Preparing for a Career in the Health Professions
2014 - 2015

Princeton University
Health Professions Advising
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The Office of Health Professions Advising provides support to Princeton students and alumni by many means as they consider careers in and prepare for admission to medical, dental, veterinary, and other health professions schools.
Preparing for a Career in the Health Professions

First Year

- Take some courses that interest you that you may never have heard of in high school.
- Think about the things that you want to do/explore/accomplish in college, and don’t sacrifice them to your interest in “being pre-med.”
- Strive to do well in your classes – join study groups, go to office hours and foster relationships with faculty, go to tutors, the McGraw Center, Writing Center, etc.
- Improve your time management strategies and study skills.
- Develop your co-curricular interests; join organizations that you find interesting.
- Attend pre-professional student group meetings and events.
- Attend on-campus events that relate to your interests, in health professions or otherwise.
- Meet with a pre-health advisor in the Health Professions Advising (HPA) to introduce yourself and discuss your interest in the health professions.
- Start gaining a realistic understanding of the medical world and its diversity.
  - Borrow and read some medically related books from the HPA Library.
  - Surf through the Explore Health Careers website: http://www.explorehealthcareers.org/
  - Read the Health section of The New York Times, or otherwise stay abreast of current events in health care.
- Put together your resume and bring it to Career Services (across the hall from HPA) for review. This should include GPA, major, employment, activities, service, medical/research experience, honors, etc.
- Explore and apply for summer volunteering / research / work opportunities.
- Keep developing your answers to the following questions:
  - Why do I want to be a health professional?
  - What qualities do I want to embody as a professional?
  - What can I do to develop these qualities in myself?

Summer after Freshman Year

- Participate in research, volunteering, etc.
- Volunteer with/shadow professionals in your potential career area.
- Continue to update your resume to include recent experiences.
Dear pre-health students:

Welcome to the Princeton community and to the exciting journey toward health professions school.

The advisers in the Office of Health Professions Advising (HPA) work with all students interested in careers in the health professions (e.g., human medicine, veterinary medicine, dentistry), and with alumni who are applying to health professions schools.

This guide has been developed to assist you in planning your path to health professions school. As you will hear us reiterate throughout your time with us, there is no single, correct way to prepare yourself—there is no magical formula that will ensure your acceptance to medical school. We are here to help you make informed choices about classes, activities, and your future.

In addition to using this guide, we encourage you to attend workshops, familiarize yourself with our website, read our weekly email newsletter, Vitals, and come to meet with us at any time! Drop-In Hours are available during the school year, and the times are posted on the website; you may make individual appointments through WASS online scheduling.

We enjoy working with students at all stages of the pre-health track—indecision and questions are welcome!

Kate Fukawa-Connelly, Director
Allison Smith, Associate Director
Jennifer Samarel, Administrative Assistant
THE DIVERSITY OF CAREERS IN THE HEALTH PROFESSIONS

Among the health professions, medicine has traditionally drawn the largest number of Princeton graduates. But, there are many options for students interested in becoming health care professionals, with varying degrees of time in school, required knowledge and skills, and career advancement opportunities. Within medicine alone there are many career options and a wide variety of ways for you to make a contribution. There are physicians, veterinarians, and dentists in clinical practice, academic medicine, biomedical research, healthcare administration, public health, college health, government, and many other areas.

The HPA website provides information about pre-requisite courses for a number of health professions, as well as links to gather more information.

Sample Careers of Princeton Alums

- Allopathic Medicine (MD)
- Osteopathic Medicine (DO)
- Veterinary Medicine (DVM, VMD)
- Dentistry (DMD, DDS)
- Pharmacy (Pharm D)
- Optometry (OD)
- Podiatry (DP)
- Physician Assistant (PA)
- Nursing (NP, RN)
- Public Health (MPH)

US News Best Healthcare Jobs 2014

1. Dentist
2. Nurse Practitioner
3. Pharmacist
4. Registered Nurse
5. Physical Therapist
6. Physician
7. Dental Hygienist
8. Physician Assistant
9. Occupational Therapist
10. Phlebotomist

SUITYABILITY FOR A CAREER IN THE HEALTH PROFESSIONS

You may not have given it a second thought, since you’ve known “since before you can remember” that you were “destined” to become a doctor. Now is the time to think long and hard about your motivation, consider your personal goals and values, and measure them against concrete information about the reality of becoming a health professional.

How do you know if you’re well-suited to pursue a career in healthcare?

- You should have an intellectual interest and ability in science, particularly concerning human biology and disease. Different health careers require differing amounts of science mastery.

- You should have a deep and abiding interest in people and their problems, and a service-oriented mentality.

- You should be ready to work in a team setting, both as a leader of the team, and as a collaborator who draws on others’ expertise. You should be ready to work with a wide variety of people, as your colleagues and as your patients.

- You should be comfortable interacting with patients and others in a healthcare setting. Some medical schools will assign you to your first patients in the first week of school. You are going to spend much of your training in the clinical setting—knowing that you enjoy the environment before you apply to health professions school is critical.

Gaining actual experience—through courses and activities—will help you to clarify your values, skills, and interests, and to determine whether they’re best applied to a health professions career.
Important Characteristics in a Health Professional

PLANNING YOUR PRE-MED/PRE-HEALTH PROGRAM

What Do Medical and Other Health Profession Schools Look For?

The environment in which health professionals work demands high levels of intellectual and interpersonal ability. Here are some of the broader characteristics that are valued by admission committees:

**Academic ability.** Admissions committees want to be sure that students can survive the rigorous curriculum, which will include a more difficult science course load than most are exposed to as undergraduates.

