

PHYSICS

Associate of Science

The Associate of Science degree with a field of study in Physics offers students the opportunity to take a core curriculum of general education with an emphasis in Physics. Additionally, students can choose from pathways in general physics, geoscience/geospatial science, environmental science, and geophysics.

Physics students have a wide range of scientific and technical fields to choose from for their career. The student should bear in mind that most of these career areas require education or training beyond the Associate of Science degree.

Career fields available to the physics student include:

- Astronomy
- Biophysics
- Chemistry
- Computer Science
- Elementary or Secondary Education
- Engineering - Civil, Electrical, Industrial
- Geophysics
- Hydrogeology
- Medicine
- Meteorology
- Patent Law
- Physics
- Seismology

The course listing for the Associate of Science degree with a field of study in Physics 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 physics fields. However, students intending to transfer should be aware of the transfer institution's requirements.

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.

Physics program webpage: <https://www.southtexascollege.edu/physics>

Program Learning Outcomes

1. The student will solve problems using the principles of Classical Mechanics (particles, rigid bodies, waves).
2. The student will solve problems using the basic concepts of Thermodynamics.
3. The student will solve problems using the principles of electromagnetics.
4. The student will apply the principles of optics.
5. The student will perform experiments using basic techniques and will communicate analysis in written reports.
6. The student will apply calculus-based mathematical skills to solve physics related problems.

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Field of Study - 18 credit hours

| | | |
|-----------|---|---|
| MATH 2414 | Calculus II | 4 |
| MATH 2415 | Calculus III | 4 |
| MATH 2420 | Differential Equations | 4 |
| PHYS 2426 | University Physics II | 4 |
| COSC 1436 | Programming Fundamentals I ¹ | 4 |

Geoscience/Geo-Spatial Science Track - 18 credit hours

| | | |
|--------------|---------------------------------|---|
| MATH 2414 | Calculus II | 4 |
| GEOL 1403 | Physical Geology | 4 |
| PHYS 2425 | University Physics I | 4 |
| GEOL 1404 | Historical Geology ² | 4 |
| PHYS 2426 | University Physics II | 4 |
| or COSC 1436 | Programming Fundamentals I | |

Students should speak with an advisor and check with the institution they intend to transfer in order to choose either PHYS 2426 or COSC 1436 for this track.

Environmental Science Track - 18 credit hours

| | | |
|-----------|---------------------------------|---|
| MATH 2414 | Calculus II | 4 |
| GEOL 1403 | Physical Geology | 4 |
| PHYS 2425 | University Physics I | 4 |
| PHYS 2426 | University Physics II | 4 |
| GEOL 1404 | Historical Geology ² | 4 |

Geophysics Track - 18 credit hours

| | | |
|-----------|---------------------------------|---|
| MATH 2414 | Calculus II | 4 |
| GEOL 1403 | Physical Geology | 4 |
| PHYS 2425 | University Physics I | 4 |
| PHYS 2426 | University Physics II | 4 |
| GEOL 1404 | Historical Geology ² | 4 |

STC Core Curriculum - 42 credit hours

Complete 42 credit hours of required Core Curriculum including the following:

Life and Physical Sciences

| | |
|-----------|-----------------------------------|
| CHEM 1411 | General Chemistry I ³ |
| PHYS 2425 | University Physics I ³ |

Mathematics

| | |
|-----------|------------|
| MATH 2413 | Calculus I |
|-----------|------------|

Total Credit Hours **60**

¹ COSC 1436 Programming Fundamentals I is scheduled for 2 credit hours of field of study and 2 credit hours of general education requirements (Component Area Option).

² GEOL 1404 Historical Geology is scheduled for 2 credit hours of field of study and 2 credit hours of general education requirements (Component Area Option).

