Pre-Med and Pre-Health Planning at Johns Hopkins University

Office of Pre-Professional Programs and Advising
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Introduction

The guidelines presented in this document provide important details for Johns Hopkins University undergraduates or recent graduates; primarily those who intend to apply to allopathic (MD), physician-scientist (MD/PhD), osteopathic (DO) and dental (DDS, DMD) programs. The academic policies and recommendations in this document, however, primarily apply to incoming students from the Class of 2021. There are some subtleties and differences for returning students in the Classes of 2020, 2019, and 2018.

Our office also provides support for applicants to other health professions schools (veterinary medicine, nursing, optometry, pharmacy, etc.). Information about applying to those programs can be found on the Pre-Professional website: http://web.jhu.edu/prepro/health/Health.professions.guides.

In this Guide, “medical school” refers to allopathic (MD), academic medicine (MD/PhD), osteopathic (DO), and dental (DDS, DMD) programs. In addition, each of the medical options in this guide has separate websites on the Pre-Professional Office website with important information:

- Allopathic Medical School: http://web.jhu.edu/prepro/health/allopathic.html
- Osteopathic Medical School: http://web.jhu.edu/prepro/health/osteopathic.html
- Dental School: http://web.jhu.edu/prepro/health/predental.html
- MD/PhD Programs: http://web.jhu.edu/prepro/health/md_phd.html

Topics Covered

- What are health professions schools looking for?......................................................3
- What is the most common path for JHU students?.....................................................4
- Pre-health prerequisites .............................................................................................5
- Pre-medical course planning: Caveats to consider .................................................8
- The English/Writing requirement ............................................................................9
- Choosing a major ......................................................................................................9
- Summer courses/study abroad ..................................................................................10
- Academic assistance – at a glance! ........................................................................11
- Planning reminders ................................................................................................13
What are the health professions schools looking for?

★ **Academic Achievement and Aptitude** – Health professions schools look for evidence that you can handle the challenges of a rigorous science curriculum. They review your cumulative GPA, BCPM GPA (Biology, Chemistry, Physics, Math), and MCAT or DAT score. They also look for trends in your academic performance and evidence of a challenging course load.

★ **Academic Breadth and Diversity of Interests** – This is reflected in course selection, and the depth and scope of your academic interests. Medical schools value independent inquiry, regardless of the discipline.

★ **Clinically Related Experience** – Medical schools place a strong emphasis on your clinical exposure to patient care, including time spent shadowing, working in clinics, and other patient-centered exposure. Engaging in direct patient interaction (i.e., transporting patients, serving as a medical translator, etc.) will greatly enhance your experience.

★ **Community and Public Service** – Good doctors also have a strong sense of service, of wanting to help people improve their health, making health care work better, and giving back to their communities. Medical schools value engagement in community service as a way to demonstrate respect toward others with very different life circumstances, empathy, and cultural sensitivity.

★ **Research and Independent Investigation** – Research is investigative in nature. It is conducted to learn facts, acquire new knowledge, and draw conclusions. Medical schools like to see investment in and contributions to research, whether basic science or clinical. And, as noted, medical schools value independent inquiry, regardless of the discipline.

★ **Individuality and Passion** – There are many ways applicants demonstrate their individuality, passion for learning, and diversity of interests. Medical schools look for demonstration of substantive and long-term investment in activities that distinguish an applicant, particularly those that include creativity, leadership, and exploration.

★ **Strong Letters of Recommendation** – As a freshman, you do not need to worry about collecting letters of recommendation just yet, but you should begin developing rapport with pre-professional advisors and, in the case of your professors, attending office hours, and letting them get to know you. Letters of recommendation are a critical element in the health professions application process and you will eventually collect letters from individuals who know you well and can speak enthusiastically about your abilities, competences, and interpersonal skills.

For more information, visit the Relevant Experience section of the Pre-Professional website: [http://studentaffairs.jhu.edu/preprofadvising/pre-medhealth/relevant-experience/](http://studentaffairs.jhu.edu/preprofadvising/pre-medhealth/relevant-experience/)
What is the most common path for JHU students?