**Orientation to learning.** Students must have developed strategies that allow them to process and retain vast quantities of information. Additionally, students who are intellectually curious and adept, are able to solve complex problems, and are interested in lifelong learning will fare well in the health professions. You have to know how to learn and love learning.

**Interpersonal skills/Ability to work with others.** You should be able to relate well to a broad spectrum of people with respect, empathy, and compassion; with an open mind and a willingness to help. Think about sectors of the population that you may have had limited exposure to or feel uncomfortable with and reflect on how you will learn to care for them.

**Motivation for your future career.** It is expensive to educate a health professions student, and deciding who to train is a responsibility that schools take seriously – they want to accept students who understand what they are getting into.

**Personal Competencies.** An emerging consensus is arising in medical education: factual knowledge is only part of what makes a skilled physician; personal characteristics, experiences, and attributes are equally significant. Characteristics that are considered particularly important in physicians (and therefore in medical school applicants) include:

- Integrity and ethics
- Reliability and dependability
- Service orientation
- Social and interpersonal skills
- Teamwork
- Capacity for improvement
- Resilience and adaptability
- Cultural competence
- Oral communication
How Do Admissions Committees Evaluate Applicants?

Again, there is no guaranteed way to get into health professions schools, but there are five main factors that schools will consider in evaluating you:

Coursework and grades.
Admissions boards will look at the breadth and depth of coursework, and balance of the academic program. They may want to know why you chose certain courses, or your concentration, or how you made other decisions in your academic career. They will look at trends in your GPA and will compute your GPA based for all Biology, Chemistry, Math and Physics courses, as well as overall. All courses that you have ever taken in college will count toward your applicant GPA (including courses taken outside of Princeton and courses that you repeat). The average GPA of accepted applicants to medical schools is about 3.6.

Activities.
Carefully choose your activities and strive for quality of involvement rather than quantity of activities. The only required activity is experience in a clinical setting that will provide a realistic understanding of caring for others in a healthcare environment, such as volunteering in a hospital or working in another patient care facility. Other activities should help you to develop all of those personal competencies listed above. Leadership, community service, and research activities are considered particularly useful in preparing for a health professional career.

Letters of Recommendation.
All schools require them, and most require at least some of them to be written by faculty in your science courses. For medical and dental school admissions, you’ll be expected to have at least three academic recommendations. Cultivate relationships with faculty and other mentors who will be able to advocate for you in the admissions process.

Standardized Test Scores.
Every health professions school requires a standardized test. These tests are designed to evaluate your abilities in areas that will be important in your further study. Like the SAT and ACT, they also provide a universal “number” against which they can compare all applicants.

Interview.
All schools require an interview: you’ll be able to expand on your written application and learn more about the schools to which you’re applying. Cultivate your oral communication skills and gain comfort in speaking with diverse audiences in preparation for interviews.
Co-Curricular Preparation for Medical, Vet, & Dental School

Ultimately, you should get involved with activities that matter to you, on campus, in the larger Princeton community, and during your summers. There are endless opportunities—the arts, athletics, service work, religious organizations, debate, singing groups, etc. Try something you enjoy, and devote time and energy to it. You will be a richer person for it, and you will come to your academic work refreshed. As you participate in your co-curricular endeavors, keep the personal competencies in mind. What are you doing that demonstrates and develops your strengths? Are there areas in which you’d like to improve through your activities? But remember, you’re a student first! Heavy participation in activities at the expense of your academic performance is discouraged. You are welcome to come and talk with an adviser who can help you navigate your activities.

You may have to work on campus to contribute to your college expenses. Your ability to keep up with coursework and handle a job speaks well about your discipline, motivation, and priorities.

Health-Related & “Clinical” Experience:

It is essential for you to gain some real-world perspective on whatever form of medicine interests you. There are many ways in which you can learn about the field, many of which are discussed in detail on our website. Princeton students work or volunteer in hospitals or clinics, do internships (through our International Internship Program or through the Office of Career Services), read about the field, come to HPA or student organization workshops and programs, shadow family doctors, work on clinical trials as research assistants, etc.

As you consider types of health care experience, how, when, and through what organizations you pursue them are not the most important considerations. What does matter is that you gain a realistic understanding of what being a health care professional is like, reflect on how your career of choice might be satisfying to you and consider ways that you will best serve your patients and the profession. This should be your first priority if you are considering health professional school. Many students who do some clinical- or service-related activity during the semesters find it easier to keep the “bigger picture” in mind—you’re going into medicine to help people; helping people as you take classes can remind you of this larger goal. Also, please note: you will want to develop and sustain your exposure to clinical practice, not rely on what you did back in high school or observed through family members who are in health care—you’ll develop as a person in college, and your perspectives will change.
Academic Preparation for Medical, Vet, & Dental School

COURSE REQUIREMENTS FOR MEDICAL SCHOOL

It is best to be aware of the admission requirements early on in college so that you can time your coursework wisely. The basic requirements for medical schools are outlined in the following chart.

Note that there are two types of requirements: courses required before you begin medical school, and courses that may not be required, but are recommended to prepare for the Medical Colleges Admissions Test (MCAT).

