# MAJOR REQUIREMENTS (97 units)

Grades of "C" or better required. Courses may not need to be completed in order listed.

**Chemistry & Biochemistry Core curriculum (47 units)**
- CHEM 111 General Chemistry I (4) and CHEM 111L Laboratory (1) Prerequisite: MATH 007/013 eligibility and placement or CHEM 110. Physical Science*  
- CHEM 112 General Chemistry II (4) and CHEM 112L Laboratory (1) Prerequisite: CHEM 111 and CHEM 111L. Physical Science*  
- CHEM 113 General Chemistry III (4) and CHEM 113L Laboratory (1) Prerequisite: CHEM 112 and CHEM 112L. Physical Science*  
- CHEM 224 Analytical Chemistry (4) Prerequisite: CHEM 113  
- CHEM 281 Organic Chemistry I (4) and CHEM 281L Laboratory (1) Prerequisite: CHEM 113 and CHEM 113L  
- CHEM 282 Organic Chemistry II (4) and CHEM 282L Laboratory (1) Prerequisite: CHEM 281 and CHEM 281L  
- CHEM 321 Molecular Science Research Literature Review (2) Prerequisite: CHEM 281 and CHEM 281L  
- CHEM 322 Molecular Science Research Lab (2) Prerequisite: CHEM 224, 282, 282L, 321 & consent  
- CHEM 351 Physical Chemistry: Thermodynamics (4) Prerequisite: CHEM 224, MATH 132, PHYS 233  
- CHEM 352 Physical Chemistry: Dynamics (4) Prerequisite: CHEM 351  
- CHEM 421 Writing for Molecular Science Research (1) Prerequisite: CHEM 322  
- CHEM 422 Molecular Science Research Presentation (1) Prerequisite: CHEM 421  
  
*Choose 1 from Below*

- CHEM 424 Instrumental Analysis I (3) and CHEM 424L Laboratory (1) Prerequisite: CHEM 224  
- CHEM 425 Instrumental Analysis II (3) and CHEM 425L Laboratory (1) Prerequisite: CHEM 224  
- CHEM 426 Instrumental Analysis III (3) and CHEM 426L Laboratory (1) Prerequisite: CHEM 124  

**Core Cognates (23 units)**
- MATH 131 Calculus I (4) Prerequisite: MATH 122 or applicable Math Placement Test score  
- MATH 132 Calculus II (4) Prerequisite: MATH 131  
- PHYS 231 General Physics I (4) and PHYS 231L Laboratory (1) PHYS 231A prerequisite: MATH 122; for PHYS 231B MATH 132. Physical Science*  
- PHYS 232 General Physics II (4) and PHYS 232L Laboratory (1) Prerequisite: PHYS 231 and 231L. Physical Science*  
- PHYS 233 General Physics III (4) and PHYS 233L Laboratory (1) Prerequisite: PHYS 232 and 232L. Physical Science*  

**Chemistry courses (12 units)**
- CHEM 316 Advanced Inorganic Chemistry (4)  
- CHEM 353 Physical Chemistry: Quantum Mechanics (4) Prerequisite: CHEM 352  
- CHEM 380 Advanced Organic Chemistry (3) and CHEM 380L Laboratory (1)  

Additional units to be selected in consultation with an advisor (11 units)

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<th>Additional units</th>
<th>Required cognate (4 units)</th>
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<td>(______)</td>
<td>MATH 133 Calculus III (4)</td>
<td>Prerequisite: Calculus 132 or applicable Math Placement Test score</td>
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# UNIVERSITY STUDIES FOUNDATIONAL STUDIES (20-33 UNITS)

Grades of "C" or better required.

