# CHEMISTRY, ASSOCIATE IN SCIENCE (AS)

## In Workflow

1. VC Technical Review 1 (dfarias@vcccd.edu)
2. VC Articulation Officer (czarina_gutierrez1@vcccd.edu)
3. 3183 Chair (mrose1@vcccd.edu)
4. VC Technical Review 2 (sbranca@vcccd.edu)
5. VC Curriculum Technician (jmartinez19@vcccd.edu)
6. VC Curriculum Technician Pre-Banner (jmartinez19@vcccd.edu)
7. Banner

## Approval Path

1. 2025-02-25T21:30:04Z
   Czarina Gutierrez (czarina_gutierrez1): Approved for VC Technical Review 1
2. 2025-02-26T16:27:11Z
   Czarina Gutierrez (czarina_gutierrez1): Approved for VC Articulation Officer
3. 2025-02-26T16:36:38Z
   Malia Seisa (mrose1): Approved for 3183 Chair
4. 2025-03-11T16:35:22Z
   Czarina Gutierrez (czarina_gutierrez1): Approved for VC Technical Review 2

### New Program Proposal

Date Submitted: 2025-02-07T22:13:57Z

### Viewing: Chemistry, Associate in Science (AS)

### Last edit: 2025-04-09T17:50:29Z

Changes proposed by: mrose1

**Originator**

mrose1

**Co-Contributor(s)**

| Name(s) |
| --- |
| Han, Howard (hhan) |

### Program Information

**College**

Ventura College

**Division**

Ventura Sciences (328)

**Discipline/Department**

Chemistry

**Program Title**

Chemistry, Associate in Science (AS)

**Banner Code**

Chemistry AS

**Program Type**

Credit

**Program Award/Degree**

A.S. Degree (S)

**Program Goal**

O – Local (all other AA/AS degrees and certificates not in a CTE TOP code)

**Justification of Need or Modification**

The Associate in Science in Chemistry degree prepares students for transfer into BA and BS programs in Chemistry and Biochemistry at the CSU and UC systems and other institutions granting baccalaureate degrees. Currently, Ventura College is unable to offer an AS-T degree within the required 60 unit maximum. Additionally, the UCTP degree is on indefinite hold awaiting Cal-GETC approval. This AS is designed to give students flexibility in preparation for transfer, including the core of required courses for both CSU and UC programs and allowing students to take other additional courses as required by their specific intended transfer institution's major's requirements.

**Start Term**

Fall 2025

**Catalog Edition**

2025-2026

## Program Details

**Guided Pathways: Areas of Interest**

VC - Science & Technology

## Collaborative/Joint Programs

**Collaborative/Joint Program**

No

## Distance Education

**Distance Education**

1-50

## Program Narrative

**Program Narrative Attachment**

Chemistry, Associate in Science (AS) Narrative (1).docx

## Program Goals and Objectives

**Must address a valid transfer, workforce preparation, basic skills, civic education, or lifelong learning purpose.**

The Associate in Science in Chemistry degree prepares students for transfer into BA and BS programs in Chemistry and Biochemistry at the CSU and UC systems and other institutions granting baccalaureate degrees. Currently, Ventura College is unable to offer an AS-T degree within the required 60 unit maximum. Additionally, the UCTP degree is on indefinite hold awaiting Cal-GETC approval. This AS is designed to give students flexibility in preparation for transfer, including the core of required courses for both CSU and UC programs and allowing students to take other additional courses as required by their specific intended transfer institution's major's requirements.

This degree will recognize students' work at Ventura College within the discipline of chemistry and provide them with an Associates in Science before transfer. The coursework will adequately prepare them for transfer to pursue a bachelor's degree in the same field. This program will seek to support Ventura College's goals to increase the success of our students while closing equity gaps and increase our community's access to transfer and workforce preparation by providing the support, guidance, and training needed for those students interested in pursuing a career in chemistry.

Chemistry graduates with degrees of all levels are in high demand in many areas, including scientific research, the energy industry, materials sciences, aerospace and space technology, agriculture, quality assurance and testing, water science, pharmaceuticals, medicinal research, semiconductors, polymers, and many others. They are employed by a multitude of industries both private and public. They also often work in related fields such as chemical engineering, biotechnology, nutrition, geology, toxicology, wine making, and others.

## Evidence of Need

**The proposal must demonstrate a need for a program that meets the stated goals and objectives in the region the college proposes to serve with the program.**

The Associate in Science in Chemistry degree at Ventura College is designed to meet the needs of students who wish to pursue transfer studies in chemistry and related fields. The program provides a comprehensive foundation in general and organic chemistry, along with essential coursework in mathematics and physics, aligning with the transfer requirements of CSUs and UCs.

