

Cornell Courses Recommended to Satisfy Medical and/or Dental School Requirements 2009-2010

The Health Careers Program Advisory Board (HCPAB) of Cornell University recommends that students preparing for medical/dental school take the following courses. **This list provides general minimal requirements for the medical and dental schools where Cornell students usually apply.** For details on particular schools, students should consult school web pages and the publications *Medical School Admission Requirements (MSAR)* and *ADEA Official Guide to Dental Schools*.

Recommended minimum courses for medical and/or dental schools	Rec. sem. hrs.	Cornell University courses recommended to fulfill these requirements																				
CHEMISTRY General or Inorganic	8	<p>Chem 2070 (207) + 2080 (208) or Chem 2150 (215) + 2160 (216)* For students with strong chemistry backgrounds (Honors) (Will fulfill Engineering requirements) or Chem 2090 (209) + 2080 (208) Required sequence for Engineering</p> <p>See also "Course Selection." It is possible that mixing sequences (e.g., 2150 + 2080, 2150+ 2090) may not provide full coverage of MCAT topics, despite satisfying the medical school requirements for two semesters of introductory chemistry. See www.aamc.org/students/mcat/preparing/creatingstudyplan.htm for MCAT topics. Chem 2060 is a one-semester introduction to chemistry. Although it can be used to replace Chem 2070 in the Chem 2070-2080 sequence, this is not recommended, and students particularly those with a weaker chemistry background, may find themselves disadvantaged in Chem 2080. Engineering students may not use Chem 2060 to replace Chem 2090.</p> <p>*Students who decide not to proceed to Chem 2160 should see the Director of Undergraduate Studies (DUS) in the Chemistry Department for possible alternative courses in that department. See AP section.</p>																				
Organic	8	<p>Chem 3570 (357) + 3580 (358) + 2510 (251) Usual sequence or Chem 3570 (357) + 3580 (358) + 3010 (301)* or Chem 3590 (359) + 3600 (360) + 3010 (301)* or Chem 3590 (359) + 3600 (360) + 2510 (251)</p> <p>Chem 3590, 3600, and 3010 are honors courses *Note: Chem 3000 is a prerequisite for 3010.</p>																				
BIOLOGY Introductory	8	<p>Bio G 1101 (101)/1103 (103) + 1102 (102)/1104 (104) or Bio G 1105 (105) + 1106 (106) or Bio G 1107 (107) + 1108 (108) (summer only) or Bio SM 1110 (Shoals Marine Laboratory; summer only)</p> <p>Also possible is any combination of the first term of one of the above sequences followed by the second term of another. The HCPAB does NOT recommend Bio G 1109 + 1110 because it is not as comprehensive an introductory biology sequence and it does not meet the prerequisite for some of the advanced courses. See AP section.</p>																				
Advanced		<p>A minimum of one advanced course is recommended, though not required by all medical/dental schools. There are many appropriate courses, some examples follow which do not require a biology course beyond Introductory Biology. See an academic advisor for other examples.</p> <table> <tbody> <tr> <td>Introduction to Behavior</td> <td>BioNB 2210 (221)</td> </tr> <tr> <td>Introduction to Neurobiology</td> <td>BioNB 2220 (222)</td> </tr> <tr> <td>The Vertebrates: Structure, Function and Evolution</td> <td>BioEE 2740 (274)</td> </tr> <tr> <td>Genetics</td> <td>BioGD 2810 (281)</td> </tr> <tr> <td>Microbiology</td> <td>BioMI 2900 (290)</td> </tr> <tr> <td>Physiology</td> <td>BioAP 3110 (311)</td> </tr> <tr> <td>Animal Physiology Experimentation</td> <td>Bio AP 3190 (319)</td> </tr> <tr> <td>Human Anatomy and Physiology</td> <td>NS 3410 (341)</td> </tr> <tr> <td>Histology</td> <td>BioAP 4130 (413)</td> </tr> <tr> <td>Biochemistry</td> <td>BioBM 3300 (330), 3310 (331) + 3320 (332), or 3330 (333) (summer)</td> </tr> </tbody> </table>	Introduction to Behavior	BioNB 2210 (221)	Introduction to Neurobiology	BioNB 2220 (222)	The Vertebrates: Structure, Function and Evolution	BioEE 2740 (274)	Genetics	BioGD 2810 (281)	Microbiology	BioMI 2900 (290)	Physiology	BioAP 3110 (311)	Animal Physiology Experimentation	Bio AP 3190 (319)	Human Anatomy and Physiology	NS 3410 (341)	Histology	BioAP 4130 (413)	Biochemistry	BioBM 3300 (330), 3310 (331) + 3320 (332), or 3330 (333) (summer)
Introduction to Behavior	BioNB 2210 (221)																					
Introduction to Neurobiology	BioNB 2220 (222)																					
The Vertebrates: Structure, Function and Evolution	BioEE 2740 (274)																					
Genetics	BioGD 2810 (281)																					
Microbiology	BioMI 2900 (290)																					
Physiology	BioAP 3110 (311)																					
Animal Physiology Experimentation	Bio AP 3190 (319)																					
Human Anatomy and Physiology	NS 3410 (341)																					
Histology	BioAP 4130 (413)																					
Biochemistry	BioBM 3300 (330), 3310 (331) + 3320 (332), or 3330 (333) (summer)																					

