Degree Requirements for the BS in Chemistry

This degree requires at least 124 credit hours, including 64 credit hours of chemistry requirements and at least 60 additional credit hours to satisfy distribution requirements. The following courses are required for all students pursuing the Bachelor of Science degree in Chemistry:

General Chemistry:
☐ CHEM 151 Honors Chemistry I or CHEM 121 General Chemistry I
☐ CHEM 152 Honors Chemistry II or CHEM 122 General Chemistry II
☐ CHEM 153 Honors Chemistry Laboratory I or CHEM 123 General Chemistry III
☐ CHEM 154 Honors Chemistry Laboratory II or CHEM 124 General Chemistry IV

Chemistry Foundation Courses:
☐ CHEM 211 Organic Chemistry I
☐ CHEM 211 Organic Chemistry I
☐ CHEM 310 Physical Chemistry
☐ CHEM 310 Physical Chemistry
☐ CHEM 330 Analytical Chemistry
☐ CHEM 330 Analytical Chemistry
☐ CHEM 360 Inorganic Chemistry
☐ CHEM 360 Inorganic Chemistry
☐ BIOC 301 Biochemistry I

Introductory Laboratory Modules:
☐ CHEM 231 or CHEM 351 Introductory Module in Inorganic Chemistry
☐ CHEM 231 or CHEM 351 Introductory Module in Inorganic Chemistry
☐ CHEM 232 or CHEM 352 Introductory Module in Organic Chemistry
☐ CHEM 232 or CHEM 352 Introductory Module in Organic Chemistry
☐ CHEM 353 Introductory Module in Analytical Methods

Mathematics*:
☐ MATH 101 Single Variable Calculus I
☐ MATH 101 Single Variable Calculus I
☐ MATH 102 Single Variable Calculus II
☐ MATH 102 Single Variable Calculus II
☐ MATH 211 Ordinary Differential Equations and Linear Algebra or MATH 221 Honors Calculus III
☐ MATH 211 Ordinary Differential Equations and Linear Algebra or MATH 221 Honors Calculus III
☐ MATH 212 Multivariable Calculus or MATH 222 Honors Calculus IV
☐ MATH 212 Multivariable Calculus or MATH 222 Honors Calculus IV

* The Department of Mathematics may, after consultation with a student concerning his/ her previous math preparation, recommend that a student be placed into a higher level math course than for which the student has official credit. The Department of Chemistry will accept this waiver of the math classes upon a written confirmation of the waiver from the Department of Mathematics and upon the student’s successful completion of the higher level math course.

Physics:
☐ PHYS 101 or 111 Mechanics (with lab) or PHYS 125 General Physics (with lab)
☐ PHYS 101 or 111 Mechanics (with lab) or PHYS 125 General Physics (with lab)
☐ PHYS 102 or 112 Electricity and Magnetism (with lab) or PHYS 126 General Physics II (with lab)

Advanced Lab Modules:
Two 300-level chemistry laboratory modules beyond CHEM 353. Laboratory courses from other departments can count if they have substantial chemistry content (these must be approved by the track advisor). Students interested in health professions need two credit hours of organic laboratory (either CHEM 215, or both CHEM 232 and CHEM 374).

☐ 300-level Chem Laboratory Module Course Number and Name: _________________________
☐ 300-level Chem Laboratory Module Course Number and Name: _________________________

☐ Signature of Advisor if the lab courses are from another department: ____________________________  Date: _____________

Research:
Each student must complete three semesters of research, each with 3 or more credit hours (any combination of CHEM 491 Research for Undergraduates, CHEM 492 Undergraduate Honors Research, or CHEM 493 Undergraduate Honors Research). Corresponding research courses from other departments in Science and Engineering may be used towards this requirement. A semester of research can be replaced by 1) CHEM 215; 2) an additional advanced laboratory module; 3) or CHEM 700 (Teaching Practicum, which can be taken by undergrads who gain the instructor’s permission). No more than two semesters of research can be replaced through these substitutions.

☐ Course name and number ______________________________
☐ Course name and number ______________________________
☐ Course name and number ______________________________
In-depth Chemistry Courses

In addition to the above required courses for the Bachelor of Science in Chemistry, each student must complete the requirements for one of the following specializations or tracks. Other departments offer advanced courses with substantial chemistry content, and these may count toward this requirement with approval of a track advisor. A student may, by working with his or her chemistry major advisor and with the approval of the chemistry department, propose a track in another specialization. Such proposed tracks must have course and laboratory experiences comparable to those of the tracks listed below. A double specialization can be earned by completing the requirements for two specialties. For double specialization, only two advanced lecture courses may count towards both specializations. The remaining two advanced courses in each specialization must be unique (i.e., double specialization requires six advanced lecture courses, and triple specialization require eight). A nanotechnology specialization can be added to any of the standard tracks by adding two nanoscience courses. Most in-depth courses are 400-level or higher, but CHEM 212 Organic Chemistry II and CHEM 320 Organic Chemistry II build upon the foundation established in CHEM 211 and are classified as in-depth courses.

Specialization in Biological and Medicinal Chemistry

- CHEM 212 Organic Chemistry II or CHEM 320 Organic Chemistry II
- BIOC 302 Biochemistry II

Two additional three-credit advanced chemistry courses. Students interested in biological and medicinal chemistry are encouraged to consider:

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<td>CHEM 401 Advanced Organic Chemistry</td>
<td>CHEM 442 Medicinal Chemistry I</td>
<td>CHEM 547 Supramolecular Chemistry</td>
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<tr>
<td>CHEM 411 Spectral Methods in Organic Chemistry</td>
<td>CHEM 443 Medicinal Chemistry II</td>
<td>BIOC 352 Physical Chemistry for the Biosciences</td>
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<td>CHEM 440 Enzyme Mechanisms</td>
<td>CHEM 543 Secondary Metabolism</td>
<td>CHEM 537 Biophysical Chemistry</td>
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Specialization in Inorganic Chemistry and Inorganic Materials

- CHEM 475 Physical Methods in Inorganic Chemistry
- CHEM 495 Transition Metal Chemistry

Two additional three-credit advanced chemistry courses. Course Number and Name ________________________________

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<td>CHEM 543 Secondary Metabolism</td>
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<td>CHEM 430 Quantum Chemistry</td>
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<td>CHEM 440 Enzyme Mechanisms</td>
<td>CHEM 445 Physical Organic Chemistry</td>
<td>CHEM 495 Transition Metal Chemistry</td>
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Specialization in Organic Chemistry

- CHEM 212 Organic Chemistry II or CHEM 320 Organic Chemistry II
- CHEM 401 Advanced Organic Chemistry

Two additional three-credit advanced chemistry courses. Students interested in organic chemistry are encouraged to consider:

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Specialization in Physical and Theoretical Chemistry

- CHEM 430 Quantum Chemistry
- CHEM 420 Classical and Statistical Thermodynamics

One additional three-credit advanced course in physical chemistry (CHEM 415 Chemical Kinetics and Dynamics, CHEM 450 Chemical Physical of Condensed and Biological Matter, CHEM 531 Advanced Quantum Chemistry, or CHEM 537 Biophysical Chemistry)

One additional three-credit advanced course in chemistry outside of physical chemistry

Specialization in an Alternative Area:

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