



This course plan is a recommended sequence for this major. Courses designated as critical (!) may have a deadline for completion and/or affect time to graduation. Please see the Program Notes section for details regarding “critical courses” for this particular Program of Study.

| Critical                                   | Course Subject and Title   | Credit Hours | Min. Grade <sup>1</sup> | Major GPA <sup>2</sup> | Code             | Prerequisites  | Notes |
|--|--|--------------|-------------------------|------------------------|------------------|--|-------|
| <b>Semester One (17-18 Credit Hours)</b>   |  |              |                         |                        |                  |  |       |
| !  | ENGL 101 Critical Reading and Composition  | 3            | C                       |                        | CC-CMW           |  |       |
|  | MATH 141 Calculus I <sup>3</sup>   | 4            |                         |                        | CC-ARP           | Math 112/115/116 <i>or</i> Math placement test   |       |
|  | CHEM 111 General Chemistry I <sup>4</sup>  | 3            | C                       |                        | PR               | MATH 111/112/122/141 <i>or</i> higher math <i>or</i> placement test; Coreq: CHEM 111L  |       |
|  | CHEM 111L General Chemistry I Lab  | 1            | C                       |                        | PR               | Coreq: CHEM 111  |       |
|  | Foreign language <sup>5</sup> <i>or</i> other Carolina Core Requirement <sup>6</sup>   | 3-4          |                         |                        | CC-GFL           |  |       |
|  | UNIV 101 The Student in the University <i>or</i> Carolina Core Requirement <sup>6</sup>  | 3            |                         |                        | PR/CC            |  |       |
| <b>Semester Two (18 Credit Hours)</b>      |  |              |                         |                        |                  |  |       |
| !  | ENGL 102 Rhetoric and Composition  | 3            | C                       |                        | CC-CMW<br>CC-INF |  |       |
|  | MATH 142 Calculus II   | 4            |                         |                        | CC-ARP           | MATH 141   |       |
| !  | CHEM 112 General Chemistry II <sup>4</sup>   | 3            | C                       |                        | PR               | CHEM 111 <i>or</i> 141 & MATH 111, 115 <i>or</i> higher math; Prereq <i>or</i> Coreq: MATH 122, 141 <i>or</i> higher & CHEM 112L                     |       |
|  | CHEM 112L General Chemistry II Lab   | 1            | C                       |                        | PR               | Coreq: CHEM 112  |       |
|  | PHYS 211 Essentials of Physics I   | 3            | C                       |                        | CC-SCI           | MATH 141; Coreq: PHYS 211L   |       |
|  | PHYS 211L Essentials of Physics I Lab  | 1            | C                       |                        | CC-SCI           | Coreq: PHYS 211  |       |
|  | Foreign language <sup>5</sup> <i>or</i> other Carolina Core Requirement <sup>6</sup>   | 3            |                         |                        | CC-GFL           |  |       |
| <b>Semester Three (15 Credit Hours)</b>    |  |              |                         |                        |                  |  |       |
|  | MATH 241 Vector Calculus <sup>7</sup>  | 3            |                         |                        | PR               | MATH 142   |       |
|  | CHEM 333 Organic Chemistry I   | 3            | C                       |                        | MR               | CHEM 112 <i>or</i> CHEM 142  |       |
|  | CHEM 333L Organic Chemistry I Lab  | 2            | C                       |                        | MR               | Prereq <i>or</i> Coreq: CHEM 333   |       |
|  | PHYS 212 Essentials of Physics II <sup>7</sup>   | 3            | C                       |                        | CC-SCI           | PHYS 211 & MATH 142; Coreq: PHYS 212L  |       |
|  | PHYS 212L Essentials of Physics II Lab <sup>7</sup>  | 1            | C                       |                        | CC-SCI           | PHYS 212   |       |
|  | Foreign language <sup>5</sup> <i>or</i> Carolina Core Requirement <sup>6</sup>   | 3            |                         |                        | CR/CC            |  |       |