<p>PHYSICS General or Introductory</p>	<p>8</p>	<p>Physics 1101 (101) + 1102 (102) Usual sequence, not calculus based, auto-tutorial</p> <p>or Physics 2207 (207) + 2208 (208) Usual sequence, calculus based</p> <p>or Physics 1112 (112) + 2208 (208) Possible sequence, also using calculus</p> <p>or Physics 1112 (112) + 2213 (213) + 2214 (214) Possible 12 semester hour sequence*</p> <p>*This three-semester sequence gives minimal coverage to fluids. Students using only parts of a sequence or mixing parts of two and three-semester sequences may find certain MCAT topics not covered. This is the preferred sequence for Engineering students. See www.aamc.org/students/mcat/preparing/creatingstudyplan.htm for MCAT topics.</p> <p>Crossovers between 1101/2208 and 2207/1102 are acceptable; consult appropriate faculty.</p>
<p>MATHEMATICS</p>		<p>or Finite Math 1105 (105) + Calculus I: 1106 (106) or 1110 (111)</p> <p>or Calculus I 1110 (111) + Calculus II: 1120 (112) or 1220 (122) or 1910 (191)</p> <p>or Calculus I: 1106 (106) or 1110 (111) + statistics</p> <p>College work in mathematics is required by some schools, highly recommended by almost all. A very few schools require one year of calculus.</p> <p>Statistics is accepted as college level mathematics at some schools, and at a few schools statistics is required or recommended. Suitable statistics courses include the following, however, some may only be open to students in a particular college.</p> <p>Applied Economics and Management 2100 (210)</p> <p>Biometry 3010 (301)</p> <p>Industrial and Labor Relations 2100 (210)</p> <p>Mathematics 1710 (171)</p> <p>Policy Analysis and Management 2100 (210)</p> <p>Psychology 3500 (350)</p> <p>Sociology 3010 (301)</p> <p>Engineering 2700 (270)</p> <p>Statistical Science 2100 (210)</p>
<p>ENGLISH</p>	<p>6</p>	<p>Most medical schools will accept First-Year Writing Seminars (FWS) in fulfillment of their writing requirement. The John S. Knight Institute for Writing in the Disciplines, 101 McGraw Hall, will provide a notice stating that First-Year Writing Seminars taken in any department at Cornell are equivalent to English composition courses.</p> <p>Some medical schools, however, specifically require English literature to fulfill their writing requirement. For example, Weill Cornell requires one writing course focusing on "English-language literature." Students who plan to apply to such schools should take either their First-Year Writing Seminars or advanced courses in the Department of English. See specific school's web pages for details.</p>
<p>ADDITIONAL COURSES</p>		<p>Students need to be aware that some institutions have very specific requirements and/or recommendations in addition to the almost universal requirements listed above. You need to be concerned about other additional courses only if they are required by your state medical/dental school or by schools in which you have a particular interest. See <i>MSAR</i> and/or <i>Official Guide to Dental Schools</i> well in advance of the time of application.</p>
<p>COURSE NUMBER CHANGES</p>		<p>Beginning academic year 2008-2009 Cornell assigned four-digit course numbers. Previous three-digit course numbers are in parenthesis. To verify any course number see www.cs.cornell.edu/gries/courses/</p>

Courses Beyond the Requirements

Students should work with their academic advisors in choosing courses beyond the requirements. Some students decide to take courses similar to those taken in medical school, such as biochemistry or histology, in an attempt to demonstrate that they can perform well in a course taught in medical school or to ease their studying during the first year of professional school. These advantages, however, should be weighed against possible disadvantages. These include not being able to take an elective that may be important to your personal development and undergraduate education or which will not be available for you to take once you are in medical school.

