# CHEMISTRY

**Associate of Science**

The Associate of Science degree with a field of study in Chemistry offers students the opportunity to take a core curriculum of general education with an emphasis in Chemistry.

Chemistry students have a wide choice of careers in many different scientific and technical fields. The student should bear in mind that many of the career areas will require training beyond the Associate of Science degree and in some cases a post-graduate degree:

Career fields available to Chemistry students:

- Biochemistry
- Chemical Engineering
- Chemical Technician
- Civil Engineering
- Education, secondary and post-secondary
- Environmental Science
- Forensic Science
- Medical Technology
- Medical Doctor or Physician Assistant
- Mineral Processing
- Molecular Biology
- Oil Refining
- Petroleum Engineering
- Pharmacy
- Plastics Manufacturing
- Research Scientist
- Water Treatment

This listing closely parallels the first two years of education that one would receive at most universities. Upon completion of this sequence, many students transfer to obtain a degree in one of the various chemistry fields. However, students intending to transfer should be aware of the transfer institution's requirements.

Entering students, please note that the first semester suggests MATH 2413 Calculus I. Students with a score of 980+ on the math portion of the TSIA2 Exam may test-out of MATH 2412 Pre-Calculus Math and enroll directly into MATH 2413 Calculus I after taking and passing the Calculus I Placement Exam provided by the Mathematics Department. Students who qualify and elect this option must contact and make arrangements with the Mathematics Department at 956-872-8327 no later than two (2) weeks prior to the start of the semester the students intends to enroll.

Students with an SAT score of 560+ (SAT II Math Level 1), 520+ (SAT II Math Level 2) or an ACT score of 28+ may also enroll directly into MATH 2413 Calculus I. Otherwise, it is recommended that students take the prerequisite MATH 2412 Pre-Calculus Math the summer prior to the start of the fall semester. Enrollment in MATH 2412 Pre-Calculus Math requires a prerequisite of MATH 1414 College Algebra or ACT scores of 25-27, SAT II Math Level I scores of 520-559, or SAT II Math Level 2 scores of 500-519.

Chemistry Program Webpage: https://www.southtexascollege.edu/chemistry

## Program Learning Outcomes

1. The graduate will solve problems utilizing chemical concepts (stoichiometry, colligative properties, acid/base).
2. The graduate will describe the structure, bonding, and reactivity of chemical compounds (acid/base, redox).
3. The graduate will describe reaction mechanisms and synthesis of organic compounds.
4. The graduate will safely perform laboratory experiments involving a variety of chemical techniques and will communicate analysis of results in writing.
5. The graduate will apply principles of molecular nature of matter and its changes (chemical reactions, electron configuration, electronic trends).
6. The graduate will apply rules of nomenclature on compound chemicals.
7. The graduate will apply spectroscopic techniques for structural determination of organic compounds.

**TSI Liable**

| | | |
|---|---|---|
| **Field of Study - 18 credit hours** | | |
| CHEM 1411 | General Chemistry I | 4 |
| CHEM 1412 | General Chemistry II | 4 |
| CHEM 2423 | Organic Chemistry I [1] | 4 |
| CHEM 2425 | Organic Chemistry II [1] | 4 |
| MATH 2414 | Calculus II | 4 |
| **STC Core Curriculum - 42 credit hours** | | |
| Complete 42 credit hours of required Core Curriculum including the following: [2] | | 42 |
| *Life and Physical Sciences* | | |
| PHYS 1401 & PHYS 1402 | College Physics I and College Physics II | |
| or PHYS 2425 & PHYS 2426 | University Physics I and University Physics II | |
| BIOL 1406 & BIOL 1407 | Biology for Science Majors I and Biology for Science Majors II (only recommended for Pre-Med majors) | |
| *Mathematics* | | |
| MATH 2413 | Calculus I | |
| **Total Credit Hours** | | **60** |

[1] For CHEM 2423 Organic Chemistry I and CHEM 2425 Organic Chemistry II, 3 credit hours are scheduled for the field of study and 1 credit hour is scheduled to meet the general core curriculum requirements (Component Area Option).

[2] In addition to the courses in the Field of Study, the student is required to take 42 credit hours from the STC Core Curriculum.

**TSI Liable**

## Recommended Course Sequence

| Course | Title | Credit Hours |
|---|---|---|
| **First Year** | | |
| **Fall** | | |
| Creative Arts Elective - Core Curriculum | | 3 |
| CHEM 1411 | General Chemistry I | 4 |
| ENGL 1301 | Composition I | 3 |
| MATH 2413 | Calculus I | 4 |
| | **Credit Hours** | **14** |
| **Spring** | | |
| CHEM 1412 | General Chemistry II | 4 |

| | | |
|---|---|---|
| HIST 1301<br>or HIST 2327<br>or<br>HIST 2381 | United States History I<br>or Mexican-American History I<br>or African American History I | 3 |
| ENGL 1302 | Composition II - Rhetoric | 3 |
| Life and Physical Sciences Elective - Core Curriculum | | 4 |
| Select one of the following: [1] | | |
| PHYS 1401 | College Physics I | |
| PHYS 2425 | University Physics I | |
| BIOL 1406 | Biology for Science Majors I | |
| | **Credit Hours** | **14** |
| **Summer** | | |
| HIST 1302<br>or HIST 2328<br>or<br>HIST 2382 | United States History II<br>or Mexican-American History II<br>or African American History II | 3 |
| | **Credit Hours** | **3** |
| **Second Year** | | |
| **Fall** | | |
| CHEM 2423 | Organic Chemistry I [2] | 4 |
| GOVT 2305 | Federal Government | 3 |
| Life and Physical Sciences Elective - Core Curriculum | | 4 |
| Select one of the following: [1] | | |
| PHYS 1402 | College Physics II | |
| PHYS 2426 | University Physics II | |
| BIOL 1407 | Biology for Science Majors II | |
| Social and Behavioral Sciences Elective - Core Curriculum | | 3 |
| Recommended: | | |
| PSYC 2301 | General Psychology | |
| | **Credit Hours** | **14** |
| **Spring** | | |
| GOVT 2306 | Texas Government | 3 |
| CHEM 2425 | Organic Chemistry II [2] | 4 |
| MATH 2414 | Calculus II | 4 |
| Component Area Option - Core Curriculum | | 1-3 |
| | **Credit Hours** | **12** |
| **Summer** | | |
| Language, Philosophy & Culture Elective - Core Curriculum | | 3 |
| | **Credit Hours** | **3** |
| | **Total Credit Hours** | **60** |

[1] College Physics or University Physics must be taken for a broad chemistry associate and chemical engineering majors. Pre-Med Majors are recommended to complete both the BIOL and PHYS sequences to meet program requirements and to prepare for the MCAT.

[2] CHEM 2423 Organic Chemistry I and CHEM 2425 Organic Chemistry II are combined lecture and lab courses with 3 hours of each course designated as field of study and one hour allocated to the institutional component area option.