# CHEMISTRY/BIOCHEMISTRY–CHEMISTRY MAJOR, BACHELOR OF SCIENCE (BS)

This major program provides the normal preparation in chemistry for students planning employment as chemists and considerable chemical background in preparation for careers outside chemistry. It is appropriate for some students who plan to enter professional schools such as dentistry, or public and environmental health.

Note: a computer programming course is strongly recommended–see your chemistry/biochemistry advisor.

**Grade Requirements:** due to the cumulative nature of chemistry courses, the department strongly recommends that students receive a grade ≥C in all prerequisite chemistry courses.

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|---|---|---|
| **Required Courses** | | |
| CHEM 171<br>& 171L<br>& CHEM 172<br>& CHEM 172L<br>& CHEM 173<br>& CHEM 173L | GENERAL CHEMISTRY I<br>and GENERAL CHEMISTRY LABORATORY I<br>and GENERAL CHEMISTRY II<br>and GENERAL CHEMISTRY LABORATORY II<br>and GENERAL CHEMISTRY III<br>and GENERAL CHEMISTRY LABORATORY III | 15 |
| CHEM 304<br>& 304L | QUANTITATIVE ANALYSIS<br>and QUANTITATIVE ANALYSIS LAB | 6 |
| CHEM 319 | MODERN INORGANIC CHEMISTRY | 4 |
| CHEM 351 | ORGANIC CHEMISTRY | 4 |
| CHEM 352 | ORGANIC CHEMISTRY | 4 |
| CHEM 353 | ORGANIC CHEMISTRY | 3 |
| CHEM 372 | ORGANIC CHEMISTRY LABORATORY I | 3 |
| CHEM 373 | ORGANIC CHEM LABORATORY II | 3 |
| CHEM 421 | PHYSICAL CHEMISTRY | 4 |
| CHEM 422 | PHYSICAL CHEMISTRY | 4 |
| CHEM 423 | PHYSICAL CHEMISTRY | 3 |
| CHEM 431 | PHYSICAL CHEMISTRY LABORATORY | 1 |
| CHEM 432 | PHYSICAL CHEMISTRY LABORATORY | 2 |
| CHEM 433 | PHYSICAL CHEMISTRY LABORATORY | 2 |
| CHEM 499 | DIRECTED STUDY (variable credit course) | 4 |
| **Required Supporting Courses** | | |
| MATH/HONS 161 | CALCULUS I | 5 |
| MATH 162 | CALCULUS II | 5 |
| MATH 163 | CALCULUS III | 5 |
| PHYS 151 | GENERAL PHYSICS I | 4 |
| PHYS 152 | GENERAL PHYSICS II | 4 |
| PHYS 153 | GENERAL PHYSICS III | 4 |
| PHYS 161 | MECHANICS LABORATORY | 1 |
| PHYS 162 | HEAT AND OPTICS LABORATORY | 1 |
| PHYS 163 | ELECTRONICS LABORATORY I | 1 |
| **Electives–choose 300- 400-level CHEM courses – see your chemistry/biochemistry advisor** | | **10** |
| **Required Senior Capstone** | | |
| CHEM 491 | SENIOR THESIS | 4-6 |
| or CHEM 490 | ADVANCED INORGANIC CHEMISTRY OR SENIOR CAPSTONE | |
| **Total Credits** | | **106-108** |

## Plan of Study

**The following plan of study is for a student with zero credits.** Individual students may have different factors such as: credit through transfer work, Advanced Placement, Running Start, or any other type of college-level coursework that requires an individual plan.

Courses could be offered in different terms, checking the academic schedule is paramount in keeping an individual plan current. **Students should connect with an advisor to ensure they are on track to graduate.**

All Undergraduate students are required to meet the Undergraduate Degree Requirements (http://catalog.ewu.edu/undergraduate-degree/).

**First Year**

| Fall Quarter | Credits | Winter Quarter | Credits | Spring Quarter | Credits |
|---|---|---|---|---|---|
| CHEM 171 & 171L (Natural Science BACR 1) | 5 | CHEM 172 & 172L (Natural Science BACR 2) | 5 | CHEM 173 & 173L | 5 |
| ENGL 101 | 5 | ENGL 201 | 5 | MATH 163 | 5 |
| MATH 161 | 5 | MATH 162 | 5 | Social Science BACR 1[1] | 5 |
| | **15** | | **15** | | **15** |

**Second Year**

| Fall Quarter | Credits | Winter Quarter | Credits | Spring Quarter | Credits |
|---|---|---|---|---|---|
| CHEM 304 & 304L | 6 | CHEM 319 | 4 | PHYS 153 | 4 |
| PHYS 151 | 4 | PHYS 152 | 4 | PHYS 163 | 1 |
| PHYS 161 | 1 | PHYS 162 | 1 | Humanities & Arts BACR 2[1] | 5 |
| Humanities & Arts BACR 1[1] | 5 | Social Science BACR 2[2] | 5 | Elective - certificate, minor, or general elective | 5 |
| | **16** | | **14** | | **15** |

