# Chemistry (AS)

## CAREER PATHS:
- Biochemist and Biophysicist
- Chemical Engineer
- Biochemical Engineer
- Chemistry Teacher
- Chemist
- Chemical Plant and System Operator

Additional Career Paths and related data, including state-by-state wage info and growth in the field, can be found at www.onetonline.org.

This program map represents one possible pathway. See a counselor to create a customized education plan. Map is for the 2019-2020 catalog year.

## 2020-2021 catalog year Pathways coming soon.

### GET STARTED NOW!
- Get started on your Pathway now with these recommended courses!
- Then – See a counselor to create a CUSTOMIZED education plan personalized to your career and transfer goals!
- Required courses may change depending on a student’s career and transfer goals, including requirements for cross-cultural and foreign language courses, and/or specific requirements for an individual CSU or UC.
- Unique transfer requirements for a specific institution can be found at www.assist.org.

### LET US HELP YOU!
- How to Apply: solano.edu/ar/apply.php
- Questions? Talk to a Counselor Now!
  - Main Campus, Fairfield: (707) 864-7101
  - Vacaville Center: (707) 863-7836
  - Vallejo Center: (707) 642-8188
  - Travis AFB: (707) 863-7878
- Visit online at solano.edu/counseling
- Contact Our Career Center to Learn Your Career Options!
  - Call 707-864-7124, or email at CareerCenter@solano.edu
- Visit online at solano.edu/career
- You Can Afford College! Learn more about Financial Aid!
  - Call 707-864-7103, or email at FinancialAid@solano.edu
- Visit online at solano.edu/financial_aid
- College is Accessible! Contact our Disability Services Program (DSP) at 707-864-7136.

## Program Total Units: 70

For more information please contact: (707) 864-7211

## Program Total Units: 70

**CHEM 001 5 units**
General Chemistry (IGETC 5A with lab)

**ENGL 001 4 units**
College Composition (IGETC 1A)

**LR 010 1 units**
Library Research and Information Competency

**IGETC 3A 3 units**

**CHEM 002 5 units**
General Chemistry

**Math 021 5 units**
Analytic Geometry and Calculus II

**IGETC 1B 4 units**
Suggested: ENGL 002 or 004

**IGETC 3C 3 units**
Suggested: PLSC001 or PLSC 005

**CHEM 003 5 units**
Organic Chemistry I

**PHYS 006 5 units**
Physics for Science and Engineering I

**IGETC 1C 3 units**
Suggested: Comm 001

**IGETC 4 3 units**

**CHEM 004 5 units**
Organic Chemistry II

**PHYS 007 5 units**
Physics for Science and Engineering II

**IGETC 3B 3 units**
Suggested: Hist 017 or 018 or 028 or 029 or 037

**IGETC 3A or 3B 3 units**

## Required Courses/Courses in Discipline

## GE Courses/Categories
Chemistry

Program Description
This program is designed to foster an understanding of the fundamental principles of chemistry in a variety of applications. Students will learn how chemical knowledge is derived, theorized, and applied in solving problems in everyday life.

Associate in Science Degree
The Associate in Science Degree can be obtained by completing the 26-30-unit major, general education requirements, and electives. All courses in the major must be completed with a minimum grade of C or a P if the course is taken on a Pass/No Pass basis.

Program Outcomes
Students who complete the Chemistry Associate Degree will be able to:
1. Demonstrate skills for various lab techniques.
3. Interpret and analyze chemical data.
4. Identify and write different types of chemical reactions.

REQUIRED COURSES.................................Units
CHEM 001 General Chemistry I ..................5
CHEM 002 General Chemistry II ..................5
CHEM 003 Organic Chemistry I ..................5
CHEM 004 Organic Chemistry II ..................5
BIO (any course except 048 or 098) .............3-5
One course from List A.................................3-5
Required Major Total Units .......................26–30

List A: (select one course) .........................Units
PHYS 002 General Physics (Non-calculus) .......5
PHYS 006 Physics for Science and Engineering ....5
PHYS 010 Descriptive Physics .......................3

CHEM 001     General Chemistry I                             5.0 Units
Prerequisite: CHEM 160 with a minimum grade of C (recommended for students with no previous chemistry) or CHEM 010 with a minimum grade of C (recommended for students who have had an introductory level chemistry course) or a score of 3, 4, or 5 on the Chemistry AP exam; and MATH 104 with a minimum grade of C or eligibility for MATH 002 based on a Multiple Measures Evaluation
Transferable to UC/CSU
Hours: 48-54 lecture, 96-108 lab
Presents principles of general chemistry for students in science, engineering, medical and related professions. Topics include atomic structure and theory, the periodic table, bonding, gas laws, stoichiometry, solutions, ionization, thermochemistry and equilibrium. This course requires significant math skills and previous knowledge of fundamental chemistry concepts. Field trips and online work may be required. (CHEM 001 = C-ID CHEM 110)

