

# CHEMISTRY, ASSOCIATE IN SCIENCE FOR TRANSFER

Chemistry is the study of matter, including its composition, its properties, and the transformations it undergoes. Chemistry is considered “the central science” because it draws from physics and mathematics and its principles and applications constitute the foundation for other scientific disciplines including the biological sciences, the earth sciences, engineering, and medicine. A degree in chemistry affords excellent academic preparation for further study in any of these disciplines.

The Associate in Science in Chemistry for Transfer degree (AS-T in Chemistry) prepares students to pursue a Bachelor’s degree in Chemistry at a California State University. Successful completion of the transfer degree guarantees the student acceptance to a California State University (but does not guarantee acceptance to a particular campus or major). Students must complete the Associate Degree for Transfer requirements to earn the AS-T degree.

## Learning Outcomes

Upon successful completion of the program, students will be able to:

- Describe the particle nature of matter, explain the attractions and/or bonds between chemical units, and predict the physical and chemical properties they possess.
- Describe chemical compounds and their reactions using the fundamental language of chemistry, including the use of proper chemical names, molecular formulas, chemical equations, structural drawings, and reaction mechanisms.
- Predict the likelihood and extent of a chemical reaction by analyzing the kinetic and thermodynamic properties of the system.
- Solve chemistry-specific problems by identifying the essential parts of the problem, formulating a strategy for solving the problem, applying appropriate techniques to arrive at a solution, testing the correctness of the solution, and interpreting the results.
- Successfully execute chemistry experiments using standard laboratory equipment, modern instrumentation, and classical purification techniques.
- Communicate the concepts and results of chemistry experiments through effective writing and/or oral communication using the discipline standards for reporting and citation.
- Follow the proper procedures and regulations for safe handling and use of chemicals.

## Associate in Science for Transfer Degree Major Requirements

| Code                 | Title                              | Units |
|----------------------|------------------------------------|-------|
| <b>Required Core</b> |                                    |       |
| CHEM 1A              | General Chemistry I                | 5     |
| CHEM 1B              | General Chemistry II               | 5     |
| CHEM 12A             | Organic Chemistry I                | 5     |
| CHEM 12B             | Organic Chemistry II               | 5     |
| MATH 20A             | Calculus with Analytic Geometry I  | 4     |
| MATH 20B             | Calculus with Analytic Geometry II | 4     |
| PHYS 3A              | Science and Engineering Physics I  | 4     |
| PHYS 3B              | Science and Engineering Physics II | 4     |

|  |           |
|--|-----------|
| <b>TOTAL MAJOR UNITS</b>   | <b>36</b> |
| <b>Additional Requirements</b>   | <b>24</b> |
| Complete IGETC for STEM pattern for a total of 60 transferable units.<br>1 |           |

**Total Units** **60**

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This degree program requires completion of the IGETC for STEM pattern, allowing for completion after transfer of one course each in IGETC Area 3 (Arts and Humanities) and Area 4 (Social and Behavioral Sciences).

Please refer to the graduation requirements section of the Catalog for information about degree and certificate requirements including Reading and Writing, Mathematics, Information Competency, and General Education requirements.

The model sequence of coursework below is one pathway for students to complete the program. The information below is not an official educational plan. An MPC Counselor can assist you with creating a personalized education plan based on your academic, career, and personal goals. Visit MPC’s Counseling website for more information about Counseling and up-to-date program requirements.

## Suggested 2-Year Course Sequence

### Year 1

| Fall                                    |   | Units     |
|---|---|-----------|
| ENGL 1A<br>or ENGL 1AE                  | College Composition<br>or College Composition: Enhanced | 3         |
| MATH 20A                                | Calculus with Analytic Geometry I                       | 4         |
| CHEM 1A                                 | General Chemistry I                                     | 5         |
| IGETC Area 3B (US-1 Course Recommended) |   | 3         |
| <b>Units</b>                            |   | <b>15</b> |

### Spring

|              |   |           |
|--------------|---|-----------|
| ENGL 2       | Argumentative Writing and Critical Thinking | 3         |
| MATH 20B     | Calculus with Analytic Geometry II          | 4         |
| CHEM 1B      | General Chemistry II                        | 5         |
| PHYS 3A      | Science and Engineering Physics I           | 4         |
| <b>Units</b> |   | <b>16</b> |

### Summer

|                                    |            |
|------------------------------------|------------|
| IGETC Area 6 (UC Requirement)      | 0-5        |
| SPCH 1 or SPCH 2 (CSU Requirement) | 0-3        |
| <b>Units</b>                       | <b>0-8</b> |

### Year 2

| Fall                                       |  | Units     |
|--|--|-----------|
| CHEM 12A                                   | Organic Chemistry I  | 5         |
| MATH 20C<br>or PHYS 3B<br>or PHYS 3C       | Calculus of Several Variables<br>or Science and Engineering Physics II<br>or Science and Engineering Physics III | 4         |
| IGETC Area 4 (US-2 & 3 Course Recommended) |  | 3         |
| <b>Units</b>                               |  | <b>12</b> |

### Spring

|               |                      |   |
|---------------|----------------------|---|
| CHEM 12B      | Organic Chemistry II | 5 |
| IGETC Area 3A | 3                    |   |
| IGETC Area 4  | 3                    |   |

|                    |           |
|--------------------|-----------|
| IGETC Area 5B      | 3         |
| <b>Units</b>       | <b>14</b> |
| <b>Total Units</b> | <b>60</b> |

MPC transfer programs are designed to enable students to complete lower-division requirements in preparation for transfer to a baccalaureate-granting institution.

The Student Transfer Achievement Reform Act (Senate Bill 1440, codified in California Education Code sections 66746-66749) guarantees admission to California State University (CSU) system for any community college student who earns an Associate Degree for Transfer (ADT), although not to a particular campus or major. Upon transferring to a CSU campus that accepts the Associate in Arts for Transfer (AA-T) or Associate in Science for Transfer (AS-T), students will be required to complete no more than 60 upper-division units to earn a bachelor's degree in a same or similar major (unless designated as a "high-unit" major).

The following Associate Degree for Transfer requirements must be completed to earn the AA-T or AS-T degree:

- a. Minimum of 60 CSU-transferable semester units;
- b. Minimum grade point average (GPA) of 2.0 in all CSU-transferable coursework (while a minimum of 2.0 is required for admission, some majors may require a higher GPA);
- c. Completion of a minimum of 18 semester units as detailed in the Major Requirements;
- d. Completion of all courses in the major with a grade of C or better (or a "P" if the course is taken on a "Pass/No Pass" basis);
- e. Certified completion of the California State University General Education-Breadth pattern (CSU GE-Breadth) pattern; OR the Intersegmental General Education Transfer Curriculum (IGETC) pattern.

All students should consult with a Counselor to discuss transfer pathways and specific university admission requirements. Visit MPC's Counseling website for more information about Counseling services provided by MPC and to connect with a Counselor.