

UNIVERSITY OF DELAWARE

DEPARTMENT *of*
MEDICAL AND MOLECULAR SCIENCES

MEDICAL DIAGNOSTICS
STUDENT HANDBOOK

(2026-27)

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Administration

These policies were adopted in order to facilitate the success and ensure the welfare of students in the Medical Diagnostics major and in their future careers. Feel free to contact the Program Director if you have any questions concerning Departmental policies.

Please indicate your understanding of these policies by signing on the indicated space on page 16 and returning a copy of the signed student signature page to Dr. Pekarek either by email, in pdf format, or in person using the address below. Please return the signed signature page by September 9, 2026. Keep a copy of the document for your records.

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Mission Statement

The Department of Medical and Molecular Sciences is committed to providing skilled, critically thinking practitioners equipped to be future leaders in health sciences. In this pursuit, the Department is committed to active engagement of undergraduate and graduate students in experiential learning, to forming collaborative partnerships with educational, clinical, industrial and research experts locally and globally, to discovering innovative breakthroughs in research that contribute to the health and basic sciences body of knowledge, and to functioning as an expert resource regarding all issues related to Medical and Molecular Science.

Goals and Competencies

It is the goal of the University of Delaware to encourage students to achieve their highest standard of scholarship and to help them assume responsibility for developing and achieving their own goals and objectives. In accordance with this, the primary educational goals of the Department of Medical and Molecular Sciences are to provide students with an excellent comprehensive education in medical diagnostics leading to a baccalaureate degree, to prepare students to function in professional positions as practitioners for the healthcare environment of the 21st century, and to prepare students to be life-long learners so as to remain current with advances in medical science.

The curriculum design assures student-oriented instruction in the pathology of disease and the theory of diagnostic laboratory procedures. The capstone course, MMSC 462, Interprofessional Healthcare Perspectives, is a continuum of this specialized, medical education and is designed to broaden the student's education and experience. This approach to medical education enables students to graduate from the University prepared to enter the healthcare profession or professional and graduate schools.

The Medical Diagnostics major's educational objectives, listed below, encompass each area of laboratory services including clinical chemistry, hematology, hemostasis, immunohematology, immunology, microbiology, molecular diagnostics/genetics, urinalysis and body fluids analysis. To accomplish the educational goals of the program and some of the general education goals of the University, the curriculum incorporates cognitive competencies. After successfully attending lectures and completing assignments, the student will be able to:

- Utilize scientific principles (e.g., physiology, immunology, biochemistry, genetics, microbiology, etc.), laboratory principles, and methodologies as they apply to the clinical and medical settings

- Accurately interpret laboratory test data and determine their clinical significance
- Communicate, through oral and written skills, effectively and professionally to enable consultative and educational interactions with healthcare personnel, the public, and patients in order to function successfully as a member of the healthcare team
- Demonstrate ethical behavior and professionalism, maintain confidentiality of patient information, and participate in continuing education for one's own professional career development
- Develop skills and knowledge to become life-long learners
- Evaluate published scientific studies utilizing knowledge of research design

General Education Goals of the University

After successfully attending lectures and completing assignments in the liberal arts courses, the student will be able to:

- Read critically, analyze arguments and information, and engage in constructive ideation
- Communicate effectively in writing, orally, and through creative expression
- Work collaboratively and independently within and across a variety of cultural contexts and a spectrum of differences
- Critically evaluate the ethical implications of their words and actions
- Reason quantitatively, computationally and scientifically

Students who successfully complete the Medical Diagnostics (BS) will be able to:

- Utilize scientific principles (e.g., physiology, immunology, biochemistry, molecular biology, genetics, microbiology, hematology, etc.) as applicable for the healthcare arena
- Interpret clinical significance, laboratory test data, and test utilization accurately
- Utilize principles of quality assurance and quality improvement for all phases of laboratory services, *i.e.*, pre-analytical, analytical, and post-analytical focusing on patient safety
- Communicate, through oral and written skills, effectively and professionally to enable consultative and educational interactions with healthcare personnel,

the public, and patients to function successfully as a member of the healthcare team