CHEM 002     General Chemistry II                            5.0 Units
Prerequisite: CHEM 001 with a minimum grade of C
Transferable to UC/CSU
Hours: 48-54 lecture, 96-108 lab
A continuation of chemical principles and theory covered in CHEM 001 with emphasis on electrochemistry, chemical equilibrium, acid-base equilibrium, thermodynamics, descriptive chemistry and quantitative and qualitative analysis. This course requires significant math skills and previous knowledge of fundamental chemistry concepts. Field trips and online work may be required. (CHEM 001 + CHEM 002 = C-ID CHEM 120S)
## Chemistry

**CHEM 003 Organic Chemistry I**  
**5.0 Units**  
**Prerequisite:** CHEM 002 with a minimum grade of C  
**Transferable to UC/CSU**  
**Hours:** 64-72 lecture, 64-72 lab  
First half of a two semester course sequence (CHEM 003 and CHEM 004) that begins a survey of organic chemistry for students in chemical, biological, health science, and related professions. Topics include analysis of structure and nomenclature, bonding, isomerism, and basic reaction mechanisms of organic chemicals. Functional groups considered include alkanes, alkenes, alkynes, alcohols, and alkyl halides and ethers. Basic organic laboratory procedures are introduced along with spectral analysis, simple syntheses, and reactions described in lecture. Field trip may be required. Online homework and quizzes may be required. *(CHEM 003 = C-ID CHEM 150) *(CHEM 003 + CHEM 004 = C-ID CHEM 160S)*

**CHEM 004 Organic Chemistry II**  
**5.0 Units**  
**Prerequisite:** CHEM 003 with a minimum grade of C  
**Transferable to UC/CSU**  
**Hours:** 64-72 lecture, 64-72 lab  
Second half of a two semester course sequence (CHEM 003 and CHEM 004) that begins a survey of organic chemistry for students in chemical, biological, health science, and related professions. Topics include analysis of structure, nomenclature, and reaction mechanisms of conjugated systems, aromatics, organometallics, aldehydes, ketones, amines, carboxylic acids and acid derivatives, and various functional groups, carbohydrates, lipids, proteins, and nucleic acids. The laboratory will emphasize more advanced work and the application of instrumentation in organic chemistry. Field trip may be required. Online homework and quizzes may be required. *(CHEM 003 + CHEM 004 = C-ID CHEM 160S)*

**CHEM 010 Intermediate Chemistry**  
**4.0 Units**  
**Prerequisite:** Recommendation of MATH 104 based on a Multiple Measures Evaluation  
**Course Advisory:** CHEM 160 strongly recommended for students who have never taken Chemistry before; recommendation of MATH 104 based on a Multiple Measures Evaluation  
**Transferable to UC/CSU**  
**Hours:** 48-54 lecture, 48-54 lab  
A general chemistry course often required for nursing students and for students majoring in physical therapy, occupational therapy, industrial technology and home economics. It emphasizes the chemistry of inorganic compounds and covers selected topics such as atomic theory, bonding, equations, gas laws, solutions, acid-base theory, and oxidation-reduction. Field trip may be required. Online homework may be required. NOTE: Not open for credit to students who have completed CHEM 001. *(C-ID CHEM 101)*

**CHEM 011 Basic Organic Chemistry & Biochemistry**  
**4.0 Units**  
**Prerequisite:** CHEM 001 or CHEM 010 with a minimum grade of C.  
**Transferable to UC/CSU**  
**Hours:** 48-54 lecture, 48-54 lab  
Presents an overview of organic chemistry and biochemistry for majors in nursing, home economics, liberal arts and technical fields. Field trip may be required. Online work may be required. *(C-ID CHEM 102)*

**CHEM 012 Chemistry for the Health Sciences**  
**5.0 Units**  
**Course Advisory:** CHEM 160 strongly recommended for students who have never taken Chemistry before; recommendation of MATH 104 based on a Multiple Measures Evaluation  
**Transferable to UC/CSU**  
**Hours:** 48-54 lecture, 96-108 lab  
An overview of general, organic chemistry, and biochemistry for majors in nursing and other allied health occupations. Topics covered include chemical bonding, chemical equations, gas laws, solutions, acid-base theory, oxidation-reduction, functional groups and properties of organic compounds, and the structure and function of carbohydrates, lipids, proteins, and nucleic acids. These topics are discussed in the context of cellular metabolism and human health. This course is not a prerequisite for any chemistry course. Field trip may be required. Online homework may be required. NOTE: Not open for credit to students who have completed CHEM 011. Formerly CHEM 051.

**CHEM 160 Introductory Chemistry**  
**4.0 Units**  
**General Education:** Opt. A: Area A  
**Hours:** 48-54 lecture, 48-54 lab  
The fundamental principles of inorganic chemistry. Field trips may be required. Online work may be required. NOTE: Not open to students who have completed CHEM 001, CHEM 010, or equivalent.

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*C-ID Designation may change periodically visit c-id.net/courses/search for current designation or consult with your counselor*