

BEYOND BARNARD PREHEALTH COURSEWORK

UNDERSTANDING THIS GUIDE

Beyond Barnard's Health Professions Advising team advises the following coursework for prospective applicants to allopathic (MD) or osteopathic (DO) medical programs as well as dental programs (DDS, DMD). **Please note** that students and alumnae interested in nursing, physician assistant, veterinary medicine, or any other health profession should research prerequisites for these programs, since those requirements can vary substantially from the courses listed here. For pre-medical and pre-dental students, core prerequisites typically include:

- Two semesters of biology with lab(s)
- Two semesters of general/inorganic chemistry with lab(s)
- Two semesters of organic chemistry with lab(s)
- Two semesters of physics with lab(s)
- Two semesters of English/writing-intensive coursework
- Two semesters of mathematics (typically, calculus and statistics)
- One semester of biochemistry
- Introductory social science courses (recommended)

In each section, required and recommended courses are described, along with their titles and course codes. The tables below provide course options at both Barnard and Columbia. **We recommend that students complete their coursework at Barnard whenever possible.**

BIOLOGY

We recommend taking two semesters of biology with labs as well as one semester of genetics and/or microbiology. Students who would like additional preparation may take BIOL BC1001 and/or BC1002 before taking the recommended courses below. If you have any questions about which course is suitable for you, consult a professor in the biology department.

More advanced courses in biology, including genetics and microbiology, are often recommended by health professions programs. We encourage prospective applicants, particularly those majoring in areas outside of the natural sciences, to enroll in one or two advanced science electives.

Note: many health professions programs (nursing, physician assistant, physical therapy, etc.) may require one year of human anatomy and physiology as well.

Course	Barnard College Course Number	Columbia University Course Number
Intro to Organismal & Evolutionary Biology	BIOL BC1500 (Lecture) BIOL BC1501 (Lab)	BIOL UN2005 (Lecture) BIOL UN2015 (Recitation)
Intro to Cellular & Molecular Biology	BIOL BC1502 (Lecture) BIOL BC1503 (Lab)	BIOL UN2006 (Lecture) BIOL UN2016 (Recitation)
Genetics (recommended)	BIOL BC2100	
Microbiology (recommended)	BIOL BC3320	

CHEMISTRY

You will need a year of general chemistry (with one semester of lab that is at least 2 credits) and a year of organic chemistry (with one semester of lab that is at least 2 credits). Students who would like additional preparation in chemistry can take CHEM BC1002, a one-semester preparatory course without a lab, prior to enrolling in General Chemistry I. Barnard College's Chemistry Department offers courses in the following sequence:

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General Chemistry I (includes lab – 2 points)
Organic Chemistry I (with accompanying lab – 2.5 points)
Organic Chemistry II (optional lab)
One additional inorganic chemistry course
One biochemistry course (without lab)

Options for the second semester of inorganic chemistry coursework include:

- **CHEM BC3232 Descriptive Organic Chemistry:** This course (formerly known as Chemistry IV) is recommended for prehealth students who are not majoring in chemistry or biochemistry. There is no lab for this course.
- **CHEM BC3271y Inorganic Chemistry:** There is no lab attached to this course.
- **CHEM BC3242y Quantitative Analysis Lecture:** This course is required for students majoring in chemistry or biochemistry. Students who are not majoring in chemistry or biochemistry are not required to take the Quantitative Analysis Lab (CHEM BC3338y).

Biochemistry is required by some professional schools and is strongly recommended for students who will be taking the MCAT. Barnard's biochemistry course (CHEM BC3282, Biological Chemistry) is offered in fall and spring, and has BIOL BC1502 and one year of organic chemistry as prerequisites.

Notes:

1. Barnard students may not receive credit for General Chemistry II (CHEM UN1404) at Columbia University after completing General Chemistry I (CHEM BC2001) at Barnard. This is because there is significant overlap between the content of CHEM BC2001 and CHEM UN1404. Students who need credit for a second semester of inorganic chemistry in order to fulfill professional school requirements should complete one of the courses listed above.

2. The labs for Organic Chemistry II and Quantitative Analysis are intended for students majoring or minoring in Chemistry or majoring in Biochemistry, although other students are able to register for these laboratory components. Thus, the majority of our pre-health students *do not* take the labs associated with Organic Chemistry II and their second semester of general or inorganic chemistry. This has been acceptable for the vast majority of medical and dental schools.

