

## ADVISING STUDENTS INTERESTED IN HEALTH PROFESSIONS

August 2023

From: Professor William Loinaz (Chair, Health Professions Committee)  
Dean Richard Aronson (Health Professions Advisor)

To: Orientation Academic Advisors

This memo is for faculty advising first-year students who may be interested in becoming physicians, dentists, veterinarians, or other health professionals. For more information:

- Students or academic advisors with questions can write Dean Aronson ([raaronson69@amherst.edu](mailto:raaronson69@amherst.edu)) or Professor Loinaz ([waloinaz@amherst.edu](mailto:waloinaz@amherst.edu)). For the 2023-2024 academic year, all initial first-year advising will take place in small group sessions led by Dean Aronson and Becca Tishler ([rtishler@amherst.edu](mailto:rtishler@amherst.edu)), the Assistant Director for Health Professions Advising. These advising sessions will provide an orientation to the pre-health program and resources, and will answer any preliminary questions students might have. **It is important that pre-health students are in contact with and get to know the Health Professions Office during their time at Amherst, and ideally as soon as they begin articulating an interest in health, and on a regular basis going forward.**
- Students should read our online *Guide for Premedical Students Part I: Preparing to Apply to Medical School & Part II: The Medical School Application Process* which are updated each year and provide a great deal of detail about preparation for and application to medical school. The *Guides* are at: <https://careers.amherst.edu/resources/amherst-college-guide-for-premedical-students/>
- **Important:** The Health Professions Office has a peer pre-health mentoring program for low-income students, first generation students, and students of color interested in health careers. They don't have to be set on a health profession, but should at least be thinking about it. This program has proven to be of considerable benefit to such students. Please advise your students who you feel would benefit from this program to contact Dean Aronson as soon as possible, since we aim to get them connected to older mentors as early in the year as possible. Thank you.

**Updates for the 2023-2024 year:** It is clear that, as in the past few years, students' circumstances and constraints will be more varied and stressors directly and indirectly related to the pandemic will continue.

Students' best pre-med schedule may be different than it would be in other years. We encourage students to be in close contact with their academic advisors and with us to discuss their course selections. Individual circumstances vary, and we suggest speaking with one of us directly if students have questions about how changes in their academic or personal lives (including having taken one or more semesters off) might impact a future application to medical school.

We encourage students and advisors to consider the student's schedule for the next semester, next year, and future years, keeping in mind not just pre-med and major course requirements, but also intellectual balance and exploration. There is flexibility and openness in how and when a student completes the pre-med course requirements, and it is increasingly clear that the students who do best in the medical school application process and beyond as health professionals are those who take full advantage of the open curriculum.

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We always advise students to proceed through their pre-med courses at a pace that will ensure that they are successful and happy in those courses and in their other academic and non-academic endeavors. There is no one ideal path to medical school, and students should, as always, not feel obliged to rush through the requirements. This is as true now as ever. As always, we encourage pre-med students to aim for a balance between the pre-med science and their major requirements, and a breadth of other courses across the curriculum.

### **General information:**

It is of *vital importance* that students who are interested in medicine or other health professions explore a wide variety of courses in their time at Amherst. There is no one “correct” academic schedule nor is there a major that is expected or “looks better” for medical schools. Moreover, if a student feels unsure about their future career (as one would hope many do in their first year of college), front-loading or rushing to complete the pre-medical course requirements achieves little and is not in their best interest.

Students are highly encouraged to explore in their coursework and create a schedule that pushes them to try new things, learn outside of their comfort zones, and be exposed to a variety of perspectives and disciplines. Many applicants to medical/health professions schools from Amherst major in the humanities or social sciences, or STEM but take a wide variety of course across the curriculum, study abroad, take a few years before applying, and are met with great success in the application process and professionally as well. Moreover, none of these approaches are “nontraditional”; rather, they have always been an approach that many take and are increasingly the norm. Students should be encouraged to give themselves time to find the subjects that interest and excite them, and to give themselves space to pursue such coursework freely and with enthusiasm.