More than 80% of JHU students applying to medical school take at least one “bridge” year following graduation. This path is outlined below:

**Years 1 & 2**

**Freshmen and Sophomore Year**
- Get to know your academic advisor
- Attend Pre-Professional Small Group Advising Meeting
- Identify research opportunities
- Secure summer medically-related opportunities, research, or volunteering
- (Sophomore Year) Participate in academic success programs like PILOT and Learning Den
- Meet individually with pre-health advisor in Pre-Professional Office
- Engage in meaningful public service in the Baltimore community

**Years 3 & 4**

**Junior Year**
- Consult Pre-Professional Office regarding pre-health course requirements, MCAT timing, application timeline
- Participate in meaningful service activities
- Secure summer medically-related experience

**Senior Year**
- Maintain contact with pre-health advisor in the Pre-Professional Office
- Complete medical school application(s)

**Gap /Bridge Year**
- Engage in research, public service, clinical experience, etc.
- Continue contact with a pre-health advisor in the Pre-Professional Office
- Attend interviews & receive acceptances!
Pre-health prerequisites

While there is no required major for entrance into a health professions school, there are many skills, abilities, and values you should develop during your undergraduate years to help you succeed. Among them are:

★ Mastery of basic scientific principles
★ Broad exposure to the humanities and social sciences
★ Understanding of the physician-patient relationship
★ Demonstration of desired personal traits such as maturity, integrity, compassion, empathy, and leadership
★ Development of meaningful relationships with faculty members
★ Engagement in activities that demonstrate caring for fellow human beings
★ Understanding of the health care profession of your choice
★ Commitment to public service

Pre-Medical Coursework

In addition to your major and degree requirements, pre-health students at Johns Hopkins are advised to take the courses necessary to prepare for the MCAT. These courses also fulfill the admission requirements of the majority of medical/dental schools in the U.S.

We RECOMMEND that JHU students pursue the following coursework (or the equivalent of):

★ 2 courses in general (inorganic) chemistry with associated labs
★ 2 courses in organic chemistry with associated lab (rather than separate labs for each course, a single 3 credit Organic Chemistry lab)
★ 2 courses in biology with associated labs
★ 1 course in biochemistry (lab requirements vary for each student; speak to an advisor)
★ 2 courses in general physics with associated labs (Calculus I and II are co-requisites for General Physics I & II at JHU)
★ 2 courses in mathematics
★ 1 course in statistics
★ 2 courses that emphasize English and/or writing (see section below)
★ 2 courses that emphasize social and behavioral sciences principles (Note: there are numerous introductory courses in psychology, sociology, and related disciplines that will provide a foundation for the MCAT).
Examples of courses providing a foundational background in psychology:

- 200.101 Introduction to Psychology
- 200.141 Foundations of Brain, Behavior, and Cognition

Examples of courses providing a background in sociology:

- 230.101 Introduction to Sociology
- 230.341 Sociology of Health and Illness
- 661.317 The Culture of the Medical Profession

Note: Courses in any one of the areas of ethics, philosophy, cross-cultural studies, and public health are recommended, regardless of the discipline. Not only will the pursuit of such academic areas positively impact performance on the MCAT, it will also provide a broad and relevant foundation for medical school.

Chemistry Placement Guidelines

For many of our science, engineering, and pre-med students, selecting a chemistry course in the freshman fall semester can be a difficult decision. As discussed above, we advise pre-health students to take (a) two courses in general (inorganic) chemistry with associated labs and (b) two courses in organic chemistry with an associated 3-credit lab.

It is very important that you take the right chemistry course for you! The chemistry course options (and combinations) for the first year by course number:

- 030.101 Introductory Chemistry I with 030.105 Introductory Chem. Lab I (fall semester)
- 030.102 Introductory Chemistry II with 030.106 Introductory Chem. Lab II (spring semester)
- 030.103 Applied Chemical Equilibrium (fall or spring semester)
- 030.204 Chemical Structure and Bonding (spring semester)
- 030.205 Organic Chemistry I (fall semester)
- 030.206 Organic Chemistry II (spring semester)

As a general rule, consider the following guidelines based on whether you received a score of 4 or 5 on the AP Chemistry exam: [http://www.advising.jhu.edu/placement_chemistry.php](http://www.advising.jhu.edu/placement_chemistry.php).

Be sure to consult with your academic advisor by phone or email if you have questions regarding the best chemistry placement for you upon entering Johns Hopkins.

