

PHYSICS, BACHELOR OF SCIENCE WITH A CONCENTRATION IN BIOMEDICAL PHYSICS

Requirements

The Bachelor of Science (B.S.) degree in physics with concentration in biomedical physics is offered for students who intend to continue education in biological physics, medical physics or go to medical school. To help the prospective physics majors make optimal decisions, they are encouraged to speak with a departmental adviser as early as possible.

To obtain a B.S. with a major in Physics and a concentration in biomedical physics, a student must fulfill university, college, and departmental requirements. Hour requirements follow:

- 46 hours of University General Education courses
Most commonly, Physics majors do not complete 46 hours of coursework solely for the purpose of meeting University General Education requirements. Instead, they often test out of at least three hours of fundamental academic skills, take courses that meet both the six hours of diversity requirements and six hours of distribution requirements, and meet 4 hours of the natural sciences distribution requirement through completing major courses. In such cases, the number of credit hours taken solely to meet General Education requirements is reduced to 33 or fewer.
- 12-19 hours college breadth requirement
- 55 hours of major courses
- 15-16 hours cognate courses
- 0-4 hours of electives

TOTAL HOURS: 120

Code	Title	Credits
Introductory Physics and Math Courses		
PHYS 1950	PHYSICS GATEWAY COURSE	1
PHYS 2110 & PHYS 1154	GENERAL PHYSICS I - CALCULUS LEVEL and GENERAL PHYSICS LABORATORY I	5
PHYS 2120 & PHYS 1164	GENERAL PHYSICS-CALCULUS LEVEL and GENERAL PHYSICS LABORATORY II	5
PHYS 2130	MODERN PHYSICS	4
PHYS 3250	MATHEMATICAL METHODS OF PHYSICS ¹	3
MATH 1950	CALCULUS I	5
MATH 1960	CALCULUS II	4
MATH 1970	CALCULUS III	4
Physics Core Courses		
PHYS 3300	INTRODUCTION TO BIOMEDICAL PHYSICS	3
PHYS 3450	CLASSICAL MECHANICS	3
PHYS 3600	THERMODYNAMICS AND STATISTICAL PHYSICS	3
PHYS 3750	ELECTRICITY AND MAGNETISM I	3
PHYS 3800	OPTICS	3
Advanced Laboratory		
PHYS 3504	EXPERIMENTAL PHYSICS I	1

Select one of the following:		1
PHYS 3524	EXPERIMENTAL MATERIALS SCIENCE	
PHYS 3544	EXPERIMENTAL PHYSICS III	
PHYS 3564	EXPERIMENTAL PHYSICS IV	

Senior Project and Physics Electives

In addition to the above requirements, a senior project is mandatory, requiring 1 credit in either PHYS 4950 or PHYS 4960.²

PHYS 4950	PROBLEMS IN PHYSICS	
or PHYS 4960	PROBLEMS IN PHYSICS	

The following two upper level electives are also required:

PHYS 4500	BIOLOGICAL PHYSICS	3
PHYS 4550	PHYSICS IN MEDICINE	3

Total Credits **55**

¹ Students taking a number of 2000-level mathematics courses may be permitted to waive PHYS 3250 or PHYS 3260.

² Please see more details about the senior project in the "Other Information" portion of the physics section.

Code	Title	Credits
Recommended Courses from other disciplines		
CHEM 1180 & CHEM 1184	GENERAL CHEMISTRY I and GENERAL CHEMISTRY I LABORATORY	4
CHEM 1190 & CHEM 1194	GENERAL CHEMISTRY II and GENERAL CHEMISTRY II LABORATORY	4
CHEM 2250	ORGANIC CHEMISTRY I	3
CHEM 2260 & CHEM 2274	ORGANIC CHEMISTRY II and ORGANIC CHEMISTRY LABORATORY	5
Select one of the following options:		
Option I		
CHEM 4610	BIOCHEMISTRY OF METABOLISM	4
Option II		
BIOL 1450	BIOLOGY I	5
BIOL 1750	BIOLOGY II	5
CHEM 4650 & CHEM 4654	BIOCHEMISTRY I and BIOCHEMISTRY I LABORATORY	4
CHEM 4660 & CHEM 4664	BIOCHEMISTRY II and BIOCHEMISTRY II LABORATORY	4
Freshman		
Fall		
CMST 1110 or CMST 2120	PUBLIC SPEAKING FUNDS or ARGUMENTATION AND DEBATE	3
ENGL 1150	ENGLISH COMPOSITION I (*)	3
MATH 1950	CALCULUS I (**)	5
PHYS 1950	PHYSICS GATEWAY COURSE	1
Humanities & Fine Arts Course #1 – Add Global Diversity		3
*ENGL 1150: Requires appropriate placement.		
**MATH 1950: Requires ALEKS Exam or ACT or SAT scores OR grades of C- or better within the past 2 years in both Math 1320 and 1330 or Math 1340.		
Credits		15
Spring		
ENGL 1160	ENGLISH COMPOSITION II (*)	3
MATH 1960	CALCULUS II	4

PHYS 2110 & PHYS 1154	GENERAL PHYSICS I - CALCULUS LEVEL and GENERAL PHYSICS LABORATORY I (**)	5
Humanities & Fine Arts Course #2		3
*ENGL 1160: Requires ENGL 1150 or placement via AP or EPPE.		
**PHYS 2110: Requires MATH 1950.		

Credits 15

Sophomore

Fall

MATH 1970	CALCULUS III	4
PHYS 2120 & PHYS 1164	GENERAL PHYSICS-CALCULUS LEVEL and GENERAL PHYSICS LABORATORY II (*)	5
PHYS 3300	INTRODUCTION TO BIOMEDICAL PHYSICS (**)	3
Social Science Course #1 & US Diversity		3
*PHYS 2120: Requires PHYS 2110 - PHYS 1154 and MATH 1960.		
**PHYS 3300: Requires PHYS 2110.		