| <b>Semester Four (15 Credit Hours)</b>     |  |              |                         |                        |                  |  |       |
|  | CHEM 322 Analytical Chemistry  | 3            | C                       |                        | MR               | CHEM 112/112L <i>or</i> CHEM 142; MATH 141; Coreq: CHEM 322L   |       |
|  | CHEM 322L Analytical Chemistry Lab   | 1            | C                       |                        | MR               | Coreq: CHEM 322  |       |
|  | CHEM 334 Organic Chemistry II  | 3            | C                       |                        | MR               | CHEM 333   |       |
|  | CHEM 334L Organic Chemistry II Lab   | 2            | C                       |                        | MR               | CHEM 333L; Prereq/Coreq: CHEM 334  |       |
|  | History <sup>9</sup>   | 3            |                         |                        | CR               |  |       |
|  | Carolina Core Requirement <sup>6</sup>   | 3            |                         |                        | CC               |  |       |
| <b>Semester Five (14-17 Credit Hours)</b>  |  |              |                         |                        |                  |  |       |
|  | CHEM Elective <sup>10</sup>  | 3            | C                       |                        | MR               |  |       |
|  | CHEM 541 & CHEM 541L – Physical Chemistry <i>or</i> CHEM 542 & CHEM 542L – Physical Chemistry                                    | 5            | C                       |                        | MR/CC-INT        | See Bulletin listing.  |       |
|  | STAT 509 Statistics for Engineers <i>or</i> STAT 515 Statistical Methods I <sup>7</sup> & <sup>8</sup> ( <i>only if needed</i> ) | 0-3          |                         |                        | CR               | MATH 142 ( <i>STAT 509 only</i> ); MATH 122 <i>or</i> 141 <i>or</i> both MATH 111 <i>or</i> higher and any statistics class ( <i>STAT 515 only</i> ) |       |
|  | Cognate <i>or</i> Minor Course <sup>7</sup> <i>or</i> Approved Elective <sup>11</sup>  | 3            | C ( <i>minor</i> )      |                        | PR               |  |       |
|  | Humanities <i>or</i> Fine Arts   | 3            |                         |                        | CR               |  |       |
| <b>Semester Six (14-15 Credit Hours)</b>   |  |              |                         |                        |                  |  |       |
|  | CHEM 541 & CHEM 541L – Physical Chemistry <i>or</i> CHEM 542 & CHEM 542L – Physical Chemistry                                    | 5            | C                       |                        | MR/CC-INT        | See Bulletin listing.  |       |
|  | CSCE 206 Scientific Applications Programming <i>or</i> CSCE 145 Algorithmic Design I   | 3-4          |                         |                        | CR               | MATH 122 <i>or</i> 141 ( <i>CSCE 206 only</i> ); pre- <i>or</i> co-req: MATH 111 <i>or</i> 115 ( <i>CSCE 145 only</i> )                              |       |
|  | Cognate <i>or</i> Minor Course <sup>7</sup> <i>or</i> Approved Elective <sup>11</sup>  | 3            | C ( <i>minor</i> )      |                        | PR               |  |       |
|  | Carolina Core Requirement <sup>6</sup>   | 3            |                         |                        | CC               |  |       |
| <b>Semester Seven (12-15 Credit Hours)</b> |  |              |                         |                        |                  |  |       |
|  | CHEM 496-499 Undergraduate Research <sup>12</sup> ( <i>optional</i> )  | 0-3          | C                       |                        | MR               | Independent Study Contract Required  |       |
|  | Cognate <i>or</i> Minor Course <sup>7</sup> <i>or</i> Approved Elective <sup>11</sup>  | 3            | C ( <i>minor</i> )      |                        | PR               |  |       |
|  | Cognate <i>or</i> Minor Course <sup>7</sup> <i>or</i> Approved Elective <sup>11</sup>  | 3            | C ( <i>minor</i> )      |                        | PR               |  |       |
|  | Social Science   | 3            |                         |                        | CR               |  |       |
|  | Carolina Core Requirement <sup>6</sup> <i>or</i> Approved Elective <sup>11</sup>   | 3            |                         |                        | CC/PR            |  |       |

