

Applied Physics Major, B.S.

Department of Physics

The Bachelor of Science (B.S.) degree in Applied Physics is primarily for students planning to work in industry. The physics courses emphasize conceptual foundations, problem-solving skills, and experimental and computational techniques.

Typical Program of Study:

Fall Semester

First Year

Math 1296 Calculus I ^a	5 cr
Comp 1120 College Writing	3 cr
Phys 1021 Exploring Current Topics in Physics	1 cr
Liberal education courses	<u>6 cr</u>
	15 cr

Second Year

Math 3298 Calculus III	4 cr
Phys 2012 General Physics II	4 cr
Phys 2112 Solving Phys Problems II (recommended)	1 cr
CS 1211 Programming in C	3 cr
Liberal education or minor field course	<u>3 cr</u>
	15 cr

Third Year*

Physics elective ^b	4 cr
Physics 5052 Computational Methods	
OR Phys 5053 Data Analysis Methods	3 cr
Liberal education or minor field courses	<u>8 cr</u>
	15 cr

Fourth Year*

Phys 3061 Instrumentation	3 cr
Physics elective ^b	4 cr
Comp 3150 Advanced Writing: Science	3 cr
Liberal education or minor field courses	<u>5 cr</u>
	15 cr

Spring Semester

Math 1297 Calculus II	5 cr
Phys 2011 General Physics I	4 cr
Phys 2111 Solving Phys Problems I (recommended)	1 cr
CS 1131 Intro to Programming in FORTRAN	3 cr
Liberal education course	<u>3 cr</u>
	16 cr

Math 3280 Diff Equations/Linear Algebra	4 cr
Phys 2021 Relativity & Quantum Physics	4 cr
Phys 2022 Classical Physics	4 cr
Phys 2033 Classical & Quantum Physics Lab	<u>2 cr</u>
	14 cr

Chem 1151 General Chemistry I ^c	5 cr
Technical elective ^d	3 cr
Technical elective ^d	3 cr
Liberal education or minor field courses	<u>4 cr</u>
	15 cr

Phys 5061 Experimental Methods	3 cr
Phys 5090 Physics Seminar	1 cr
Technical elective ^d	3 cr
Liberal education or minor field courses	<u>8 cr</u>
	15 cr

^a First math course is determined by math placement exam. This schedule presupposes placement into Math 1296.

^b Students are required to complete two courses (8 cr) from the following electives: Phys 4001, 4011, 4021, 4031.

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

^d A minimum of 9 credits of technical electives are required. Students may choose from: Phys 5041, 5052, 5053, 5062, 5531, 5541; Lim 5001; or an approved set of engineering courses.

*Courses numbered above 3000 will be offered in alternate years only. Some courses suggested in the junior and senior years may need to be switched to match the course offerings.

For further information:

Department of Physics
371 Marshall W Alworth Hall
1023 University Drive
Duluth, MN 55812-2496
218-726-7124
phys@d.umn.edu
<http://www.d.umn.edu/physics>

Applied Physics Major, B.S.

MAJOR COURSE REQUIREMENTS	CREDITS	PREREQUISITES	SEMESTER TO BE COMPLETED	GRADE
YEAR 1				
Comp 1120 College Writing	3			
CS 1131 Intro to Programming in Fortran	3	3.5 yrs HS algebra or Math 1250		
Phys 1021 Exploring Current Topics in Physics	1			
Phys 2011 General Physics I	4	Math 1296		
Phys 2111 Solving Physics Problems I (recommended)	1	Math 1296; concurrent registration in 2011		
Math 1296 Calculus I	5	Math placement or Math 1250		
Math 1297 Calculus II	5	Math 1296		
YEAR 2				
CS 1211 Intro to Programming in C	3	3 yrs HS math, 1 semester programming		
Math 3280 Diff Equations w/ Linear Algebra	4	Math 1297		
Math 3298 Calculus III	4	Math 1297		
Phys 2012 General Physics II	4	Phys 2011		
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	Concurrent registration in Phys 2012		
YEAR 3*				
Chem 1151 General Chemistry I **	5	One year HS chemistry, one year HS algebra.		
Phys 5052 Computational Methods	3	Phys 2021; Math 3280; 1 semester programming		
OR				
Phys 5053 Data Analysis Methods	3	Phys 2012, lab/field exp beyond 2012; 1 sem prog		
Physics electives [^]	4			
Technical electives ⁺	6			
YEAR 4*				
Comp 3150 Advanced Writing: Science	3	Comp 1120; 60 credits		
Phys 3061 Instrumentation	3	Phys 2012; 1 semester college programming		
Phys 5061 Experimental Methods	3	Phys 2033; Phys 3061		
Phys 5090 Seminar	1	90 credits		
Physics elective [^]	4			
Technical elective ⁺	3			

*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.

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

[^] Eight credits of Physics electives are required. Choose from Phys 4001, 4011, 4021, 4031.

⁺ Nine credits of technical electives are required. Choose from Lim 5101, Phys 5041, 5052, 5053, 5531, or 5541. Department approved engineering courses may also be used.

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