**Third Year**

| Fall Quarter | Credits | Winter Quarter | Credits | Spring Quarter | Credits |
|---|---|---|---|---|---|
| CHEM 351 | 4 | CHEM 352 | 4 | CHEM 353 | 3 |
| Chemistry Elective[2] | 2 | CHEM 372 | 3 | CHEM 373 | 3 |
| Global Studies - graduation requirement[1] | 5 | Chemistry Elective[2] | 4 | Elective - certificate, minor, or general elective | 5 |
| Elective - certificate, minor, or general elective | 4 | Diversity - graduation requirement[1] | 5 | Elective - certificate, minor, or general elective | 5 |
| | **15** | | **16** | | **16** |

**Fourth Year**

| Fall Quarter | Credits | Winter Quarter | Credits | Spring Quarter | Credits |
|---|---|---|---|---|---|
| CHEM 421 | 4 | CHEM 422 | 4 | CHEM 423 | 3 |
| CHEM 431 | 1 | CHEM 432 | 2 | CHEM 433 | 2 |
| CHEM 499 | 2 | CHEM 499 | 2 | CHEM 490 or 491 (Senior Capstone - graduation requirement) | 4-6 |
| Elective - certificate, minor, or general elective | 5 | Elective - certificate, minor, or general elective | 5 | Chemistry Elective[2] | 4 |
| Elective - certificate, minor, or general elective | 5 | | | | |
| | **17** | | **13** | | **13-15** |

**Total Credits 180-182**

[1] University Graduation Requirements (UGR) and Breadth Area Course Requirements (BACR) courses may be less than 5 credits and additional credits may be required to reach the required 180 total credits needed to graduate. Students should connect with an advisor to ensure they are on track to graduate.

[2] Electives–choose ten credits of 300- 400-level CHEM courses – see your chemistry/biochemistry advisor.

**University Competencies and Proficiencies**

English (http://catalog.ewu.edu/undergraduate-degree/#newitemtext)
Quantitative and Symbolic Reasoning (http://catalog.ewu.edu/undergraduate-degree/#mathcompproficienciestext)
Placement and Clearance (http://catalog.ewu.edu/placement/)
Prior Learning/Sources of Credit AP, CLEP, IB (http://catalog.ewu.edu/prior-learning/)

**General Education Requirements (http://catalog.ewu.edu/undergraduate-degree/#generaleducationrequirementstext) (GER)**

- Minimum Credits—180 cumulative credit hours
  - 60 upper-division credits (300 level or above)
  - 45 credits in residence (attendance) at Eastern, with at least 15 upper-division credits in major in residence at Eastern
- Minimum Cumulative GPA ≥2.0

**Breadth Area Core Requirements (BACR)**

Humanities and Arts (http://catalog.ewu.edu/undergraduate-degree/#humanitiesandfineartsgecrtext)
Natural Sciences (http://catalog.ewu.edu/undergraduate-degree/#naturalsciencesgecrtext)
Social Sciences (http://catalog.ewu.edu/undergraduate-degree/#socialsciencesgecrtext)

**University Graduation Requirements (http://catalog.ewu.edu/undergraduate-degree/#universitygraduationrequirementstext) (UGR)**

Diversity Course List (http://catalog.ewu.edu/undergraduate-degree/#cultureandgenderdiversityintheuslisttext)
World Language (http://catalog.ewu.edu/undergraduate-degree/#worldlanguagetext) (for Bachelor of Arts)
Global Studies Course List (http://catalog.ewu.edu/undergraduate-degree/#internationalstudiesrequirementtext)
Minor or Certificate (http://catalog.ewu.edu/undergraduate-degree/#majorminororcertificateugrtext)
Senior Capstone Course List (http://catalog.ewu.edu/undergraduate-degree/#capstonecourselisttext)

Application for Graduation (use EagleNET (https://inside.ewu.edu/eaglenet/)) must be made at least two terms in advance of the term you expect to graduate (undergraduate and post-baccalaureate).

Use the Catalog Archives (http://catalog.ewu.edu/archives/) to determine *two important catalog years*.
Requirements in Degree Works (https://inside.ewu.edu/records-and-registration/degree-works/) are based on these two catalog years:

a. The catalog *in effect at the student's first term* of current matriculation is used to determine **BACR** (Breadth Area Credit Requirements) **and UGR** (Undergraduate Graduation Requirements).
b. The catalog *in effect at the time the student declares a major or minor* is used to determine the program requirements.

**Students who earn a BS in Chemistry/Biochemistry–Chemistry from EWU should be able to:**

- demonstrate a broad-based knowledge of major concepts in the areas of inorganic, organic, analytical and physical chemistry;
- demonstrate sufficient preparation in chemistry to successfully compete in a graduate or professional program or to realize employment in a chemistry- or biochemistry-related career;
- demonstrate a capacity to use modern instrumentation and classical techniques for the analysis and/or separation of chemicals and an ability to interpret data;
- demonstrate effective oral and written communication skills and critical thinking skills as related to the field of chemistry;
- demonstrate knowledge of safe practices in the handling, usage and disposal of chemicals.