Physics Placement Guidelines

In preparation for applying to medical school, it is recommended that you take a minimum of two courses in physics with associated labs. General Physics at JHU is calculus-based, so Calculus I and II are co-requisites. Students who come to JHU with AP Physics credit are advised to take one upper-level physics course at some point over their four years.
**Biology Placement Guidelines**

In preparation for applying to medical school, it is recommended that you take a minimum of two courses in biology with associated labs. Depending on your major, the courses may be from the Department of Biology, the Department of Biophysics, or the Department of Biomedical Engineering.

If you are in the **Whiting School of Engineering**:
- *Biomedical Engineering* students fulfill their biology coursework through the *Systems Bioengineering I & II* sequence with associated labs.
- *Pre-med students in other engineering majors* will enroll in higher-level biology courses. Please consult with an academic advisor about your options.

If you are in the **Krieger School of Arts & Sciences**:
- *If you earned a 5 on the AP Biology exam* (International Baccalaureate students must earn a 6 or 7 in IB HL Biology) you will receive 6 credits. If you accept the AP/IB credit, your “2 courses in biology with associated labs” will be covered by upper-level courses. Please consult with an academic advisor about your options.

- *If you earned a 4 or lower on the AP Biology exam* (or did not take the AP test) you will not receive AP Biology credit, and the vast majority of you will be taking *General Biology I & II* with associated labs. Depending on your major, a different biology course may be appropriate. Please consult with an academic advisor about your options.
1. **Varying requirements across medical schools.** Please note that course requirements can vary among medical schools as can AP credit policies. *It is simply not possible for you to meet every pre-med requirement for every medical school in the U.S.* What is most important is to consider the coursework and academic background necessary to gain a solid academic foundation for medical school and the academic background necessary to perform well on the MCAT.

2. **AP and IB Credit:** Policies regarding AP and IB credit are not consistent across medical schools. Regardless of whether a medical school accepts AP or IB credit, applicants must complete additional coursework while in college.
   - If you have AP or IB credit for an introductory science sequence for medical school, **you are advised to take at least one additional course in that area.** (You will need two biology classes with labs, regardless of whether or not you have AP/IB biology.)
   - In the case of mathematics and statistics, it is generally acceptable to use your AP exam credits as long as you take at least one mathematics or statistics course while in college. It is acceptable to forfeit your AP or IB credit if you feel more comfortable reviewing the material and strengthening your skills and background in an introductory course. Furthermore, college-level coursework in that area will provide reinforcement in preparation for the MCAT.

3. **Biochemistry.** A background in biochemistry is essential for MCAT preparation and is increasingly a requirement of medical schools. Most JHU students take Biochemistry from the Department of Biology with the exception of:
   - **Biomedical Engineering majors** and those students in the Biomaterials Track in the **Materials Science and Engineering** major take Molecules and Cells (580.221).
   - **Biophysics majors** (and occasionally other science majors) take a two course Biochemistry sequence offered through the Department of Biophysics (250.315 and 250.316).
   - **Chemistry majors** typically take the Biochemistry sequence taught in the Chemistry Department (030.105, 030.316).
   - **Public Health Studies majors** may choose to take a two-course Biochemistry sequence offered through the Johns Hopkins Bloomberg School of Public Health.

4. **Genetics.** Genetics is neither a formal pre-medical requirement nor necessary in preparation for the MCAT. However, the Genetics course, like both Biochemistry and Statistics, is increasingly considered an important background course in preparation for medical school curricula.

5. **Cell Biology.** Most students take Cell Biology through the Biology Department (Cell Biology, 020.316). Students in the Chemistry and Biomolecular Engineering major, however take the cell biology course in their home department (Cell Biology for Engineers, 540.307).

6. **Math/Statistics.** Calculus I & II are co-requisites to the physics sequence at Johns Hopkins. In addition to calculus, it is suggested you enroll in a statistics class in preparation for the MCAT and as a requirement for most medical schools. If you have exam credit (AP, IB, etc.) for calculus and/or statistics, please carefully read #2 above regarding the treatment of these credits.

