## Bachelor of Science with Physics in Medicine Major

PHIM students must fulfill one or the other set of requirements in their totality; the two versions of the major may not be combined, and course substitutions are only permitted with the consent of the Physics department and the Dean of Science.

### Requirements for the Physics in Medicine Major

The following tables outline the course requirements for the Physics in Medicine major.

First, the required Physics courses:

| YEAR 1 | YEAR 2 | YEAR 3/4 | PHYSICS COURSES | COURSE TITLES | CREDITS | SEMESTER OFFERED |
|---|---|---|---|---|---|---|
| ✓ | | | PHYS 10411[1] | General Physics A-M: Mechanics and lab | 4 | Fall |
| ✓ | | | PHYS 10424 | General Physics B-M: Waves, Thermo, SpRel and lab | 3 | Spring |
| ✓ | | | PHYS 10430 | Introduction to Circuitry and Electronics | 1.5 | Spring |
| | ✓ | | PHYS 20435[1] | General Physics C-M: Electricity & Magnetism and lab | 4 | Fall |
| | ✓ | | PHYS 20451 | Math Methods in Physics I and tutorial | 3.5 | Fall |
| | ✓ | | PHYS 20452 | Math Methods in Physics II and tutorial | 3.5 | Spring |
| | ✓ | | PHYS 20454 | Intermediate Mechanics | 3 | Spring |
| | ✓ | | PHYS 20464 | Modern Physics I | 3 | Spring |
| | ✓ | | PHYS 23411 | Sophomore Seminar | 1 | Fall |
| | | ✓ | PHYS 30465 | Topics in Modern Physics II | 3 | Fall |
| | | ✓ | PHYS 30471 | Electricity and Magnetism | 3 | Fall |
| | | | | **Total PHYSICS Credits** | **32.5** | |

[1] PHYS 10310 and PHYS 10320 (with labs) may substitute for PHYS 10411 and PHYS 20435 respectively.

The following are the required Biology, Chemistry and Mathematics courses:

| OTHER SCIENCE COURSES | COURSE TITLES | CREDITS | SEMESTER OFFERED |
|---|---|---|---|
| BIOS 20201[2]<br>BIOS 21201 | General Biology A<br>General Biology A Laboratory | 4 | Fall |
| BIOS 20202[2]<br>BIOS 21202 | General Biology B<br>General Biology B Laboratory | 4 | Spring |
| CHEM 10171[3]<br>CHEM 11171 | Intro to Chemical Principles (I)<br>Intro Chem Principles Lab | 4 | Fall |
| CHEM 10172[3]<br>CHEM 11172 | Organic Struct & Mechanisms (II)<br>Orgo Struct & Mech Lab | 4 | Spring |
| CHEM 20273[3]<br>CHEM 21273 | Organic Reactions & Apps (III)<br>Orgo Reactions & Apps Lab | 4 | Fall |
| CHEM 20274[3]<br>CHEM 21274 | Advanced General Chemistry (IV)<br>Advanced Gen Chem Lab | 4 | Spring |
| MATH 10550[4] | Calculus I and tutorial | 4 | Both |
| MATH 10560[4] | Calculus II and tutorial | 4 | Both |
| MATH 20550[4] | Calculus III and tutorial | 3.5 | Both |
| | **Total BIO/CHEM/MATH credits** | **35.5** | |

[2] BIOS 10161, 11161, 10162, 11162 may substitute for BIOS 20201, 21201, 20202, 21202.
[3] Current ND students may substitute CHEM 10117, 10118, 20223 and 20224 for the usual chemistry sequence. All students may substitute the chemistry majors sequence (10181/10182/ 20283/20284) for this sequence.
[4] Honors Calculus I through IV (MATH 10850, 10860, 20850, and 20860) may substitute for Calculus I to III.

In addition, PHIM majors must complete 9 credits of Science Electives to be chosen from the following list:

| SCIENCE ELECTIVES | COURSE TITLES | CREDITS | SEMESTER OFFERED |
|---|---|---|---|
| PHYS 40371 | Medical Physics | 3 | Fall |
| PHYS 40432 | Biological Physics | 3 | Spring |
| BIOS 20303 | Fundamentals of Genetics | 3 | Spring |
| BIOS 30344 | Vertebrate Physiology | 3 | Both |
| BIOS 30341 | Cellular Biology | 3 | Both |
| CHEM 40420 | Principles of Biochemistry | 3 | Both |
| | **Total ELECTIVE credits** | **9** | |

## Other Requirements of PHIM Major

The following table outlines the other requirements for undergraduate majors in the Department of Physics. This table lists the combination of college and university requirements.

| COURSE | REQUIREMENTS | CREDITS |
|---|---|---|
| | Foreign Language (Intermediate level) | 9[1] |
| FYC 13100 | First-Year Composition | 3 |
| | Philosophy Requirement[2] | 6 |
| | Theology Requirement[2] | 6 |
| | History Requirement[2] | 3 |
| | Social Sciences Requirement[2] | 3 |
| | Literature/Fine Arts Requirement[2] | 3 |
| **SubTotal** | | **33** |
| **Total Credits** | | **124**[3] |

[1] Assumes intermediate-level competency in language was achieved by taking three 3-credit courses.
[2] One of these courses must be a University Seminar.
[3] All students must complete 124 degree credits. Dual-degree students must complete 154 credits.

## Sample Schedules

Only courses required for the major are listed, no electives. Credits are shown after the abbreviated course titles. Schedule #1 is typical for students taking Calculus I first fall; schedule #2 is typical for those starting in Calculus II (or III). Other scheduling options are available on consultation with your advisor.

| FALL | SPRING |
|---|---|
| Chem I (4)<br>Calculus I (4)<br>Phys A (4) | Chem II (4)<br>Calculus II (4)<br>Phys B (3)<br>Circuitry (1.5) |
| Chem III (4)<br>Calculus III (3.5)<br>Gen Bio A (4)<br>Phys C (4)<br>Soph. Sem. (1) | Chem IV (4)<br><br>Gen Bio B (4)<br>Modern Phys I (3) |
| MMP I (3.5) | MMP II (3.5)<br>Mechanics (3) |
| E&M I (3)<br>Modern Phys II (3) | |

| FALL | SPRING |
|---|---|
| Chem I (4)<br>Calculus II (4)<br>Phys A (4) | Chem II (4)<br>Calculus III (4)<br>Phys B (3)<br>Circuitry (1.5) |
| Chem III (4)<br>Gen Bio A (4)<br>MMP I (3.5)<br>Phys C (4)<br>Soph. Sem. (1) | Chem IV (4)<br>Gen Bio B (4)<br>MMP II (3.5)<br>Mechanics (3) |
| E&M I (3) | Modern Phys I (4) |
| Modern Phys II (3) | |

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