCP) ^{CM}	Linda Fitzgerald, MT(ASCP) Jonathan Meyer, MLS(ASCP) ^{CM}

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PHONE DIRECTORY

Pennsylvania Hospital phones can be reached from outside the hospital by dialing **(215) 829-** and adding the last 4-digits of the extension.

Pennsylvania Hospital Security – STAT Line	3333
Pennsylvania Hospital Security – Routine (doors, thefts, escorts, etc.)	3434
Fire and Medical Emergencies (PAH)	5050
Blood Bank (PAH)	829-3218
Blood Bank (HUP)	215-662-3448
Blood Bank (PPMC)	215-662-8336
Central Processing Lab	829-3552
Center for Personalized Diagnostics, CPD (3020 Market St)	215-662-3966
Chemistry Lab / Urinalysis	829-3551
Cytogenetics	215-662-4937
Cytology	829-6969
Endocrinology Lab (HUP)	215-662-3420
▪ Nancy Mayer	215-662-4020
Flow Cytometry	215-662-6024
Gross Room	829-5135
Hematology Lab (PAH)	829-5044
Hematology Autolab (HUP)	215-662-6833
▪ Special Hematology Lab (HUP)	215-662-6196
▪ Special Coagulation Lab (HUP)	215-662-3447
HLA Lab	215-662-6010
Immunology Lab	215-662-6023
Medical Laboratory Science School Office	829-7634
Microbiology Lab (PAH)	829-3555
Microbiology Lab (HUP)	215-615-0159
Molecular Pathology Lab	215-615-3094
Outpatient Lab (PAH)	829-5032
Penn Medicine Washington Square (8 th Floor)	215-454-3459
Toxicology Lab (HUP)	215-662-3474
National Accrediting Agency for Clinical Laboratory Science (NAACLS)	773-714-8880

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ACADEMIC CALENDAR

August 2024 Cohort

2024	
August 5	First day of Fall semester
September 2	Labor Day Holiday
November 26 – December 1	Thanksgiving Holiday Break
December 14, 2024 – January 5, 2025	Semester Break
2025	
January 6	First day of Spring semester
January 20	Martin Luther King Holiday
March 8 – 16	Spring Break
May 20	Spring Graduation

January 2025 Cohort

2025	
January 6	First day of Spring semester
January 20	Martin Luther King Holiday
March 8 – 16	Spring Break
May 17 – August 3	Summer Break
August 4	First day of Fall semester
September 1	Labor Day Holiday
November 25 – November 30	Thanksgiving Holiday Break
December 16	Fall Graduation

ACADEMIC AFFILIATIONS

The School of Medical Laboratory Science at Pennsylvania is affiliated with:

- | | | |
|---------------------------------|----------------------------|---------------------|
| ▪ St. Joseph's University | ▪ Gwynedd-Mercy University | ▪ Wilkes University |
| ▪ Pennsylvania State University | ▪ Holy Family University | ▪ York College |
| ▪ West Chester University | ▪ Indiana University of PA | ▪ Auburn University |
| ▪ East Stroudsburg University | ▪ SUNY Fredonia | |

Upon successful completion of the program, students are granted a baccalaureate degree from their affiliated college or university and receive a certification of completion from Pennsylvania Hospital. Postgraduate students will receive a certificate of completion from the hospital. Students are then eligible to take a national certification exam in Medical Laboratory Science offered by the American Society for Clinical Pathology. In states with licensure, students are then eligible to apply for licensure. Issuing of the baccalaureate degree or the certificate of completion is not dependent on successful certification or licensure.

ADMISSIONS POLICY

POLICY

Admission to the program is determined by an Admissions Committee under a general policy of offering admission to those students whose academic performance, recommendations by references and attributes in the affective domain indicate the highest probability of success. *Students from an academic affiliate of the hospital program will receive preference in the case of equal rankings.*

ADMISSIONS COMMITTEE

The Admissions Committee is comprised of the Program Director and two faculty members or laboratory managers/supervisors.

CRITERIA FOR ADMISSION TO THE PROGRAM

1. Minimum overall GPA of 2.8.
2. Minimum GPA in chemistry and biological sciences of 2.5.
3. Three references:
 - 2 technical and 1 personal
4. Personal interview:
 - Applicant is evaluated as to accountability, ability to work with others, ability to manage time and resources, self-confidence, communication and interpersonal skills, general maturity and motivation toward medical laboratory science.
5. Transcript evaluation by the Program Director or University or College Program coordinator.

