CHEMISTRY

CAREER INFORMATION
Chemistry is a major branch of the physical sciences and involves the study of the properties, composition, changes and uses of matter. It is a central component in attempts to feed, house, and clothe the world’s growing population, to find and use new energy sources, to conquer disease, and to improve the environment. The major sub-disciplines of chemistry are inorganic, organic, physical, biological, and analytical. This discipline permits a student a wide range of career choices such as chemistry, medicine, law, business, chemical physics, environmental science, teaching, research and development in private or non-profit organizations and government agencies. In government or industry, beginning chemists with a bachelor’s degree work quality control, analytical testing, or assist senior chemists in research and development. Many employers prefer chemists with a Ph.D. or at least a Master’s Degree to lead basic and applied research. A Ph.D. is also often preferred for advancement to many administrative positions. Typical areas of employment for chemistry majors include technical or research chemist, pharmaceutical or scientific instrument sales representative, technical writer, occupational safety and health inspector, quality control chemist, instrument technician, chemistry instructor, and chemical engineers. A survey by the American Chemical Society reports that the median salary of all their members with a bachelor’s degree was $50,100 a year; with a master’s degree, $61,000; and with a Ph.D., $76,000. Median salaries were highest for those working in private industry; those in academia earned the least.

GENERAL INFORMATION
Not all universities with this major are listed below. The lower division core preparation is listed for universities with which LBCC has established articulation agreements. As requirements do change, please check WWW.ASSIST.ORG for the most current articulation information. Moreover, please see a counselor to develop an accurate educational plan to ensure your competitiveness for admissions for your school(s) of choice. To thoroughly understand admissions and general education requirements please check the catalog of the transfer university. CSU/UC admissions and general education requirements are outlined on a separate curriculum guide.

*** Schools are listed in alphabetical order ***

CAL POLY POMONA

• B.S. Degree – Chemistry  
  Core Requirements: Chem 1A (Chem 121 & 121L & 122L), 1B (122 & 123 & 123L), 12A, 12B; Math 60 & 70 (Mat 114 & 115 & 116); Phys 3A (Phy 131 & 131L), 3B (133 & 133L)
  Options: Chemistry; Chemical Sciences; Industrial Chemistry
  Option Requirements:  
  Chemistry option: add Math 85.
  Chemical Sciences: No additional lower-division equivalents at LBCC
  Industrial Chemistry: No additional lower-division equivalents at LBCC

CAL POLY SAN LUIS OBISPO

• B.S. Degree – Biochemistry  
  Bio 1A (Bio 151), Bio 2 (Mcro 224); Cbs 6 (Csc 110); Chem 1A & 1B (Chem 127 & 128 & 129), 12A (216), 12B (217); Math 60 & 70 & 80 (Math 141 & 142 & 143 & 241); Phys 3A & 3B & 3C (Phys 131 & 132 & 133)
• B.S. Degree – Chemistry  
  Chem 1A & 1B (Chem 127 & 128 & 129), 12A (216), 12B (217); Math 60 & 70 & 80 (Math 141 & 142 & 143 & 241), Phy 3A & 3B & 3C (Phys 131 & 132 & 133)
  One course from: Bio 1A & 1B (Bio 151 & 152 & 153), 2 (Mcro 224), 5 (Bio 152); Cbs 6 (Csc 110)
CHEMISTRY continued...

CSU CHICO

- **B.S. Degree – Chemistry**
  - Options: Biochemistry; Professional Chemistry

  **Option Requirements:**
  - **Biochemistry:** Bio 1A (Biol 6A), 2 (11); Chem 1A (Chem 37), 1B (38), 12A (70); Math 60 (Math 7A), 70 (7B), 80 (7C); Phys 3A & 3B & 3C (Phys 4A & 4B & 4C)
  - **Professional Chemistry:** Chem 1A (Chem 37), 1B (38), 12A (70); Math 60 (Math 7A), 70 (7B), 80 (7C); Phys 3A & 3B & 3C (Phys 4A & 4B & 4C)