Additional notes:

- All requirements must be taken for a grade, not P/D/F.
- It is preferable to take all science requirements at Princeton, during the regular academic year. Consult with HPA if you plan to take courses in the summer (and see advice, p. 23).
- AP credit in chemistry, biology or physics must be supplemented with upper-level work, preferably with lab (see p. 12).
- Generally, taking more than the minimum required Biology courses is valued. Consider Genetics (MOL 342), Microbiology (MOL 380), Immune Systems (EEB 327), and other courses with human biology content.
- While the chart (p. 10) is representative of the requirements at the majority of schools, individual schools may have specific requirements.
- We recommend that students know the prerequisites and AP policies for the public medical schools in their state of residence. About 70% of medical students attend their public, state medical school.
  - Residents of California, Illinois, Iowa, Michigan, Nevada, Texas, and Wisconsin should expect to take at 3-4 semesters of Biology.
  - UCLA is among the strictest schools in terms of AP credit policy.
- Many questions about course requirements are answered in the Questions of the Week Archive on the HPA website: http://www.princeton.edu/hpa/faq/
## COURSE REQUIREMENTS FOR MEDICAL SCHOOL

<table>
<thead>
<tr>
<th>Course type</th>
<th>Course number @ Princeton</th>
<th>Required by most medical schools</th>
<th>Required by some medical schools</th>
<th>Recommended for MCAT prep</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Chemistry</td>
<td>CHM 201 (or 207) + CHM 202 [or CHM 215 only if AP 1 Unit]</td>
<td>✓</td>
<td></td>
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<tr>
<td>Organic Chemistry</td>
<td>CHM 303 + CHM 304</td>
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<td></td>
<td>✓</td>
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<tr>
<td>Biology</td>
<td>EEB 211 (fall only) + either MOL 214 (spring only) or MOL 215 (fall only)</td>
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<td>✓</td>
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<tr>
<td>Physics</td>
<td>PHY 101 + PHY 102 or PHY 103 + PHY 104</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Biochemistry</td>
<td>MOL 345 (fall only)</td>
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<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>English</td>
<td>2 semesters of literature courses (WRI counts as one)</td>
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<td></td>
<td>✓</td>
</tr>
<tr>
<td>Math</td>
<td>1 semester of calculus + 1 semester of statistics (see note below)</td>
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</tr>
<tr>
<td>Social Sciences</td>
<td>Psychology and Sociology</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
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</table>

### A note about Math
About 40 medical schools require college math. Of those, about 10 require one semester of calculus; Harvard requires two semesters of calculus. Many schools recommend statistics, and concepts from statistics will be tested on the MCAT. Members of the class of 2018 are strongly encouraged to take statistics in any department.

### A note about Biochemistry
Biochemistry is required by about 30 and recommended by an additional 90 of the 142 MD schools. The MCAT will include significant Biochemistry content. Members of the class of 2018 should take Biochemistry.

### A note about Social Sciences
Concepts related to the *Psychological and Social Foundations of Behavior* will be tested on the MCAT. No specific course will align perfectly with the subject matter on the exam. Basic familiarity with concepts in psychology and sociology will be helpful, but could be studied outside of formal course work.

### A note about English
Focus on courses that require reading, analyzing literature, and writing papers for the majority of your grade. See our FAQs online for more information.
GENERAL CHEMISTRY

CHM 201 (offered in Fall) and CHM 202 (offered in Spring). The goal of General Chemistry is to enhance our understanding of our surroundings through a study of matter at the molecular scale. Topics in CHM 201 include chemical reactions, equilibrium, energy and entropy, quantum theory, atomic structure, and chemical bonding. Topics in CHM 202 include introduction to chemical bonding and solid state structure; chemical kinetics, descriptive inorganic chemistry; laboratory manipulations, preparations, and analysis.

ORGANIC CHEMISTRY

CHM 303 (offered in Fall) and CHM 304 (offered in Spring). CHM 303 will introduce the principles of organic chemistry, including the structures, properties, and reactivity of simpler organic compounds. The emphasis will be on the mechanisms of organic reactions, with examples taken from biology when appropriate to illustrate the principles. CHM 304 begins by discussing the chemical consequences of conjugation and the Diels-Alder reaction. After a coverage of aromaticity and the chemistry of benzene, we move into the heart of the course: the nature and reactivity of the carbonyl group, a subject that is central to both mainstream organic chemistry and biochemistry. CHM 201/202 is a prerequisite.

BIOLOGY

EEB 211 — Life on Earth: Chaos and Clockwork of Biological Design (offered in Fall). An examination of how life evolved and how organisms function. Design—’intelligent’ and otherwise—will provide a unifying theme. Why are males brightly colored in some species, but in others females are the showy sex? Why do humans have knees that fail whereas horses and zebras do not? These and other ‘why is it so’ questions related to the origin and history of life, genetic code, biochemistry, physiology, morphology and body plans, sex and reproduction, cooperation, and ecosystems will be explored.

MOL 214 — Introduction to Cellular and Molecular Biology (offered in Spring). Important concepts and elements of molecular biology, biochemistry, genetics, and cell biology, are examined in an experimental context. During the last two weeks of the semester, topics-based sections will be taught by different faculty members in cell biology, virology, genomics and development.

MOL 215 — Quantitative Principles in Cell and Molecular Biology (offered in Fall). Central concepts and experiments in cellular, molecular, and developmental biology with an emphasis on underlying physical and engineering principles. Topics include important insights into the genetic code; energetics and cellular organization; communication, feeding, and signaling between cells; ideas about feedback loops and cellular organization; problems and solutions in development; and the organization of large cellular systems, such as the nervous and immune systems.

PHYSICS

Concerned with an introduction to the fundamental laws underlying physics and general application in other areas of science. The treatment in PHY 101-102 is complete and detailed, however, less mathematical preparation is assumed than for PHY 103-104. Mechanics and thermodynamics are treated quantitatively with a special emphasis on problem solving. In the spring semester PHY 102 covers electricity and magnetism, optics and relativity using the topics treated in PHY 101.

BIOCHEMISTRY

MOL 345 — Biochemistry (offered in Fall). Fundamental concepts of biomolecular structure and function will be discussed, with an emphasis on principles of thermodynamics, binding and catalysis. A major portion of the course will focus on metabolism and its logic and regulation. Prerequisites: MOL 214/215 and CHM 304.
ADVANCED PLACEMENT CREDIT AND PRE-MED

Schools have differing policies regarding Advanced Placement credit. Most will accept advanced courses that supplement AP credit to satisfy requirements.

**AP Biology**: Some medical schools insist on two semesters of lab. EEB concentrators are required to take EEB 211. MOL concentrators with AP credit can satisfy this requirement by taking MOL 214 and MOL 350 (core lab). If you choose another concentration and have a 5 on the AP test, either opt to take EEB 211 and MOL 214 (especially recommended if you don’t plan to concentrate in a science), or take MOL 214 and at least one additional upper-level Biology course, preferably with lab (e.g., EEB 314, MOL 380B).

**AP Chemistry**: Students with a 4 on the AP test can take CHM 215, Organic Chemistry and an additional upper-level Chemistry course. Students with a 5 on the AP test often take Organic Chemistry (typically in the sophomore year, so you can focus on adjusting to Princeton before tackling this sequence) and at least one additional upper-level Chemistry course. Past pre-med students have taken advanced Chemistry courses including CHM 440 (Drug Discovery), CHM 305 (The Quantum World), and CHM 306 (Physical Chemistry).

**AP Physics**: Students with two units of AP credit should take at least one upper-level, physics-based class from the following courses: CHM 305; CHM 306; AST 204 (not 203), or GEO 371 (Global Geophysics). Other courses that require Introductory Physics as a pre-requisite may be appropriate – contact HPA to check on other courses.

**AP English**: Students should take Writing Seminar and an additional literature course in which writing comprises at least half of the graded assignments.

**AP Math**: Students with 2 units of AP in math do not need to take further math for health professional school; their AP in this subject, without more advanced coursework in college, will be accepted. This is the only exception to the rule about supplementing AP with upper-level coursework in college. An additional class in statistics is still recommended.

“Giving up AP”: if you do not feel well-prepared in a subject area despite your AP score, we recommend a conversation with HPA advisers or your Director of Studies/Dean to discuss whether or not to “backtrack” in the subject.

*In past years, Biochemistry could substitute for the upper-level Chemistry or Biology; now that Biochemistry is a stand-alone requirement at more schools, we recommend students choose different upper-level Biology or Chemistry courses to satisfy medical school requirements.*
YOUR ACADEMIC PLAN

*No one academic plan is suitable for all students.*

The following timelines show how you might plan the pre-medical coursework in conjunction with your other academic responsibilities. No one plan is the “right” way, no one plan “better” than another. Your background and goals for your years at Princeton (both academic and non-academic) make it important for you to speak with an HPA adviser or your Director of Studies in order to craft a timeline that most effectively leads to your success. The following are samples: talk with advisers about your unique situation.

**Starting with one science course:**

Most students should take one of the basic science courses freshman year, usually chemistry, unless their science background is particularly strong (this will differ for engineers). General chemistry must be taken before organic chemistry (since it is a prerequisite for organic chemistry); math and chemistry are usually taken before biology, physics after math.

At many schools, students “double up” on sciences in the first year; based on our experiences, Princeton students tend to fare much better taking just one science (and possibly math), at least in the first semester. If the fall goes well, you might choose to add a second science (probably biology) in the spring. Also, please note that students interested in pursuing a PhD in addition to their medical, vet, or dental degree need to complete the same course requirements for their health professions preparation.

**Standardized tests:**

Included in the following timelines are the pre-med pre-requisite courses, as well as the timing of application and MCAT (timing for DAT and GRE testing, for dental and other pre-health students, varies slightly). Students must apply in June, over a year ahead of their desired date of matriculation. To apply, they must take the MCAT, and to take the MCAT, they must have completed the coursework covered on the exam.

**When to Apply:**

Most incoming pre-health students expect that they will apply in their junior year, to enter medical school directly after graduation (i.e., apply in Summer 2017, graduate in Spring 2018, start medical school in Fall 2018).

Historically, however, about 60-70% of our applicants are seniors and alumni, taking a “glide year” or “gap year” (or multiple years) between graduation and matriculation at their school of choice.
## Glide Year Timeline I

No AP, apply senior year, summer MCAT

<table>
<thead>
<tr>
<th></th>
<th>Fall</th>
<th>Spring</th>
<th>Summer</th>
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<tbody>
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<td>2014-15</td>
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<td>2019-20</td>
<td>Matriculate</td>
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</table>

This plan is suitable for MOL, EEB, or non-science concentrators. Chemistry concentrators will be expected to take Physics by the sophomore year. Always work with your academic adviser or a departmental representative to plan for the implications of your concentration.

**Pros:**
- All four years of your course work will be taken into consideration when you apply – most students finish strong.
- Letters of recommendation may be stronger as students move into more advanced course work, and can ask for a letter from the thesis advisor.
- Allows full summer of MCAT study and more time to retake if necessary.
- The “glide year” allows you to build your resume, gain experience, maturity, and professionalism, and recharge mentally before taking on the rigor of medical school course work.