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REQUIRED PREREQUISITE CURRICULUM

1. Minimum 90 semester hours or 135 quarter hours of study in an accredited college or university.
2. **CHEMISTRY** – Organic and/or Biochemistry must be included (3.0 credit hours). The content of the chemistry course must be acceptable toward a major in this field or in medical laboratory science, or be certified by the college/university as equivalent. Survey courses do not qualify as fulfillment of the chemistry prerequisites.
3. **BIOLOGICAL SCIENCES** – Individual courses in Microbiology and Immunology are required (3.0 credit hours each). The content of the biological science course must be acceptable toward a major in this field or in medical laboratory science, or be certified by the college/university as equivalent. Survey courses do not qualify as fulfillment of the biology prerequisites.
4. Courses in Human Anatomy & Physiology, Genetics, Molecular Biology, and Statistics are strongly recommended.
5. Applicants who have met the minimum course requirements above 7 or more years prior to their application must update their Chemistry and Biological Science courses at the discretion of the Program Director.
6. All required pre-clinical medical laboratory science courses must be completed and student must be eligible for a baccalaureate degree from affiliated college/university or must currently hold a baccalaureate degree.
7. Foreign degree applicants whose degree is from a foreign university will require an official transcript evaluated by World Education Services, Inc, New York, NY prior to consideration.
8. Foreign degree applicants who did not receive their degree in the biological sciences or in chemistry will need to complete 16 semester hours or 24 quarter hours of course work in both disciplines.

ABILITY TO MEET ESSENTIAL FUNCTIONS OF PROGRAM

In addition to the required prerequisite curriculum, applicants must acknowledge their ability to meet the essential functions of the program. The student must, with or without reasonable accommodation, have sufficient:

1. Visual acuity to be able to identify microscopic structures, cells, organisms and color recognition; to operate analytical instruments appropriately and safely without substantially endangering students, coworkers and patients.
2. Fine motor skills and manual dexterity to obtain and manipulate specimens, reagents, instruments and analytical equipment according to established guidelines with speed, accuracy, precision and in a manner that does not endanger others.
3. Communication skills to effectively convey and/or explain results to other health care personnel, both within and outside the laboratory.

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4. Interactive skills to maintain cooperative and productive working relationships with patients and other health care personnel.
5. Emotional stability to exercise appropriate judgment in responding to emergency situations that may present in the health care environment.
6. Ability to effectively handle stressful situations.
7. Ability, with or without reasonable accommodation, to safely perform all core tasks required of a medical laboratory scientist.

ADMISSIONS PROCEDURE

1. Applicants must meet the admissions guidelines set forth above to be considered eligible for admission to the program.
2. Applications must be submitted before the application deadline. The deadline is 10 months prior to the start date for the program.
3. Applicants desiring admission into the program must submit a complete application packet, including:
 - Application form with personal statement
 - Three references (submitted directly from the reference to the program)
 - Official transcripts (submitted directly from the university to the program)
4. Applicants must schedule and complete a personal interview with the Admissions Committee. Each applicant is also given a tour of the laboratory.
 - *NOTE: At the time of the interview the Essential Functions will be reviewed with the applicant. The applicant is made aware that if during the clinical portion of the program the student is deemed not able to perform the Essential Functions, the student may be dismissed, unless a reasonable adjustment can be made to allow the student to perform satisfactorily.*
5. Applicants will be notified of the program's decision of acceptance to the Medical Laboratory Science Program in writing.
6. Acceptance or rejection of the position is to be made in writing to the Program Director within **two weeks** after mailing.
7. A final, official transcript must be submitted by the student. This transcript must demonstrate completion of all required prerequisite courses for admission into the program.
 - *NOTE: Should the student meet entrance requirements at time of selection, but fall below the GPA requirement in subsequent semesters at the college, the student's record will be re-evaluated by the admissions committee, probation may be necessary.*
8. Information will be sent to accepted applicants with information pertaining to: program starting date, tuition, vaccination requirements, orientation week and any other information deemed necessary to the student.
9. Students must complete a background check, drug screen, and health screening, including a color blindness test upon entering the program.

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FEES AND EXPENSES POLICY

TUITION

The tuition fee for this program is established and reviewed annually in the Fall. The fee is payable in two (2) installments, due before the first day of class for each semester. The program is not eligible for Title IV funding and does not offer financial aid. Students receiving financial aid from their college or university will continue to receive aid during their internship as it represents the 4th year of college or university study.

- **Penn State University** will be billed by the hospital for those undergraduate students enrolled from those institutions. University policy is to reimburse the hospital from tuition it receives from the students at a percentage of the tuition each semester.
- **Students of other affiliates, graduates, and students enrolled under temporary agreement** will be billed directly by the hospital at the rate and times stated in this policy. Payment is made by the individual student to Pennsylvania Hospital.
- If a student does not complete the program, refunds for tuition paid will be negotiated. Any subsequent tuition to the hospital will not be billed.
- If a student fails to pay tuition, student will not be awarded a graduation certificate nor will grades be forwarded.

BOOKS

Copies of all textbooks are maintained in the student room. Students are not required to purchase their own copies of textbooks. Students may use textbooks on campus anytime during didactic or clinical instruction. Students may borrow and remove textbooks from the student room with approval from the Program Coordinator or Program Director.

TRANSPORTATION

Transportation costs from HUP to PAH are the students' responsibility. One hour is allotted for transportation; public transportation is accessible (bus, trolley, subway).

HEALTH INSURANCE

All students are required to maintain health insurance for the entire duration of enrollment in the program.