CSU FRESNO

- **B.A. Degree - Chemistry**
  - Bio 1A (Biosc 1A), 1B (1B), Chem 1A (Chem 1A), 1B (1B); Math 60 (Math 75), 70 (76), 80 (77); Phys 3A (Phys 4A & 4AL), 3B & 3C (4B & 4BL & 4C)

- **B.S. Degree - Chemistry**
  - Chem 1A (Chem 1A), 1B (1B); Math 60 (Math 75), 70 (76), 80 (77), Phys 3A (Phys 4A & 4AL), 3B & 3C (4B & 4BL & 4C)

CSU HAYWARD

- **B.A. Degree - Chemistry**
  - Chem 1A & 1B (Chem 1101 & 1102 & 1103); Math 60 & 70 & 80 (Math 1304 & 1305 & 2304); Phys 2A & 2B (Phys 2701 & 2702 & 2703)

- **B.S. Degree – Chemistry**
  - Chem 1A & 1B (Chem 1101 & 1102 & 1103); Math 60 & 70 & 80 (Math 1304 & 1305 & 2304); Phys 3A & 3B & 3C (Phys 1001 & 1002 & 1003)

CSU LONG BEACH

- **B.A. Degree - Chemistry**
  - Chem 1A (Chem 111A) 1B (111B); Math 60 (Math 122), 70 (123); Phys 2A & 2B (Phys 100A & 100B) or 3A & 3B (154 & 155)
  - (No LBCC equivalent to the following CSULB course: Chem 251)

- **B.S. Degree - Chemistry**
  - Bio 1A (Biol 211A); Chem 1A (Chem 111A), 1B (111B); Math 60 (Math 122), 70 (123), 80 (224); Phys 3A (Phys 151), 3B (152), 3C (154 & 155)
  - (No LBCC equivalent to the following CSULB course: Chem 251)

- **B.S. Degree – Biochemistry**
  - Bio 1A (Biol 211A), 1B (211B) Chem 1A (Chem 111A), 1B (111B); Math 60 (Math 122), 70 (123); Physics 2A & 2B (Phys 100A & 100B) or 3A & 3B (Phys 154 & 155)
  - (No LBCC equivalent to the following CSULB course: Chem 251)
CHEMISTRY continued…

CSU LOS ANGELES

• **B.A. Degree - Chemistry**
  Engl 3 or 3H (Engl 102); Chem 1A & 1B (Chem 101 & 102 & 103); Math 60 & 70 (Math 206 & 207 & 208)
  One physics sequence: Phys 2A & 2B (Phys 101 & 102 & 103) or 3A & 3B (201 & 202 & 203)
  (No LBCC equivalent to the following CSULA course: Chem 201)

• **B.S. Degree - Chemistry**
  Engl 3 or 3H (Engl 102); Chem 1A & 1B (Chem 101 & 102 & 103); Engr 54 (Cs 290) or Math 84 (Math 255) or lower division course at CSULA; Math 60 & 70 & 80 (Math 206 & 207 & 208 & 209)
  (No LBCC equivalents to the following CSULA courses: Chem 170, 201; Math 215; Phys 201 & 202 & 203 & 204 & 205)

CSU SACRAMENTO

• **B.A. Degree – Chemistry**
  Core Requirements: Chem 1A (Chem 1A), 1B (1B), 12A (24 & 25); Math 60 (Math 30), 70 (31)
  (No LBCC equivalent to the following CSUS course: Chem 31)
  Concentrations:  General; Biochemistry
  Concentration Requirements:  General: Math 80 (Math 32)
  One physics sequence: Phys 2A & 2B (Phys 5A & 5B) or 3A & 3C & 3B (11A & 11B & 11C)
  Biochemistry: Bio 1A & 1B (Bio 10)
  One physics sequence: Phys 2A & 2B (Phys 5A & 5B) or 3A & 3B & 3C (11A & 11B & 11C)