³ Physics majors pursuing the **General track** are required to take the sequence CHEM 1411 General Chemistry I and PHYS 2425 University Physics I to fulfill the Life and Physical Sciences component of the Core Curriculum. Physics majors pursuing the **Geophysics track** are required to take the sequence CHEM 1411 General Chemistry I and CHEM 1412 General Chemistry II to fulfill the Life and Physical Sciences component of the Core Curriculum. Physics majors pursuing the **Environmental Science track** are required to take CHEM 1411 General Chemistry I and BIOL 1406 Biology for Science Majors I to fulfill the Life and Physical Sciences component of the Core Curriculum. Physics majors pursuing the **Geosciences/Geo-Spatial track** are required to take CHEM 1411 General Chemistry I and GEOL 1445 Oceanography (or GEOL 1447 Meteorology) to fulfill the Life

and Physical Sciences component of the Core Curriculum.

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Recommended Course Sequence
- General Track

| Course | Title | Credit Hours |
|---|--|--------------|
| First Year | | |
| Fall | | |
| MATH 2413 | Calculus I | 4 |
| COSC 1436 | Programming Fundamentals I ¹ | 4 |
| ENGL 1301 | Composition I | 3 |
| Creative Arts Elective - Core Curriculum | | 3 |
| Credit Hours | | 14 |
| Spring | | |
| ENGL 1302 | Composition II - Rhetoric | 3 |
| CHEM 1411 | General Chemistry I | 4 |
| MATH 2414 | Calculus II | 4 |
| HIST 1301 or HIST 2327 | United States History I or Mexican-American History I | 3 |
| Credit Hours | | 14 |
| Summer | | |
| HIST 1302 or HIST 2328 | United States History II or Mexican-American History II | 3 |
| Credit Hours | | 3 |
| Second Year | | |
| Fall | | |
| MATH 2420 | Differential Equations | 4 |
| GOVT 2305 | Federal Government | 3 |
| Social and Behavioral Sciences Elective - Core Curriculum | | 3 |
| Recommended: | | |
| PSYC 2301 | General Psychology | |
| PHYS 2425 | University Physics I | 4 |
| Credit Hours | | 14 |
| Spring | | |
| GOVT 2306 | Texas Government | 3 |
| PHYS 2426 | University Physics II | 4 |
| MATH 2415 | Calculus III | 4 |
| Component Area Option - Core Curriculum | | 1-3 |
| Credit Hours | | 12-14 |
| Summer | | |
| Language, Philosophy & Culture Elective - Core Curriculum | | 3 |
| Credit Hours | | 3 |
| Total Credit Hours | | 60-62 |

¹ COSC 1436 Programming Fundamentals I is scheduled for 2 credit hours of field of study and 2 credit hours of general education requirements (Component Area Option).

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Recommended Course Sequence
- Geoscience/Geo-Spatial Science Track

| Course | Title | Credit Hours |
|--|---------------------------|--------------|
| First Year | | |
| Fall | | |
| MATH 2413 | Calculus I | 4 |
| GEOL 1403 | Physical Geology | 4 |
| ENGL 1301 | Composition I | 3 |
| Creative Arts Elective - Core Curriculum | | 3 |
| Credit Hours | | 14 |
| Spring | | |
| ENGL 1302 | Composition II - Rhetoric | 3 |
| CHEM 1411 | General Chemistry I | 4 |

| | | |
|---|---|--------------|
| MATH 2414 | Calculus II | 4 |
| HIST 1301 or HIST 2327 | United States History I or Mexican-American History I | 3 |
| Credit Hours | | 14 |
| Summer | | |
| HIST 1302 or HIST 2328 | United States History II or Mexican-American History II | 3 |
| Credit Hours | | 3 |
| Second Year | | |
| Fall | | |
| PHYS 2425 | University Physics I | 4 |
| GEOL 1404 | Historical Geology ¹ | 4 |
| GOVT 2305 | Federal Government | 3 |
| Social and Behavioral Sciences Elective - Core Curriculum | | 3 |
| Recommended: | | |
| PSYC 2301 | General Psychology | |
| Credit Hours | | 14 |
| Spring | | |
| GOVT 2306 | Texas Government | 3 |
| PHYS 2426 or COSC 1436 | University Physics II ² or Programming Fundamentals I | 4 |
| GEOL 1445 or GEOL 1447 | Oceanography or Meteorology | 4 |
| Component Area Option - Core Curriculum | | 1-3 |
| Credit Hours | | 12-14 |
| Summer | | |
| Language, Philosophy & Culture Elective - Core Curriculum | | 3 |
| Credit Hours | | 3 |
| Total Credit Hours | | 60-62 |

¹ GEOL 1404 Historical Geology is scheduled for 2 credit hours of field of study and 2 credit hours of general education requirements (Component Area Option).