This program addresses a critical demand for skilled STEM professionals within Ventura County and the broader Southern California region. Fields such as healthcare, environmental science, biotechnology, and chemical engineering rely heavily on individuals with strong chemistry backgrounds. By equipping students with the knowledge and skills necessary to excel in these areas, the program contributes to fulfilling both educational and workforce demands.

Ventura College's commitment to equity and access ensures that students from diverse backgrounds have the opportunity to achieve academic and professional success. The Chemistry A.S. program supports this mission by providing an accessible, affordable pathway to advanced studies and careers in the sciences.

## Program Student Learning Outcomes

**Program Student Learning Outcomes**

| Upon completion of this program a student will be able to: |
|---|
| Design and/or conduct experiments safely according to current ACS laboratory standards to collect and analyze data and interpret its results. |
| Research, read, and analyze primary scientific literature and prepare lab reports to communicate experimental results. |
| Demonstrate proper use of modern laboratory instrumentation for chemical analysis and demonstrate proficiency in data collection, analysis, and safety. |
| Apply fundamental chemical principles, such as atomic theory, bonding theory, equilibria, acid-base chemistry, and others to integrated problems to derive solutions. |
| Effectively communicate scientific ideas and principles through problem-solving, written, and/or orally. |

## Catalog Description

**Includes program requirements, prerequisite skills or enrollment limitations, student learning outcomes, and information relevant to program goal.**

The Associate in Science in Chemistry provides a comprehensive foundation in chemistry, mathematics, and physics, preparing students for transfer to four-year institutions and careers in STEM fields. This program includes coursework in general and organic chemistry, along with essential lab skills, fostering critical thinking and problem-solving abilities. Students will be equipped with the knowledge and expertise to pursue further studies in chemistry, biochemistry, chemical engineering, and related disciplines.

## Program Requirements

**Includes course requirements and sequencing that reflect program goals.**

| Course ID | Title | Units/Hours |
|---|---|---|
| **Required Core Courses** | | |
| CHEM V120A | General Chemistry I | 5 |
| CHEM V120B | General Chemistry II | 5 |
| CHEM V160A | General Organic Chemistry I | 5 |
| CHEM V160B | General Organic Chemistry II | 5 |
| MATH V21A | Calculus with Analytic Geometry I | 5 |
| MATH V21B | Calculus with Analytic Geometry II | 5 |
| PHYS V04<br>& V04L | Mechanics for Scientists and Engineers<br>and Mechanics Laboratory for Scientists and Engineers | 5 |
| PHYS V05<br>& V05L | Electricity and Magnetism for Scientists and Engineers<br>and Electricity and Magnetism Laboratory for Scientists and Engineers | 5 |
| **Required Core Units** | | **40** |
| **Required Additional Courses** | | |
| Choose one option from the following: | | |
| MATH V21C | Multivariable Calculus | 5 |
| PHYS V06<br>& V06L | Optics, Heat, and Modern Physics: For Scientists and Engineers<br>and Optics, Heat, and Modern Physics Laboratory for Scientists and Engineers | 5 |
| **Total Required Major Units** | | **45** |
| VCCCD General Education Units | | 24 |
| Double-Counted Units | | (6) |
| Elective Units | | 0 |
| **Total Units for the A.S. Degree** | | **63** |

## Plan of Study

**Includes a list of courses organized by the suggested semester a student should enroll. Make sure to align the plan of study with when courses are typically offered.**

| | | |
|---|---|---|
| **Year 1** | | |
| **Fall Semester** | | **Units/Hours** |
| CHEM V120A | General Chemistry I (Double Counts for VC Local GE Area 5) | 5 |
| ENGL V01A | Academic Reading and Writing (Satisfies VC Local GE Area 1a) | 4 |
| MATH V21A | Calculus with Analytic Geometry I ((Double Counts for VC Local GE Area 2)) | 5 |
| Select minimum 3 unit course from VC Local GE Area 7 | | 3 |
| | **Units/Hours** | **17** |
| **Spring Semester** | | |
| CHEM V120B | General Chemistry II | 5 |
| MATH V21B | Calculus with Analytic Geometry II | 5 |
| PHYS V04 | Mechanics for Scientists and Engineers | 4 |
| PHYS V04L | Mechanics Laboratory for Scientists and Engineers | 1 |
| | **Units/Hours** | **15** |
| **Year 2** | | |
| **Fall Semester** | | |
| CHEM V160A | General Organic Chemistry I | 5 |
| PHYS V05 | Electricity and Magnetism for Scientists and Engineers | 4 |
| PHYS V05L | Electricity and Magnetism Laboratory for Scientists and Engineers | 1 |
| Select course from VC Local GE Area 1b | | 3 |
| Select course from VC Local GE Area 3 | | 3 |
| | **Units/Hours** | **16** |
| **Spring Semester** | | |
| CHEM V160B | General Organic Chemistry II | 5 |
| MATH V21C<br>or PHYS V06 ***and*** PHYS V06L | Multivariable Calculus<br>or Optics, Heat, and Modern Physics: For Scientists and Engineers ***and*** Optics, Heat, and Modern Physics Laboratory for Scientists and Engineers | 5 |
| Select course from VC Local GE Area 4 | | 3 |
| Select course from VC Local GE Area 6 | | 3 |
| | **Units/Hours** | **16** |
| | **Total Units/Hours** | **64** |