• **B.S. Degree – Chemistry**
  Core Requirements: Chem 1A (Chem 1A), 1B (1B), 3A (6A), 3B (6B), 12A (24 & 25); Math 60 (Math 30), 70 (31); 80 (32); Phys 3A & 3B & 3C (Phys 11A & 11B & 11C)
  Recommended: Elementary German
  (No LBCC equivalent to the following CSUS course: Chem 20)

CSU SAN BERNARDINO

• **B.A. Degree – Chemistry**
  Options:  General Chemistry; Biochemistry
  Option Requirements:  General Chemistry:
  Chem 1A (Chem 215), 1B (216); Math 60 & 70 (Math 211 & 212 & 213)
  One physics sequence from: Phys 3A & 3B (Phys 221 & 222) or lower division sequence at CSUSB
  One course from: Bio 1A (Biol 200) or lower division course at CSUSB
  One course from: Chinese 1, 1A & 1B, 2, French 1, 1A +1B, 2, 2A + 2B, 3, 4, 25A, German 1, 1A + 1B, 2, 2A + 2B, 3/3H, 4/4H, Italian 1A + 1B, 2A + 2B, Japanese 1, 1A + 1B, 2, Spanish 1, 1A + 1B, 2, 2A + 2B, 3, 4, 9
  (No LBCC equivalents to the following CSUSB courses: Biol 100; Chem 245; Phys 121, 122, 123, 223)
CHEMISTRY continued…

CSU SAN BERNARDINO (cont.)

Biochemistry:
Bio 1A & 1B (Biol 200 & 201 & 202); Chem 1A (Chem 215), 1B (216); 12A & 12B (221A & 221B & 222A & 222B & 223A & 223B) or upper division courses at CSUSB; Math 60 & 70 (Math 211 & 212 & 213)
One physics sequence from: Phys 3A & 3B (Phys 221 & 222) or lower division sequence at CSUSB
(No LBCC equivalents to the following CSUSB courses: Chem 245; Phys 121, 122, 123, 223)

• B.S. Degree – Chemistry
Options: ACS Certified; Biochemistry

Option Requirements:
ACS Certified:
Chem 1A (Chem 215), 1B (216); Math 60 & 70 (Math 211 & 212 & 213), 84 (251); Phys 3A (Phys 221), 3B (222)
One course from: Bio 1A (Biol 200) or lower division course at CSUSB
One course from: Math 80 (Math 252) or 85 (270) or upper division options at CSUSB
One course from: Chinese 1, 1A & 1B, 2, French 1, 1A +1B, 2, 2A + 2B, 3, 4, 25A, German 1, 1A + 1B, 2, 2A + 2B, 3/3H, 4/4H, Italian 1A + 1B, 2A + 2B, Japanese 1, 1A + 1B, 2, Spanish 1, 1A + 1B, 2, 2A + 2B, 3, 4, 9
(No LBCC equivalents to the following CSUSB courses: Biol 100; Chem 245; Phys 223)

Biochemistry:
Bio 1A & 1B (Biol 200 & 201 & 202); Chem 1A (Chem 215), 1B (216); Math 60 & 70 (Math 211 & 212 & 213)
One physics sequence from: Phys 3A & 3B (Phys 221 & 222) or lower division sequence at CSUSB
One course from: Chinese 1, 1A & 1B, 2, French 1, 1A +1B, 2, 2A + 2B, 3, 4, 25A, German 1, 1A + 1B, 2, 2A + 2B, 3/3H, 4/4H, Italian 1A + 1B, 2A + 2B, Japanese 1, 1A + 1B, 2, Spanish 1, 1A + 1B, 2, 2A + 2B, 3, 4, 9
(No LBCC equivalents to the following CSUSB courses: Chem 245; Phys 121, 122, 123, 223)

HUMBOLDT STATE UNIVERSITY

• B.A. Degree – Chemistry
Core Requirements: Chem 1A (Chem 109), 1B (110)
One math sequence from: Math 60 (Math105) and lower division course at Humboldt State or Math 60 & 70 & 80 (Math 109 & 110 & 210)
One physics sequence from: Phys 2A & 2B (Phyx 106 & 107) or Phys 3A & 3B & 3C (Phyx 109 & 110 & 111)
(No LBCC equivalent to the following Humboldt State course: Math 205)

