B.S. Chemistry: Applied Requirements

The Chemistry major focuses on developing an understanding of our world from atomic to macroscopic perspectives. It couples theoretical foundations in organic, inorganic, physical, analytical and biochemistry with hands-on laboratory experience involving state-of-the-art instrumentation. This major prepares students for graduate study in chemistry and related disciplines, and for careers in pharmaceutical industries, environmental testing, manufacturing, food science, etc. The track in Applied Chemistry provides the flexibility to pursue courses in areas such as business, supply chain management, criminal justice, computer science, and math to suit individualized career trajectories.

Note that all students must achieve 120 undergraduate credits and a minimum 2.0 overall GPA to graduate. The final major GPA requirement for Chemistry is 2.0.

Required Chemistry Core Courses – 36 credits

CHEM 100 General Chemistry I (4 credits)
CHEM 102 General Chemistry II (4 credits)
CHEM 214 Organic Chemistry I (4 credits)
CHEM 216 Organic Chemistry II (4 credits)
CHEM 230 Analytical Chemistry I (4 credits)
CHEM 310 Biochemistry I (4 credits) *or* CHEM 320 Advanced Inorganic Chemistry (4 credits)
CHEM 314 Physical Chemistry I (4 credits)
CHEM 340 Analytical Chemistry II (4 credits)
CHEM 380 Senior Seminar in Chemistry (2 credits)
CHEM 37X Research in Chemistry (2 credits) *or* CHEM 390 Internship in Chemistry (2 credits)

Chemistry Applied Track Major Electives – 18 to 20 credits

At least 3 courses must be taken in a single subject area. The combined credit total toward the major program for CHEM 370, CHEM 371, CHEM 372, CHEM 373, and CHEM 390 may not exceed 4 credits. Any additional credit hours count toward University Electives. Some electives are not offered every year.

Business and Supply Chain Management

ACCT 121 Financial Accounting (3 credits)
MKTG 210 Principles of Marketing (3 credits)
MGMT 210 Principles of Management (3 credits)
BUSN 275 Business Data Management and Information Systems (3 credits)
SCMG 260 Principles of Supply Chain Management (3 credits)
SCMG 361 Principles of Business Logistics (3 credits)
SCMG Any course above 300 (3 credits)

Computer Science

CPSC 123 Introduction to Scientific Programming (3 credits) *or* CSC 135 Computer Science I (3 credits)
CPSC 223 Advanced Scientific programming (3 credits) *or* CPSC 136 Computer Science II (3 credits)
CPSC 125 Discrete Math for Computing I (3 credits)
CPSC 256 SQL Programming (3 credits)
CPSC 458 Data Mining and Predictive Analytics I (3 credits) *or* CPSC 459 Introduction to Big Data (3 credits)

Mathematics
MATH 140 Applied Statistical Methods (3 credits) *or* MATH 150 Introduction to Biostatistics (3 credits)
MATH 182 Calculus II (4 credits)
MATH 224 Foundations of Higher Mathematics (3 credits)
MATH 283 Calculus III (4 credits)
Criminal Justice and Forensic Studies
CRJU 101 Introduction to Policing (3 credits)
CRJU 181 Criminal Law (3 credits)
CRJU 182 Criminal Procedure (3 credits)
CRJU 301 Investigation and Intelligence (3 credits)
Astronomy, Geology, Physics and Chemistry
ASTR 140 Planetary Science (3 credits) *or* ASTR 142 Stellar & Galactic Astronomy (3 credits)
ASTR Any course above 200 (3 credits)
GEOL Any course at 100-level (3-4 credits)
GEOL Any course above 200 (3-4 credits)
PHYS 212 Modern Physics (3 credits)
PHYS Any course above 200 (3 credits)
SCED 220 Practical Scanning Electron Microscopy (3 credits)
CHEM Any course above 300 (3-4 credits)
CHEM Any course above 300 (3-4 credits)
CHEM Any course above 300 (3-4 credits)

Other Required Courses – 4 credits

Note that PHYS 100 Physics I is included as part of the Directed General Education requirements listed below.
PHYS 102 Physics II (4 credits)

Directed General Education Courses – 12 credits

These courses are required for the major and satisfy the general education requirement "Understanding Science and Technology."
MATH 181 Calculus I – Category C2 (4 credits)
PHYS 100 Physics I – Category C1 (4 credits)
BIOL 104 Principles of Biology – Category C3 (4 credits)

University Electives – 15 to 17 credits

Program Plan Code: BS_CHEM_APPL
Effective Date: Fall 2024

B.S. Chemistry: Applied Major Check Sheet

Student Name: Student ID Number:

This check sheet provides a mechanism for students and advisors to keep track of a student's progress in the program. Please refer to the program requirements for more details regarding options.

Note that all students must achieve 120 undergraduate credits and a minimum 2.0 overall GPA to graduate. The final major-GPA requirement for Chemistry is 2.0.

