BACHELOR OF SCIENCE, MAJOR IN PHYSICS, ELECTRICAL ENGINEERING 2+2

Additional information: Reference the Program Landing Page (https://www.shsu.edu/programs/bachelor-of-science-in-physics/) for additional information, such as cost, delivery format, contact information, or to schedule a visit.

Code	Title	Hours
Bachelor of Science, Major in Physics, Electrical Engineering 2+2		
Core Curriculum (https://catalog.shsu.edu/undergraduate/academic-policies-procedures/degree-requirements-academic-guidelines/core-curriculum/)		
Component Area I (Communication)		6
Component Area II (Mathematics) [1]		3
Component Area III (Life and Physical Science) [2]		8
Component Area IV (Language, Philosophy, and Culture) [3]		3
Component Area V (Creative Arts)		3
Component Area VI (U.S. History)		6
Component Area VII (Political Science/Government)		6
Component Area VIII (Social and Behavioral Sciences) [4]		3
Component Area IX (Component Area Option) [1,5]		4
Degree Specific Requirements		
CHEM 1411	General Chemistry I [2]	4
MATH 1420	Calculus I [1]	4
MATH 1430	Calculus II	4
PHYS 1401	Physics Boot Camp [2]	4
PHYS 1411	Introduction To Physics I	4
PHYS 1422	Introduction To Physics II	4
Major: Foundation		
MATH 3376	Differential Equations	3
PHYS 3115	Electronics and Circuit Analysis Lab	1
PHYS 3395	Electronics & Circuit Analysis	3
Major: Concentration		
COSC 1436	Programming Fundamentals I [6]	4
ETDD 1361	Engineering Graphics	3
MATH 2440	Calculus III	4
Total Hours		**72**

1. MATH 1420 satisfies the Core Curriculum requirement for Component Area II (Mathematics) and one semester credit hour for Component Area IX (Component Area IX) as well as the major.
2. Credits in PHYS 1401 and CHEM 1411 satisfy the Core Curriculum requirement for Component Area III (Life and Physical Science) as well as the major.
3. Students transferring to UT Tyler should delay taking credit in Component Area IV (Language, Philosophy, and Culture) at SHSU and instead register for PHIL 2306 (Intro to Ethics) at UT Tyler.
4. Students transferring to UT Tyler should register for ECON 2301 (Macroeconomics) or ECON 2302 (Microeconomics) at ECON 2302 (Microeconomics) at SHSU to fulfill the Core Curriculum requirement for Component Area VIII (Social and Behavioral Sciences).
5. Students transferring to UT Tyler should register for COMS 1361 (Public Speaking) at SHSU to fulfill the Core Curriculum requirement for Component Area IX (Component Area Option).
6. Students transferring to UT Tyler should enroll in in the c++ (rather than Java) section of this course.

While SHSU does not offer a major in Engineering, the Department of Physics and Astronomy does provide several options for Pre-Engineering. Physics and Engineering go together very well, because so much of Engineering is built upon the underlying foundation of Physics. Physicists seek to discover the first principles of Nature, and Engineers seek to use those principles for designing practical solutions to problems.

Students on the Electrical Pre-Engineering plan complete 72 credit hours in residence at Sam Houston State University, focusing on the Core Curriculum and developing a firm foundation in math and the hard sciences. They then transfer to a partner institution to complete remaining requirements for award of a degree in Electrical Engineering.

Our transfer articulation agreement with the University of Texas at Tyler (UT Tyler) makes matching credits a seamless process and guarantees acceptance for students meeting GPA requirements. This agreement holds for the main campus in Tyler and also for the new Houston Engineering Center branch campus. However, students are also free to continue their study at any institution with an accredited Engineering program.

For students considering Pre-Engineering vs. Engineering Technology, it is very important to understand the similarities and differences between these programs. Engineering tracks include significantly more Math (especially Calculus) than Technology tracks do, leading to very different careers. The Accreditation Board for Engineering and Technology (ABET) says that Engineering programs often focus on theory and conceptual design, while Technology programs usually focus on application and implementation. Engineers often do work involving original research and development, and many continue on to Masters or Doctoral programs in Engineering. Technologists are most likely to work in construction, manufacturing, product design, testing, or technical services and sales. Students interested in Engineering are supervised by the Department of Physics and Astronomy. Students interested in Technology are supervised by the Department of Engineering Technology.

Students may also wish to consider the Physics and Engineering Dual Degree (https://catalog.shsu.edu/archives/2025-2026/undergraduate/colleges-academic-departments/science-and-engineering-technology/physics-and-astronomy/bs-physics-engineering-dual-degree/), or "3+2" program, where students earn Bachelors Degrees in both Physics and Engineering. This starts with three years at SHSU, completing the Core Curriculum, the Calculus and Physics introductory sequence, and a portion of the upper division Physics Curriculum. Students then transfer to an accredited Engineering program (such as UT Tyler) for the last two years of degree work. After completion of the Engineering Degree, credits are retroactively transferred back to SHSU so that the Physics Degree can be awarded simultaneously.

All students interested in Physics or Pre-Engineering enroll in the Physics Bootcamp (PHYS 1401) during their first semester on campus. This ensures that students master the math skills required during the next two years and helps them understand what those skills are good for in Physics and Engineering. It develops confidence, teamwork, camaraderie, and a sense of belonging in the department. A weekly group-based problem-solving practice session is integrated. The Bootcamp is offered each Fall and Spring term.