7. **Humanities and Social Sciences.** It is important to show interests beyond the sciences, as medical schools want to see that applicants have diverse intellectual interests. In light of the content on the MCAT, pre-meds are advised to consider enrolling in courses that emphasize ethics, philosophy, cross-cultural studies, and public health, regardless of the disciplines.
8. **Letter Grades.** All pre-medical requirements must be taken for a letter grade and, for the majority of medical schools, you must earn a “C” or higher in those courses. **Do not take ANY suggested pre-med courses or requirements pass-fail (S/U).**

9. **Find balance.** You do not want to be in a position where extra-curricular activities pull you away from the time necessary to excel academically. Conversely, do not develop an obsession with “perfect” grades. Although you do need a strong GPA to be admitted to medical school, trying to maintain a perfect GPA may prevent you from pursuing experiences outside of the classroom that will help set you apart from other medical school candidates. The key is to find balance between your academics and extra-curricular activities.

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### The English/writing requirement

We recommend the following to fulfill the pre-med English requirement:

- ★ At least one introductory level “writing intensive” course from the English and/or Writing Seminars departments. Although any introductory level course is acceptable, we recommend *Expository Writing* as one of your two courses.

- ★ A second humanities or social sciences class that fulfills the Johns Hopkins University writing intensive requirement.

Ultimately, it is at the discretion of a medical or dental school to determine whether a particular course meets their English requirement, and it is your responsibility as an applicant to be familiar with the English requirement for each medical/dental school to which you will apply.

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### Choosing a major

**So, what should you major in at Hopkins?** One of the biggest myths is that you have to major in the sciences to get into medical school. **This is absolutely not true.** Each year, many JHU graduates majoring in humanities and social science fields are accepted into medical school. It is important that you choose a major that reflects your strongest academic interests rather than one that you think looks good to medical schools. **Choose a major you are passionate about!** Whether that major is anthropology, biomedical engineering, Molecular and Cellular Biology, Medicine, Science and the Humanities, Public Health Studies, Writing Seminars, or something else entirely, all students who apply to medical school must complete specific prerequisites in addition to the requirements of their major.

**Double-majoring** as a pre-med student will **not** increase your chances of medical school admission. Far more important are the types of courses you have taken, the rigor of the courses, the number of credit hours per semester, and academic performance. You certainly do not want to detract from your overall academic performance by subjecting yourself to the demands of two majors.
As a general rule, the academic program at Johns Hopkins is designed for students to be able to complete degree requirements during the academic year. For a pre-med, this means that the summers can be dedicated to pursuits that contribute to one’s overall background and experiences, regardless of whether they are considered medically-related or community service. Most important, the summer is a time to seek out meaningful activities that will enhance your overall undergraduate experience.

In some circumstances, taking a summer course or two may make sense given your academic planning and unique circumstances. A good example is study abroad, when it can make sense to take half or whole of a science sequence to remain on track for completing your science major. If you are planning to take a pre-medical requirement in the summer, consider the following:

**Do’s**

- **Take pre-medical science courses at JHU**
  - Though this is preferable, medical schools accept summer courses taken at other universities.
- **Get courses taken at another institution approved**
  - For major or graduation requirements, for example. Check procedures outlined by the Offices of Academic/Engineering Advising.
- **Use the summer months to work in your community, do research, study abroad, or engage in other meaningful activities**

**Dont’s**

- **Be in a rush to complete pre-medical requirements**
  - Most students span the courses over three or four years.
- **Take more than two pre-medical science courses over your summers as an undergraduate**
- **Take coursework in consecutive summers**
- **Take pre-medical science courses at community colleges**

Medical school admissions committees believe study abroad offers students an opportunity to broaden their undergraduate experience. The student who has studied abroad gains maturity, self-knowledge, and appreciation of cultural differences. These students bring an enhanced wisdom to any medical program that accepts them. If you are preparing for a career in the medical and health professions, you will gain important experience from living and studying internationally. As with all students, your overall goals for your undergraduate studies should shape how you envision your international experience. As you consider your plans, it is important to establish a set of priorities and to remain flexible. For more information on planning an international experience or credit issues for pre-health students, consult with an advisor in the Office of Pre-Professional Advising and any of the advisors in the Office of Study Abroad.

**Are there study abroad programs specifically for pre-health students?** Yes, there are some. There are also programs that focus on health, community issues, development, and biomedical subjects where you might pursue your own interests in science and health. Please see the selection of study abroad programs recommended for pre-health students on the Pre-Professional Study Abroad website.

Of course, there are many other programs and universities abroad that may be of interest to a pre-health student. For more information on planning an international experience, first consult an advisor in the Office of Study Abroad. Then don’t hesitate to come by the Pre-Professional Office.
Academic assistance – at a glance!

