# CHEMISTRY MAJOR  
## Suggested Four-Year Program*  

<table>
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<tr>
<th>YEAR</th>
<th>COURSE</th>
<th>CRED.</th>
<th>PREREQUISITE(S)</th>
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| **First-year** | Fall | CHEM BC2001x (Gen. Chem.)  
MATH UN1101x (Calc. I), Note 1 | 5.0  
3.0 | Algebra |
| | Spring | CHEM BC3230y (Orgo I)  
CHEM BC3328y (Orgo I Lab)  
MATH UN1102 y (Calc. II), Note 1 | 3.0  
2.5  
3.0 | CHEM BC2001x  
CHEM BC2001x; Coreq.: CHEM BC3230y  
MATH UN1101x,y |
| **Soph.** | Fall | CHEM BC3231x (Orgo II)  
CHEM BC3333x (Mod. Tech.)  
PHYS BC2001x (Physics w/ lab), Note 2 | 3.0  
3.0  
4.5 | CHEM BC3230y  
CHEM BC3328y; Coreq.: CHEM BC3231x  
Coreq.: MATH UN1101x,y |
| | Spring | CHEM BC3242y (Quant. Lecture)  
CHEM BC3338y (Quant. Lab)  
PHYS BC2002y (Physics w/ lab), Note 2 | 3.0  
3.0  
4.5 | CHEM BC3231x; MATH UN1101x,y; Coreq.: CHEM BC3338y  
CHEM BC3231x, 3333x; Coreq.: CHEM BC3242y  
Coreq.: MATH UN1102x,y |
| **Junior** | Fall | CHEM BC3253x (Quantum)  
Elective Course (optional), Note 3 | 3.0  
3.0 | CHEM BC3242y; MATH UN1102 or 1201; PHYS BC2001x, 2002y |
| | Spring | CHEM BC3252y (Thermo. & Kinetics)  
CHEM BC3348y (Adv. Spec. Lab)  
CHEM BC3271y (Inorganic) | 3.0  
3.0  
3.0 | CHEM BC3242y, MATH UN1102 or 1201; PHYS BC2001x, 2002y  
CHEM BC3253x; Coreq.: CHEM BC3271y, 3252y, CHEM BC3231x |
| **Senior** | Fall | CHEM BC3358x (Adv. Syn. Lab)  
Senior Requirement, Note 4  
CHEM BC3282x (Biol. Chem.), Note 5 | 5.0  
4.0  
3.0 | CHEM BC3333x, 3338y, 3271y; Coreq.: CHEM BC3253x  
CHEM BC3231y; BIOL BC1502y |
| | Spring | Senior Requirement (Note 4)  
Elective Course (Note 3) | 4.0  
3.0 | |

*If you complete CHEM BC2001 (General Chemistry) in your sophomore year, it is still possible to complete the major in three years. Please consult the department website and contact a Chemistry faculty member for assistance with program planning.

**Note 1.** Two semesters of math **after entering college**, including Calculus I and II are required. Students having AP credit for 1 or 2 semesters of calculus will fulfill this requirement with additional mathematics, statistics, or computer science courses. **For the Class of 2021 and beyond, students must complete through Calculus II, including two math courses while a student at Barnard.** At least one of the courses taken at Barnard must be a calculus class. The remaining requirement can be fulfilled with a mathematics, statistics, or computer science course. A few suggested courses that fulfill this requirement after students have taken through Calculus II and after they have completed at least one calculus class in college are (1) Computer Science W1004 INTRO-COMP SCI/PROG IN JAVA; (2) Computer Science W1005 INTRO-COMP SCI/PROG-MATLAB; (3) Engineering E1006 INTRO TO COMP FOR ENG/APP SCI; (4) ORCA 2500 Foundations of Data Science; (5) BC3050 BIG DATA WITH PYTHON.

**Note 2.** The Barnard physics sequence (PHYS BC2001x-2002y) is strongly recommended. Any calculus-based Columbia sequence, with two semesters of laboratory work, is acceptable (1401-2, 1601-2, but not 1201-2). Consult with your advisor to ensure proper laboratory placement. For greater coverage of basic physics, PHYS BC3001x (Waves and Optics) is recommended.

**Note 3.** One elective course is required. A list of approved advanced lecture and/or lab courses at Barnard or Columbia is available.

**Note 4.** **Senior Honors Thesis (CHEM BC3901/3902) or Guided Research (CHEM BC3599) at Barnard, Columbia, or elsewhere.**

**Note 5.** Completion of CHEM BC3282 (Biological Chemistry) is required to receive an American Chemical Society certified degree. It is **not required** for the major.
ELECTIVE COURSE(S):

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<tr>
<th>COURSE</th>
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<tr>
<td>☐ CHEM BC3280 Advanced Organic</td>
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<td>☐ CHEM BC3272x Advanced Inorganic</td>
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<td>☐ CHEM BC3254 Methods and Applications in Physical Chemistry</td>
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<tr>
<td>☐ CHEM BC3282 Biological Chemistry I (required for ACS certification)</td>
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<td>☐ CHEM BC3283 Biological Chemistry II</td>
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<tr>
<td>☐ CHEM BC3355 Biochemistry Laboratory Techniques</td>
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<tr>
<td>☐ Approved CU course: _____________________________</td>
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SENIOR REQUIREMENT:

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<tr>
<td>☐ CHEM BC3901/3902 Senior Honors Thesis</td>
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<tr>
<td>☐ CHEM BC3599 Guided Research</td>
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GENERAL ADVISING NOTES:

- Students are encouraged to take Quantum Chemistry before Thermodynamics and Kinetics, but either order is acceptable. Note that Quantum is a co-requisite for the Advanced Synthesis Lab.
- Students are encouraged to consider taking an elective course during the Fall semester of their junior year.
- Students are strongly encouraged to take a math course after their first year.

OTHER NOTES/COMMENTS: