

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.

1 FIRST SEMESTER

Total Recommended Units: 18

- 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
- Math 020 (IGETC 2)** 5 units
Analytic Geometry and Calculus I
- IGETC 3A** 3 units

3 THIRD SEMESTER

Total Recommended Units: 19

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

2 SECOND SEMESTER

Total Recommended Units: 17

- CHEM 002** 5 units
General Chemistry
- Math 021** 5 units
(prerequisite for PHYS 006)
Analytic Geometry and Calculus II
- IGETC 1B** 4 units
Suggested: ENGL 002 or 004
- IGETC 4** 3 units
Suggested: PLSC001 or PLSC 005

4 FOURTH SEMESTER

Total Recommended Units: 16

- CHEM 004** 5 units
Organic Chemistry II
- PHYS 007** 5 units
Physics for Science and Engineering II
- IGETC 4** 3 units
- IGETC 3B** 3 units
Suggested: Hist 017 or 018 or 028 or 029 or 037

Required Courses/Courses in Discipline GE Courses/Categories



SOLANO
COMMUNITY COLLEGE

Chemistry

Associate in Sciences
 GE Pattern: IGETC
 Program Total Units: 70

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

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.

Chemistry

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.
2. Formulate and write names applying International Union of Pure and Applied Chemistry rules for chemical compounds.
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

CSU General Education or IGETC Pattern units 37-39
Transferable Electives (as needed to reach 60 units).. 0-3
Total Degree Units CSU GE or IGETC 60-63

Solano General Education..... 21
Electives (as needed to reach 60 units)..... 9-13
Total Degree Units Solano GE..... 60

* 6 units may be double counted toward both the major area of emphasis and CSU General Education or IGETC Pattern. Consult with a counselor for more information on completing this degree.

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 recommendation of MATH 002 by a counselor or math instructor based on a Multiple Measures Evaluation.

General Education: Option A: Area A; Option B: Area 5A, Area 5C; Option C: Area B1, Area B3

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 + CHEM 002 = C-ID CHEM 120S)

CHEM 002 General Chemistry II 5.0 Units

Prerequisite: CHEM 001 with a minimum grade of C.

General Education: Option A: Area A; Option B: Area 5A, Area 5C; Option C: Area B1, Area B3

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.

Course Advisory: Eligibility for ENGL 001.

General Education: Option A: Area A; Option B: Area 5A, Area 5C;

Option C: Area B1, Area B3

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.

General Education: Option A: Area A; Option B: Area 5A, Area 5C;

Option C: Area B1, Area B3

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, amino acids, 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

Course Advisory: CHEM 160 strongly recommended for students who have never taken Chemistry before; recommendation of MATH 104 by a counselor or math instructor based on a Multiple Measures Evaluation.

General Education: Option A: Area A; Option B: Area 5A, Area 5C;

Option C: Area B1, Area B3

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

4.0 Units

Basic Organic Chemistry & Biochemistry

Prerequisite: CHEM 001 or CHEM 010 with a minimum grade of C.

Course Advisory: Eligibility for ENGL 001.

General Education: Option A: Area A; Option B: Area 5A, Area 5C;

Option C: Area B1, Area B3

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)

Chemistry

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 by a counselor or math instructor based on a Multiple Measures Evaluation; Eligibility for ENGL 001.

General Education: Option A: Area A; Option B: Area 5A; Option C: Area B1

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 020 Elements of Chemistry 3.0 Units

Prerequisite: A minimum grade of C in MATH 330 or recommendation of counselor or math instructor based on a Multiple Measures Evaluation.

Transferable to UC/CSU

Hours: 48-54 lecture.

Develops scientific literacy for non-science majors. When combined with the lab (CHEM 020L), the course will meet the General Education requirement for physical science with lab. The course is a survey of the fundamental concepts and contemporary applications of chemistry. Students will explore the real world applications of chemistry in the home, the environment, nutrition, health, fitness and medicine.

CHEM 020L

Elements of Chemistry Laboratory

Prerequisite: CHEM 020 (may enroll concurrently).

Transferable to UC/CSU

Hours: 48-54 lab.

An introduction to the chemistry laboratory. Experiments are performed to allow understanding and application of chemistry principles in our world. Must register within two years of successful completion of CHEM 020.

CHEM 160 Introductory Chemistry

4.0 Units

Course Advisory: SCC minimum English standard.

General Education: Option A: Area A, 48-54 lab.

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.