Pre-health students need to have the strongest possible study techniques and time management skills. Since students enter Hopkins with varying levels of these skills, we strongly encourage you to take advantage of an array of available support services.

What are my options?

PILOT Learning

The Study Consulting Program

The Learning Den

Your Professors and TA’s

The Writing Center

Help rooms in Math and Chemistry

The Office of Academic Advising (on the third floor in Garland Hall adjacent to the Pre-Professional Office) coordinates a number of free programs open to all students in the School of Arts & Sciences and in the School of Engineering.

Hover your cursor over the words for PILOT Learning, The Learning Den, and The Study Consulting Program, as well as The Writing Center and help rooms, for links to these resources.

PILOT Learning

PILOT learning stands for peer-led team learning. It is a fabulous science support resource. Participants are organized into study teams consisting of 6-10 members who meet weekly to work problems together. A trained student leader acts as captain and facilitates the meetings. PILOT aims to actively teach and demonstrate how collaborative learning uses contributions from individuals to benefit a group. For more info contact the Office of Academic Advising at 410-516-8216 or go to the academic assistance webpage.
Small Group Tutoring at The Learning Den
Small group tutoring is available for many science, math, and engineering courses at The Learning Den. This service is free of charge. Groups consist of one group tutor and no more than six students from the same course and instructor. During these group sessions, students are able to ask questions and receive assistance with topics covered in class. To learn more about this service, contact tutoring@jhu.edu or call the Office of Academic Advising at 410-516-8216.

The Study Consulting Program
The Study Consulting Program is designed to assist undergraduate students who are interested in meeting the challenges of college life and excelling academically. Participating students are matched with a study consultant (a trained senior or graduate student) to work one-on-one to develop strategies and techniques for success. Areas addressed through the program include, but are not limited to:

- Time management/procrastination
- Writing papers
- Note taking skills
- Test taking skills
- Heavy reading load strategies

Math Help Room
The Math Department offers tutoring for math courses each semester on Monday through Thursday from 9:00 am- 9:00 pm and Fridays 9:00 am - 5:00 pm. Complete schedule information can be found on the Math Department’s webpage.

Chemistry Help Room
The Chemistry Department offers free assistance for Introduction to Chemistry I (030.101). Help sessions for the lecture run Monday through Friday from 6:30 pm-8:00 pm. Times and locations for the Chemistry lab help sessions can be found on your course syllabus.

Writing Center
The Writing Center offers assistance to students at any stage of the writing process. For more information, visit their website at http://krieger.jhu.edu/writingcenter/.

Each of these resources are available throughout the academic year and are provided free of charge. We strongly encourage you to meet with your professors, attend their office hours, and reach out to your teaching assistants if you have questions or are struggling with your studies. Your academic advisor and advisors in the Pre-Professional Office are also ready to meet with and support you.
Planning reminders

1. Sign up for the **Pre-Health Listserv**. All incoming students who have indicated a pre-health interest in their Advising Profile will be added to our pre-health email listserv before fall classes begin. If you did not indicate a pre-health interest in your profile, in September please visit the **Pre-Health Listserv** website to sign up for the appropriate listserv.

2. Attend a **First Time Group Meeting**. You must first attend this small group meeting before you can schedule an individual advising appointment. Following this group meeting, you are eligible to schedule an individual **appointment** with a pre-professional advisor.

3. Explore **Volunteer and Community Service Opportunities**.

4. Explore **Research Opportunities** that are right for you.

5. Consider **Studying Abroad**.

6. Consider **Other Health Professions** before committing to a single one.

7. Work to develop strong **Science Study Skills** sooner rather than later. Be aware that the study habits that worked well for you in high school may not necessarily lead to strong grades in college.

8. Attend relevant programs and events (announced in the **eProf-Newsletter** sent to the listserv).

9. Review relevant **Shadowing Opportunities, Internships, Preceptorships, and Employment** in the **weekly Health Opportunities Newsletter**.

10. “Like” us on **Facebook**.

**In Closing**

Navigating your way through academic requirements at Johns Hopkins is, in itself, a challenge that takes careful planning and great patience. If you are pursuing pre-medical or pre-dental requirements, the academic planning process requires precision, adaptability, and flexibility. And remember that your academic path is unique to you! Most of all, we encourage you to seek input from your advisors to make sense of your situation and to devise a plan that is appropriate for your emerging academic and professional goals.

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