- Demonstrate ethical behavior and professionalism, maintain confidentiality of patient information, and participate in continuing education for professional career development
- Function in a culturally diverse, global society that demonstrates variations in intellectual expression and human creativity

Essential Functions

As a Medical Diagnostics major, you have chosen to pursue a healthcare profession, where honesty and integrity are critical personal characteristics required both in academic studies and in the practice of the medical profession. Successful students are self-sufficient, problem-solvers who like the challenge and responsibility that careers in healthcare provide. In order for graduates to maintain their competence, they need to be life-long learners. As a Medical Diagnostic student, you must develop skills and techniques to locate reliable information and to be self-learners. The principles that embody the Essential Functions are applicable to the many career opportunities that exist in healthcare. Physicians, physician assistants, dentists, optometrists, etc. need to possess the same qualities that are detailed in the Essential Functions including but not limited to manual dexterity, good eye-hand coordination, safe utilization of equipment, accuracy, maintaining composure in stressful situations, utilizing independent judgment, exercising good communication skills, demonstrating ability to comprehend scientific and medical information, and maintaining patient confidentiality. The Essential Functions comprise emotional and professional/intellectual demands and are the expectations for a student who plans to pursue graduate or professional school upon graduation.

The ***emotional demands*** required of students include the ability to:

- Maintain composure and professionalism while providing appropriate services under stressful situations, such as time constraints, emergencies, rudeness, etc.
- Utilize independent judgment and act logically in the performance of one's duties
- Organize and accept responsibility for one's work, including acknowledgement of errors or uncertainty and acceptance of constructive criticism

- Employ sufficient psychological stability to consistently and dependably utilize critical thinking in order to formulate and implement safe and ethical healthcare decisions in a variety of healthcare settings

The ***professional/intellectual demands*** required of students include the ability to:

- Communicate in a professional, positive, tactful manner with patients, physicians, nurses, and other healthcare and non-healthcare employees
- Communicate understandably, comprehend, and follow directions in English as evidenced by verbal, written, and reading skills
- Communicate, through the use of assistive devices (e.g., hearing aids, phone receivers, etc.) if needed, so as to converse understandably in English
- Maintain patient confidentiality and exercise ethical judgment, integrity, honesty, dependability, and accountability in the performance of one's responsibilities
- Demonstrate the intellectual skills required to comprehend scientific and medical information, perform mathematical calculations, analyze information, evaluate information, and use critical thinking skills to solve problems
- Maintain a well-groomed, neat, professional appearance

Health and Safety Requirements

While not required in the undergraduate curriculum, many graduate educational programs that lead to healthcare careers, including those for physicians, physician assistants, dentists, optometrists, podiatrists, etc., require undergraduate students to experience the particular career by participating in clinically oriented activities. The number of clinical service hours performed and the type of facility in which the service is performed vary among the career options. Students should inquire about the clinical experience early in the freshman year to be sure that they meet the requirements of their chosen graduate education. The best way to obtain patient contact is by the student volunteering in a health-related environment such as a hospital, emergency department, ambulance corps, neighborhood clinic, physician's office, nursing home, etc.

Health Requirements

To safeguard the health and safety of staff and patients when performing educational activities in the clinical setting, students may be required to have a routine physical examination before the start of volunteer activities. The physical examination provides

verification that the student appears to be free from disease or any impediment which would interfere with normal activity, study, or physical effort.

Immunizations

Before starting clinical activities, students may be required to have specific testing and/or immunization (or documentation thereof) for hepatitis B virus, tetanus, measles (rubeola), mumps, and rubella (MMR), varicella (chicken pox), influenza and tuberculosis (2-step PPD tuberculin skin test or QuantiFERON® test). Students might be required to submit documentation of immunity as evidenced by positive immune titers for several of these diseases. For the safety of patients, healthcare institutions have the right to refuse student participation, if the student is unwilling to comply with immunization requirements.