Options: Chemical Technology

Option Requirements:
Chemical Technology: Bio 1A & 1B (Biol 105)
(No LBCC equivalent to the following Humboldt State course: Biom 109)

B.A. Degree – Chemistry
Core Requirements: Chem 1A (Chem 109), 1B (110); Math 60 (Math 109), 70 (110), 80 (210), 84 (241); Phys 3A (Phyx 109), 3B (110), 3C (111)

Options: Biochemistry; Environmental Toxicology

SEE REVERSE SIDE FOR ADDITIONAL REQUIREMENTS
CHEMISTRY continued…

HUMBOLDT STATE UNIVERSITY (cont.)

Option Requirements:
Biochemistry: Bio 1A & 1B (Biol 105)
Environmental Toxicology: Bio 1A & 1B (Biol 105)
(No LBCC equivalent to the following Humboldt State course: Biom 109)

SAN DIEGO STATE UNIVERSITY

- **B.S. Degree – Chemistry Major with degree in Applied Arts & Sciences and Certificate of the American Chemical Society:**
  Chem 1A, 1B, 12A; Math 60, 70, 80; Physics 3A, 3B, 3C.

- **B.S. Degree – Chemistry Major with degree in Applied Arts & Sciences and Certificate of the American Chemical Society with emphasis in Biochemistry:**
  Bio 1A, 1B; Chem 1A, 1B, 12A; Math 60, 70, 80; Physics 3A, 3B, 3C.

- **B.A. Degree - Chemistry Major with degree in Liberal Arts & Sciences and Certificate of the American Chemical Society:**
  Chem 1A, 1B, 12A; Math 60, 70, 80; Physics 3A, 3B, 3C; one level 3 foreign language course.

- **B.A. Degree - Chemistry Major with degree in Liberal Arts & Sciences:**
  Bio 1A, 1B; Chem 1A, 1B, 12A; Math 40, 50, 60, 70, 80; Physics 3A, 3B, 3C; one level 3 foreign language course.

- **B.S. Degree - Chemical Physics Major with degree in Applied Arts & Sciences:**
  Chem 1A, 1B, 12A; Math 60, 70, 80; Physics 3A, 3B, 3C.

  Recommended: CBIS 11 or 12 or 14A.

SAN JOSE STATE UNIVERSITY

- **B.S. Degree – Chemistry**
  Chem 1A, 1B; German 1, 2; Math 60, 70, 80; Physics 3A, 3B, 3C.

- **B.S. Degree – Chemistry: Concentration in Analytical Chemistry**
  Chem 1A, 1B; Math 60, 70, 80; Physics 3A, 3B, 3C.

- **B.S. Degree – Chemistry: Concentration in Biochemistry**
  Bio 1A, 1B; Chem 1A, 1B; Math 60, 70, 80; Physics 3A, 3B, 3C.

- **B.S. Degree – Chemistry: Concentration in Materials Science**
  Chem 1A, 1B; Math 60, 70, 80; Physics 3A, 3B, 3C.

- **B.A. Degree – Chemistry**
  Chem 1A, 1B; Math 60; Physics 2A, 2B.

SEE NEXT PAGE FOR ADDITIONAL REQUIREMENTS
CHEMISTRY continued…

UC BERKELEY

- **A.B. Degree - Chemistry**
  The A.B. Degree is offered by the College of Letters and Science (L&S). You must complete either the L&S Essential Skills Requirements (Reading & Composition, Foreign Language, Quantitative Reasoning) or IGETC by the end of the spring term that precedes fall enrollment at Berkeley.

  **Requirements:** Chem 1A, 1B; Engl 1, 2, 3; Math 60, 70, 80, 84; Physics 3A, 3B, 3C; one level 2 foreign language course (for those who are not completing the entire IGETC pattern.)

  **Recommended:** Chem 12A, 12B.

  **Note:** Completion of Chem 12A & 12B, combined with a score in the 75th percentile or higher on the American Chemical Society’s Organic Chemistry Exam will constitute satisfactory completion of Berkeley’s Chem 112A & 112B. Students are encouraged to take the exam through their community college, if possible.