CURRENT FEE SCHEDULE

TUITION	\$13,000.00	Biannual payments of \$6,500.00 are due before class begins and in January. <i>Penn State students: Please note that your tuition is determined by the university, and not Pennsylvania Hospital. Therefore, your tuition will differ from the above.</i>
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JOB ENTRY LEVEL COMPETENCIES

Graduates of the program are expected to achieve certain job entry level competencies, so only the routine, standard orientation needed by a new employee would be required for full productivity. At career entry, a graduate of the program will be able to accomplish the following as a professional Medical Laboratory Scientist:

1. Be proficient in collecting and processing biological specimens for analysis.
2. Be proficient in performing the full range of clinical laboratory tests in hematology, chemistry, immunohematology, microbiology, immunology, coagulation, molecular, and other emerging diagnostics.
3. Perform preventive and corrective maintenance of equipment and instruments or refer to appropriate source for repairs.
4. Make judgments concerning the results of quality control measures and institute proper procedures to maintain accuracy and precision.
5. Analyze and correlate laboratory data to make clinical decisions regarding abnormal results, possible discrepancies, and probable patient diagnosis.
6. Participate in the evaluation of new techniques and procedures.
7. Recognize and act upon individual needs for continuing education as a function of growth and maintenance of professional competence. Apply the principles of education methodology.
8. Have responsibilities in area of laboratory safety, regulatory compliance, and quality assurance/performance improvement.
9. Possess basic knowledge, skills and relevant experiences in:
 - Communications to interact professionally with patients and colleagues and to consult with members of the health care team.
 - Finances, operations, marketing, and human resource management of the clinical laboratory to enable cost-effective, high-quality laboratory services.
 - Information management to enable effective, timely, accurate, and cost-effective reporting of laboratory-generated information.
 - Research design/practice sufficient to evaluate published studies as informed consumer.

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PROGRAM COURSES

The 10-month rotation program is based on a 40-hour week and provides both practical and theoretical training in the various sections of the clinical laboratory. The following table outlines the clinical experience within the different sections of the laboratory.

COURSE NUMBER	COURSE TITLE	LECTURE HOURS	LABORATORY HOURS	PAH CREDIT HOURS
MLS 490	CLINICAL HEMATOLOGY / COAGULATION Composition and function of blood; disease related to blood disorders; and role of platelets and coagulation. Manual and automated techniques of diagnostics tests for abnormalities.	36	192	7.0
MLS 491	CLINICAL IMMUNOHEMATOLOGY (includes Histocompatibility rotation) Review of immunologic and genetic principles that relate to Immunohematology. Procedure/topics to cover blood collection, donor testing, storage and labeling of blood products, pre-transfusion testing, adverse reactions to transfusions, histocompatibility, and regulatory requirements of FDA, CAP, and AABB.	21	256	6.0
MLS 492	CLINICAL CHEMISTRY (includes Toxicology and Endocrinology rotations) Enzymology, endocrinology, biochemistry of lipids, carbohydrates and proteins; metabolism of nitrogenous end products; physiology and metabolism of fluids and electrolytes; and toxicology as related to the body and diseases. Technical procedures include colorimetry, spectrophotometry, electrophoresis, chromatography, automation and quality control.	36	160	7.0
MLS 493	CLINICAL MICROBIOLOGY Review of all aspects of Bacteriology, Mycobacteriology, Mycology, and Parasitology, including specimen processing, culture identification, clinical features of infectious disease, and the role of the clinical microbiology laboratory.	30	224	7.0
MLS 494	CLINICAL IMMUNOLOGY / SEROLOGY (includes Flow Cytometry rotation) Immune response, immunoglobulins, autoimmunity, complement, disorders of immunity, and related tests. Survey and demonstration of serological diagnostic tests. Basic principles of virology and spirochetology and related tests.	14	96	3.0

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COURSE NUMBER	COURSE TITLE	LECTURE HOURS	LABORATORY HOURS	PAH CREDIT HOURS
MLS 495	CLINICAL SEMINAR I (includes below)	26		
	▪ Phlebotomy	2	32	
	▪ Specimen Collection and Processing	1	8	4.0
	▪ Management, Quality Assurance, Laboratory Procedure Writing, Research Design	11		
	▪ Education and Case Studies Review	1		
	▪ Molecular Pathology	11	32	
MLS 496	CLINICAL URINALYSIS Renal anatomy and physiology, normal and abnormal Urinary constituents, basic laboratory urinalysis, including processing, analysis, and reporting results of urine specimens. Formation, function and testing of body fluids.	7	64	2.0
MLS 497	CLINICAL SEMINAR II (includes below)	5	0	2.0
	▪ Orientation and Introduction to CLS	3		
	▪ Laboratory Safety, HIPAA	1		
	▪ Laboratory Information System (LIS)	1	0	
MLS 498	OPTIONAL TECHNICAL TRAINING	-	< 20/week	1.0

Note: Affiliated colleges and universities assign credit according to individual requirements.

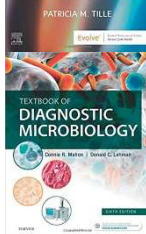
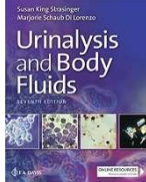

- Immunology (2 weeks), Blood Bank (2 weeks), Microbiology (3 weeks), Endocrinology, Hematology, Special Coagulation, Toxicology, Molecular Diagnostics, Flow Cytometry, and Histocompatibility rotations are one week each (unless otherwise noted) at the Hospital of the University of Pennsylvania.
- Select students will complete Blood Bank (4 weeks) at Penn Presbyterian Medical Center.
- All other applied education assignments are normally at Pennsylvania Hospital.
- Detailed lecture and rotation schedules for the current semester are found on the PAH MLS SharePoint site (<http://pennpointplus.uphs.upenn.edu/sites/pah/mls>).