**Cons:**
- Need to complete MCAT prep course work in three years. May be too strenuous for some students.
Glide Year Timeline II
No AP, apply senior year, spring MCAT

<table>
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<td>2019-20</td>
<td>Matriculate</td>
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</tbody>
</table>

This plan is suitable for non-science concentrators. Science concentrators will need to take some of the science courses earlier in their curriculum to complete the concentration in a timely manner. Always work with your academic adviser or a departmental representative to plan for the implications of your concentration.

The MCAT should be taken no later than May of the year in which you plan to apply to medical school.

Pros:
- Same as Timeline I, plus: spreads courses out across all four years; it can be more reasonable for students to do well with a course load that balances sciences more equally with other courses.

Cons:
- Juggling MCAT study with senior thesis requires excellent time management.
- Lack of time to repeat MCAT if score is less than desired and still apply early in the application cycle.
### Glide Year Timeline III

2 Units AP Chemistry, apply senior year, summer MCAT

<table>
<thead>
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<th>Spring</th>
<th>Summer</th>
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<td>2019-20</td>
<td>Matriculate</td>
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### Glide Year Timeline IV

2 Units AP Physics, apply senior year, summer MCAT

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<th>Spring</th>
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<td>CHM 201 WRI/FRS MAT</td>
<td>CHM 202 WRI/FRS PSY/SOC</td>
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<td>2015-16</td>
<td>CHM 303 EEB 211</td>
<td>CHM 304 MOL 214</td>
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<tr>
<td>2016-17</td>
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<td>2019-20</td>
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</table>
### Direct Entry Timeline I

No AP credit, apply junior year, spring MCAT

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall</th>
<th>Spring</th>
<th>Summer</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014-15</td>
<td>CHM 201 WRI/FRS</td>
<td>CHM 202 WRI/FRS MAT</td>
<td></td>
</tr>
<tr>
<td>2015-16</td>
<td>CHM 303 EEB 211</td>
<td>CHM 304 MOL 214 PSY/SOC</td>
<td></td>
</tr>
<tr>
<td>2016-17</td>
<td>PHY 101 MOL 345 Stats</td>
<td>PHY 102 PSY/SOC MCAT</td>
<td>Apply</td>
</tr>
<tr>
<td>2017-18</td>
<td>ENG Interviews</td>
<td>Interviews Graduate</td>
<td></td>
</tr>
<tr>
<td>2018-19</td>
<td>Matriculate</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

About 30%-40% of Princeton applicants choose to apply as juniors to matriculate directly after graduation. The MCAT should be taken no later than May of the year in which you plan to apply to medical school.

**Pros:**

- “Fast track” to completion of medical degree.
- Some students fear that taking a break will make it harder to “get back into” a schoolwork frame of mind.

**Cons:**

- Thesis work, reference letters from senior year classes, and grades from senior year will not be part of your profile when you apply (because you apply the summer after junior year).
- May take away from time to explore other disciplines and reduce time to participate in activities/build social foundation.
- Students who apply as juniors to go directly to medical school may be at a disadvantage compared to applicants who have taken more time to build resume and gain experience, maturity, and professionalism.
- Lack of time to repeat MCAT if the score is less than desired and still apply early in the application cycle.
- Academically strenuous – it’s more important to focus on doing well than on doing quickly.
### Direct Entry Timeline II: BSE Students
No AP credit, apply junior year, spring MCAT

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall</th>
<th>Spring</th>
<th>Summer</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014-15</td>
<td>PHY 103, CHM 201, FRS/WRI MAT</td>
<td>PHY 104, CHM 202, WRI/FRS</td>
<td></td>
</tr>
<tr>
<td>2015-16</td>
<td>CHM 303, PSY/SOC</td>
<td>CHM 304, MOL 214</td>
<td></td>
</tr>
<tr>
<td>2016-17</td>
<td>EEB 211, MOL 345</td>
<td>PSY/SOC, Stats, MCAT</td>
<td>Apply</td>
</tr>
<tr>
<td>2017-18</td>
<td>ENG, Interviews</td>
<td>Interviews, Graduate</td>
<td></td>
</tr>
<tr>
<td>2018-19</td>
<td>Matriculate</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Taking Physics and General Chemistry together as a freshman is demanding; engineering students without AP credit should speak with their faculty advisers about their options.

### Direct Entry Timeline III: 2 Units AP Chemistry & AP Math

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall</th>
<th>Spring</th>
<th>Summer</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014-15</td>
<td>EEB 211 or PHY, WRI/FRS</td>
<td>MOL 214 or PHY, WRI/FRS</td>
<td></td>
</tr>
<tr>
<td>2015-16</td>
<td>CHM 303, PHY or EEB 211</td>
<td>CHM 304, PHY or MOL 214, PSY/SOC</td>
<td></td>
</tr>
<tr>
<td>2016-17</td>
<td>MOL 345, PSY/SOC, Stats or Adv Chem</td>
<td>Stats or Adv Chem, MCAT</td>
<td>Apply</td>
</tr>
<tr>
<td>2017-18</td>
<td>ENG, Interviews</td>
<td>Interviews, Graduate</td>
<td></td>
</tr>
<tr>
<td>2018-19</td>
<td>Matriculate</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Direct Entry Timeline IV: 2 Units AP Physics