Course	Barnard College Course Number	Columbia University Course Number
General Chemistry I	CHEM BC2001 (Lecture + lab)	CHEM UN1403 (Lecture) CHEM UN1500 (Lab)
Second inorganic chemistry	CHEM BC3271y CHEM BC3242y CHEM BC3232	CHEM UN1404 (Lecture) CHEM UN1405 (Recitation)
Organic Chemistry I	CHEM BC3230 (Lecture) CHEM BC3328 (Lab)	CHEM UN2443 (Lecture) CHEM UN2493 (Lab)
Organic Chemistry II	CHEM BC3231 (Lecture) CHEM BC3333 or BC 3335 (<i>Optional</i> labs)	CHEM UN3444 (Lecture) CHEM UN3494 (Lab)
Biochemistry	CHEM BC3282 (Recommended for chemistry and biochemistry majors)	BCHM GU4501 BIOC UN3300 (This course cannot be counted toward a chemistry or biochemistry major)

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PHYSICS

Prehealth students should plan to enroll in two semesters of physics with lab(s).

Note: Calculus I is a co-requisite for the Columbia physics sequence. Calculus I is a co-requisite for PHYS BC2001, Physics I, at Barnard, and Calculus II is a co-requisite for PHYS BC 2002, Physics II, at Barnard. Either sequence will fulfill pre-requisites for health professions programs.

Course	Barnard College Course Number	Columbia University Course Number
Physics I: Mechanics	PHYS BC2001 (Lecture + lab)	PHYS UN1201 (Lecture) PHYS UN1291 (Lab)
Physics II: Electricity & Magnetism	PHYS BC2002 (Lecture + lab)	PHYS UN1202 (Lecture) PHYS UN1292 (Lab)

MATHEMATICS

Mathematics requirements are not uniform across professional schools. You may need 1-2 semesters of math coursework to satisfy prerequisites for some medical and dental schools, but because requirements vary by program and school, we encourage you to research this in advance. Taking one semester of calculus and one semester of statistics will allow you to meet typical mathematics prerequisites.

A note about Calculus:

The majority of health professional schools will accept AP Calculus to satisfy the math requirement. Students with AP Calculus credit may forgo taking Calculus I at Barnard and use their AP credit, or take a more advanced calculus course.

A note about Calculus and Physics:

If you plan to enroll in Physics at Barnard, you will need to satisfy Calculus I (or receive permission of the instructor) for Physics I (BC 2001) and Calculus II (or receive permission of the instructor) for Physics II (BC 2001). Columbia's General Physics sequence requires Calculus I only.

A note about Statistics:

While it is not required, we encourage our students to take a statistics course, which may be taken from any department. **It need not be calculus-based.** Statistics will count towards the math requirement for many health professional schools and will also help to prepare pre-medical students for the MCAT exam.

Note: The course titled *Introduction to Statistical Reasoning*, STAT UN1001, is not appropriate for pre-health students.

Course	Barnard College Course Number	Columbia University Course Number
Calculus I	MATH UN1101	MATH UN1101
Statistics	PSYC BC1101	STAT UN1101
Calculus II	MATH UN1102	MATH UN1102
Calculus III	MATH UN1201	MATH UN1201

ENGLISH & WRITING-INTENSIVE COURSEWORK

We recommend at least one year of writing-intensive coursework taken for a letter grade. Health professions schools widely accept English-departmental courses, but writing-intensive coursework that is offered in humanities departments other than English may be acceptable for health professions programs. "Writing-intensive" coursework typically refers to courses in which significant critical reading (of texts in English) and analytical writing are required. Students who complete writing-intensive coursework outside of English or writing departments are encouraged to keep copies of syllabi in case professional schools have questions about those courses.

In general, you should look for courses in which you are writing at least 15-20 pages per semester and in which writing assignments comprise at least 50% of your final grade.

Note: *Creative writing courses are not appropriate to fulfill professional schools' English or writing-intensive course requirements.*

SOCIAL SCIENCES & HUMANITIES

We suggest one to two semesters of social or behavioral science courses, particularly for students taking the MCAT, as that exam includes a section on psychological and social foundations of behavior. In addition to social or behavioral science courses, students may also take humanities courses related to health, science, and medicine. The list provided below is non-exhaustive and should be used as a starting point—prehealth students are encouraged to investigate course offerings in a range of social science and humanities departments to find courses that fit their interests!

Language courses are also recommended for students who plan to practice in regions where languages other than English are commonly spoken.

Note: 3000-level courses should not be attempted in your first year.

Course	Course Number
Introduction to Psychology	PSYC BC1001
The Social World	SOCI UN1000
Medical Sociology	SOCI BC3246
Sociology of the Body	SOCI BC3933
Social History of American Public Health	HIST UN2950
Genetics and Society	SCPP BC3336
Women and Health	WMST BC1050
Women and Science	WMST BC3131
Ethics and Medicine	PHIL UN3716
Death and the Body	ANTH UN3064
The Body and Society	ANTH UN3160
Brain Science: A Social History	ANTH UN3826
Culture and Mental Health	ANTH UN3966