

Bachelor of Science with Major in Chemistry

Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. Essential Studies Requirements (see University ES guidelines and course listings)

II. The Following Curriculum:

Major Requirements — 43 hours (Option A) or 40 hours (Option B) of Chemistry and Biochemistry including:

Option A. Physical Science Emphasis

Freshman Year

| First Semester | | Credits |
|--|--|---------|
| CHEM 101 | Orientation to Chemistry | 1 |
| CHEM 121 & 121L | General Chemistry I and General Chemistry I Laboratory | 4 |
| ENGL 110 | College Composition I | 3 |
| MATH 165 | Calculus I ¹ | 4 |
| Essential Studies and Other Electives ² | | 4 |
| Credits | | 16 |

Second Semester

| | | |
|--|--|----|
| CHEM 122 & 122L | General Chemistry II and General Chemistry II Laboratory | 4 |
| MATH 166 | Calculus II | 4 |
| ENGL 130 | Composition II: Writing for Public Audiences | 3 |
| Essential Studies and Other Electives ² | | 4 |
| Credits | | 15 |

Sophomore Year

| First Semester | | Credits |
|-----------------|--|---------|
| CHEM 333 & 333L | Analytical Chemistry and Analytical Chemistry Laboratory | 4 |
| CHEM 341 & 341L | Organic Chemistry I and Organic Chemistry I Laboratory | 4 |
| CHEM 361 | Problem Solving in Organic Chemistry I | 1 |
| PHYS 251 | University Physics I | 4 |
| MATH 265 | Calculus III | 4 |
| Credits | | 17 |

Second Semester

| | | |
|--|--|----|
| CHEM 342 & 342L | Organic Chemistry II and Organic Chemistry II Laboratory | 4 |
| CHEM 362 | Problem Solving in Organic Chemistry II | 1 |
| PHYS 252 | University Physics II | 4 |
| Essential Studies and Other Electives ² | | 6 |
| Credits | | 15 |

Junior Year

| First Semester | | Credits |
|--|---|---------|
| CHEM 443 | Instrumental Analysis III - Chromatography/Mass Spectrometry ³ | 2 |
| CHEM 466 | Fundamentals of Physical and Biophysical Chemistry | 4 |
| First Semester of a Foreign Language ⁵ | | 4 |
| Essential Studies and Other Electives ^{2,4} | | 6 |
| Credits | | 16 |

Second Semester

| | | |
|-----------|---|---|
| CHEM 441 | Instrumental Analysis I - Spectroscopy ³ | 2 |
| CHEM 471 | Quantum Mechanics & Spectroscopy | 3 |
| CHEM 471R | Quantum Mechanics & Spectroscopy Recitation | 1 |
| CHEM 462 | Physical Chemistry Laboratory | 3 |

| | | |
|--|--|----|
| Second Semester of a Foreign Language ⁵ | | 4 |
| Essential Studies and Other Electives ^{2,4} | | 3 |
| Credits | | 16 |

Senior Year

| First Semester | | Credits |
|--|--|---------|
| Essential Studies and Other Electives ⁴ | | 15 |
| Credits | | 15 |

Second Semester

| | | |
|--|--|-----|
| CHEM 442 | Instrumental Analysis II - Electrochemistry ³ | 2 |
| CHEM 495 | Chemistry Capstone | 3 |
| Essential Studies and Other Electives ⁴ | | 10 |
| Credits | | 15 |
| Total Credits | | 125 |

¹ If a student is not ready for MATH 165 Calculus I, the math sequence may be moved back one semester and MATH 107 Precalculus (also MATH 103 College Algebra, if needed) should be taken in the first semester.

² Suggested electives are courses in Physics, Mathematics, Biochemistry, Biology, Computer Science, Chemical Engineering, Business Management, and Speech.

³ Chem 44X (CHEM 441 Instrumental Analysis I - Spectroscopy, CHEM 442 Instrumental Analysis II - Electrochemistry and CHEM 443 Instrumental Analysis III - Chromatography/Mass Spectrometry) courses are offered within a regular, two-year cycle. Students can take Chem 44X courses in any order.

⁴ Other undergraduate and graduate level courses in Chemistry may be taken as electives. One credit hour must be from either Special Problems in Chemistry (Chem 392) or Senior Research (Chem 492).

⁵ Two semesters of a foreign language are required. If a student wishes to pursue Study Abroad, taking language courses earlier is recommended.