<table>
<thead>
<tr>
<th></th>
<th>Fall</th>
<th>Spring</th>
<th>Summer</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014-15</td>
<td>CHM 201 WRI/FRS</td>
<td>CHM 202 WRI/FRS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MAT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015-16</td>
<td>CHM 303 EEB 211</td>
<td>CHM 304 MOL 214</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PSY/SOC</td>
<td>PSY/SOC</td>
<td></td>
</tr>
<tr>
<td>2016-17</td>
<td>MOL 345 Stats or Adv Physics</td>
<td>Stats or Adv Physics</td>
<td>Apply</td>
</tr>
<tr>
<td></td>
<td>PSY/SOC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2017-18</td>
<td>ENG Interviews</td>
<td>Interviews Graduate</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018-19</td>
<td>Matriculate</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Post-Baccalaureate Timeline

<table>
<thead>
<tr>
<th></th>
<th>Fall</th>
<th>Spring</th>
<th>Summer</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014-18</td>
<td>Take whatever classes interest you</td>
<td>Explore your interest in health careers</td>
<td>Begin pre-health pre-requisites in post-bac program</td>
</tr>
<tr>
<td></td>
<td>Apply to post-bac programs in senior year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018-19</td>
<td>Course work</td>
<td>Course work MCAT</td>
<td>Apply</td>
</tr>
<tr>
<td>2019-20</td>
<td>Interviews</td>
<td>Interviews</td>
<td></td>
</tr>
<tr>
<td>2020-21</td>
<td>Matriculate</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Some students decide to defer some or all of their pre-health prerequisite course work until after they graduate from Princeton, enrolling in a post-baccalaureate, or “post-bac” program, in order to complete their requirements. More information about these programs is available at HPA, and on the HPA website: [http://www.princeton.edu/hpa/post-bac-programs/](http://www.princeton.edu/hpa/post-bac-programs/).

In the Weill Cornell Med College entering class of 2013:

- 40% majored outside of the sciences
- Average age 24.3 (range 21-53)
- 20% were from underrepresented groups
The Health Professions School Application Process

You will prepare for health professions school throughout your time at Princeton by engaging in activities, taking classes, fostering supportive relationships with faculty, and ensuring that you really want to become a health professional. The preparation for and the actual application for medical and dental school begins two full years before you want to matriculate (the timeline differs somewhat for other professions). This is an overview of what you will need to do once you have decided to apply:

Two years prior to matriculation

Fall
- Attend HPA Applicant Workshop
- Read Applicant Handbook
- Schedule HPA Applicant Intake appointment
- Begin to ask for letters of recommendation (4-6 letters, at least 3 academic, at least two from science)

Spring
- Take standardized test (MCAT, DAT)
- Submit required forms, activities list and essays to HPA
- Have pre-application interview (PAI) with HPA adviser
- Ensure that letters of recommendation have been received at HPA
- Attend relevant workshops
- Prepare primary (common) application

Summer
- Submit primary (common) application
- Submit secondary (supplementary, school-specific) applications
- HPA submits committee letter to schools on your behalf

One year prior to matriculation

Fall – Spring
- Interviews (August through March)
- Continued participation in activities, communication with schools to provide updates on candidacy
- Acceptances (October through May)

Summer
- Final acceptances from wait list
- Matriculate at medical school
The Standardized Test

Medical College Admissions Test (MCAT)

Pre-medical students will take the MCAT. The test will be approximately 7.5 hours including time for breaks. Cost and exact dates of the test are released about a year in advance. The MCAT is divided into four sections. Scientific Inquiry and Reasoning Skills are applied in three sections, and ten distinct Foundational Concepts are tested.

Section I: Biological and Biochemical Foundations of Living Systems
   65% Biology / 25% Biochemistry / 10% Chemistry

Section II: Chemical and Physical Foundations of Biological Systems
   33% General Chemistry / 15% Organic Chemistry / 25% Biochemistry
   25% Physics / 2% Biology

Section III: Psychological, Social & Biological Foundations of Behavior
   60% Psychology / 30% Sociology / 10% Biology

Section IV: Critical Analysis and Reasoning Skills
   Reading passages from various disciplines—no subject-specific knowledge required

Additional information about the MCAT may be found online in the AAMC Student Resources for MCAT, and our HPA website and HPA FAQ.

Dental Admissions Test (DAT)

Pre-dental students will take the DAT. The test will take approximately five hours, and is offered year-round. The DAT is divided into four sections: Survey of Natural Sciences, Perceptual Ability Test, Reading Comprehension Test, and Quantitative Reasoning Test. Questions are drawn from Biology, General and Organic Chemistry, and math (through algebra). The Perceptual Ability test is unique; it tests your visual and spatial skills, and is not based on subject knowledge. Additional information about the DAT may be found online in the ADA Resources for the DAT.

Other Standardized Exams

Links to information about the optometry, pharmacy, and other standardized exams for health professions school are available on the HPA website.

Study Materials

About half of Princeton applicants choose to take a commercial prep course, and the other half study on their own. Sample prep materials are available to browse and borrow in the HPA office library.
COURSE REQUIREMENTS FOR OTHER HEALTH PROFESSIONS

Always check with individual schools for exact requirements, but the following is a basic guideline for some programs of interest.