Again, we advise every premedical student **not to rush** to complete the premedical requirements and go at their own pace. With regard to applying to medical school, **it is more important that students do as well they can in the premedical courses than that they complete requirements quickly.** Our ambitious students often want to do it all, and do it all right away, but there is real danger in overreaching, especially in the first semester, but also in the second semester as well.

With that said, however, we advise that, for some well-prepared students (such as those who placed into Math 121), taking two lab courses in the first semester may be fine, while keeping in mind the importance for all pre-health students to explore the curriculum widely and take non-STEM courses throughout their four years. If a student feels uncertain about doubling up in their first semester, they will not be at a disadvantage if they take only one lab course. If a student finds themselves struggling in a lab science course in the first semester, we caution doubling up in the second semester as well. Three STEM courses in the first semester plus a student’s FYS is generally not advised for pre-health students. **We strongly encourage pre-medical students to take a robust number of non-STEM courses.**

For students who wish to get started right away on premedical requirements, the starting point is calculus (MATH 105, 111, 111i, or beyond) and chemistry (CHEM 151 or 155). The Chemistry and Math Departments have made chemistry and calculus placements for all incoming students. **Introductory Chemistry (CHEM 151)** is the appropriate first course for first-year students who placed into Math 111 or Math 111i (the intensive section of Math 111), although students who have taken only a limited amount of physical science in high school may also be placed into Chem 151. **Fundamental Principles of Chemistry (CHEM 155)** is an advanced version of first-semester introductory chemistry intended for students who have a strong preparation in the physical sciences and mathematics. Questions or concerns about chemistry and calculus placements should be referred to Stephen Cartier (Chemistry) and Danielle Benedetto (Math). Finally, students who have been placed into MATH 105 may

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not begin chemistry in the fall semester but may then enroll in CHEM 151 in the spring (the so-called “off-semester” of CHEM 151). **Note that students who have placed into CHEM 155 should take the course in the fall semester as it is not offered in the spring.** These placements are discussed in more detail online.

For most prospective physicians, dentists, and veterinarians our best advice is:

### 1. Calculus

- a. *Did you place into MATH 105?* Take it.
- b. *Did you place into MATH 111 (or MATH 111i)?* Take it.
- c. *Did you place into MATH 121 or higher?* You don’t need this course for health professions graduate programs. Other considerations should decide whether you take this course.

### 2. Chemistry

- a. *Did you place into CHEM 155?* Take it. CHEM 155 is only offered in the fall, and **you will not be allowed to take the spring offering of CHEM 151.**
- b. *Did you place into CHEM 151?* If you want to take chemistry in the fall, you can take this. But CHEM 151 is offered every semester, so you can consider deferring this to the spring.
- c. *Did you place into MATH 105?* If you placed into MATH 105, you should take MATH 105 in the fall and CHEM 151 in the spring. If you want a premed-related science course in the fall, consider taking BIOL 181.

### 3. Additional notes on calculus and chemistry

- a. Students who **place into MATH 105** sometimes worry that they will be behind or “off-track” with regard to the premed requirements. It is our experience that students who start with this course will be able to complete the premed requirements on an acceptable schedule and will see better outcomes by following the placement advice than by jumping into a course for which they are underprepared.
- b. As noted above, students are not permitted to take MATH 105 and CHEM 151 simultaneously. However, CHEM 151 is also offered in the spring semester, and many students who take MATH 105 in the fall then enroll in MATH 106 and CHEM 151 in their second semester.
- c. **Important:** Note that students must have **completed** MATH 111, MATH 105/106, or have a placement from the math department into MATH 121 or higher to register for CHEM 161 (the second semester of introductory chemistry).
- d. **Important:** Students who **place out of MATH 111 and into MATH 121 or higher have satisfied the calculus requirement for medical school.** Pre-med students don’t have to take intermediate or multivariable calculus. So, for students who place out of MATH 111, taking math this first semester is entirely optional. For pre-med students who do wish to take additional math or math-related courses in the first semester, we note that in recent years medical schools have become increasingly interested in seeing a statistics course on the transcript over an advanced calculus course. Thus pre-med students who have placed out of MATH 111 and want to take a math-related course in their first semester could be encouraged to take STAT 135, which is an introductory statistics course for students who know calculus.
- e. Pre-med students who still prefer to take the MATH 121 or 211 (depending on their placement) should keep in mind that the decision whether to enroll in such a calculus course in their first semester should be determined by looking at the student’s entire schedule.

