



## Academic Requirements

The successful University of Maryland School of Medicine applicant optimizes their undergraduate and graduate education experiences by exploring personal areas of academic interest and life passions through curricular and extracurricular activities. Ultimately, the rigor of a student's education along with their life experiences and maturity mark readiness for medical education. In addition to the academic requirements detailed below, we seek candidates who evidence the following characteristics:

- Academic Excellence
- Leadership
- Service, compassion and humanism
- Diversity and attention to social justice
- Ability to work as part of a team

A career in medicine offers opportunities to those talented in both humanities and the sciences. Therefore, there are no specific majors necessary for success. We prefer you think of our curricular prerequisites as competencies which must be achieved prior to medical school and not as specific course requirements. We encourage you to familiarize yourself with the [AAMC Core Competencies for Entering Medical Students](#), including the curricular and extracurricular competencies listed, as we believe that strength in these areas will prepare you well for medical school, and for a career in medicine beyond.

The purpose of our listed curricular prerequisites is to provide guidance on strategies for academic preparation for medical school and to identify who will excel in achieving the AAMC core competencies and ultimately be successful in our rigorous academic program. Prerequisite coursework must be completed at an accredited institution recognized by the [Council of Higher Education Accreditation](#), and may be completed as Advanced Placement (AP) or International Baccalaureate (IB) credit, at a community college, and/or online.

Students entering college with a strong background in the sciences, as demonstrated by advanced placement, are encouraged to substitute advanced science courses for the traditional requirements listed below. The Committee on Admissions recommends that pre-requisite coursework be completed within five years of when an applicant submits their application.



## Curricular Prerequisites

- Biological Sciences – one year with laboratory
- Chemical Sciences (general/inorganic) – one year with laboratory
- Organic Chemistry – either one year with laboratory or one semester of organic chemistry (with lab) and one semester of Biochemistry (lab encouraged but not required)
- Physical Sciences – one year with laboratory
- English or other writing intensive course – one year

### Strongly Recommended

These courses are **not** required, but we believe they will help strengthen the academic preparation of future medical students for success in our medical education curriculum:

- Immunology – one semester
- Biochemistry – one semester with laboratory (lab encouraged but not required)
- Physiology – one semester
- Microbiology – one semester
- Genetics – one semester
- Epidemiology – one semester

The courses you choose to fulfill our prerequisites should demonstrate your commitment to achieve the AAMC Core Competencies. The [AAMC Core Competencies for Entering Medical Students](#) also offers additional information. If you are unsure whether your coursework corresponds with our prerequisites, please see this additional information about each competency area below.

### Biological Sciences

Intellectual engagement in the field of biology, which will include coursework and laboratory experience, that encompasses the core concepts of cell and developmental biology, molecular biology and genetics. These core concepts include:

- Nucleic acid/nucleosome structure and function including epigenetics (histone modification and DNA methylation)
- Cell structure, cell cycle, meiosis, and mitosis
- Genetic mutations, repair, and recombination
- Regulation of gene expression in eukaryotic and prokaryotic cells (transcription factors & mechanisms)



- RNA processing
- Protein translation
- DNA and RNA viruses - properties and generation and use of viral vectors
- Foundations of signal transduction

### **Chemical (Organic and Inorganic) Sciences**

Intellectual engagement in the field of chemistry, which will include coursework and laboratory experience, that encompasses core concepts of biochemistry and biologically applicable elements of inorganic and organic chemistry. These core concepts include:

- Acid/base chemistry
- Thermodynamics and chemical equilibrium
- Protein structure and function
- Enzymes: mechanisms, kinetics, inhibition, and binding constants
- Bioenergetics and oxidative metabolism
- Carbohydrate metabolism
- Lipid metabolism
- Membranes and transport

### **Physical Sciences**

Ability to clearly demonstrate knowledge of basic physical principles and their applications to the study and understanding of living systems is required. These core concepts include:

- Newtonian mechanics
- Fluid dynamics
- Basic thermodynamics
- Basic concepts of electrical circuits and electrostatics
- Diffusion and transport of mass and energy

### **English or Writing Intensive Coursework**

Ability to effectively communicate to convey information or a message clearly through written communication. Experience with oral presentations is also highly valued.