<table>
<thead>
<tr>
<th></th>
<th>Dental</th>
<th>Vet</th>
<th>Optom</th>
<th>Nurse Prac</th>
<th>Pharm</th>
<th>Phys Asst</th>
<th>PT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gen Chem</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>Some</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Organic Chem</td>
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<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>Some</td>
<td></td>
</tr>
<tr>
<td>Biology</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>Some</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Physics</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Calculus</td>
<td>Few</td>
<td></td>
<td></td>
<td></td>
<td>Few</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Statistics</td>
<td>Some</td>
<td>Some</td>
<td></td>
<td>✓</td>
<td>Some</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Biochem</td>
<td>Few</td>
<td>Many</td>
<td></td>
<td></td>
<td>Some</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microbio</td>
<td>Few</td>
<td>Some</td>
<td>Some</td>
<td>✓</td>
<td>Some</td>
<td>Some</td>
<td>Some</td>
</tr>
<tr>
<td>Anat &amp; Phys</td>
<td>Few</td>
<td></td>
<td>Some</td>
<td>✓</td>
<td>Some</td>
<td>Some</td>
<td>✓</td>
</tr>
<tr>
<td>English</td>
<td>Many</td>
<td></td>
<td>Some</td>
<td></td>
<td>Some</td>
<td>Some</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>Adv bio</td>
<td>Varies widely</td>
<td>Psyc, humanities and soc sci</td>
<td>Nutrition, psyc</td>
<td>ECO, Public Speaking</td>
<td>Psy</td>
<td>Psy/Soc</td>
</tr>
</tbody>
</table>

**Dental School**: Prereqs similar to med, but often includes Microbiology (MOL 380). The dental admissions test (DAT) covers the biology, general and organic chemistry, perceptual ability, reading comprehension, and quantitative reasoning (no higher than algebra-level problem solving).

**Vet School**: Veterinary school prerequisites vary widely, though all include the four basic sciences with labs. Consult with an HPA adviser if you are considering veterinary school. Veterinary schools require the GRE General Test, which tests verbal and quantitative reasoning, and analytical writing.
OTHER ACADEMIC CONSIDERATIONS FOR PRE-HEALTH STUDENTS

Study Abroad:
Future health professionals will need to be broadly-educated, mature, adaptable citizens who have had significant experience in the world beyond the classroom. Study abroad is an ideal vehicle for developing some of the skills and attitudes that are valued in the practice of medicine—flexibility, self-reliance, and sensitivity to other cultures. Study abroad can offer pre-health students a unique chance to observe diverse health care systems, explore different cultural attitudes towards health and healing, and often, to gain volunteer experience in a unique healthcare setting.

Many Princeton pre-health students have been able to study abroad. Taking one semester abroad is quite doable with careful course planning. Similarly, study abroad for both junior-year semesters works if you apply to health professional school after senior year (taking a glide year) or if you have AP credit and complete the course requirements early, taking the MCAT in the summer after sophomore year.

For detailed information on how to make your semester, summer, or year abroad a reality, read the handout “Study Abroad and the Pre-health Student” available at the HPA office and on our website, and then come and chat with us about your plans. You will also want to visit the Office of International Programs (http://www.princeton.edu/oip/) located just upstairs from HPA at 36 University Place.

Summer courses:
Students often ask about taking the pre-health courses during summer school. Each student is different, with different circumstances, but we can generalize to this extent: taking pre-health science requirements in the summer is generally not encouraged. Health professional schools prefer that you complete your required pre-requisite science courses at your home institution (Princeton) in conjunction with a full course load during the academic year. This method of completing the courses best simulates what the heavy load of science course work in health professions school will be like.

Taking non-science courses in the summers is more acceptable, though this may take away from your ability to pursue health-related activities and to simply take some time to have a break from academics.

If you have specific reasons for taking some of your sciences in the summer, please consult with HPA to discuss your specific situation.
Choosing a Major:

Many think you “should” concentrate in science, and that you will be a less competitive candidate for health professional school if you major in the humanities or social sciences. This is not the case. You should choose a major based on these questions: What discipline is most interesting to you? Most challenging? Which field will best draw on your talents and abilities? What do you want to study in your independent work?

Some additional things to consider when choosing your concentration:

- Health professional schools are interested in students who have challenged themselves in the sciences and have demonstrated strong ability in science.
- Health professional schools are also interested in students who have a broad view of the human condition, an understanding gained through the study of literature, history, language, the social and behavioral sciences.
- If you demonstrate both the ability in science and that broader understanding through a strong academic record, you will be a successful applicant to health professional school. In a typical year, about a third of our applicants are humanities/social science concentrators, and they are just as successful in gaining admission as our science majors.

<table>
<thead>
<tr>
<th>Most Popular Majors for Health Professions School Applicants 2010-2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Molecular Biology</td>
</tr>
<tr>
<td>2. Ecology &amp; Evolutionary Biology</td>
</tr>
<tr>
<td>3. Chemistry</td>
</tr>
<tr>
<td>4. Psychology</td>
</tr>
<tr>
<td>5. Chemical &amp; Biochemical Engineering</td>
</tr>
<tr>
<td>6. Anthropology</td>
</tr>
<tr>
<td>7. Economics</td>
</tr>
<tr>
<td>8. Woodrow Wilson School</td>
</tr>
<tr>
<td>9. Sociology</td>
</tr>
<tr>
<td>10. Computer Science</td>
</tr>
</tbody>
</table>

Want a current student’s opinion? Talk to some of our HPA Peer Advisers in the residential colleges about their major choices!
Selecting a concentration is not required until the spring of sophomore year. See “Major Choices” for alumni perspectives on majors and careers: go to http://www.princeton.edu/majorchoices/.

