

MAJOR: PHYSICS, B.S.

DEPARTMENT OF PHYSICS

The physics major is primarily for students planning to work toward an advanced degree in physics or a related area. The physics courses emphasize conceptual foundations, problem-solving skills, and experimental techniques. Students participate in research focused primarily on theoretical physics, instrumentation, experimental solid state and high-energy physics, and physical oceanography. The department also offers courses required for professional and pre-professional programs such as engineering and medicine.

TYPICAL PROGRAM OF STUDY			
FIRST YEAR			
FALL SEMESTER		SPRING SEMESTER	
PHYS 1021 - Exploring Current Topics in Physics	1 cr	PHYS 2011 - General Physics I	4 cr
MATH 1296 - Calculus I ^	5 cr	CS 1131 Introduction to Programming in FORTRAN	
WRIT 1120 - College Writing	3 cr	or CS 1511 Computer Science I	3-5 cr
Liberal Education courses	<u>6 cr</u>	MATH 1297 - Calculus II	5 cr
	Total: 15 cr	Liberal Education course	3 cr
		<i>Phys 2111 Solving Physics Problems (recommended)</i>	<u>1 cr</u>
			Total: 16-18cr
SECOND YEAR			
PHYS 2012 - General Physics II	4 cr	PHYS 2021 Relativity and Quantum Physics	4 cr
MATH 3298 - Calculus III	4 cr	PHYS 2022 Classical Physics	4 cr
<i>Phys 2112 Solving Physics Problems II (recommended)</i>	1 cr	PHYS 2033 Classical and Quantum Physics Lab	2 cr
Liberal education or minor field courses	<u>6 cr</u>	MATH 3280 Differential Equations with Linear Algebra	<u>4 cr</u>
	Total: 15 cr		Total: 14 cr
THIRD YEAR*			
PHYS 4001 Classical Mechanics	4 cr	PHYS 4011 Electromagnetic Theory	4 cr
PHYS 4021 Quantum Physics II	4 cr	CHEM 1151 General Chemistry I ¹	5 cr
Liberal education or minor field courses	<u>7 cr</u>	Liberal education or minor field courses	<u>6 cr</u>
	Total: 15 cr		Total: 15 cr
FOURTH YEAR*			
PHYS 3061 Instrumentation	3 cr	PHYS 5061 Experimental Methods	3 cr
PHYS 4031 Thermal & Statistical Physics	4 cr	PHYS 5090 Physics Seminar	1 cr
WRIT 3150 - Advanced Writing Science	3 cr	Liberal education or minor field courses	<u>7 cr</u>
Liberal education or minor field courses	<u>6 cr</u>		Total: 14 cr
	Total: 16 cr		

^First math course is determined by math placement exam. This schedule presupposes placement into Math 1296. Students may take MATH 1596 and 1597, Honors Calculus I and II, in place of MATH 1296 and 1297.

¹Or Chem 1161 Honors General Chemistry I. A second semester of chemistry is recommended (Chem 1152 or Chem 1162.)

*Courses numbered above 3000 will be offered in alternate years only. Some courses listed for years 3 and 4 may need to be interchanged to match the course offerings.

FOR ADDITIONAL INFORMATION:

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218.726.7124
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PHYSICS, B.S.

MAJOR COURSE REQUIREMENTS	CREDITS	PREREQUISITES	SEMESTER TO BE COMPLETED	GRADE
YEAR 1				
WRIT 1120 College Writing	3			
CS 1511 Intro to Programming in Fortran or CS 1131 Computer Science I	3 5	3.5 yrs HS algebra or Math 1250 3.5 yrs HS algebra		
PHYS 1021 Exploring Current Topics in Physics	1			
PHYS 2011 General Physics I	4	MATH 1290 or 1296 or 1596		
PHYS 2111 Solving Physics Problems I (recommended)	1	MATH 1290 or 1296; or 1596; concurrent reg in 2011		
MATH 1296 Calculus I [^]	5	Math ACT \geq 25 or Math placement or MATH 1250		
MATH 1297 Calculus II [^]	5	with C- grade or higher MATH 1290 or 1296 with a 'C-' or better		
YEAR 2				
MATH 3280 Diff Equations w/ Linear Algebra	4	MATH 1297 or 1597 with a 'C-' or better		
MATH 3298 Calculus III	4	MATH 1297 or 1597 with a 'C-' or better		
PHYS 2012 General Physics II	4	PHYS 2011, MATH 1297 or 1597		
PHYS 2021 Relativity and Quantum Physics	4	PHYS 2012		
PHYS 2022 Classical Physics	4	PHYS 2012		
PHYS 2033 Classical & Quantum Physics lab	2	PHYS 2021, 2022 (concurrent registration OK)		
PHYS 2112 Solving Physics Problems II (recommended)	1	MATH 1297 or 1597; concurrent reg in PHYS 2012 is required		
YEAR 3*				
CHEM 1151 General Chemistry I ¹	4	1 yr HS chemistry, HS algebra, Math ACT \geq 21 or MATH 1005 with \geq a 'C-' or math placement		
PHYS 4001 Classical Mechanics	4	PHYS 2022 or 2001; MATH 3280		
PHYS 4011 Electromagnetic Theory	4	PHYS 2022 or 1203 or 1205; MATH 3280		
PHYS 4021 Quantum Physics II	4	PHYS 2021; MATH 3280		
YEAR 4*				
WRIT 3150 Advanced Writing: Science	3	WRIT 1120; 60 credits		
PHYS 3061 Instrumentation	3	PHYS 2022 or 1203 or 1205; 1 sem. programming		
PHYS 4031 Thermal & Statistical Physics	3	PHYS 2021		
PHYS 5061 Experimental Methods	3	PHYS 2033 or 2031; PHYS 3061		
PHYS 5090 Seminar	1	Senior or graduate student		

[^]First math course is determined by ACT math score or math placement exam. This schedule presupposes placement into Math 1296.

Students may take MATH 1596 and 1597, Honors Calculus I and II, in place of MATH 1296 and 1297.

¹ Or CHEM 1161 Honors General Chemistry I. A second semester of chemistry is recommended (CHEM 1152 or CHEM 1162.)

*Courses numbered above 3000 will be offered in alternate years only. Some courses listed for years 3 and 4 may need to be interchanged to match the course offerings.

NOTE: In addition to the above requirements, students must complete the liberal education program and a minor (or a second major) to earn a B.S. degree.