Healthcare personnel are among those at increased risk for acquiring hepatitis B virus infection due to their frequent contact with human blood and other body fluids. A student who wishes to be immunized may receive the injections from his or her primary care provider. **Such immunizations should begin at least six months prior to volunteer activities.** Alternatively, the vaccine is available through Student Health Services paid for by the student. The vaccine is administered as a series of three injections given at appropriate intervals over a six-month period. If a student has been vaccinated previously, most hospitals will require a blood test to determine antibody titer to the hepatitis B virus or an additional booster.

Drug Screening, Criminal Background Check, and Other Requirements

Before starting clinical activities, a student may be required to complete a urine drug screening and a criminal background check. There are some requirements that may be specific to certain healthcare institutions, including but not limited to: child abuse registry investigation and adult abuse registry investigation. For the safety of patients, healthcare institutions reserve the right to request a urine drug screening and such criminal/abusive background checks at the commencement of clinical activities.

Important Note: Students should be aware that results from the criminal background check, urine drug screening, child abuse registry investigation, and adult abuse registry investigation could prevent the student's ability to participate in clinical activities at healthcare institutions. In addition, candidates applying for employment in healthcare are typically required to undergo a criminal background check and urine drug screening. Each student should use sound judgment and avoid situations which could result in poor decisions. Failure to do so could jeopardize the student's ability to complete graduate medical education or secure health profession employment, thus impacting future career goals in healthcare.

Academic Requirements

Non-core required courses, university and department breadths and other requirements for graduation can be found in the UD catalog as well as the courses listed below

Core Courses

MMSC 100 Intro to Medical and Molecular Sciences (1) Orientation to the laboratory and non-laboratory-based health professions, including Medical Laboratory Scientist, Biotechnologist, Physician Assistant, Doctor of Medicine as well as other allied health professions. Discussion of the inter-professional nature of health-care delivery and the diversity of employment and career opportunities.

BISC 207/217 Introductory Biology I with Lab (4)

CHEM 103/133 General Chemistry I with Lab (4)

MATH 115 (Consult Advisor- Based on Testing) (3) Note: Check the medical schools that you are interested in applying to for a calculus requirement; not all require it now. If you need calculus choose appropriate prerequisites and the calculus course.

UNIV 101 First Year Experience I (1)

MMSC200 Language of Medicine (3) Comprehensive foundation of medical terminology for use in health care careers. Emphasis on body structures, anatomical systems, pathologies, medical procedures, medical specialties, and common terms and abbreviations used in health care.

BISC 208/218 Introductory Biology II with Lab (4)

CHEM 104/134 General Chemistry II with Lab (4)

ENG 110 First-Year Writing (3)

BISC 300/310 Introduction to Microbiology with Lab OR MMSC 270 Medical Microbiology & Infectious Disease (4)

CHEM 321/325 Organic Chemistry I with Lab (4)

PHYS 201/221 Introductory Physics I with Lab (4)

CHEM 322/326 Organic Chemistry II with Lab (4)

BISC 306 General Physiology (3)

PHYS 202/222 Introductory Physics II with Lab (4)

MMSC 415 Clinical Immunology and Medical Virology (3) Introductory immunology concepts and use of immunological assays, such as enzyme immunoassays and fluorescent antibody assays, for diagnosis of infectious diseases and immunological disorders. Study of viruses, diseases they cause, and methods used to diagnose viral infections.

MMSC 402 Body Fluid Analysis (2) Overview of protocols, technical and clinical correlations involved in body fluid analysis of non-blood body fluids, including urine, synovial, cerebrospinal, seminal, serous, amniotic and gastric fluids.

CHEM 214 Elementary Biochemistry (3)

STAT 200 Basic Statistical Practice OR STAT 408 Statistical Research Methods I (3)

MMSC 407 Clinical Physiological Chemistry I (3) Application and theory of manual and automated techniques used in diagnostic and therapeutic medicine. Emphasis on clinical procedures for carbohydrates, proteins, lipids, nonprotein nitrogenous compounds, blood gases and pH, and electrolytes.