Required Chemistry Core Courses – 36 credits

CHEM 100 General Chemistry I	4 credits	Grade:
CHEM 102 General Chemistry II	4 credits	Grade:
CHEM 214 Organic Chemistry I	4 credits	Grade:
CHEM 216 Organic Chemistry II	4 credits	Grade:
CHEM 230 Analytical Chemistry I	4 credits	Grade:
CHEM 314 Physical Chemistry I	4 credits	Grade:
CHEM 310 Biochemistry I *or* CHEM 320 Advanced Inorganic Chemistry	4 credits	Grade:
CHEM 340 Analytical Chemistry II	4 credits	Grade:
CHEM 380 Senior Seminar in Chemistry	2 credits	Grade:
CHEM 37X Research in Chemistry *or* CHEM 390 Internship in Chemistry	2 credits	Grade:
Total Credits	36 total credits	

Chemistry Applied Track Electives – 18 to 20 credits

Course 1:	credits	Grade:
Course 2:	credits	Grade:
Course 3:	credits	Grade:
Course 4:	credits	Grade:
Course 5:	credits	Grade:
Course 6 (if necessary):	credits	Grade:
Course 7 (if necessary):	credits	Grade:
Total Credits	18-20 total credits	

Other Required Courses – 4 credits

PHYS 102 Physics II	4 credits	Grade:
Total Credits	4 total credits	

Directed General Education Courses

PHYS 100 Physics I	4 credits	Grade:
MATH 181 Calculus I	4 credits	Grade:
BIOL 104 Principles of Biology	4 credits	Grade:

University Electives – 15 to 17 credits

Course 1:	credits	Grade:
Course 2:	credits	Grade:
Course 3:	credits	Grade:
Course 4:	credits	Grade:
Course 5	credits	Grade:
Course 6:	credits	Grade:
Total Credits	15-17 total credits	

Summary of Graduation Requirements

Total credits from major courses	**58-60**
Total credits from general education program	**45**
Total credits from university electives	**15-17**
Minimum total credits to graduate	**120**
Minimum overall GPA	**2.0**
Minimum GPA in major program	**2.0**

Program Plan Code: BS_CHEM_APPL
Effective Date: Fall 2024

B.S. Chemistry: Applied 8-Semester Planner

Student Name: Student ID Number:

Each semester listed below provides information including course categories, typical credit hours (CH.), and space to add specific course selections. This planner is a suggested path. Consult with your advisor regarding your unique plans and interests as you make choices about your schedule.

First Semester Plan

Major	CHEM 100	4 CH.	Selection:
Major	BIOL 104	4 CH.	Selection:
Major	MATH 105, MATH 106, MATH 115, *or* MATH 181	3-4 CH.	Selection:
Gen Ed	FYSM 100	3 CH.	Selection: FYSM 100
Total		**14-15 CH.**	

Second Semester Plan

Major	CHEM 102	4 CH.	Selection:
Major	Chemistry Applied Track Elective	3-4 CH.	Selection:
Major or Elective	MATH 106, MATH 181, *or* University Elective	3-4 CH.	Selection:
Gen Ed	Category A1	3 CH.	Selection:
Total		**13-15 CH.**	

Third Semester Plan

Major	CHEM 214	4 CH.	Selection:
Major	PHYS 100	4 CH.	Selection:
Major	Chemistry Applied Track Elective	3-4 CH.	Selection:
Major or Elective	MATH 181 *or* University Elective	3-4 CH.	Selection:
Total		**14-16 CH.**	

Fourth Semester Plan

Major	CHEM 216	4 CH.	Selection:
Major	PHYS 102	4 CH.	Selection:
Gen Ed	Category A2	3 CH.	Selection:
Gen Ed	Category B	3 CH.	Selection:
Elective	University Elective	3 CH.	Selection:
Total		**17 CH.**	

Fifth Semester Plan

Major	CHEM 230	4 CH.	Selection:
Major	CHEM 310 *or* Chemistry Applied Track Elective	3-4 CH.	Selection:
Major	Chemistry Applied Track Elective	3-4 CH.	Selection:
Gen Ed	Category B	3 CH.	Selection:
Gen Ed	Category D	3 CH.	Selection:
Total		**16-18 CH.**	

Sixth Semester Plan

Major	CHEM 340	4 CH.	Selection:
Major	CHEM 320 *or* Chemistry Applied Track Elective	3-4 CH.	Selection:
Gen Ed	Category B	3 CH.	Selection:
Gen Ed	Category D	3 CH.	Selection:
Elective	University Elective	3 CH.	Selection:
Total		**16-17 CH.**	

Seventh Semester Plan

Major	CHEM 314	4 CH.	Selection:
Major	CHEM 380	2 CH.	Selection:
Major	Chemistry Applied Track Elective	3-4 CH.	Selection:
Gen Ed	Category A3 (*COMM 010 for example*)	3 CH.	Selection:
Gen Ed	Category D	3 CH.	Selection:
Total		**15-16 CH.**	

Eighth Semester Plan

Major	CHEM 37X *or* CHEM 390	2 CH.	Selection:
Major	Chemistry Applied Track Elective	3- 4 CH.	Selection:
Gen Ed	Category A4	3 CH.	Selection:
Elective	University Elective	3 CH.	Selection:
Elective	University Elective	3 CH.	Selection:
Total		**14-15 CH.**	

Additional Notes:

1. MATH courses are dependent on ALEKS placement exam.
2. The combined credit total toward the major program for CHEM 370, CHEM 371, CHEM 372, CHEM 373 & CHEM 390 may not exceed 4 credits. Any additional credit hours count toward University Electives.

Program Plan Code: BS_CHEM_APPL
Effective Date: Fall 2024