Advice from an Alum

Brooke Peterson ‘11

Concentrator in the Woodrow Wilson School of Public & International Affairs with certificates in Global Health and Health Policy (GHP) and African Studies

Pursuing an MD at the University of Chicago Pritzker School of Medicine

My first piece of advice is to pursue what you’re truly interested in and not just what you think admissions committees want to see. My route to medical school was rather non-traditional: at Princeton, I studied public policy, and spent my three summers working and researching in Germany, Thailand, and South Africa; after Princeton, I spent three years working in federal health consulting. Each of these experiences broadened my perspective in ways that I believe will make me a better doctor. Since I chose my activities based on my genuine interests, I was also able to tell a unique, interesting, and coherent story in my medical school applications. My second piece of advice is to truly get to know Princeton’s faculty: email anyone whose research interests you, take small seminars, and invite your professors to meals. Even though it’s been three years since I graduated, some of my professors remain among my closest mentors and most helpful role models. Their support undoubtedly helped me get to where I am today.
WHAT YOU NEED TO KNOW NOW
Preparing for and applying to health professions school are long, detail-oriented processes, and HPA is here to help you navigate them! Here is some general advice for the first two years:

Find your niche. Get involved, but don’t over-load! Pursue your interests in the classroom and beyond, but be careful not to over-commit. In high school, you might have found time for a long list of activities. College rigor and expectations are different, so be careful with your time commitments. Try one or two activities in your first semester, and if you find that you have time for more, go for it.

Do well academically! As a pre-health student, you have to prove that you'll be able to survive the rigors of professional school. It's essential for all pre-health students to develop good study habits and a college lifestyle that is conducive to academic achievement. Try to diagnose and treat difficulties early and remedy them. If you need help, many resources are available to you on campus including professors and preceptors, Deans/Directors of Studies, peer advisers, and McGraw Center and Writing Center staff.

Get to know your faculty. Members of the faculty and your preceptors are a great resource. They will not only help you academically, but will also provide you with letters of recommendation when you apply to health professions school. Stop in to meet some of your faculty during their office hours, even if you are in a large course. You don’t have to have a significant question to ask as a pretense to visiting with a professor; any specific question about a course, curiosity about your class performance, or question about a professor’s research interests are a few legitimate reasons for visiting with a professor. The earlier you learn to communicate with faculty, the easier it will become later when you’re looking for research opportunities, asking for letters of recommendation, and otherwise developing these relationships.

Get to know your peers. Studies have shown that students who have a "support group" on campus do better in their courses. You can't get through the pre-health courses alone – study groups, friends who will help you maintain a balanced lifestyle, older students who can provide advice – all of these are critical in doing well at Princeton. Start with classmates, attend a study group, join a pre-health student organization, meet your pre-health peer advisors in your residential college.
Final Words of Advice from Princeton Alums

Daniel Barson ‘12
Molecular Biology concentrator with Quantitative and Computational Neuroscience and Global Health certificates. Pursuing an MD/PhD at Yale Medical School
Key Princeton activities: Neuroscience research, EMT at PFARS, OA, Ski & Snowboard Team
Post-college activities: One year at the University of Cambridge pursuing an MPhil by research in Clinical Neurosciences, one year in Nicaragua at a public health NGO

Take classes that you think will be the most stimulating and personally rewarding. ‘Being pre-med’ should never be a reason not to take a class. This particularly applies to Integrated Science—it is certainly not the easiest way to satisfy pre-med requirements, but it is the best foundation in the natural sciences that Princeton offers, and it’s basically a breeding ground for future MD/PhDs (and some MDs). If you’re considering an MD/PhD, get started on research early and try to stick with a single lab for an extended period of time. You need a strong letter of recommendation from your research advisor. Be ready to convincingly answer the question “why do you want an MD?” And have fun. Doing the things that you enjoy most will give you the most to write and talk about throughout the application process.

Allie Harjo, ‘13
Molecular Biology concentrator. Pursuing an MD at Duke University School of Medicine
Key Princeton activities: Quad Club Treasurer; Daily Prince Photographer; Foundation for International Medical Relief of Children Co-President; Princeton Evangelical Fellowship
Post-college activities: Princeton Evangelical Fellowship Ministry Intern

As pre-meds, we often treat it as our responsibility to warp ourselves into whatever we think admissions committees will like best. The cost of this mindset is high. We may sacrifice the relationships and non-medical passions that make us come alive. Through my four years at Princeton and my time applying to medical school, I came to understand how wrong we are. The admissions process is challenging, but training myself to be (or seem) superhuman would not prepare me to be a good doctor. Being a doctor is about recognizing our humanity and acknowledging our limits. Ironically, I didn’t truly thrive as a pre-med student until I realized there were more important callings in life than getting into medical school: loving the people around me, staying healthy, and making time for the nonacademic activities I love.

Matthew Vengalil, ‘14
Psychology concentrator. Pursuing an MD at the University of California San Francisco
Key Princeton activities: LGBT activism; Student Health Advisory Board; Sustained Dialogue; Religious Life

Everyone seems to have advice on what you should study and what activities to pursue, but my advice is to follow your passion. Medicine is first a humanistic discipline and any insight you gain into the human condition is knowledge that can serve you in your career. I often found pre-med classes incredibly draining and frustrating and wondered whether the track was worth the lost opportunities to experience different things. Keeping front and center in my mind my calling to serve others as a doctor got me through, and I hope this might help some of you who have similar experiences. Because in the end, medicine is about service, not grades, scores, or status, no matter what impression peers or the application process give you.

Contact us:

609.258.3144  hpa@princeton.edu

Health Professions Advising
36 University Place, Suite 230 (floor 2M)
http://www.princeton.edu/hpa

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