

**College of SCIENCE  
Department of CHEMISTRY  
Bachelor of Science in CHEMISTRY  
Major in CHEMISTRY**

**For Student Date of Entry Under UG Catalog 2022–2023**

A dagger (†) indicates a course with prerequisites or co-requisites.  
These are detailed on the last page of this check-sheet.

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| <b>I. Pathways General Education Requirements (49 credits)</b> |
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**Concept 1 Discourse (9 credits)**

(1f): 6 credits in foundational courses ENGL 1105-1106 is recommended

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(1a): 3 credits in advanced or applied writing or speaking courses

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**Concept 2 Critical Thinking in the Humanities (6 credits)**

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**Concept 3 Reasoning in the Social Sciences (6 credits).** PSYC 1004 and SOC 1004 are recommended for students contemplating careers in health sciences.

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**Concept 4 Reasoning in the Natural Sciences (8 credits).** The following two-course sequence is required of all students majoring in Chemistry within the B.S. Degree in Chemistry.

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| † PHYS 2305–2306 Foundations of Physics | 4 |  | 4 |  |
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**Concept 5 Quantitative and Computational Thinking (11 credits)**

(5f): 6 credits in foundational courses. The following course sequence is required of all students majoring in Chemistry within the B.S. Degree in Chemistry.

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| † MATH 1225–1226 Calculus of a Single Variable | 4 |  | 4 |  |
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(5a): 3 credits in advanced or applied courses. Students majoring in Chemistry within the B.S. Degree in Chemistry must select either STAT 3005 (†) or STAT 3615 (†).

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**Concept 6 Critique and Practice in Design and the Arts (6 credits = 3 in design + 3 in arts)**

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**Concept 7 Critical Analysis of Identity and Equity in the United States (3 credits)**

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**II. Chemistry Bachelor of Science Core Courses (22 credits)**

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|--|---|--|---|--|
| CHEM 1004 First Year Experience in Chemistry                               | 1 |  |   |  |
| † CHEM 1055–1056 General Chemistry for Majors                              | 4 |  | 4 |  |
| † CHEM 1065–1066 General Chemistry for Chemistry Majors Lab <sup>1,2</sup> | 1 |  | 1 |  |
| † CHEM 2565–2566 Principles of Organic Chemistry <sup>3</sup>              | 3 |  | 3 |  |
| † CHEM 2154 Analytical Chemistry for Chemistry Majors                      | 4 |  |   |  |
| † CHEM 2164 Analytical Chemistry for Chemistry Majors Lab                  | 1 |  |   |  |

**III. Additional Required Courses for the Chemistry Bachelor of Science (6 credits)\***

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| † CHEM 2555–2556 Organic Synthesis & Techniques Laboratory <sup>4</sup> | 2 |  | 2 |  |
| † CHEM 2564 Problem-Solving in Organic Chemistry <sup>3</sup>           | 1 |  |   |  |
| † CHEM 4014 Survey of Chemical Literature                               | 1 |  |   |  |

\* All students completing a B.S. in Chemistry must complete either STAT 3005 Statistical Methods (†) or STAT 3615 Biological Statistics (†). This requirement is included in Section I above.

