

2023-2024 Catalog

Engineering Physics

Bachelor of Science
Academic Department
Physics and Engineering

Note: Students earning this degree will follow the [31-hour core curriculum for Engineering/Physics BS students](#).

The Engineering Physics degree prepares students with a strong interest in both engineering and physics for a career in industry, either directly following their undergraduate studies or after additional graduate studies in engineering or physics. The degree encompasses both a rigorous course of study in physics as well as a strong foundation in an engineering core.

Students will be ideally prepared for a career either as a professional engineer in industry or a successful student and researcher pursuing an advanced degree, e.g., a Master's or PhD degree in Engineering or Physics. Many employers, especially in industrial research and development, value the combination of the unique problem-solving approach of physics and knowledge in engineering core classes.

Students in the 3:2 Pre-Engineering program have the opportunity to switch after their second year of studies into the four year BS Engineering Physics program rather than continuing after their third year at UST for two additional years at a collaborating university.

Total Credits 93

ENGR/PHYS Coursework			
Item #	Course Title		Credits
<input type="checkbox"/> ENGR 1300	Introduction to Engineering		3
<input type="checkbox"/> ENGR 1100	Intro to Engineering Lab	ENGR 1100 Prerequisite: ENGR 1300	1
<input type="checkbox"/> ENGR 1314	Fundamentals of Computer-Aided Design		3
<input type="checkbox"/> ENGR 2100	Introduction to Engineering Design	ENGR 2100 Prerequisites: ENGR 1300, 1100	1
<input type="checkbox"/> PHYS 2333	University Physics I	PHYS 2333 Corequisites: PHYS 2111, MATH 1431	3
<input type="checkbox"/> PHYS 2111	University Physics I Laboratory	PHYS 2111 Corequisite: PHYS 2333	1
<input type="checkbox"/> PHYS 2334	University Physics II	PHYS 2334 Prerequisite: PHYS 2333; Pre/Corequisite: MATH 1432.	3
<input type="checkbox"/> PHYS 2112	University Physics II Lab	PHYS 2112 Corequisite: PHYS 2334	1
<input type="checkbox"/> PHYS 3337	Modern Physics	PHYS 3337 Prerequisites: PHYS 2334/2112; Corequisites: PHYS 3137.	3
<input type="checkbox"/> PHYS 3137	Modern Physics Laboratory	PHYS 3137 Prerequisites: PHYS 2334/2112; Corequisite: PHYS 3337	1
<input type="checkbox"/> ENGR 3333	Electrical Circuits I	ENGR/PHYS 3333 Prerequisites: PHYS 2334 or Instructor Permission	3
<input type="checkbox"/> ENGR 3133	Electrical Circuits Lab	ENGR/PHYS 3133 Prerequisites: PHYS 2334, 2112. Corequisite: ENGR/PHYS 3333.	1

<input type="checkbox"/>	ENGR 3335	Thermodynamics	PHYS/ENGR 3335 Prerequisites: CHEM 1342; MATH 1432; PHYS 2334	3
<input type="checkbox"/>	ENGR 3341	Statics	ENGR 3341 Prerequisites: PHYS 2333, MATH 1432	3
<input type="checkbox"/>	ENGR 3342	Dynamics	ENGR 3342 Prerequisites: ENGR 3341	3
<input type="checkbox"/>	ENGR 3343	Mathematical Methods for Physics and Engineering	ENGR 3343 Prerequisites: PHYS 2334, MATH 1432	3
<input type="checkbox"/>	ENGR 3130	Junior/Senior Seminar in Physics and Engineering	ENGR 3130 Prerequisites: PHYS 2334, 2112; Junior or Senior Standing.	1
<input type="checkbox"/>	ENGR 3138	Advanced Laboratory	ENGR 3138 Prerequisites: PHYS 3337, 3137.	1
<input type="checkbox"/>	PHYS 3339	Optics	PHYS 3339 Prerequisites: PHYS 2334, 2112.	3
<input type="checkbox"/>	PHYS 3139	Optics Laboratory	PHYS 3139 Prerequisites: PHYS 2334, 2112.	1
<input type="checkbox"/>	ENGR 4312	Engineering Communications	ENGR 4312 Prerequisites: ENGR 3333, Junior or Senior Standing	3
<input type="checkbox"/>	PHYS 4333	Electromagnetism	ENGR/PHYS 4333 Prerequisites: PHYS 3333 or Instructor Permission.	3
<input type="checkbox"/>	PHYS 4334	Quantum Mechanics	PHYS 4334 Prerequisites: PHYS 3337, PHYS 3343, and either PHYS 3342 or PHYS 3338	3
<input type="checkbox"/>	ENGR 4343	Computational Methods for Engineering	PHYS/ENGR 4343 Prerequisites: PHYS 3337, ENGR/PHYS 3343, or instructor permission.	3
<input type="checkbox"/>	ENGR 4364	Fundamentals of Nanotechnology	ENGR 4364 Prerequisites: ENGR/PHYS 3337; Junior-level standing.	3

Engineering Capstone and Lab Requirement Option

Choose one of the following options:

- Mechanical Engineering Design
- Electrical Engineering
- Chemical Engineering

Item #	Course Title		Credits
<input type="checkbox"/> ENGR 4320	Mechanical Engineering Design Capstone	ENGR 4320 Prerequisites: ENGR 2100, 3342; Senior Standing.	3
<input type="checkbox"/> ENGR 4120	Mechanical Engineering Design Capstone Laboratory	ENGR 4120: Prerequisites: ENGR 4320; Senior Standing.	1
<input type="checkbox"/> ENGR 4344	Electrical Engineering Capstone	ENGR 4344 Prerequisites: ENGR 3331, ENGR 3131, Senior Standing	3
<input type="checkbox"/> ENGR 4144	Electrical Engineering Capstone Laboratory	ENGR 4144 Prerequisites: ENGR 4344, Senior Standing	1
<input type="checkbox"/> ENGR 4356	Chemical Engineering Capstone	ENGR 4356 Corequisites: ENGR 4354. Prerequisites: ENGR 2100, Senior Standing.	3
<input type="checkbox"/> ENGR 4156	Chemical Engineering Capstone Laboratory	ENGR 4156 Prerequisites: ENGR 4356, Senior Standing	1

ENGR/PHYS Electives

Complete 12hrs ENGR/PHYS elective hours. Consult with your Academic Advisor for options.

Chemistry

Complete all of the following courses. Must take in order.

Item #	Course Title		Credits
<input type="checkbox"/> CHEM 1341	General Chemistry I	CHEM 1341 Corequisite: CHEM 1141	3
<input type="checkbox"/> CHEM 1141	General Chemistry I Laboratory	CHEM 1141 Corequisite: CHEM 1341	1
<input type="checkbox"/> CHEM 1342	General Chemistry II	CHEM 1342 Prerequisite (C or better): CHEM 1341/1141. Corequisite: CHEM 1142	3
<input type="checkbox"/> CHEM 1142	General Chemistry II Laboratory	CHEM 1142 Corequisite: CHEM 1342	1

Mathematics

Complete all of the following courses. Must take in order.

Item #	Course Title		Credits
<input type="checkbox"/> MATH 1431	Calculus I	MATH 1431 Prerequisite: MATH 1430 or department consent.	4
<input type="checkbox"/> MATH 1432	Calculus II	MATH 1432 Prerequisite: Grade of 'C' or Better in MATH 1431	4
<input type="checkbox"/> MATH 2431	Calculus III	MATH 2431 Prerequisite: MATH 1432 with a grade of "C" or better	4