Credits 15

Spring

PHYS 2130	MODERN PHYSICS (*)	4
PHYS 3250	MATHEMATICAL METHODS OF PHYSICS (**)	3
Natural/Physical Science no Lab***		3
Social Science #2		3
Humanities & Fine Arts Course #3^		3
*PHYS 2130: Requires PHYS 2110, PHYS 2120, MATH 1950, and MATH 1960.		
**PHYS 3250: Requires MATH 1950, 1960, 1970, and PHYS 2120.		
***NPS Must be in a field other than PHYS.		
^HFA Must be in a 2nd discipline.		

Credits 16

Junior

Fall

PHYS 3504	EXPERIMENTAL PHYSICS I (*)	1
PHYS 3750	ELECTRICITY AND MAGNETISM I (**)	3
PHYS 4500 or PHYS 4550	BIOLOGICAL PHYSICS (***) or PHYSICS IN MEDICINE	3
Social Science #3^		3
Humanities & Fine Arts Gen Ed for A&S or Course towards Minor/2nd Major/Cognate Course~		3
HIST 1000 or Course towards Minor/2nd Major/Cognate Course#		3
*PHYS 3504: Requires PHYS 2120.		
**PHYS 3750: Requires MATH 1950, 1960, 1970, and PHYS 3250.		
***PHYS 4500: Requires PHYS 2110. PHYS 2120 and 3300 recommended. PHYS 4550 Requires PHYS 2110 and 2120, and PHYS 2130 for PHYS majors. PHYS 3300 and PHYS 4500 are recommended.		
***Must take both PHYS 4500 and PHYS 4550. PHYS 4500 is offered only in Fall of odd-numbered years. PHYS 4550 is offered only in Fall of even-numbered years.		
^SS Must be in a 2nd discipline.		

~A&S College Requirement Options. HFA Must be in a 3rd discipline.

#A&S College Requirement Options

Credits 16

Spring

ENGL 3980	TECHNICAL WRITING ACROSS THE DISCIPLINES (*)	3
PHYS 3450	CLASSICAL MECHANICS (**)	3
PHYS 3800	OPTICS (***)	3
Social Science Gen Ed for A&S or Course towards Minor/2nd Major^		3
HIST 1010 or Course towards Minor/2nd Major#		3
*ENGL 3980: Requires ENGL 1160.		
**PHYS 3450: Requires MATH 1970 and PHYS 3250.		
***PHYS 3800: Requires PHYS 2120 and MATH 1970.		
^A&S College Requirement Options. SS must be in a 3rd discipline.		

#A&S College Requirement Options **Credits 15**

Senior

Fall

PHYS 3600	THERMODYNAMICS AND STATISTICAL PHYSICS (*)	3
PHYS 4500 or PHYS 4550	BIOLOGICAL PHYSICS (**) or PHYSICS IN MEDICINE	3
Advanced Laboratory***		1
Social Science for A&S or Course towards Minor/2nd Major/Cognate Course^		3
Elective or Minor/2nd Major Course/Cognate Course		3
Elective		2
*PHYS 3600: Requires PHYS 2120 and MATH 1970.		
**PHYS 4500: Requires PHYS 2110. PHYS 2120 and 3300 recommended. PHYS 4550 Requires PHYS 2110 and 2120, and PHYS 2130 for PHYS majors. PHYS 3300 and PHYS 4500 are recommended.		
**Must take both PHYS 4500 and PHYS 4550. PHYS 4500 is offered only in Fall of odd-numbered years. PHYS 4550 is offered only in Fall of even-numbered years.		
***Advanced Laboratory: Requires PHYS 2120. Options: PHYS 3524, 3544, or 3564. Each is designed to compliment specific classes. See Catalog for details.		
^A&S College Requirement Options. SS must be from 3rd discipline.		

Credits 15

Spring

PHYS 4950 or PHYS 4960	PROBLEMS IN PHYSICS (*) or PROBLEMS IN PHYSICS	1
Upper Level PHYS Elective		3
Elective or Minor/2nd Major Course/Cognate Course		3
Elective**		3
Elective**		3
*PHYS 4950 and 4960: Requires PHYS 2120 and permission of instructor. See "Graduation Requirements" below for more information.		
**27 upper level credits throughout the entire degree are required. Electives may need to be taken at the 3000-4000 level to reach this minimum. 120 total credits are required for a bachelor's degree.		

Credits 13

Total Credits 120

This roadmap is a suggested plan of study and does not replace meeting with an advisor. Please note that students may need to adjust the actual sequence of courses based on course availability. Please consult an advisor in your major program for further guidance.

This plan is not a contract and curriculum is subject to change

Additional Information About this Plan:

University Degree Requirements:

The minimum number of hours for a UNO undergraduate degree is 120 credit hours. Please review the requirements for your specific program to determine all requirements for the program. In order to graduate on-time (four years for an undergraduate degree), you need to take 30 hours each year.

Placement Exams:

For Math, English, Foreign Language, a placement exam may be required. More information on these exams can be found at <https://www.unomaha.edu/enrollment-management/testing-center/placement-exams/information.php>

**Transfer credit or placement exam scores may change suggested plan of study

GPA Requirements: 2.0

Graduation Requirements: Physics majors must also take the two assessment tests (Major Field Test and Local test) and complete the exit interview.

The senior project must be approved and the department chair notified at least eight months prior to graduation as a Physics major and the student must register for either PHYS 4950 (<https://catalog.unomaha.edu/search/?P=PHYS%204950>) or PHYS 4960 (<https://catalog.unomaha.edu/search/?P=PHYS%204960>).