

HEALTH PROFESSIONS PREPARATION FOR BIOENGINEERING STUDENTS

Approximately 25-30% of Bioengineering graduates pursue a health professions degree. The Health Professions Advising Office (213 Whitmore) is an additional resource for information about the application process. They have guidebooks with medical and dental school requirements specific to each program. This is general guide, but it is strongly based on medical school preparation. For other health professions, please contact the Bioengineering Department or the Health Professions office.

Most medical schools require, in addition to a course of general studies, one full year each of physics, inorganic chemistry, organic chemistry, and biology, each with appropriate labs. Be aware though that each school has a specific set of requirements and you should do some research to determine that you are working toward completing those. For example several schools are now requiring a biochemistry course. Also, increasingly some schools are not accepting credit from AP tests.

You need to consider three things during your undergraduate career to prepare for medical school:

- You need to complete the course requirements that medical schools expect to see on your transcript. There are general guidelines, but there is variation between schools. Also, you need to do this while keeping your GPA as high as possible.
- You need to prepare yourself for taking the MCAT – through both course work and individual study.
- You need to develop your resume to demonstrate significant clinical experience and make yourself stand apart from the thousands of other applications.

Coursework

The basic course requirements for medical school are 1 year (8 credits) each of: biology, chemistry, organic chemistry, and physics. You should plan to take the MCAT at the end (April) of your Junior year, so you need to have all the course requirements completed by that time. The courses you need to take, in addition to the Bioengineering core requirements, are as follows:

BIOL 110 – This is a basic biology course that needs to be taken in addition to BIOL 141/142 (physiology) and BIOE 201 (cell and molecular biology). It is offered in Fall semester for 1st and 2nd year students and in the Spring semester for upper level students. It is also offered in the first 6 week Summer session. You should try to take it before (or concurrently) with BIOL 141/142 and BIOE 201. You can use BIOL 110 as a Science & Engineering elective in Bioengineering.

PHYS 213/214 – BIOE 313 satisfies the PHYS 213 (thermodynamics) requirement. PHYS 214 (2 credits of waves) may be a useful course to take if you do not want to learn any material on your own.

Organic Chemistry – You will need to take CHEM 210, CHEM 212 and CHEM 213. These courses can be completely fulfilled in the CH E Option, partially fulfilled in the Material Science Option and 3-6 credits can be used to fulfill requirements in the other options.

Biochemistry – Some medical schools are now requiring biochemistry, this varies by school, but it is something you should research before applying to schools and you may want to consider adding a Biochemistry course to your academic plan.

General Education elective courses – Many schools either require or prefer you to have completed general Sociology and Psychology courses. These can be taken as your General Education courses. A very brief selection of relevant electives that maybe used as General Electives follow:

PHIL 132/RL ST 131 (GH) **Introduction to Bioethics** (3)

SOC 119 (GS;US) **Race and Ethnic Relations** (4)

S T S 124/HIST 124 (GH;US;IL) **History of Western Medicine** (3)

NUTR 251 (GHA) **Introductory Principles of Nutrition** (3)

MCATs

You should plan to take MCATs at the end of your Junior year. About 60% of Penn State students take prep courses (Kaplan or Princeton Review), it is your decision. You can do well without taking these courses, although some people like the structure of the courses.

Working in the Health Care System

To apply to medical school, you need experience working in the health care profession and demonstrate that you like to work with sick people and understand the rigors of clinical medicine. There are a number of ways to get this experience, including volunteering at a hospital, rehab center or nursing home, completing EMT training (available as a PSU class), shadowing a doctor at a hospital or clinic, etc. This is a critical experience necessary for medical school application.

Laboratory Research

Having experience in a research laboratory on campus or elsewhere strengthens your application package and provides depth for your Bioengineering coursework. If possible, try to work in a lab (for credit, for pay, or simply volunteering) to gain experience and learn how research is performed.

Extracurricular Activities and Minors

To be a strong applicant to medical school, it is good to have at least one extracurricular activity that you have done well. This can be a hobby, a volunteering experience (i.e. THON), being an officer in a club/organization, or many other options. Stress depth and leadership in an activity rather than spreading yourself thin across many small activities or clubs.

Having a second minor in engineering or science, while not bad, is not that important to medical school admissions boards. However, a second minor away from your major (i.e. in a Liberal Arts or Humanities) shows you are a well rounded student.

Final Notes

To prepare yourself for medical school, you need to organize your coursework and try to have a college experience that provides a well rounded education and training for working in health care. Don't try to do everything, do a few things well. Also, if you want to go abroad, add a minor, do a co-op, or engage in another experience that adds richness to your college experience but takes time, consider staying for an extra semester or year if your financial situation permits. There are some experiences that you can only get in college, and medical schools tend to look favorably on more mature students that have taken the time to pursue deep experiences during their college years.

Again, for more details on the specifics of the MCAT, medical school applications, consult the Premed web page <http://www.science.psu.edu/premed/>, AMCAS Yearly Admissions Guide or visit the Premed Office.

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