| Semester Eight (15 Credit Hours) |   |   |                    |  |       |  |
|----------------------------------|---|---|--------------------|--|-------|--|
|                                  | Minor Course <sup>7</sup> or Approved Elective <sup>11</sup>              | 3 | C ( <i>minor</i> ) |  | PR    |  |
|                                  | Minor Course <sup>7</sup> or Approved Elective <sup>11</sup>              | 3 | C ( <i>minor</i> ) |  | PR    |  |
|                                  | Carolina Core Requirement <sup>6</sup> or Approved Elective <sup>11</sup> | 3 |                    |  | CC/PR |  |
|                                  | Approved Elective <sup>11</sup>   | 3 |                    |  | PR    |  |
|                                  | Approved Elective <sup>11</sup>   | 3 |                    |  | PR    |  |

### Graduation Requirements Summary

| Minimum Total Hours | Minimum Major Requirements Hours | College & Program Requirements Hours | Carolina Core Hours | Minimum Institutional GPA |
|---------------------|----------------------------------|--------------------------------------|---------------------|---------------------------|
| 120                 | 27                               | 47-60                                | 34-46               | 2.000                     |

- Regardless of individual course grades, students must maintain a minimum 2.000 cumulative GPA.
- Some colleges require a minimum GPA for major courses. Courses indicated in this column are included in the major GPA for this program of study.
- Students who do not place into MATH 141 will be required to successfully complete MATH 112, 115, or 116 before taking MATH 141.
- CHEM 141 may be taken in place of CHEM 111 and CHEM 111L, and CHEM 142 may be taken in place of CHEM 112 and CHEM 112L.
- Students in the College of Arts and Sciences are required to demonstrate proficiency in one foreign language equivalent to the 122 course through course credit or the corresponding foreign language placement score.
- The [Carolina Core](#) provides the common core of knowledge, skill and academic experience for all Carolina undergraduate students.
- The cognate is intended to support the course work in the major. The cognate must consist of twelve hours of courses at the advanced level, outside of, but related to the major. In place of a cognate, a student may choose a minor consisting of at least 18 credit hours of courses concentrated in one area that follow a structured sequence. A second major eliminates the minor/cognate requirement. Students may use MATH 241, STAT 509/515, and PHYS 212 and 212L toward the cognate requirement, but would need to complete additional electives to meet hours to graduate.
- If CHEM 111, 112, 322, and 322L (or CHEM 141, 142, 322 and 322L) are all completed at USC, STAT 509 or 515 is not required. Also, if CHEM 621 and 621L are completed, STAT 509 or 515 is not required. Students who exempt STAT 509 or 515 through this process will be required to take an approved elective to reach minimum hours for graduation.
- The College of Arts and Sciences requires one U.S. History and one non-U.S. History course, both of which must be chosen from the approved Carolina Core GHS courses. Whichever is not fulfilled through the Carolina Core GHS requirement must be fulfilled through this college requirement.
- CHEM Electives (3-4 hours)

| Choose one from the following:  |  |
|---|--|
| CHEM 511 Inorganic Chemistry (3)  | CHEM 621 Instrumental Analysis (3) ( <i>and CHEM 621L</i> )    |
| CHEM 533 Comprehensive Organic Chemistry III (3)                              | CHEM 623 Introductory Environmental Chemistry (3)              |
| CHEM 545 Physical Biochemistry (3)  | CHEM 624 Aquatic Chemistry (3) – <i>cross-listed: MSCI 624</i> |
| CHEM 550 Biochemistry (3) – <i>cross-listed: BIOL 541</i>                     | CHEM 633 Introduction to Polymer Synthesis (3)                 |
| CHEM 555 Biochemistry/Molecular Biology I (3) – <i>cross-listed: BIOL 545</i> | CHEM 644 Materials Chemistry (3)                               |

- No courses of a remedial, developmental, skill-acquiring, or vocational nature may apply as credit toward degrees in the College of Arts and Sciences. The College of Arts and Sciences allows the use of the Pass-Fail option on elective courses. Further clarification on inapplicable courses can be obtained from the College of Arts and Sciences.
- Students are encouraged to start undergraduate research as early as possible to allow participation in long-term projects. Three credits of undergraduate research are required, but additional research experience is recommended. Extramural Research opportunities, such as REU's may qualify for CHEM 496-499 credit; however, a request form must be submitted and preapproved by the Department of Chemistry.

### Program Notes:

- ENGL 101 and ENGL 102 must be completed in the student's first 60 semester hours of work in order for these courses to be credited toward graduation. CHEM 112 is a prerequisite for subsequent required courses and may delay progression if not taken in a timely manner.
- Any Chemistry or Biochemistry and Molecular Biology major can qualify for ACS certification by taking additional courses as listed: CHEM 511, CHEM 621, CHEM 621L, CHEM 550 or CHEM 555, and 6 credits of undergraduate research, CHEM 496-499.
- CHEM 401 Industrial Chemistry Capstone Experience is a recommended elective that prepares students for future roles in chemistry.
- Chemistry majors may enroll in a chemistry course a **maximum of twice** to earn the required grade of C or higher.
- A Chemistry major must receive a grade of C or higher in any chemistry course in order for it to be used to satisfy a major requirement.
- The last 30 credit hours toward your degree must be earned in residence at the University of South Carolina-Columbia.

**University Requirements:** Bachelor's degree-seeking students must meet Carolina Core (general education) requirements. For more information regarding these requirements, please visit the [Carolina Core](#) page on the University website.

| Codes:        |  |               |   |
|---------------|--|---------------|---|
| <b>CC</b>     | Carolina Core  | <b>CC-INF</b> | Carolina Core – Information Literacy                      |
| <b>CC-AIU</b> | Carolina Core-Aesthetic and Interpretive Understanding                             | <b>CC-INT</b> | Carolina Core – Integrative Course                        |
| <b>CC-ARP</b> | Carolina Core-Analytical Reasoning and Problem-Solving                             | <b>CC-SCI</b> | Carolina Core – Scientific Literacy                       |
| <b>CC-CMS</b> | Carolina Core-Effective, Engaged, and Persuasive Communication: Spoken Component   | <b>CC-VSR</b> | Carolina Core – Values, Ethics, and Social Responsibility |
| <b>CC-CMW</b> | Effective, Engaged, and Persuasive Communication: Written Component                | <b>CR</b>     | College Requirement                                       |
| <b>CC-GFL</b> | Carolina Core-Global Citizenship and Multicultural Understanding: Foreign Language | <b>MR</b>     | Major Requirement   |
| <b>CC-GHS</b> | Carolina Core – Historical Thinking  | <b>PR</b>     | Program Requirement                                       |
| <b>CC-GSS</b> | Carolina Core – Social Sciences  |               |   |

Disclaimer: Major maps are only a suggested or recommended sequence of courses required in a program of study. Please contact your academic advisor for assistance in the application of specific coursework to a program of study and course selection and planning for upcoming semesters.