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TEXTBOOK LIST

TEXTBOOKS	COVER
<p>Clinical Chemistry</p> <ul style="list-style-type: none"> ▪ Tietz Fundamentals of Clinical Chemistry and Molecular Diagnostics (8th edition, 2019) Nader Rifai, Andrea Rita Horvath, Carl T. Wittwer ISBN-13: 978-0323530446 ISBN-10: 0323530443 	
<p>Clinical Hematology</p> <ul style="list-style-type: none"> ▪ Clinical Hematology: Theory and Procedures (6th edition, 2018) Mary Louise Turgeon ISBN-13: 978-1496332288 ISBN-10: 1496332288 ▪ Heme Notes: A Pocket Atlas of Cell Morphology (1st edition, 2013) Denise M. Harmening, Kathleen Finnegan ISBN-13: 978-0803619029 ISBN-10: 9780803619029 	 
<p>Clinical Immunohematology</p> <ul style="list-style-type: none"> ▪ Modern Blood Banking and Transfusion Practices (7th edition, 2019) Denise M. Harmening ISBN-13: 978-0803668881 ISBN-10: 0803668880 ▪ Reference (copies provided): Technical Manual of the American Association of Blood Banks (20th edition, 2014) American Association of Blood Banks ISBN-13: 978-1563958885 ISBN-10: 1563958880 	 
<p>Clinical Immunology, Serology, Virology</p> <ul style="list-style-type: none"> ▪ Clinical Immunology and Serology: A Laboratory Perspective (5th edition, 2021) Linda E. Miller, Christine Dorresteyn Stevens ISBN-13: 978-0803694408 ISBN-10: 0803694407 ▪ Reference (Microbiology textbook): Bailey & Scott's Diagnostic Microbiology (15th edition, 2022) Patricia M. Tille ISBN-13: 978-0323681056 ISBN-10: 0323681050 	 

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<p>Clinical Microbiology (Bacteriology, Mycology, Mycobacteriology, Parasitology)</p> <ul style="list-style-type: none"> ▪ Bailey & Scott's Diagnostic Microbiology (15th edition, 2022) Patricia M. Tille ISBN-13: 978-0323681056 ISBN-10: 0323681050 ▪ Reference (copies provided): Textbook of Diagnostic Microbiology (7th edition, 2022) Connie R. Mahon, Donald C. Lehman ISBN-13: 978-0323829977 ISBN-10: 032382997X ▪ DPDx – Laboratory Identification of Parasites of Public Health Concern (CDC) 	 
<p>Clinical Urinalysis</p> <ul style="list-style-type: none"> ▪ Urinalysis and Body Fluids (7th edition, 2021) Susan King Strasinger, Marjorie Schaub Di Lorenzo ISBN-13: 978-0803675827 ISBN-10: 0803675828 	
<p>Molecular Pathology</p> <ul style="list-style-type: none"> ▪ Molecular Diagnostics: Fundamentals, Methods, and Clinical Applications (3rd edition, 2019) Lela Buckingham ISBN-13: 978-0803668294 ISBN-10: 0803668295 	
<p>Laboratory Operations</p> <ul style="list-style-type: none"> ▪ Laboratory Operations and Management (1st edition, 2024) Jeanne M. Isabel, Patricia J. Ellinger, Dana M. Griffin ISBN-13: 978-1719646901 ISBN-10: 1719646902 	
<p>General (copies provided):</p> <ul style="list-style-type: none"> ▪ BOC Study Guide: Clinical Laboratory (7th edition, 2022) American Society for Clinical Pathology ISBN-13: 978-08918696845 ISBN-10: 0891869688 ▪ Quick Compendium of Medical Laboratory Sciences (2nd edition, 2023) American Society for Clinical Pathology ISBN-13: 978-089189-6909 ISBN-10: 0891896902 	 

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- **Success! In Clinical Laboratory Science (5th edition, 2019)**

Donald C. Lehman, Janelle M. Chiasera

ISBN-13: 978-0134989181

ISBN-10: 013489818X

- **PAH, HUP, PPMC Laboratory Procedures**

- [Clinical Laboratory Service Manual](#)



GRADING POLICY

1. A passing grade in all sections of both the didactic and clinical laboratory components must be achieved before recommendation to a certifying examination will be granted by the program.
2. The minimum passing grade is 70% in all areas of didactic instruction and 80% in all areas of practical instruction.
3. Lecture grades for each section are determined by written examinations.
4. Laboratory grades for each section are determined by practical examinations (including testing on unknown samples), written examinations, and evaluation by instructors.
5. If an exam is not taken on the scheduled day, the exam grade will be decreased by 10 points (one letter value) unless a doctor's note is provided.
6. The final course grade comprises 50% of the didactic lecture grade and 50% of the clinical laboratory grade, unless otherwise stated or required by the student's college or university.
7. Advanced placement is NOT a policy of this program.
8. Equivalencies for letter grades:
 - 90-100 = A
 - 86-89 = B+
 - 80-85 = B
 - 76-79 = C+
 - 70-75 = C
9. Transcripts sent to student's college or university at the conclusion of the hospital program reflect the credit hours and quality point values as set by the college or university.
10. For students from affiliated colleges and universities, a Bachelor's degree is also granted by the college or university, in addition to the certificate from the program. Others will receive a certificate from the program.

