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
--- | --- | ---
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 | 3
MATH 1950 | CALCULUS I | 5
MATH 1960 | CALCULUS II | 4
MATH 1970 | CALCULUS III | 4

Physics Core Courses

- 3300 | INTRODUCTION TO BIOMEDICAL PHYSICS | 3
- 3450 | CLASSICAL MECHANICS | 3
- 3600 | THERMODYNAMICS AND STATISTICAL PHYSICS | 3
- 3750 | ELECTRICITY AND MAGNETISM | 3
- 3800 | OPTICS | 3

Advanced Laboratory

- 3504 | EXPERIMENTAL PHYSICS | 1

Select one of the following:

PHYS 3524 | EXPERIMENTAL MATERIALS SCIENCE | 1
PHYS 3544 | EXPERIMENTAL PHYSICS III | 1
PHYS 3564 | EXPERIMENTAL PHYSICS IV | 1

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.

- PHYS 4950 | PROBLEMS IN PHYSICS | 1
- PHYS 4960 | PROBLEMS IN PHYSICS | 1

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.

Recommended Courses from other disciplines

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
</table>
| CHEM 1180 | GENERAL CHEMISTRY I | 4
& CHEM 1184 | and GENERAL CHEMISTRY I LABORATORY | 4
| CHEM 1190 | GENERAL CHEMISTRY II | 4
& CHEM 1194 | and GENERAL CHEMISTRY II LABORATORY | 4
| CHEM 2250 | ORGANIC CHEMISTRY I | 3
| CHEM 2260 | ORGANIC CHEMISTRY II | 5
& CHEM 2274 | 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 | BIOCHEMISTRY I | 4
& CHEM 4654 | and BIOCHEMISTRY I LABORATORY | 4
- CHEM 4660 | BIOCHEMISTRY II | 4
& CHEM 4664 | and BIOCHEMISTRY II LABORATORY | 4

Freshman

Fall

- CMST 1110 | PUBLIC SPEAKING FUNDS | 3
or CMST 2120 | 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
<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Notes</th>
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<tbody>
<tr>
<td>Sophomore</td>
<td>PHYS 2110 &amp; PHYS 1154</td>
<td>GENERAL PHYSICS I - CALCULUS LEVEL and GENERAL PHYSICS LABORATORY I</td>
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<td><strong>PHYS 2110: Requires MATH 1950.</strong></td>
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<td>Fall</td>
<td>MATH 1970</td>
<td>CALCULUS III</td>
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<tr>
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<td>PHYS 2120 &amp; PHYS 1164</td>
<td>GENERAL PHYSICS-CALCULUS LEVEL and GENERAL PHYSICS LABORATORY II</td>
<td>5</td>
<td><strong>PHYS 2110: Requires PHYS 2110 - PHYS 1154 and MATH 1960.</strong></td>
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<td>PHYS 3300</td>
<td>INTRODUCTION TO BIOMEDICAL PHYSICS</td>
<td>3</td>
<td><strong>PHYS 3300: Requires PHYS 2110.</strong></td>
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<tr>
<td></td>
<td>Social Science Course #2</td>
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<td>3</td>
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<tr>
<td>Spring</td>
<td>PHYS 2130</td>
<td>MODERN PHYSICS</td>
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<td>PHYS 3250</td>
<td>MATHEMATICAL METHODS OF PHYSICS</td>
<td>3</td>
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<td>Natural/Physical Science no Lab***</td>
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<td>Social Science #2</td>
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<td>Humanities &amp; Fine Arts Course #3^</td>
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<td>Junior</td>
<td>PHYS 3504</td>
<td>EXPERIMENTAL PHYSICS I</td>
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<td>Fall</td>
<td>PHYS 3750</td>
<td>ELECTRICITY AND MAGNETISM I</td>
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<td></td>
<td>PHYS 4500 or PHYS 4550</td>
<td>BIOLOGICAL PHYSICS or PHYSICS IN MEDICINE</td>
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<tr>
<td></td>
<td>Social Science #3^</td>
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<td>3</td>
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<td></td>
<td>Humanities &amp; Fine Arts Gen Ed for A&amp;S or Course towards Minor/2nd Major/Cognate Course~</td>
<td></td>
<td>3</td>
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<tr>
<td>Senior</td>
<td>PHYS 3600</td>
<td>THERMODYNAMICS AND STATISTICAL PHYSICS</td>
<td>3</td>
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<tr>
<td>Fall</td>
<td>PHYS 4950 or PHYS 4960</td>
<td>PROBLEMS IN PHYSICS or PROBLEMS IN PHYSICS</td>
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<tr>
<td>Spring</td>
<td>PHYS 4500</td>
<td>PROBLEMS IN PHYSICS</td>
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<td>Credits</td>
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<td><strong>120</strong></td>
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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](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](https://catalog.unomaha.edu/search/?P=PHYS%204950)) or PHYS 4960 ([https://catalog.unomaha.edu/search/?P=PHYS%204960](https://catalog.unomaha.edu/search/?P=PHYS%204960)).