MMSC 436 Clinical Physiological Chemistry II (3) Application and theory of methodologies in enzymology, endocrinology and toxicology. Relationship of normal and abnormal laboratory findings in organ functional tests.

MMSC 423 Hematology I (2) Quantitative and qualitative study of the formed elements of blood with emphasis on the normal state, as well as the study of normal and abnormal coagulation and hemostasis.

MMSC 433 Hematology II (2) Study of the pathophysiology of erythrocytic and leukocytic disorders and the laboratory findings of these disorders.

MMSC 428 Medical Microbiology and Parasitology (3) Study of the occurrence and pathogenesis of human infections and microorganisms associated with humans in health and disease.

MMSC 409 Immunohematology I (2) Study of antigen and antibody systems of human red cells and compatibility testing of blood for transfusion.

MMSC 420 Immunohematology II (2) Study of blood and component transfusions, their risks, complications and quality assurance. Blood component therapy and testing of the neonate and adult is also covered.

MMSC 438 Diagnostic Bacteriology and Medical Mycology (3) Diagnostic bacteriology, emphasizing the correlation of in vitro and in vivo findings in the diagnosis and treatment of infectious disease, including human mycoses. Identification of pathogenic and nonpathogenic bacteria and fungi in clinical specimens.

ENGL 200+ English (3)

MMSC 462 Interdisciplinary Healthcare Perspectives (3) Final reflective component of the volunteer experiences accumulated throughout the student's undergraduate years in preparation for a graduate program in a healthcare field. Evidence of critical thinking and knowledge of healthcare concepts will be demonstrated through various assignments.

MMSC 490 Clinical and Molecular Cell Biology (3) Molecular diagnostics topics emphasize DNA, RNA and protein structure and function, including detailed review of the central dogma. Genetic topics emphasize cell development, chromosome structure and function, and disease inheritance patterns.

MMSC 491 Human Molecular Genetics (3) Molecular processes required to diagnose inherited disorders, cancer, hematological disorders, and infectious agents. Additionally, the employment of DNA identity-based testing in transplantation, paternity testing and forensics will be discussed.

BISC 401 Molecular Biology of the Cell (3) Introduction to the molecular biology of eukaryotes and prokaryotes. Topics include structure and function of proteins and nucleic acids, replication and repair of DNA; biosynthesis of RNA and proteins, membranes, transport, composition and function of the eukaryotic cell, chromosomes, viruses, the immune system and recombinant DNA.

BISC 403 Genetics (3) The physical and chemical basis of heredity, the nature and mechanisms of gene action. Note that BISC 303 is now a pre-req for BISC 403.

NOTE: STUDENTS EITHER TAKE THE SEQUENCE OF MMSC 490 AND MMSC491 OR BISC401 AND BISC403.

Grading

Students must obtain a grade of C- or higher in each of the Department of Medical and Molecular Sciences (MMSC) courses to progress in the Medical Diagnostics major. A grade of C- requires attainment of a minimal grade of 70%. Grades are not curved and Medical and Molecular Sciences courses are offered only once a year. To avoid problems that may impede progression in the major, a student who finds themselves in academic difficulty is encouraged to seek assistance from the Office of Academic

Coaching and Tutoring (<https://www.act.udel.edu/>), and the Center for Counseling and Student Development (<https://www.udel.edu/students/health-wellbeing/mental-health/>).

NOTE: In accordance with university policy, courses taken at another institution must be graded C or better to transfer, i.e., a grade of C- is not acceptable for transfer. See <http://www.udel.edu/registrar/transfer/transins.html>.

Lecture Attendance

Attendance at all Medical and Molecular Sciences lectures is highly recommended. Individual faculty might require attendance. The student must abide by the regulations set forth in each Medical and Molecular Sciences course, so the student should consult the policy contained in each course manual. In general, absence from class due to illness, death of a family member, a personal emergency, participation in university-related events or observance of a religious holiday will constitute cause for an excused absence. Examples of unexcused absences include but are not limited to scheduling routine medical and dental appointments, expanding spring break beyond its allotted time, or scheduling other travels for personal reasons.