ACADEMIC DISMISSAL POLICY

1. The student must maintain the minimum passing grades as stated above.
2. Student progress will be monitored routinely, and reviewed with each student at least twice each semester. Failure to maintain a minimum average in any department will result in the following course of action.
 - Student will be notified of unsatisfactory performance by Program Director in person and in writing. A Student Coaching Record is provided for this purpose. A remedial course of action is decided upon and recorded. Two coaching records with indications of first, second and third warning can result in academic probation.
 - Didactic instructor, laboratory supervisor, or Program Director determines the time allotted to improve performance at which time the student will be reevaluated. With multiple coaching records, the duration of probation will be decided.
3. Continued unsatisfactory performance in the department will result in dismissal from the program. There is no suspension.

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4. Students dismissed from the program for academic reasons may file an appeal via the Grievance/Appeals Policy on page 21.
5. Students failing or withdrawing from the program may have the option of returning to the affiliated university and earning a baccalaureate degree in a curriculum other than medical laboratory science.

ACADEMIC HONESTY POLICY

Honor Code: *Every student shall be honor bound to refrain from cheating (including plagiarism, photographing or copying exams). Every student shall be honor bound to report immediately all violations of the Honor Code of which the student has first-hand knowledge; failure to do so shall be a violation of the Honor Code.*

All course work submitted for evaluation is pledged with the student's name: *"On my honor, I pledge that I have neither given nor received help on this work, and I am unaware of any violations of the Honor Code by others."*

In pledging his or her work, the student affirms that any significant learning must be done within the boundaries of the pledge, that any knowledge falsely represented as one's own is hollow and without merit. Every student found guilty of a violation of the Honor Code is subject to dismissal from the Program.

ATTENDANCE POLICY AND LATENESS POLICY

ATTENDANCE

Students are expected to be in attendance in-person at all times. Excessive absences will result in additional days in the laboratory, an unsatisfactory rating on the laboratory student evaluation, and a written warning from the Program Director. Consecutive warnings may result in Dismissal from the program.

If unable to attend due to illness, the ***student must notify the laboratory or lecture instructor an hour before the start time by phone and the Program Director or Coordinator before 8:00 AM by phone or email.*** If a student is ill and confined to bed for more than two days, he/she will be required to submit a note from a physician.

If a personal day is required, it must be scheduled with the Program Director and with the Rotation Supervisor ***at least two weeks in advance.***

If a student needs to leave early any day, it must be scheduled with the Program Director and with the Rotation Supervisor ***at least one week in advance.***

LATENESS

Students are expected to be at their respective laboratory rotation at the time designated by that section. Excessive lateness will result in additional days in the laboratory, an unsatisfactory rating on the laboratory student evaluation, and a written warning from the Program Director. Consecutive warnings may result in dismissal from the program.

GENERAL DISMISSAL POLICY

Dismissal is the permanent withdrawal of the student by the Program Director of the privilege of class attendance and laboratory rotation at Pennsylvania Hospital with no promise (implied or otherwise) that the student may return at any future time.

Misconduct which may result in dismissal consists of the following offenses:

1. Violation of written Hospital policy or regulations contained in any official publication or administrative announcement of Pennsylvania Hospital.
2. Forgery, alteration, destruction, falsification, or misuse of laboratory documents, records, reports, test results.
3. Use, possession, or carrying of firearms (including, but not limited to pistols, rifles, shotguns, or ammunition), knives, explosives, or other dangerous weapons while on hospital-owned property.
4. Use, possession, or distribution of alcoholic beverages on Hospital property shall comply with laws of the Commonwealth of Pennsylvania and Hospital Policy.
5. Use, possession, distribution, or being under the influence of narcotics or dangerous drugs.
6. Theft of or damage to Hospital property.
7. Physical abuse of any person on Hospital-owned property.
8. Disorderly conduct or lewd, indecent, or obscene conduct on Hospital owned or controlled property.
9. Academic dismissal due to poor grades.
10. Academic dishonesty including, but not limited to cheating and plagiarism.
11. Academic dismissal due to failure to meet expectations of Essential Functions of program.
12. Chronic absence or lateness.
13. Endangering the life/wellbeing of the patients.

Reasons for a recommendation for dismissal of a student are fully documented and discussed with the student. Signatures of all persons involved appear on the documentation statement. The Coordinator of the affiliated institution involved is notified of the recommended action to be followed.

If the student voluntarily withdraws from the program, no further action will be taken.

QUALIFIED SUPERVISION POLICY

Students are paired with a laboratory instructor during rotations. Once proficiency is demonstrated, a student may be permitted to perform laboratory procedures under qualified supervision.

GRIEVANCE/APPEALS POLICY

Academic and non-academic grievances are handled in the same process. Any student with a problem or a complaint concerning his work study program may avail him/herself of the following procedures:

1. Person or persons involved should attempt to resolve the problem, or differences in preliminary discussions.
2. In cases where the involved persons cannot resolve the problem, it should be taken to the immediate supervisor or the Program Director. Any action taken in this step and following steps are to be documented on a complaint record and signed by the involved persons.
3. If the problem has not been resolved by the immediate supervisor or the Program Director to the satisfaction of the involved person (within 5 working days), the student must submit the grievance in writing to the Grievance Committee. A blank student Complaint Record can be found on the network drive (G:) in the MLS folder or from the Program Coordinator. The completed complaint record will be filed in a separate location; it will not be part of the student's file of permanent record.
4. The Grievance Committee is comprised of the Program Director, Supervisor of Nursing Education, Administrative Director of the Laboratory, and the Director of Human Resources or designee.
5. If the problem cannot be resolved, the Medical Laboratory Science Advisor of the affiliated college shall be informed of the situation. The decision of the Program officials will be final.

VOLUNTARY WITHDRAWAL POLICY

The Program Director shall be notified in writing if a student is voluntarily withdrawing from the program. The withdraw will be submitted to the Administrative Director of the laboratory. A written confirmation of the withdraw will be sent to the student. The advisor or coordinator of the affiliated college will be notified of the withdrawal.

RETENTION OF RECORDS POLICY

Student records from the past 7 years are kept in hard copy form in the Program Coordinator's office or in Iron Mountain Archives. These files contain all documents pertinent to the student's admission to, progress in, and completion of the Pennsylvania Hospital program. Student files are open to the student at her/his request with the exception of reference letters if the student has waived the right of access.

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Student records over 7 years are in the form of a Database file located in the Program Coordinator's Office. This file list student name, year of graduation, letter grades in each subject, and pass/fail record of a national certification examination. Beginning with the class of 2001, the student's GPA is listed and a hard copy of the student's transcript from the program is retained.

HEALTH SERVICES POLICY

The Pennsylvania Hospital Medical Laboratory Science Program requires each student to maintain adequate health insurance, which shall not be permitted to lapse during the Program. There is no program or hospital group coverage available to the student. A student who sustains work-related injuries or work-impacted illnesses (such as conjunctivitis) will be treated at Employee Health. For acute, but non-work related illness, students may use the Pennsylvania Hospital Emergency Services on the same basis as any other patient.

The health and safety of students is safeguarded by requiring updated immunizations (reviewed by PAH Occupational Medicine), by providing a safety in-service training, and by providing appropriate personal protective equipment in all areas of the laboratory.

While training in the Department of Pathology and Laboratory Medicine of the Hospital of the University of Pennsylvania, students who are injured or become suddenly ill may use the hospital's Emergency Services on the same basis as any other patient. Follow-up for needle sticks or exposure may be done at PAH Employee Health.

COVID-19 POLICY

The MLS Program will follow Penn Medicine/Pennsylvania Hospital guidelines to prevent transmission of COVID-19. Students are expected to abide by hospital guidelines. Any time missed from the program due to contraction of COVID-19 will need to be made up during program breaks.

SAFETY POLICY

Students will comply with the Safety Standards as described in the Laboratory Safety Manual, the Pennsylvania Hospital Infection Control Manual, and the Pennsylvania Hospital Emergency Manual.

Students will follow any special safety instructions and wear personal protective equipment as designated by each laboratory.

A safety in-service is provided during the Hospital Orientation which students attend during Orientation. The laboratory safety in-service is provided by the laboratory safety officer during the Orientation Week.

ACCEPTABLE CONDUCT AND DRESS CODE POLICY

Students are expected to present themselves regarding dress and conduct in a professional manner at all times. Shorts, sweat pants, sweat shirts, and jeans are not permitted at Pennsylvania Hospital. The designated scrub color for the lab is hunter green. Other clothing should not violate current safety policies found in the Laboratory Safety Manual (e.g. open-toed shoes). Professional conduct includes strict regard for the confidential nature of all laboratory patient testing.

The Lab Dress Code Policy is found on the PAH Intranet under Allied Health, Policy Manual, Professional Image Policy.

Cell phone use is not permitted during lab rotations, lectures, or exams. Exceptions may be made for emergency situations, and requires pre-approval from the Program Director. Cell phones may be used in the student room during breaks.

During exams, all student belongings are to be placed at the back of the examination room. Students are expected to cover/protect their work during exams to maintain academic integrity.

HIPAA POLICY

Students will participate in training and comply with hospital policy relating to Health Insurance Portability and Accountability Act (HIPAA) of 1996.

STUDENT SERVICE WORK POLICY

Once a student has completed the rotation in a clinical area and has been determined proficient in the area, he/she may be given the opportunity to work part-time as a Laboratory Trainee for compensation, if they so desire.

The student is given the responsibility for performing the tests and reporting results under the direction of laboratory staff with the approval of the supervisor, outside of regular academic hours. ***As a part-time employee, the student will be subject to UPHS/PAH employee regulations.***

This training is non-compulsory, but is an integral part of the established curriculum. It is offered for 1 academic credit as course: MLS 498 and is allowed as Curricular Practical Training (CPT) for international students in F-1 status. This is designed as a Pass/Fail course based on satisfactory work as determined by laboratory supervisor and without being placed into performance management. Academic credit is awarded for a passing grade.