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4. **Prospective physics majors** who are also premedical students should take PHYS 123 and MATH 121 or 211 this fall if their calculus placement is MATH 121 or 211. Optionally those students could instead take CHEM 151/155 this semester and take PHYS 123 next fall. For more information about placement into physics courses, students can attend the physics academic orientation sessions or contact a member of the physics faculty. Only well-prepared students should consider taking both chemistry and physics in the first semester. **Prospective BCBP majors on the Biophysics track** who are also premedical students may also start with physics, either PHYS 116 or PHYS 123, if they wish.
5. Note to **prospective biology, neuroscience majors, and BCBP majors on the Biochemistry track**: Pre-med students considering any one of these majors should prioritize completing CHEM 151/155 and CHEM 161. (CHEM 151/155 in the fall if math placement is MATH 111 or greater; CHEM 151 in spring if math placement is MATH 105/106). BIOL 191 is required for all three majors and for Biochemistry, which is part of the pre-med curriculum. BIOL 191 requires completion or co-enrollment in CHEM 161 and is offered in both semesters. So, BIOL 191 can be taken in spring of first year or fall/spring of second year, depending on the student (if the student takes a lab science course in the fall, their experience with that course should guide the decisions for the subsequent semester: one lab course or two?). BIOL 181 is required for the Biology major, but not BCBP or Neuroscience; it has no prerequisites and is offered only in the fall. BIOL 181 in the fall of first year is recommended for: (a) students enrolled in MATH 105, (b) students placed into CHEM 151 who prefer to delay starting chemistry until the spring semester, (c) CHEM 155 students who have already fulfilled the premed calculus requirement (and choose not to take math in the fall) and show evidence of being able to handle two lab courses in the first semester (most students should start with one lab course and ramp up to two in the spring).
6. Note to **students not majoring in biology or another STEM subject**: medical schools require two lab biology courses, one of which must be BIOL 191 (since it is required for Biochemistry). The remaining lab biology course can be satisfied by BIOL 181 or by a more advanced lab biology course. However, advanced lab biology courses are usually overenrolled and priority is given to students who need it for their major. So, we recommend BIOL 181. Note, however, that BIOL 181 is offered only in the fall semester. As stated above, first-year students should go at their own pace with the pre-med requirements and should not feel pressured to double up on BIOL 181 and CHEM 151/155 in their first semester.

Motivated by what they've heard about the MCAT, students may ask about taking non-science courses – such as psychology and sociology – as additional pre-med requirements. At this time, we do not consider these required premed courses (though we encourage students to take whichever courses are of interest to them). The vast majority of medical schools do not (yet) require such courses. However, because of the Foundations of Behavior section on the MCAT, applicants to medical school will have to learn much of the content typically covered in introductory psychology courses as well as some topics often covered in introductory sociology courses. They could do that by either reading a textbook on their own when they prepare for the MCAT, or by taking an introductory psychology course (here or perhaps elsewhere).

**Note regarding international students:** It is very difficult for international students who aren't permanent residents of the U.S. to be accepted and to matriculate at a U.S. medical school, even if those students have graduated with good records from a U.S. college or university. Only a limited number of U.S. medical schools will consider applications from students who are not U.S. citizens or permanent residents. Among those medical schools that may consider international applicants, an even smaller number offer any scholarship aid.

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International students are not eligible for the government or non-government loans that most U.S. citizens and permanent residents use to finance their medical educations. If your advisee is interested in medical, dental, or veterinary school and is not a U.S. citizen or permanent resident, please encourage them to see Dean Aronson or Professor Loinaz.