² Students should speak with an advisor and check with the institution they intend to transfer in order to choose the best option.

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Recommended Course Sequence
- Environmental Science Track

| Course | Title | Credit Hours |
|--|--|--------------|
| First Year | | |
| Fall | | |
| MATH 2413 | Calculus I | 4 |
| GEOL 1403 | Physical Geology | 4 |
| ENGL 1301 | Composition I | 3 |
| Creative Arts Elective - Core Curriculum | | 3 |
| Credit Hours | | 14 |
| Spring | | |
| ENGL 1302 | Composition II - Rhetoric | 3 |
| CHEM 1411 | General Chemistry I | 4 |
| MATH 2414 | Calculus II | 4 |
| HIST 1301 or HIST 2327 | United States History I or Mexican-American History I | 3 |
| Credit Hours | | 14 |
| Summer | | |
| HIST 1302 or HIST 2328 | United States History II or Mexican-American History II | 3 |
| Credit Hours | | 3 |
| Second Year | | |
| Fall | | |
| PHYS 2425 | University Physics I | 4 |
| BIOL 1406 | Biology for Science Majors I | 4 |
| GOVT 2305 | Federal Government | 3 |

| | |
|---|--------------|
| Social and Behavioral Sciences Elective - Core Curriculum | 3 |
| Recommended: | |
| PSYC 2301 General Psychology | |
| Credit Hours | 14 |
| Spring | |
| GOVT 2306 Texas Government | 3 |
| PHYS 2426 University Physics II | 4 |
| GEOL 1404 Historical Geology ¹ | 4 |
| Component Area Option - Core Curriculum | 1-3 |
| Credit Hours | 12-14 |
| Summer | |
| Language, Philosophy & Culture Elective - Core Curriculum | 3 |
| Credit Hours | 3 |
| Total Credit Hours | 60-62 |

¹ GEOL 1404 Historical Geology is scheduled for 2 credit hours of field of study and 2 credit hours of general education requirements (Component Area Option).

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Recommended Course Sequence - Geophysics Track

| Course | Title | Credit Hours |
|---|--|--------------|
| First Year | | |
| Fall | | |
| MATH 2413 | Calculus I | 4 |
| GEOL 1403 | Physical Geology | 4 |
| ENGL 1301 | Composition I | 3 |
| Creative Arts Elective - Core Curriculum | | 3 |
| Credit Hours | | 14 |
| Spring | | |
| ENGL 1302 | Composition II - Rhetoric | 3 |
| CHEM 1411 | General Chemistry I | 4 |
| MATH 2414 | Calculus II | 4 |
| HIST 1301 or HIST 2327 | United States History I or Mexican-American History I | 3 |
| Credit Hours | | 14 |
| Summer | | |
| HIST 1302 or HIST 2328 | United States History II or Mexican-American History II | 3 |
| Credit Hours | | 3 |
| Second Year | | |
| Fall | | |
| PHYS 2425 | University Physics I | 4 |
| CHEM 1412 | General Chemistry II | 4 |
| GOVT 2305 | Federal Government | 3 |
| Social and Behavioral Sciences Elective - Core Curriculum | | 3 |
| Recommended: | | |
| PSYC 2301 General Psychology | | |
| Credit Hours | | 14 |
| Spring | | |
| GOVT 2306 | Texas Government | 3 |
| PHYS 2426 | University Physics II | 4 |
| GEOL 1404 | Historical Geology ¹ | 4 |
| Component Area Option - Core Curriculum | | 1-3 |
| Credit Hours | | 12-14 |
| Summer | | |
| Language, Philosophy & Culture Elective - Core Curriculum | | 3 |
| Credit Hours | | 3 |
| Total Credit Hours | | 60-62 |

¹ GEOL 1404 Historical Geology is scheduled for 2 credit hours of field of study and 2 credit hours

of general education requirements (Component Area Option).