**IV. Required Courses Specific to the Major in Chemistry (34 credits)\*\***

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|--|---|--|---|--|
| † CHEM 2424 Descriptive Inorganic Chemistry                    | 3 |  |   |  |
| † CHEM 3615–3616 Physical Chemistry                            | 3 |  | 3 |  |
| † CHEM 3625–3626 Physical Chemistry Laboratory                 | 1 |  | 1 |  |
| † CHEM 4114 Instrumental Analysis                              | 3 |  |   |  |
| † CHEM 4124 Instrumental Analysis Lab                          | 1 |  |   |  |
| † CHEM 4404 Physical Inorganic Chemistry                       | 3 |  |   |  |
| † CHEM 4414 Inorganic Chemistry Lab                            | 2 |  |   |  |
| <b>One</b> of the following courses:                           | 3 |  |   |  |
| † CHEM 4534 Organic Chemistry of Polymers                      |   |  |   |  |
| † CHEM 4634 / †MSE 4534 Polymer and Surface Chemistry          |   |  |   |  |
| † CHEM 4424 / †SBIO 4424 Polysaccharide Chemistry <sup>5</sup> |   |  |   |  |
| † CHEM 4584 Bioorganic Chemistry                               | 3 |  |   |  |
| MATH 1114 Elementary Linear Algebra                            | 2 |  |   |  |
| † MATH 2204 Introduction to Multivariable Calculus             | 3 |  |   |  |
| † MATH 2214 Introduction to Differential Equations             | 3 |  |   |  |

\*\* MATH 1225–1226 (†) and PHYS 2305–2306 (†) are also required of all Chemistry Majors within the B.S. Degree Program in Chemistry. These courses are listed in Section I above.

**V. Restricted Elective (3 credits)**

Any 3-credit, 4000-level course in CHEM, BCHM, or CHE for which applicable prerequisites are met.<sup>6</sup>

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**VI. Free Electives (6 credits)**

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### Prerequisites

This checklist has no hidden prerequisites, although some of the courses listed are prerequisites for other courses. Please see your advisor or consult the Undergraduate Course Catalog for more information. Please note that Chemistry majors are expected to be “calculus-ready” upon the start of their curriculum.

### Acceptable Substitutions

<sup>1</sup>Prior credit for CHEM 1045 may be substituted for CHEM 1065.

<sup>2</sup>Prior credit for CHEM 1046 may be substituted for CHEM 1066.

<sup>3</sup>If a student has taken CHEM 2535 prior to adding a degree in chemistry, a minimum grade of “B” (3.0) or better is required to substitute CHEM 2535 as CHEM 2565. If a student has taken CHEM 2536 prior to adding a degree in chemistry, a minimum grade of “B” (3.0) or better is required to substitute CHEM 2536 as CHEM 2566. A student who is substituting CHEM 2535 for CHEM 2565 may also substitute one additional credit of free elective for CHEM 2564 for a total of 7 credits of free electives.

<sup>4</sup>Since CHEM 2545-2546 does not satisfy the prerequisite for CHEM 2556 (due to training on specific instrumentation), if a student adds a CHEM BS degree after completing CHEM 2545-2546, two or more credits of CHEM 4994 may substitute for CHEM 2556 to meet the requirement.

<sup>5</sup>STAT 4604 may be substituted for (STAT 3005 or STAT 3615).

<sup>6</sup>Credit for CHE 2164 may be substituted for CHEM 3615

### Foreign Language Requirement

Students who did not successfully complete at least two years of a single foreign, classical, or sign language during high school must successfully complete six credit hours of a single foreign, classical, or sign language at the college level. Courses taken to meet this requirement do not count toward the hours required for graduates. Please consult the Undergraduate Catalog for details.

### Satisfactory Progress Towards Degree and Minimum Grade Requirements

Upon having attempted 72 credits, student must have completed CHEM 1055-1056, CHEM 1065-1066, CHEM 1004, CHEM 2565-2566, CHEM 2555-2556, PHYS 2305-2306, and MATH 1225-1226.

Chemistry majors must maintain an in-major GPA of 2.0. If a chemistry major fails to meet this requirement for one academic term the student will be placed on Policy 91 (Satisfactory Progress Towards Degree) probation. Failure to meet the standard for two consecutive semesters will result in a Policy 91 suspension.

Chemistry majors must earn a grade of “C” or better in CHEM 1055, 1056, and 2565.

