MEDICAL SCHOOL PREPARATION FOR BIOMEDICAL ENGINEERING STUDENTS - MCAT 2015

Approximately 25-30% of Bio-/Biomedical Engineering 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. For information about other health professions, please contact the Biomedical Engineering Department or the Health Professions office.

Most medical schools require, in addition to a course of general studies, one full year each of physics (PHYS 211 and 212 at minimum), inorganic chemistry (CHEM 110,111,112,113), organic chemistry (CHEM 210,212,213), and biology (BIOL 110, BIOL 240W or 141+142), each with appropriate labs. In addition, the revised MCAT will test competency areas and not just content from specific courses. It is expected that these additional courses will be necessary to be prepared for the MCAT 2015: PSYCH 100, SOC 001, PHIL 132, and BMB 401. Be aware though that each school has a specific set of course requirements and you should do some research to determine that you are working toward completing those. Increasingly some schools are not accepting credit from AP tests and Credit by Exam is typically not accepted by medical schools. Medical schools do not accept credit by exam.

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, biochemistry, social sciences, ethics, and physics. You should plan to take the MCAT by 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 either BIOL 141+142 or BIOL 240W (physiology) and BIOE/BME 201 (cell and molecular biology). You should try to take it before (or concurrently) with BIOL 141+142 or BIOL 240W and BIOE 201. BIOL 141+142 or BIOL 240W and BIOE/BME 201 are required by the Bioengineering curriculum.

PHYS 213 and 214 – These are often recommended for MCAT preparation but very few BME students actually take them. BIOE/BME 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 (8 credits total). Six of these 8 credits can be used toward BME degree requirements.

Biochemistry – For the new MCAT (2015), content from BMB 401 is covered on the exam and this course should be taken prior to taking the MCAT. This course can be used as a Related Elective for BME students.

General Education elective courses – Many schools either require or prefer you to have completed general Sociology and Psychology courses. The new MCAT will cover content from Introductory Psychology and Sociology courses and will emphasize social and cultural factors that affect behavior.
A very brief selection of relevant electives that maybe used as General Electives follow:

SOC 001 (GS) Introductory Sociology (3) - required
PYSCH 100 (GS) Introductory Psychology (3) - required
PHIL 132/RL 131 (GH) Introduction to Bioethics (3) - required
S T S 124/HIST 124 (GH;US;IL) History of Western Medicine (3) - recommended
NUTR 251 (GHA) Introductory Principles of Nutrition (3) - recommended

**MCATs**
You should plan to take MCATs by 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. It is highly recommended that you review the “AAMC Preview Guide for the MCAT 2015 Exam” - available free at AAMC.org

**Changes in 2015**
After a three-year review process, the MCAT exam will be changing in 2015. January 2015 is the last offering of the old exam. Exams offered after January 2015 will be the new exam. It is not clear if medical schools will accept old MCAT score after the new MCAT is offered. So rushing to take the old version may not be an advantage. It will depend on the school to which you apply and their policies.

**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.

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 Health Professions Advising Office, 213 Whitmore Lab.