## Master Planning

**Address how the degree/certificate fits in the mission, curriculum, and master planning of the college and higher education in California.**

The Chemistry Associate in Science (A.S.) degree at Ventura College aligns with the college's mission to provide equitable, accessible, and high-quality education that prepares students for academic transfer and career success. This program supports Ventura College's role as a leading institution for STEM education in Ventura County by fostering the development of critical scientific knowledge and skills.

The program is designed to meet the transfer requirements of the California State University (CSU) and University of California (UC) systems, providing a streamlined pathway for students pursuing advanced degrees in chemistry and related fields. It also addresses California's broader master plan for higher education by contributing to the preparation of a skilled and diverse STEM workforce, vital for the state's economic growth and sustainability.

By integrating rigorous coursework in chemistry, mathematics, and physics with practical laboratory experience, the program enhances the college's curriculum and supports its commitment to student equity and success. Ventura College remains a critical contributor to the educational pipeline, ensuring that students from diverse backgrounds are prepared for the challenges of advanced scientific studies and the demands of the modern workforce.

## Enrollment and Completer Projections

**Projection of number of students to earn certificate annually.**

This section will include projections based on historical enrollment data and anticipated trends in student interest in STEM disciplines at Ventura College. Estimated enrollment and completion rates are as follows:

- Annual Enrollment: [XXX Number of Students]
- Annual Completion: [XXX Number of Students]

These projections should reflect the growing demand for STEM education within Ventura County and the increasing interest among students in preparing for advanced studies and careers in chemistry, biochemistry, and related fields.

Sources for these projections include historical enrollment data for similar programs, regional labor market trends, and institutional reports.

## Place of Program in Curriculum

**How the degree/certificate fits in the college's existing program inventory.**

The Chemistry Associate in Science (A.S.) degree at Ventura College complements the college's existing STEM programs, including biology, mathematics, and physics, by offering a focused pathway in chemical sciences. This program prepares students for transfer to UC and CSU systems, aligning with lower-division requirements for chemistry majors.

By integrating essential coursework in general and organic chemistry with mathematics and physics, the program strengthens Ventura College's role in providing high-quality STEM education. This degree enhances the curriculum without displacing other programs, supporting the college's mission to equip students for academic and professional success.

## Similar Programs at Other Colleges in Service Area

**Justification of need for program in the region.**

Within the Ventura County Community College District (VCCCD), both Oxnard College and Moorpark College offer Associate in Science (A.S.) degrees in Chemistry. Oxnard College and Moorpark College provide an Associate in Science in Chemistry for UC Transfer (A.S.-UCTP), designed to facilitate transfer to University of California campuses.

Ventura College's Chemistry A.S. degree offers a comprehensive curriculum in general and organic chemistry, supported by essential coursework in mathematics and physics. This program prepares students for transfer to both University of California (UC) and California State University (CSU) systems, catering to a broader range of transfer opportunities.

The presence of similar programs within the district underscores the regional demand for chemistry education pathways. Ventura College's program addresses this need by providing accessible, high-quality education in the Ventura area, supporting students in achieving their academic and professional goals in the chemical sciences.

The only other nearby community college with a similar degree is SBCC, with an A.A. College of the Canyons does not offer any degree in chemistry.

## Transfer Preparation Information

## Units

**Required Major Units/Hours (Minimum)**

45

**Required Major Units/Hours (Maximum)**

45

## General Education Pattern Available for Program

**GE Pattern of a Transfer Institution (meeting minimum of T5 requirements)**

No

**CSU GE-Breadth**

No

**IGETC**

No

**General Education Units (Minimum)**

24

**General Education Units (Maximum)**

24

**Double-Count Units (Minimum)**

6

**Double-Count Units (Maximum)**

6

**Total Units/Hours (Minimum)**

63

**Total Units/Hours (Maximum)**
63

## Codes

**Program TOP Code**
1905.00 - Chemistry, General

**Program CIP Code**
400501 - Chemistry, General.

## New Program Details

**Annual Completers**
10

**Faculty Workload**
Existing

**New Faculty Position(s)**
0

**New Equipment Narrative**
N/A

**New or Remodel Facility**
N/A

**Library Acquisitions**
N/A

## Approval Dates

**Curriculum Committee**
03/04/2025

**DCCI**
03/13/2025

**Board of Trustees**
04/08/2025

**CCCCO**
04/09/2025

**State Control #**
44993

**Next Program Review Date**
08/01/2030

**Department of Education/Accreditation**
MM/DD/YYYY

Key: 668