

| Requirements - Hope College Chemistry (Fall 2020)  |  | Credits  | Lab Hrs | BA chemistry   | BS chemistry | BS ACS        | ACS biochem emphasis | BS biochem/molec biol |
|--|--|--|---------|--|--------------|---------------|----------------------|-----------------------|
| Gen Chem Lecture (either 125 & 126 or 131)   |  | 6  |         | required   | required     | required      | required             | required              |
| Gen Chem Lab (either 127 & 128 or 132)   |  | 2  |         | required   | required     | required      | required             | required              |
| Organic 1 (221)  |  | 3  |         | required   | required     | required      | required             | required              |
| Organic Lab 1 (255)  |  | 2  | 84      | required   | required     | required      | required             | required              |
| Organic 2 (231)  |  | 3  |         | required   | required     | required      | required             | required              |
| Organic Lab 2A (256A)  |  | 1  | 42      | required   | required     | required      | required             | required              |
| Organic Lab 2B (256B)  |  | 1  | 42      | elective   | elective     | elective      | elective             | elective              |
| Biochem 1 (311)  |  | 3  |         | option (1)   | elective     | required      | required             | required              |
| Biochem 2 (314)  |  | 3  |         | elective   | elective     | option (3)    | required             | required              |
| Biochem Lab (315)  |  | 1  | 42      | elective   | elective     | elective      | required             | required              |
| Inorganic (322)  |  | 3  |         | option (1)   | required     | required      | required             | option (5)            |
| Inorganic Lab (324)  |  | 1  | 42      | elective   | elective     | required      | elective             | option (5)            |
| Analytical lecture and lab (331 + 332)   |  | 4  | 42      | option (1)   | required     | required      | required             | option (5)            |
| Physical Chem 1 (343)  |  | 3  |         | option (1)   | required     | required      | required             | required              |
| Physical Chem Lab 1 (345)  |  | 1  | 42      | elective   | required     | required      | required             | required              |
| Physical Chem 2 (344)  |  | 3  |         | elective   | required     | required      | option (4)           | option (5)            |
| Physical Chem Lab 2 (346)  |  | 1  | 42      | elective   | required     | required      | elective             | option (5)            |
| Communication in Chem and Biochem (326)  |  | 2  |         | elective   | elective     | option (3)    | option (4)           | option (5)            |
| Neurochem (335) (lecture + lab)  |  | 4  | 42      | elective   | elective     | option (3)    | option (4)           | option (5)            |
| Advanced Laboratory Techniques (350)   |  | 2  | 21      | elective   | elective     | option (3)    | option (4)           | option (5)            |
| Reactions, Mechanisms and Synth (352)  |  | 2  |         | elective   | elective     | option (3)    | option (4)           | option (5)            |
| Computational Chemistry (354)  |  | 2  | 21      | elective   | elective     | option (3)    | option (4)           | option (5)            |
| Structures and Materials (356)   |  | 2  |         | elective   | elective     | option (3)    | option (4)           | option (5)            |
| Env. Geochemistry (GES 430)  |  | 4  |         | elective   | elective     | option (3)    | n/a                  | n/a                   |
| Research (490) (42 lab hrs/credit)   |  | 1  | 84 max  | elective   | elective     | elective      | elective             | elective              |
| Choose electives so Chemistry credits total at least:  |  |  |         | 25   | 36           |               |                      |                       |
| Lab requirement (beyond General Chemistry)   |  |  |         | 4 lab credits  |              | 400 lab hours | 400 lab hours        |                       |
| Calculus 1 (Math 131 or 125+126)   |  | 4  |         | required   | required     | required      | required             | required              |
| Calculus 2 (Math 132)  |  | 4  |         | required   | required     | required      | required             | required              |
| Multivariable 1 (Math 231)   |  | 4  |         | elective   | recommend    | recommend     | recommend            | recommend             |
| Multivariable 2 (Math 232)   |  | 4  |         | elective   | recommend    | recommend     | recommend            | recommend             |
| General Physics 1 (Phys 121)   |  | 3  |         | required (2)   | required     | required      | required             | required              |
| General Physics 1 Lab (Phys 141)   |  | 1  |         | required (2)   | required     | required      | required             | required              |
| General Physics 2 (Phys 122)   |  | 3  |         | required (2)   | required     | required      | required             | required              |
| General Physics 2 Lab (Phys 142)   |  | 1  |         | required (2)   | required     | required      | required             | required              |
| General Biology I (Bio 105+107)  |  | 4  |         | n/a  | n/a          | n/a           | note (7)             | required              |
| General Biology II (Bio 106+108)   |  | 4  |         | n/a  | n/a          | n/a           | note (7)             | required              |
| Molecular Biology (Bio 366)  |  | 4  | 42      | n/a  | n/a          | n/a           | option (4)           | required              |
| Cell Biology (Bio 348) + Lab (Bio 349)   |  | 3 + 1  | 42      | n/a  | n/a          | n/a           | option (4)           | option (5)            |
| Genetics (Bio 356) + Lab (Bio 357)   |  | 3 + 1  | 42      | n/a  | n/a          | n/a           | option (4)           | option (5)            |
| Gen Ed requirements  |  | Total science credits:   |         | 41   | 60 (6)       | 60 (6)        | 60 (6)               | 64                    |
| FYS 2  |  | General education credits:   |         | 46   | 46           | 46            | 46                   | 46                    |
| Health Dy 2  |  | <b>Total committed credits:</b>  |         | <b>87</b>  | <b>106</b>   | <b>106</b>    | <b>106</b>           | <b>110</b>            |
| Religion 6   |  | Credits remaining:   |         | 39   | 20           | 20            | 20                   | 16                    |
| Arts 6   |  | Option 1: The BA degree requires two of these four courses   |         |  |              |               |                      |                       |
| Cult Heritage 8  |  | Option 2: College Physics may be applied to the BA degree in place of General Physics  |         |  |              |               |                      |                       |
| Social science 6   |  | Option 3: ACS BS degree requires two full-semester courses among indicated options. Two 2-cr courses = one full semester course.   |         |  |              |               |                      |                       |
| Exp Writing 4  |  | Option 4: ACS BS w/ biochem requires 2 full-semester upper level courses: one from among Chem 335, Bio 348, Bio 356, or Bio 366, and one from Chem 335, Chem 344, or any two 2-cr courses (Note that Neurochem/Chem 335 can satisfy either group, not both.) |         |  |              |               |                      |                       |
| Language 8   |  |  |         |  |              |               |                      |                       |
| Senior seminar 4   |  |  |         |  |              |               |                      |                       |
| (approx) total: 46   |  |  |         |  |              |               |                      |                       |
| General Education counts assume that student will need two college classes of foreign language, and that Global Learning requirements will be met within previously selected classes |  |  |         | Option 5: BMB BS requires 8 additional credits from these courses with 4 credits from each department. Beyond courses listed above, others could include General Microbiology (Bio 301), Advanced Topics in Botany (Bio 340 - depending on topic), Virology (Bio 341), and Developmental Biology (Bio 355) |              |               |                      |                       |
|  |  |  |         | Note 6: For all Chem BS degrees, additional science credits must add up to at least 60 science credits.  |              |               |                      |                       |
|  |  |  |         | Note 7: General Biology I + II are prerequisites for all upper level biology courses.  |              |               |                      |                       |