Barnard Chemistry Department FAQ's

Frequently Asked Questions from students...with answers.

Prospective students

I am thinking about college and chemistry interests me: why should I choose Barnard?

Barnard is a small undergraduate liberal arts college for women in New York City. Small liberal arts colleges are usually places where the faculty is deeply dedicated to teaching. Barnard science faculty are available to students not just in the classroom, but in formal and informal office hours, in labs, and as academic advisors. Barnard faculty are committed to the success of all their students, and if you are willing to make the effort, we are willing to be there working with you throughout your college career.

Undergraduate liberal arts colleges have an excellent record in preparing students for success in science and medicine. Barnard chemistry faculty have active research programs, often supported with funding from external public and private agencies like the National Science Foundation, the National Institutes of Health, or the Petroleum Research Fund. Professors at universities often carry out their research with a large group, including postdoctoral students, graduate students, and undergraduates. At Barnard, undergraduates are the primary co-workers of the faculty. Thus if you do research here in chemistry, you will have a lot of individual attention. Moreover our research instruments are here for your use. (At larger institutions, you might have a low priority to use a state-of-the-art NMR, for example.)

Our New York location and our relationship with Columbia mean that there are also opportunities to work in a larger scale science environment, if you wish. Barnard chemistry and biochemistry majors frequently choose to do their senior theses in research groups in the Columbia Chemistry or Biology departments, at the Columbia University Medical Center, and at other nearby institutions.

First-years and sophomores

I want to study chemistry at Barnard: which course should I take first?

If you might be a chemistry or biochemistry major, we strongly urge you to take chemistry your first year. Even if you major in Biology, starting with chemistry can make good sense.

Most students begin their study of college chemistry with BC2001x. This one-semester General Chemistry course includes both lectures and laboratory. It is designed for students with some familiarity with chemistry from high school and a good foundation in mathematics (algebra).

Students with no previous chemistry background or with weaker mathematics may choose to take BC1002y in the spring of their first year, following it with BC2001x the following fall.

Can I place out of BC2001x with AP or IB?

No: students with AP scores of 4 or 5 in Chemistry are given 3 points of credit (equivalent to BC1002y), but they must take BC2001x. There is no AP credit for chemistry lab.

I didn't take General Chemistry I (BC2001x) my first year: can I still major in chemistry or biochemistry?

Yes. The major can be completed in three years. Come speak to someone in the department to work out the details based on your background.

I have questions about the chemistry or biochemistry major: who can I ask?

Anyone in the chemistry department would be happy to answer your questions. Try to come during scheduled office hours: these are usually posted on each faculty member's door; some are available on the WWW.

How do I choose a major advisor?

Any faculty member in the chemistry department may be your official major advisor. If you have a preference, please ask that person is he or she is willing, and then enter that name on the major declaration form when you submit it to the department Chair. You advisor must approve your program, but you should feel free to consult others in the department whenever you have a question: we operate quite informally.

Everyone

Can I do research in the chemistry department for course credit? How is that arranged?

Yes, the department is very pleased to have students do research. To work safely and independently in lab, some background is needed, so students must complete a year of chemistry with lab before beginning research. In some areas, more advanced coursework may be needed.

Two courses, BC3597 and BC3599, are set up for student research in the chemistry department at Barnard. The former is for 2 credits, with an expectation of one afternoon per week (or the equivalent) in lab, with some additional work reading and analyzing results. The latter is for 4 credits, with the expectation of two afternoons (or the equivalent) of work per week, plus time for reading and analysis. The scheduling of research time is up to the sponsoring faculty member: sometimes a fixed schedule is necessary, while in other cases a more flexible arrangement may work. Some faculty have a weekly group meeting with their research students. These courses may be taken for credit multiple times.

If you are interested in doing research, speak to any Professor whose area of study interests you. He or she will describe the projects that are on-going, and discuss what might be suitable for a student with your background. Keep in mind that time and space are both limited, so not every faculty member is able to offer research opportunities each term. Moreover your background and lab skills need to be appropriate for the proposed work.

Arrangements for BC3597 or BC3599 should be made well in advance, preferably during the pre-registration period the previous semester. Research projects take planning, so it is often very difficult to set them up at the beginning of the semester.

What about getting credit for doing chemically related research off-campus?

Chemistry BC3598 is a 4-point research course for sponsored research off-campus. A member of the Chemistry department must speak to the proposed research mentor to approve the project and discuss the arrangements and expectations. This course has mandatory pass-fail grading. Barnard chemistry students have done research for credit at places like Columbia University Medical Center, Sloan-Kettering, and Montefiore Hospital.

How do I apply for a summer internship in the Barnard Chemistry department?

Summer research in the Barnard Chemistry Department typically involves some ten to twenty students. Student stipends for ten weeks' research are about $4000, with funding from various sources. Each year in February the department schedules faculty presentations where you can

hear about possible research projects. Talk to all Professors whose area of research sounds interesting. Don't be shy: we enjoy talking about our research! A simple application form is available; the deadline for application is typically in February. We usually have many more applicants that we have space or funding, so you should look for other opportunities as well. We give preference to students who will be doing Senior Theses the following year, and after that, to students who have completed BC3333/3335 and BC3338/3340. Good lab skills, enthusiasm, and ability to work well with others are other important qualifications.

How do I find a summer internships elsewhere?

There are many such programs (REU, SURF, etc.). Notices that come into the Chemistry department are posted in the 8th floor hallway, opposite room 813. Some arrive early in the fall, but others come in the spring, so it pays to check back frequently. These are often very competitive, so apply to any of interest. Additional listings are managed through Barnard's Hughes Science Pipeline Project: (*Please click below, link is active*)

http://www.barnard.edu/hspp/Internship%20website/science_internships.htm

Can I major in chemistry or biochemistry and also study abroad?

With careful planning, Chemistry and Biochemistry majors can and do study abroad. Keep in mind that many science course have prerequisites, so you need to map out carefully what fits where among your major courses. Discuss this with a department member early in your college career. It is generally not a good idea to try to take required science courses while abroad: it is unlikely to find close equivalents to courses here. Plan to focus on the language and culture of your host country while abroad, and do the science courses at home. One semester abroad is quite manageable; two semesters is more challenging.

What about doing a double major?

Examples of double majors completed in recent years are Chemistry and Italian, Chemistry and Dance, and Chemistry and Political Science. Such combinations take a lot of planning, and leave little room for other electives. If this is something you are thinking about doing, map out the courses for your four college years and discuss this early on with someone from each department. Keep in mind that you may write two senior theses. While we do not encourage students to do double majors, we are happy to work with you if this is important to you.

How do I get approval for a summer course in chemistry?

Learning chemistry in a 14-week semester is already challenging; compressing this to 5 or 6 weeks is seldom a good way to learn and retain material. However we recognize that scheduling constraints sometimes make summer courses a necessary option. If you wish to get Barnard credit, be sure to get signed approval from the department chair *before* taking any course. Under no circumstances will approval be given for a summer semester of fewer that 5 weeks: this is a sensible college policy. Detailed information about requirements for summer courses and what is needed to get them approved may be found here: (*Please click below, link is active*)

http://www.barnard.edu/chem/Course%20Listing_Summer_2.htm

Can I get Barnard credit for a summer course which is the equivalent of BC1002y?

There are many "pre-chemistry" courses out there. Some are roughly equivalent to our BC1002y, others are more remedial, and therefore not appropriate for Barnard credit. Since it is not easy to evaluate each course, the department has adopted a special policy. If you are thinking about taking such a summer course, check with the department Chair beforehand to see if it looks appropriate. The Chair will not, however, sign an approval at this point. Instead, wait until you have (1) completed the summer course, and (2) successfully taken and passed Chemistry BC2001y. Then bring the form to be signed.

What do chemistry and biochemistry majors do after they graduate?

Barnard chemistry and biochemistry alumnae mostly continue in science, and most do some graduate study. However it is quite common for students to work for a year or two, and then begin graduate or professional school. About one third of our alumnae are practicing physicians. Many are clinicians, and many are also engaged in basic research, at universities or in the pharmaceutical industry. Another third have Ph.D.'s in chemistry or chemistry-related subjects. Barnard chemistry alumnae are Professors at Caltech, Brandeis, Washington (Seattle), Carnegie-Mellon, and other fine universities. Others teach at undergraduate colleges like Providence and Xavier (LA). Other related professions chosen by alumnae include Pharmacy and Pharmacology. Some graduates work in industry, at the bench as well as in sales or management. A few alumnae teach high school science. We also have several alumnae lawyers and business people: good technical training can be very valuable in these areas.

Chemistry and Biochemistry Majors

What courses are required to be a Chemistry or Biochemistry Major?

See the Barnard College Catalogue for major requirements. For each major, a four-page handout describing and a checklist are also available: (click here to view and print these documents)

- **Chemistry major requirements**
- **Chemistry major checklist**
- **Biochemistry major requirements**
- **Biochemistry major checklist**

They are also available on our website at the following web address:

http://www.barnard.edu/chem/course_home_2.htm

What Physics is required for the major?

Barnard's Physics BC2001x-2002y (4.5 points each term, including laboratory) is strongly recommended. The equivalent CU *lecture* courses are C1401x-C1402y. Since this course does not have a year-long lab, you must take the lab at Barnard: see the physics department to make arrangements. More advanced physics courses (C1601x-C1602y) are also ok, but those with lower numbers (C1201x-1202y, C1301x-1302y) are **not** acceptable. See the Physics department Chair for prior approval of any summer physics course; the Chemistry department Chair must also sign that the course is appropriate for the major.

What Calculus is required?

Two semesters of calculus are required. This usually means Calculus I and II, but we also allow I and III. If possible, take all three, along with more advanced mathematics. This is especially true of you plan to do graduate work in physical chemistry. Linear algebra and differential equations are quite important in chemistry.

Who is invited to participate in the Senior Thesis Program?

The chemistry faculty meet and consider several factors. One is overall performance in chemistry courses: it need not be all A's, but it should be a good solid record. We also look at how many major requirements have been completed: it may be impractical to commit the time to a research project if there is too much course work remaining. Finally, we consider factors that suggest that you will be able to work on an independent project: responsibility, commitment, maturity, and good lab skills. Students not invited to do a thesis may still choose to do research, if they find a faculty member in whose laboratory they may work.