

# PHYSICS | BACHELOR OF SCIENCE: DUAL DEGREE PHYSICS AND ENGINEERING (3+2 PROGRAM)

The 3+2 Dual Degree program in Physics and Engineering prepares you for a rewarding engineering career while developing your capability to handle rapid advancements in technology. In this innovative program, you spend three years at FHSU developing a strong background in physics and research techniques in a close-knit learning community. This extra year of individual attention and research experience propels you towards the top of your class when you transfer to the college of engineering of your choice.

Once you successfully complete two years of engineering courses, you will receive your engineering degree (from the school you transfer to) and a Bachelor of Science in Physics from FHSU, giving you a competitive edge as you seek employment or begin graduate school.

## Program Summary

Code	Title	Hours
	General Education	34
	Introductory Physics	16
	Intermediate Physics	9
	Advanced Physics	9
	Laboratory Electives	1
	Projects	1
	Cognates	20
	Open Electives to Complete BS - Physics Degree at FHSU (120 Credit Hours total) <sup>1</sup>	30
	Complete All Additional Requirements from Partner Institution for Engineering Degree <sup>2</sup>	
	<b>Total Hours</b>	<b>120</b>

<sup>1</sup> Open electives are the credit hours required to reach a minimum of 120 total hours and 45 upper-level hours. The number listed assumes all courses are completed at FHSU as listed. This number may vary if students transfer courses, or have individual substitutions allowed.

Students should speak with their advisor if either situation applies to determine if the number will vary, and to ensure they enroll in a minimum of 45 upper-level hours.

Students entering within 1 year of high school graduation will take UNIV 101 Freshman Seminar and may apply that hour in the open elective category.

<sup>2</sup> Minimum total credit hours to earn a second degree is 150.

## Program Requirements

### General Education

All undergraduate degrees require completion of the Kansas Systemwide General Education (<https://catalog.fhsu.edu/general-education/>).

Courses identified with <sup>GE</sup> on this page may satisfy a general education requirement in addition to the identified degree requirement. Students

who apply a degree requirement to satisfy a general education requirement will typically add an equal number of hours to the the university elective category. This flexibility may allow you to complete a minor or certificate within the 120 hour degree. Transfer students and students majoring in programs with approved exceptions (<https://www.fhsu.edu/general-education/documents/fhsu-gen-ed-transfer-exceptions-explainer1.pdf>) are especially encouraged to select these courses in completing General Education requirements to maximize the likelihood of completing the degree with 120 credit hours.

Code	Title	Hours
	<b>General Education</b>	<b>34-35</b>

### Major

Code	Title	Hours
	<b>Introductory Physics</b>	

PHYS 100	Introduction to Physics and Engineering	3
PHYS 211 & 211L	Engineering Physics I and Engineering Physics I Laboratory <sup>GE</sup>	5
PHYS 212 & 212L	Engineering Physics II and Engineering Physics II Laboratory <sup>GE</sup>	5
PHYS 313	Modern Physics	3

### Intermediate Physics

	Select three courses from the following:	9
PHYS 312	Scientific Computing and Productivity	
PHYS 221	Statics	
PHYS 331	Electronic Circuits	
PHYS 332	Analog and Digital Electronics	
PHYS 333	Introduction to Computational Physics	

### Advanced Physics Electives

	Select three courses from the following:	9
PHYS 608	Special Topics I	
PHYS 620	Mathematics for the Physical Sciences	
PHYS 621	Mechanics	
PHYS 632	Electricity and Magnetism	
PHYS 652	Optics	
PHYS 660	Solid State Physics	
PHYS 672	Thermal Physics	
PHYS 677	Quantum Mechanics I	
PHYS 678	Quantum Mechanics II	

### Laboratory Electives

	Select one course from the following:	1
PHYS 601	Computational Physics Laboratory	
PHYS 651	Advanced Physics Laboratory I	
PHYS 654	Advanced Physics Laboratory II	

### Projects

	Select one course from the following:	1
PHYS 603	Projects I	
PHYS 675	Senior Seminar	

### Cognates

CHEM 120 & 120L	University Chemistry I and University Chemistry Laboratory I <sup>GE</sup>	5
MATH 234	Analytic Geometry and Calculus I <sup>GE</sup>	5
MATH 235	Analytic Geometry and Calculus II	5
MATH 236	Analytic Geometry and Calculus III	3

MATH 354	Differential Equations	3
<b>Total Hours</b>		<b>57</b>

## Degree Requirements

Code	Title	Hours
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### All bachelor degrees require:

GPA of 2.0 on FHSU courses & 2.0 on all coursework (Higher program requirements prevail over the 2.0 when set)

A minimum of 30 hours earned from FHSU with a grade of D, C, B, or A

Successful completion of an upper division Writing and Information Literacy course (Most majors contain a course designated)

A minimum of 45 hours of recognized upper division credit

A minimum of 120 hours of recognized college credit

## Degree Maps

**Academic Degree Maps** are term-by-term sample course plans that specify milestones, courses, and special requirements that are necessary for facilitating on-time completion. Degree Maps are *examples* and are not prescriptive. Individualized choices such as concentration options, transfer credits, optional minors, advisory programs (certificates), etc. can alter the recommended coursework. Course offerings are subject to change. Students should consult with their academic advisors for additional guidance on course planning.

To determine courses to take in the directed choices (often listed as Program Elective Course) and directed elective course blocks see the overview tab for courses. To locate approved courses in General Education areas (Undergraduate Programs) see the general education section (<https://catalog.fhsu.edu/general-education/>) of the catalog.

The undergraduate course maps typically advise the most efficient route for students to complete the general education requirements. Courses that are required in the major may be listed as fulfilling relevant general education requirements. This will result in more open elective course hours in some maps than is listed on the degree overview page.