- **B.S. Degree – Chemistry**
  The B.S. Degree is offered by the College of Chemistry. As a transfer applicant you must complete, at a minimum, courses comparable to Berkeley’s Chemistry 1A+1B, Math 1A+1B, Physics 7A, and English 1A+1B by the end of the spring term that precedes fall enrollment at Berkeley. You may use IGETC to fulfill the English requirement; however, you must complete the entire IGETC pattern by this same deadline. Completion of additional chemistry, mathematics, and calculus-based physics is also encouraged.

  **Requirements:** Chem 1A, 1B; Engl 1, 2, 3; Math 60, 70, 80, 84; Physics 3A, 3B, 3C; one level 2 foreign language course (for those who are not completing the entire IGETC pattern.)

  **Recommended:** Chem 12A, 12B.

  **Note:** Completion of Chem 12A & 12B, combined with a score in the 75th percentile or higher on the American Chemical Society’s Organic Chemistry Exam will constitute satisfactory completion of Berkeley’s Chem 112A & 112B. Students are encouraged to take the exam through their community college, if possible.

UC DAVIS

Transfer students are strongly advised to complete as many preparatory courses as possible for their major before enrolling at UC Davis. In particular, it is highly recommended that students complete chemistry courses before transferring.

- **A.B. Degree – Chemistry**
  Chem 1A, 1B, 12A, 12B; Physics 2A, 2B; Math 60, 70, 80.

- **B.S. Degree – Chemistry**
  Chem 1A, 1B, 12A, 12B; Physics 3A, 3B, 3C; Math 60, 70, 80, 84, 85.

SEE REVERSE SIDE FOR ADDITIONAL REQUIREMENTS

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UC IRVINE

- **B. S. Degree - Chemistry**
  Preference will be given to junior-level applicants with the highest grades overall, and who have satisfactorily completed the following required courses: one year of approved calculus and one year of general chemistry with lab.

  Requirements: Chem 1A, 1B, 12A, 12B; Math 60, 70; Physics 3A, 3B; 4-5 units of transferable coursework in biology, earth system science, engineering, mathematics, physics, and computer science (courses in basic physics, pre-physics, and pre-calculus are not acceptable).

  Recommended: MATH 80, 84 or 85.

UC LOS ANGELES

- **B.S. Degree – Chemistry**
  Chem 1A, 1B, 12A, 12B; Math 60, 70, 80, 84; Physics 3A, 3B, 3C.

UC RIVERSIDE (IGETC Not Acceptable)

In addition to meeting published UC admission criteria, transfer students must also complete courses comparable to at least 3 of the following UCR year-long sequences in order to meet selection criteria into this major. Courses must be completed with “C” grades or better, except for organic chemistry, which must be “B” grades or better.

- Chemistry 1A-1B-1C - General Chemistry (mandatory)
- Math 9A-9B-9C – First Year Calculus (mandatory)
- Physics 40A-40B-40C – General Physics
- One year of organic chemistry (“B” grades required)
- Math 10A-B - Calculus of Several Variables
- Math 46 – Ordinary Differential Equations

Effective Fall 2000 admission, students selected for this major will need to present an overall grade point average of at least 2.7 in all UC transferable course work. Students are advised to complete as many as possible of the remaining lower division major requirements before transferring.

- **B.A. Degree – Chemistry**
  Chem 1A, 1B, 12A, 12B; Engl 1 or 1H, 2 or 3 or 3H; Math 60, 70, 80; Physics 3A, 3B.

- **B.S. Degree – Chemistry**
  Chem 1A, 1B, 12A, 12B; Engl 1 or 1H, 2 or 3 or 3H; Math 60, 70, 80, 85; Physics 3A, 3B, 3C.

UC SANTA CRUZ

- **B.A. Degree – Chemistry**
  CBIS 9; Chem 1A, 1B, 12A, 12B; Math 60, 70, 80; Physics 3A, 3B, 3C

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