As you plan, also keep in mind that medical/dental school admissions officers frequently speak of wanting to see both breadth and depth in a student's academic record. In choosing courses you will want to strike a balance between these, avoiding a narrow approach on the one hand and a superficial approach on the other.

Satisfactory/Unsatisfactory Grades

Do not take any requirement for medical/dental school on a Satisfactory/Unsatisfactory basis.

Transfer Students

Transfer students should check that the courses they have taken at their previous college meet the requirements for entrance to medical/dental school. See also "Transfer Students' Guidelines" in the Health Careers portion of Cornell Career Services web pages, www.career.cornell.edu.

Summer School Courses

Required courses for medical/dental school may be taken during summer session here or at other universities whose educational standards are comparable to Cornell's. However, it is usually preferable to take these science courses at Cornell during the regular school year in order to demonstrate that you can perform well even while carrying a full course load. Your college advising office can explain the procedure for attending summer school elsewhere.

Advanced Placement (AP)

Courses accepted by the college as satisfying graduation credit requirements may be used to replace introductory requirements listed above at many medical/dental schools. **Check specific statements in medical and dental school web pages.** Some schools advise students to pursue advanced courses in biology, chemistry, physics, or other sciences which provide reinforcement of previous courses, even though they may have met the minimum science requirements while in high school. Most medical schools require a year of biology taken in college. If you have AP credit in biology (this AP credit must be indicated on your official transcript), most schools recommend that you take two semesters of advanced biology and want you to have taken a lab course in college.

Students with AP Biology should see the Office of Undergraduate Biology web page at www.bio.cornell.edu/advising/ap.cfm for information on using AP Biology credit at Cornell.

Course Selection

Any of the courses outlined previously will fulfill the prerequisites for medical/dental schools. Which ones to take depends on several factors: your interest in the subject; test scores; high school preparation; experience in rigorous courses; and major and academic goals. Placement in the right courses is very important. *Cornell Courses of Study* describes the courses; the academic advisor and the directors of undergraduate studies (DUS) in relevant departments can explain the differences among courses and can help you select your courses.

Sequence of Courses

Recommended order The recommended order in which to take these courses is: mathematics, chemistry or biology, physics. Biology, chemistry, and mathematics need to be started by the sophomore year if you plan to apply to medical/dental school at the end of your junior year for attendance in the fall following graduation. Courses are usually (but not necessarily) taken during these years:

- First-Year Writing Seminars - freshman
- General Chemistry - freshman or sophomore
- Introductory Biology - freshman or sophomore
- Mathematics - freshman or sophomore
- Physics - sophomore or junior
- Organic Chemistry - sophomore or junior

Mathematics Strong quantitative skills are essential for chemistry and physics. It is recommended that college mathematics precede physics.

Organic Chemistry For organic chemistry, lecture courses must be taken before, or concurrently with laboratory courses. Co-registration in organic lecture and organic laboratory is not necessary.

Natural Science Major If a you think you want to major in a natural science, the usual advice is to take two science courses or mathematics and science during freshman year.

Humanities or Social Science Major If you think you want to major in a humanities or social science discipline, you may want to take only one mathematics or science course during freshman year in order to be able to experiment with courses from several departments. However, this may require taking two science courses in both the sophomore and junior years.

Unsatisfactory Performance in a Course

Repeating Courses Generally speaking, courses should not be repeated. A poor performance (below C-) can be redeemed partially by a good performance in another course which demonstrates strength within the same area. In some cases, e.g. required science courses, however, it may be advisable to repeat the course. This is the case especially when extraneous circumstances were largely responsible for the initial weak performance. An academic advisor will help to explore these points further as well as credit hour and grade point average implications which vary among colleges.

Recommended sequences for students who receive a grade of D+ or lower in required science courses
See the appropriate departmental office.

Medical School Admission Test (MCAT)

The MCAT assesses an applicant's understanding of concepts in introductory biology, general chemistry, organic chemistry, and non-calculus-based physics.

The MCAT should not be taken until introductory courses in biology, chemistry, organic chemistry, and physics are completed (or are within a few weeks of completion) and you have studied for the exam. The MCAT is administered over twenty times a year at designated computerized test sites.

Students should review the *MCAT* web pages especially www.aamc.org/students/mcat/preparing/creatingstudyplan.htm to see the science topics in the exam and to determine that they have covered all the topics. Checking topics may be especially useful if you have mixed course sequences.

For More Information

Students who create a Cornell Career Services profile on line in Cornell CareerNet and request Health Careers Program emails will be updated on health careers topics and programs throughout the year.