- If a chemistry major fails to earn a “C” or better in CHEM 1055, the student must either retake this class (and earn the minimum grade) **or** take CHEM 1035-1036 *General Chemistry* and earn a “B” or better in both semesters to remain in good standing for a chemistry degree and to enroll in CHEM 2565.
- If a chemistry major fails to earn a “C” or better in CHEM 2565, the student must either retake this class (and earn the minimum grade) **or** take CHEM 2535 *Organic Chemistry* and earn a “B” or better to remain in good standing for a chemistry degree and to enroll in CHEM 2566.

### Graduation Requirements

Graduation requires completion of a minimum of 120 credit hours with a GPA of 2.0 or greater for all hours attempted. In addition, students must have an in-major GPA of 2.0 or greater counting all required chemistry courses and chemistry electives. The in-major CHEM GPA excludes Chemistry in Context (CHEM 1015, 1016, 1025, 1026), First-Year Experience (CHEM 1004), and Chemistry Problem Solving Skills (CHEM 2984). No more than 6 hours of CHEM 2974, 4974, and 4994 will be included in a student's in-major GPA.

### Table of Prerequisites and Co-requisites

Courses in this check-sheet marked with a dagger (†) have prerequisites or co-requisites.  
These are detailed in the following table.

| Check-sheet Course | Pre-requisites and Co-requisites   |
|--------------------|--|
| PHYS 2305-2306     | Pre: (MATH 1205 or MATH 1205H or MATH 1225) or (MATH 1206 or MATH 1206H or MATH 1226) for 2305; (MATH 1206 or MATH 1206H or MATH 1226), 2305 for 2306. Co: 2325 or (MATH 1206 or MATH 1206H or MATH 1226) for 2305 |
| MATH 1225–1226     | Pre: 1225 (C-) for 1226  |
| CHEM 1055–1056     | Co: 1065 for 1055; 1066 for 1056   |
| CHEM 1065–1066     | Co: 1055 for 1065; 1056 for 1066   |
| CHEM 2555–2556     | Co: 2565 for 2555, 2566 for 2556. Pre: 1045 or 1065 for 2555, 2555 for 2556.   |
| CHEM 2565–2566     | Pre: 1035 or 1055 or 1035H or 1055H for 2565; 2565 for 2566  |
| CHEM 2154          | Pre: 1036 or 1056 or 1056H. Co: 2164   |
| CHEM 2564          | Co: 2565   |
| CHEM 2164          | Pre: 1046 or 1066. Co: 2154  |
| CHEM 4014          | Pre: Junior standing   |
| STAT 3005          | Pre: MATH 1205 or MATH 1225; Co: MATH 1206 or MATH 1226  |
| STAT 3615          | Pre: MATH 1205 or MATH 1225 or MATH 1025 or MATH 1525  |
| CHEM 2424          | Pre: 1036 or 1056  |
| MATH 2004          | Pre: 1226  |
| MATH 2214          | Pre: (1114 or 1114H or 2114 or 2114H), (1206 or 1226)  |
| CHEM 3615–3616     | Pre: (1035 or 1055 or 1055H), (1036 or 1056 or 1056H), PHYS 2306, (MATH 2204 or MATH 2204H or MATH 2224) for 3615; MATH 2214, (CHEM 3615 or CHEM 3615H), (CHEM 3615, MATH 2214 or CHEM 3615H) for 3616.            |
| CHEM 3625–3626     | Pre: 3615 or 3615H or 4615 for 3625; (3616 or 3616H or 4616), 3625, 4014 for 3626  |
| CHEM 4404          | Pre: (3616 or 3616H), 2424   |
| CHEM 4414          | Pre: 2424, (3616 or 3616H), 4404. Co: 4424, 3616   |
| CHEM 4534          | Pre: 2536 or 2566  |
| CHEM 4634          | Pre: 3615 or 4615; course is cross-listed with MSE 4534  |
| CHEM 4424          | Pre: 2536 or 2566; course is cross-listed with SBIO 4424   |
| CHEM 4584          | Pre: 2536 or 2566  |