**CATALOG TERM: 2026-2027** **TOTAL UNITS REQUIRED = 120**

# BIOCHEMISTRY

- This worksheet is intended for supplemental use only. The University will use your Academic Requirements Report (ARR) to track your graduation requirements, including those for your major. Please continue to check your ARR for accuracy. If your ARR requires a correction, please submit an ARR Correction Form.
- Your Degree Planner will display the following requirements in the University's recommended sequence.
- With the exception of CHEM 100, all courses used for the major and preparation for the major must be completed with a grade of C (2.0) or higher.
- All non-articulated courses MUST be reviewed and approved by a faculty advisor.
- It is highly recommended that you meet with your Biochemistry faculty advisor at least once a year.
- Transfer students must complete a minimum of 24 units counted towards the Biochemistry major at CSUSM.
- With a suitable choice of electives, this degree meets the certification requirements by the American Chemical Society.
- Course offerings are subject to change. Verify course availability with the Chemistry department.
- Biochemistry majors may not minor in Chemistry.

## PREPARATION FOR THE MAJOR (49 UNITS)

### Non-Biology/Chemistry Supporting Courses (17 units):

| ✓ | Course | Units |
|---|---|---|
| | MATH 160: Calculus with Applications I (*MATH 125, 126 or pass Calculus Readiness Diagnostic) | 5 |
| | MATH 162: Calculus with Applications II (*MATH 160) | 4 |
| | PHYS 201: Physics of Mechanics & Sound (*MATH 160) | 4 |
| | PHYS 202: Physics of Electromagnetism & Optics (*PHYS 201 or 205; MATH 162) | 4 |

### Lower-division Biology/Chemistry Courses (32 units):

| ✓ | Course | Units |
|---|---|---|
| | CHEM 100: Introduction to the Chemistry and Biochemistry Major | 1 |
| | BIOL 210: Introduction to Cellular & Molecular Biology (⁺CHEM 150) | 4 |
| | BIOL 211: Introduction to Organismal & Population Biology | 4 |
| | CHEM 150: General Chemistry (*MATH 101, 103, 105 or MATH Category 1 or 2) | 4 |
| | CHEM 150L: General Chemistry Lab (⁺CHEM 150) | 1 |
| | CHEM 162: Enhanced General Chemistry II (*CHEM 150, 150L and MATH 125, 126 or 160) | 4 |
| | CHEM 201: Organic Chemistry (*CHEM 160 or 162) | 3 |
| | CHEM 201L: Organic Chemistry Lab (⁺CHEM 201) | 2 |
| | CHEM 202: Organic Chemistry (*CHEM 201, 201L) | 3 |
| | CHEM 202L: Organic Chemistry Lab (*CHEM 201, 201L, ⁺CHEM 202) | 2 |
| | CHEM 275: Quantitative Investigations in Chemistry (*MATH 160, CHEM 201L, ⁺CHEM 160 or 162) | 4 |

## MAJOR REQUIREMENTS (35 UNITS)

### Upper-division Chemistry Courses (32 units):

| ✓ | Course | Units |
|---|---|---|
| | CHEM 300: Literature of Chemistry (*CHEM 201) | 3 |
| | CHEM 351: Biochemistry I (*BIOL 211, CHEM 202; fall only) | 4 |
| | CHEM 351L: Nucleic Acid Biochemistry Laboratory (⁺CHEM 341 or 351) | 2 |
| | CHEM 352: Biochemistry II (*CHEM 351; spring only) | 4 |

**prerequisite; ⁺pre-/co-requisite; ˜corequisite; ♯course may be repeated for a total of 4 units; ^Only 4 units of CHEM 398 or 399 may be counted toward Science Electives.*

# BIOCHEMISTRY

| | | |
|---|---|---|
| | CHEM 352L: Protein Biochemistry Laboratory (*CHEM 341 or 351 and CHEM 351L, BIOT 355 or BIOL 351) | 2 |
| | CHEM 401: Physical Chemistry-Classical (*CHEM 160 or 162 and MATH 162 and PHYS 202 or 206) | 4 |
| | CHEM 404: Inorganic Chemistry (*CHEM 160 or 162 and201; ⁺CHEM 404L) | 4 |
| | CHEM 404L: Inorganic Chemistry Lab (⁺CHEM 404) | 1 |
| | CHEM 416: Instrumental Methods of Analysis (*CHEM 202, 202L, 275, 300 and PHYS 202) | 5 |
| | CHEM 450: Protein Structure and Function (*CHEM 341 or 351; spring only) | 3 |

**Upper-division Science Elective (3 units):**

Select a minimum of 3 units from the following:

BIOL 351: Molecular Cell Biology (5) (*BIOL 210, 211, CHEM 275)
BIOL 352: Genetics (5) (*BIOL 210, 211)
BIOL 353: Comparative Animal Physiology (5) (*BIOL 210, 211, CHEM 275)
BIOL 367: Biology of Microorganisms (5) (*BIOL 210, 211)
BIOL 368: Developmental Biology (3) (*BIOL 210, 211)
BIOL 370A: Plant Physiology Lecture (3) (*BIOL 210, 211)
BIOL 374: Exercise Physiology and Bioenergetics (3) (*BIOL 210, 211)
BIOL 375: Endocrinology (3) (*BIOL 210, 211, CHEM 201)
BIOL 476: Neurobiology (3) (*BIOL 353)
BIOT 355: Molecular Biotechnology (5) (*BIOL 210; fall only)
BIOT 356: Cellular Biotechnology (5) (*BIOL 355; spring only)
CHEM 308: Environmental Chemistry (3) (*CHEM 160, 201)
CHEM 395: Workshop for Future Chemistry Educators (1) (*CHEM 160, 202)
CHEM 397: Supervised Chemistry Lecture/Laboratory Instruction (1) (*CHEM 160, 202)
CHEM 398A-B^: Special Problems in Chemistry - Library (1-2) (*instructor consent)
CHEM 399A-B^: Special Problems in Chemistry - Laboratory (1-2) (*instructor consent)
CHEM 402: Physical Chemistry - Quantum (3) (*CHEM 160 or 162 and MATH 162 and PHYS 202 or 206)
CHEM 405: Physical Chemistry Laboratory (2) (⁺CHEM 401; spring only)
CHEM 451: Biophysical Chemistry (3) (*CHEM 341 or 351 and CHEM 401)
CHEM 455: Enzymology (3) (*CHEM 341 or 351)
CHEM 490-494: Selected Topics in Chemistry (1-3) (*prerequisites vary)
CHEM 495: Internship in Chemistry and Biochemistry (3) (⁺CHEM 300)
CHEM 497: Chemistry in the Community (1) (*instructor consent)
CHEM 498#: Senior Library Thesis and Seminar (2) (*instructor consent)
CHEM 499#: Senior Laboratory Thesis and Seminar (2) (*instructor consent)
Any 500-level CHEM course

| ✓ | Course | Units |
|---|---|---|
| | | 1-3 |
| | | 0-2 |

**prerequisite; ⁺pre-/co-requisite; ˜corequisite; #course may be repeated for a total of 4 units; ^Only 4 units of CHEM 398 or 399 may be counted toward Science Electives.*