Option B. Biochemistry Emphasis

Freshman Year

| First Semester | | Credits |
|-----------------------------|---|---------|
| CHEM 101 | Orientation to Chemistry | 1 |
| CHEM 121 & 121L | General Chemistry I and General Chemistry I Laboratory | 4 |
| ENGL 110 | College Composition I | 3 |
| BIOL 150 & 150L | General Biology I and General Biology I Laboratory ² | 4 |
| Essential Studies Electives | | 3 |
| Credits | | 15 |

Second Semester

| | | |
|-----------------------------|---|----|
| CHEM 122 & 122L | General Chemistry II and General Chemistry II Laboratory | 4 |
| MATH 146 | Applied Calculus I ¹ | 3 |
| BIOL 151 & 151L | General Biology II and General Biology II Laboratory ² | 4 |
| ENGL 130 | Composition II: Writing for Public Audiences | 3 |
| Essential Studies Electives | | 3 |
| Credits | | 17 |

Sophomore Year

| First Semester | | Credits |
|--|--|---------|
| CHEM 333 & 333L | Analytical Chemistry and Analytical Chemistry Laboratory | 4 |
| CHEM 341 & 341L | Organic Chemistry I and Organic Chemistry I Laboratory | 4 |
| CHEM 361 | Problem Solving in Organic Chemistry I | 1 |
| PHYS 211 | College Physics I | 4 |
| Essential Studies and Other Electives ³ | | 3 |
| Credits | | 16 |

Second Semester

| | | |
|-----------------|--|---|
| CHEM 342 & 342L | Organic Chemistry II and Organic Chemistry II Laboratory | 4 |
| CHEM 362 | Problem Solving in Organic Chemistry II | 1 |

| | | |
|--|--|-----|
| PHYS 212 | College Physics II | 4 |
| Essential Studies and Other Electives ³ | | 6 |
| Credits | | 15 |
| Junior Year | | |
| First Semester | | |
| CHEM 466 | Fundamentals of Physical and Biophysical Chemistry | 4 |
| First Semester of a Foreign Language ⁴ | | 4 |
| Essential Studies and Other Electives ³ | | 8 |
| Credits | | 16 |
| Second Semester | | |
| CHEM 467 | Survey of Physical Chemistry Laboratory | 2 |
| BMB 301 | Biochemistry | 3 |
| Second Semester of a Foreign Language ⁴ | | 4 |
| Essential Studies and Other Electives ³ | | 6 |
| Credits | | 15 |
| Senior Year | | |
| First Semester | | |
| BMB 401 | Biochemistry of Proteins and Information Flow | 3 |
| BMB 403 | Advanced Biochemistry Laboratory | 2 |
| Essential Studies and Other Electives ³ | | 11 |
| Credits | | 16 |
| Second Semester | | |
| CHEM 495 | Chemistry Capstone | 3 |
| Essential Studies and Other Electives ³ | | 12 |
| Credits | | 15 |
| Total Credits | | 125 |

¹ If a student is not ready for MATH 146 Applied Calculus I, MATH 103 College Algebra should be taken in the first semester. If a student would like the option to change into the B.S. in Chemistry or the B.S. with Major in Chemistry with emphasis for the Physical Science Option at a later date, be aware that MATH 165 Calculus I, MATH 166 Calculus II, and MATH 265 Calculus III are required. If a student who begins either the B.S. in Chemistry or the B.S. with Major in Chemistry with emphasis for the Physical Science Option wishes to change into the Biochemistry Option, MATH 165 Calculus I will substitute for MATH 146 Applied Calculus I.

² BIOL 150 General Biology I and BIOL 151 General Biology II can be taken in the sophomore year. They are prerequisites to other required biology courses.

³ Electives must include 3 credit hours from BIOL 341 Cell Biology, BIOL 315 Genetics, or MBIO 302 General Microbiology Lecture/MBIO 302L General Microbiology Laboratory and one credit hour from either CHEM 392, Special Problems in Chemistry, or CHEM 492, Senior Research. Other suggested electives are courses in Physics, Mathematics, Biochemistry, Biology, Languages, Computer Science, Chemical Engineering, Business Management, and Speech. Other undergraduate and graduate level courses in Chemistry may also be taken as electives.

⁴ Two semesters of a foreign language are required. If a student wishes to pursue Study Abroad, taking language courses earlier is recommended.