SNOW DAY POLICY

There are no snow days for essential personnel in healthcare. Students are expected to be present and must plan accordingly for inclement weather. Students are only excused when absences are decided upon by the Program Director.

PENNSYLVANIA HOSPITAL MEDICAL LIBRARY

Students in the program will have access to:

- Approximately 350 print and over 2000 electronic journal subscriptions
- Internet access for searching from library computers
- 24-hour access to library materials
- One free photocopy of any library material
- Instruction and training in performing literature searches
- Reference assistance from staff

In addition, students may access current subscriptions to laboratory periodicals held by laboratory staff.

STANDARDS FOR FACULTY

The MLS program shall maintain qualified faculty as defined by the National Accrediting Agency for Clinical Laboratory Science (NAACLS) standards. The Program Director shall administer the program on a day-to-day basis and perform the duties as defined in the job description for a Program Director at Pennsylvania Hospital. This includes ensuring all provisions of the Standards are met and maintained.

The didactic faculty are responsible for teaching courses, developing curriculum, evaluating student achievement and course effectiveness. Didactic faculty also have input in forming program policies and procedures, as well as maintaining effective communication with the Program Director.

The clinical faculty including the clinical liaisons are responsible for supervising and coordinating the clinical laboratory learning experience, monitoring and evaluating student achievement, performance, and developing curriculum. Clinical faculty and clinical liaisons also provide input in forming program policies and procedures, as well as maintaining effective communication with the Program Director.

Other PAH employed laboratory staff may participate as adjunct faculty of the MLS program. They may teach courses, supervise clinical laboratory learning experiences, evaluate student achievement and develop curriculum. The adjunct faculty will be evaluated by the students and may be removed based on the results of student evaluations.

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All faculty members must demonstrate adequate knowledge and proficiency in their content areas and demonstrate the ability to teach effectively at the MLS level. They shall maintain continuing education as required by NAACLS standards.

Faculty recruitment and employment practices shall be non-discriminatory and in accordance with the regulations of the government and Penn Medicine. Primary faculty positions are recruited cooperatively by the Program Director, Administrative Director of the Laboratory, and Medical Director.

STANDARDS FOR PROGRAM EFFECTIVENESS

The Pennsylvania Hospital School of Medical Laboratory Science is committed to ensuring quality in the MLS program. Review and analysis of outcome measures provides a systemic approach to ensure program effectiveness. The following tools are used to collect data to monitor program effectiveness, also listed are the standard which triggers action:

1. Board of Certification (BOC) pass rate
 - NAACLS and the PAH MLS program standard are a 75% pass rate average for three consecutive years for the graduates who take the exam within the first year of graduation.
2. Graduation rate
 - NAACLS and the PAH MLS program standard are a 70% graduation rate average for three consecutive years for the students who have begun the final half of the program. The final half of the program begins after winter break.
3. Graduation placement rate
 - NAACLS and the PAH MLS program standard are a 70% graduation placement rate for respondent graduates who find employment as an MLS or in a closely related field or continue their education within one year of graduation MLS program graduate 1-year post graduation survey.
Note: A respondent graduate is defined as a graduate who completes the MLS program one year graduate survey.
4. MLS program graduate one year post graduation survey
 - The program survey standard is a minimum average score of 3 out of 4 for each category of the survey.
5. MLS program employer survey
 - The program survey standard is a minimum average score of 3 out of 4 for each category of the survey.

- The employer survey is sent after the graduate completes their survey. For those graduates employed outside of Penn Medicine, employer contact information is requested in the survey.

6. Resources

- The general, financial, and physical resources of the MLS program are reviewed with the Fall Advisory Committee meeting.
- The standard is set by Hospital Administration according to the review of the program's financial standing.
- Faculty have input into the necessary supplies needed to the program.
- Data is presented and reviewed at the Fall Advisory Committee meeting.

Any year of data that does not meet the program standard and/or NAACLS standard are reviewed and analyzed by the Program Director. Any changes made, based on input from the faculty and advisory committee, are monitored for at least a year for the effect on the program.

APPLIED EXPERIENCE POLICY AND PROCEDURE

If a clinical affiliate should want to terminate their affiliation with the Medical Laboratory Science program at Pennsylvania Hospital, all students enrolled in the program at the clinical affiliate will be allowed to complete their rotation. The request for termination from the MLS program would take effect at the conclusion of the academic year. This policy has been signed by all clinical affiliates.

ADVISING

Student advising and guidance through the MLS program will take place at least quarterly with the Program Director. These advising sessions will be scheduled and will focus on the students performance in the program. The Program Director maintains an open door policy but appointments are highly recommended. Please inform the Program Director or Program Coordinator know if you are having difficulty arranging an appointment with a Faculty Member. The Program Director and Faculty will advise the students while maintaining confidentiality and impartiality.