**I FIRST-YEAR SEMINAR**
- UNST 101A (1) and 101B (1) OR UNST 100A (3) and 100B (3)  

**II RHETORICAL SKILLS**
- A. ENGL 111 (3), 112 (3), 113 (3) College Writing OR ENGL 124 Freshman Seminar (4)  
- B. Upper Division Rhetoric: CHEM 405 (1), 408 (2), and CHEM 424/425/426 (3)  

**III MATHEMATICS**
- College-level Mathematics course in MATH 115/121/155/CPTG 117 (4) MATH 131, 132 required by major  

**IV WORLD LANGUAGES**
- Level 3 proficiency (e.g. 153) in one non-English language (4-12)  

**V HEALTH AND FITNESS**
- HSLC 120 Lifet ime Fitness (2)  

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# UNIVERSITY STUDIES GENERAL STUDIES (52 UNITS, 16 UPPER DIVISION)

Grades of "D" or better required, unless courses are required by major.

**THEME I. SOCIAL SCIENCES (SSCI) 8 units**
- Globalization, Identity and Citizenship (4 units from SSCI 204/205/206/207/208) Prerequisite: ENGL 113/124  
- Social Science Breadth Courses (4 units)  

**THEME II. ARTS AND HUMANITIES (HUMN) 12 units**
- Exploring Culture (4 units from HUMN 104/105/106/107/108/109) Prerequisite: ENGL 111/124  
- Arts and Humanities Breadth Courses (4 units)  

**THEME III RELIGIOUS BELIEFS AND PRACTICES (RLGN) 16 units**
- RLGN 304 Adventism in Global Perspective or RLGN 305 Religion in Three Cultures (4) Prerequisite: ENGL 113/124, Junior Status  
- A. Spiritual Experience and Expressions (0-4 units)  
- B. Beliefs and Heritage (4 units)  
- C. Scripture (4 units)  
- D. Religion and Society (0-4 units)  

**THEME IV NATURAL SCIENCES (NSCI) 12 units**
- Scientific Foundations (4 units from NSCI 404/405/406/407/408)  
- Life Science (4 units) Either life science or physical science must include a laboratory  
- Physical Science (4 units) Either life science or physical science must include a laboratory  

**THEME V SENIOR SEMINAR**
- UNST 404D Religion, Values, and Social Responsibility (4)  

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*A maximum of 4 units from the Major, and 8 units of Cognates required by the Major, may apply to University Studies General Studies requirements (2016-2017 Undergraduate Academic Bulletin).  

**NOTE:** Should a student’s general education and major degree program not meet the minimum 190 units required for graduation, the student must complete elective units to make up the deficiency.

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**UNIVERSITY STUDIES SERVICE-LEARNING (3 courses)**
CHEMISTRY
Bachelor of Arts

CAREER OPPORTUNITIES AND RELATED OCCUPATIONS: Some chemists and materials scientists work in basic research. Others work in applied research. Chemistry applicants. In basic research, chemists investigate the properties, composition, and structure of matter. They also experiment with combinations of elements and the ways in which they interact. In applied research, chemists investigate possible new products and ways to improve existing ones. Chemistry research has led to the discovery and development of new and improved drugs, plastics, and cleaners, as well as thousands of other products. Education-related jobs in chemistry may be filled by either bachelor of science or bachelor of arts students.

EDUCATIONAL QUALIFICATIONS: A bachelor’s degree in chemistry or in a related field is needed for entry-level chemist jobs. Many jobs require master’s degrees or Ph.D.s and may also require significant levels of work experience. In addition to earning a bachelor’s degree, students interested in secondary teaching must complete applicable licensure for the secondary teaching credential. For more information, contact the School of Education.

JOB OUTLOOK: Employment of chemists and materials scientists is projected to grow 3 percent from 2014 to 2024, slower than the average for all occupations. Many chemists and materials scientists are employed in manufacturing industries that are projected to decline. Many schools report that they have difficulty filling teaching positions for certain subjects, including math, science (especially chemistry and physics), English as a second language, and special education. As a result, teachers with education in those subjects or certifications to teach those specialties should have better job prospects.

SALARY: The median annual wage for chemists was $71,260 in May 2015. The lowest 10 percent earned less than $41,110, and the highest 10 percent earned more than $125,450. The median annual wage for high school teachers was $57,200 in May 2015. The lowest 10 percent earned less than $37,800, and the highest 10 percent earned more than $91,190.