Computerized Testing

The Department of Medical and Molecular Sciences utilizes computerized assessment and assessment administration (e.g. ExamSoft) to administer examinations. In many Department courses, students will be required to bring a laptop or tablet to the classroom to participate in testing.

Student Grievances and Disciplinary Action

Honesty and reliability are essential in the medical profession, and these qualities are emphasized in all of the undergraduate professional courses. Any incident of personal misconduct, suspected cheating on an examination, plagiarism, or any other form of academic dishonesty by a student will be communicated to Community Standards & Conflict Resolution (<https://www.udel.edu/students/community-standards/>). If warranted, the incident may be adjudicated as indicated by the Student Conduct Process (<https://www.udel.edu/students/community-standards/student-guide/case-resolution>). Determination of misconduct may result in a failing grade in the course and automatic dismissal from the MDD Program.

Student grievances are handled according to the policies of the Department of Medical and Molecular Sciences, the College of Health Sciences, and the University at large. Students should refer to the University of Delaware Student Guide to University Policies

for detailed information on academic and non-academic grievance procedures (available at <http://www.udel.edu/stuguide/current>).

Professional, Doctoral, and Physician Assistant School Requirements

A minimum MDD program entrance GPA of 3.0 is strongly recommended for students considering first professional (medical, dental, optometric, podiatric), doctoral or physician assistant schools. The recommended science prerequisites for professional schools include BISC 207, BISC 208, BISC 300, CHEM 103 or CHEM 107, CHEM 104 or CHEM 108, CHEM 321, CHEM 325, CHEM 322, CHEM

326 and the science sequence of BISC 276 and PHYS 201/PHYS 202 and either MATH 221 or MATH

241. These courses satisfy the admission requirements for most professional schools. Students should review programs of interest to determine specific admission requirements and, in consultation with an advisor, adjust course plan accordingly.

Health Professions Evaluation Committee

A student whose educational goal is to attend a professional school should become familiar with the Health Professions Evaluation Committee (HPEC) no later than the junior year. Please note, students pursuing graduate education as a physician assistant are not expected to open a file with this Committee. HPEC is a university committee composed of University faculty and local physicians, who evaluate the credentials of prospective candidates for medical and dental school admission. A junior student must complete their HPEC pre-med file, be interviewed by two HPEC members in preparation for the University's evaluation of the student's record, and take the appropriate standardized admission exam, e.g., MCAT, DAT, or GRE. A student may open an HPEC file as early as the freshman year, most often during the sophomore year and no later than the junior year.

For additional information about HPEC, refer to <http://sites.udel.edu/healthpro/programs>.

Center for Health Profession Studies

The Center for Health Profession Studies focuses on assisting students who are interested in careers in the health professions. The Center helps to assist students who want to pursue careers in medicine, dentistry, optometry, podiatry, physician assistant, advanced practice registered nurse, pharmacy, physical/occupational therapy and other health profession programs.

For additional information about the Center for Health Profession Studies, refer to <https://sites.udel.edu/healthpro/>.

Student Signature Page

It is the student's responsibility to read and understand the policies in this handbook.

Please indicate your understanding of these policies by signing on the indicated space and returning a copy of the signed student signature page to Dr. Pekarek either by email, in pdf format, or in person at 305H Willard Hall. Please return the signed signature page by September 9, 2026. Keep a copy of the document for your records.

MY SIGNATURE ATTESTS THAT I HAVE READ AND UNDERSTAND ALL OF THE POLICIES AND INFORMATION RELATED IN THE MEDICAL DIAGNOSTICS STUDENT HANDBOOK FOR PROGRESSION IN AND COMPLETION OF THE MEDICAL DIAGNOSTICS MAJOR.

Student Signature: _____ Date: _____

Print Student Name: _____

Witness Signature: _____ Date: _____

Print Witness Name: _____