GENERAL PROGRAM OBJECTIVES

The following are expected intellectual outcomes, skills, and behaviors of students enrolled in the program. The taxonomic level within each domain follows the objective:

Cognitive Domain

After attending lectures, reading assigned materials, and performing tests in the laboratory, the student will be able to: *(Specific criteria listed in each course syllabus)*

1. Recall the basic theoretical concepts related to clinical discipline. LEVEL I
2. Recall terminology associated with clinical discipline and normal values. LEVEL I
3. Recall principle of operation of laboratory instruments. LEVEL I
4. Differentiate human anatomy and physiology, as it relates to discipline, in both health and disease. LEVEL II
5. Analyze the underlying theory of procedures performed in the laboratory, including general description of analyte, clinical significance of analyte, methodology of procedure, and conditions for false negatives and positives. LEVEL II
6. Apply knowledge of normal laboratory data to differentiate between normal and abnormal values and specimens. LEVEL II
7. Interpret laboratory results using guidelines of methodology and procedure. LEVEL II
8. Compare alternate methodologies. LEVEL II
9. Correlate basic laboratory procedures to identification of pathologic states. LEVEL III
10. Integrate data from multiple analyses/laboratories to determine probable diagnosis of patient. LEVEL III
11. Assess data for possible discrepancies and resolve problems considering the patient's condition. LEVEL III
12. Evaluate new methodology and instrumentation through application of basic scientific principles, accepted laboratory techniques, cost analysis, and other management principles. LEVEL III

Psychomotor Domain

After attending lectures, reading assigned materials, and performing tests in the laboratory, the student will be able to: *(Specific criteria listed in each course syllabus)*

1. Recognize acceptable, sub-optimal, unacceptable specimens according to Standard Operating Procedure of the laboratory area in which they are working. LEVEL I
2. Process specimens as instructed. LEVEL II
3. Select appropriate procedure, reagents, and controls for test requested. LEVEL I
4. Perform, as demonstrated, manual and automated procedures, including operating, maintaining, and calibrating instruments and preparing/changing reagents. LEVEL II
5. Identify sources of error and interference in analysis. LEVEL I
6. Record QC and/or patient results according to instruction and in a neat and orderly manner. LEVEL II

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7. Perform Quality Control and evaluate acceptability. LEVEL II
8. Troubleshoot procedure or instrument when QC is out of range or when results do not correlate with patient's clinical condition. LEVEL III
9. Correct errors in a timely fashion. LEVEL III

Affective Domain

While completing each laboratory rotation, the student will: *(Criteria are listed with each objective)*

1. Receive assignments given in the laboratory. LEVEL I
 - Listen attentively to explanation of procedure.
 - Observe demonstrations of techniques.
 - Accept constructive criticism willingly.
2. Respond positively to individuals who have teaching and supervisory responsibilities. LEVEL I
 - Cooperate with instructor/supervisor in lab assignment.
 - Communicate effectively with assigned instructors and supervisors regarding laboratory rotation and testing assignments.
 - Ask for clarification when a principle or procedure is not clear.
3. Demonstrate compliance with and commitment to laboratory rules and practice. LEVEL I
 - Conform to lab schedule in regard to starting/finishing/lunch/break time.
 - Complies with lab safety policies and procedures when handling specimens, reagents, and when operating instruments.
 - Notifies supervisor of any lab accident should it occur.
4. Value accuracy as being critically important in the provision of patient care. LEVEL II
 - Follows laboratory procedures for accession, identification, transport, storage and disposal of specimens.
 - Complete appropriate instrument maintenance and procedure QC before initiating patient testing.
 - Monitor normal ranges and critical values.
 - Seek consultation in a timely manner when results are questionable.
5. Endorse dependability as a work value in assignments. LEVEL II
 - Notify Program Coordinator when circumstances cause lateness or absence.
 - Plan all scheduled absences in advance and with regard to lab requirements.
 - Complete all assigned laboratory tasks (procedures, unknowns, written and practical exams) according to lab requirements.
6. Maintain effective and positive interpersonal relationships. LEVEL II
 - Communicate effectively in telephone and personal contacts with other health professionals.
 - Respect role and responsibilities of others in allied health profession.
 - Interact in a friendly, cooperative, professional manner with peers and instructors.
 - Strive to resolve any problem that may arise by discussing problem with respective peer or instructor before going to persons not directly involved.

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- Represent the laboratory favorably to other departments and to the public.
- 7. Establish good work habits. LEVEL III
 - Organize work for an efficient flow of specimen testing.
 - Manage reagents, supplies, and equipment.
 - Strive to leave work area in clean and safe condition.
- 8. Persist in self-motivation toward learning. LEVEL III
 - Initiate assigned tasks without prompting.
 - Strive to resolve sources of error or discrepancies caused by suboptimal specimens or interfering substances without prompting.
 - Strive to resolve out-of-range QC without prompting.
 - Endeavor to function independently as skills develop on rotational assignment.
 - Ask for additional information about a given test or assignment.
 - Read current literature to enhance knowledge

Cognitive objectives are measured by written examinations in both lecture and laboratory. Laboratory may include completion of quizzes, worksheets, or workbook.

Psychomotor objectives are measured by practical examinations in the laboratory. A checklist evaluation is used to record completion of tasks if appropriate.

Affective objectives are measured by a checklist evaluation in the laboratory.