# Biophysics Major - Requirements

## Gateway Courses (not required, but highly recommended):
- Biophysics 116 (Intro to Medical Imaging)
- Biophysics 117 (Intro to Programming in the Sciences)
- Biophysics 120 (Mysteries of the Double Helix)
- Biophysics 130 (DNA Origami)

## BIOLOGICAL PHYSICS TRACK

### Prerequisites:
- MATH 115 and 116
- MATH 215 and 216; or CHEM 262
- CHEM 210/211 and 215
- PHYSICS 135/136 and 235/236 or 140/141 and 240/241
- BIO 171 or 172 or 174 or 195

*NOTE: students with Math AP credit are advised to take the Math 215/216 sequence*

### Core:
- BIOPHYS 290 (Phys of the Body & Mind)
- BIOPHYS 370 (Phys & Chemical Properties)
- BIOPHYS 417 (Dynamical Processes)
- BIOPHYS 450 (Intro to Biophys Lab)
- BIOPHYS 454 (Macromolecular Structure)
- BIOPHYS 495 (Senior Seminar)

### Outside Core:
- CHEM 351
- BIO 305

### Elective*:
One of:
- BIOPHYS 430 (Medical Physics)
- BIOPHYS 433 (Biocomplexity)
- BIOPHYS 435 (Biophysical Modeling)
- BIOPHYS 440 (Biophysics of Diseases)
- BIOPHYS 463 (Math. Modeling in Biology)
- MCDB 411 (Protein Struc & Function)

## STRUCTURAL BIOLOGY TRACK

### Prerequisites:
- MATH 115 and 116
- CHEM 262
- CHEM 210/211 and 215
- PHYSICS 135/136 and 235/236 or 140/141 and 240/241
- BIO 171; and 172 or 174 or 195

### Core:
- BIOPHYS 370 (Phys & Chemical Properties)
- BIOPHYS 420 (Structural Biology I)
- BIOPHYS 421 (Structural Biology II)
- BIOPHYS 450 (Intro to Biophys Lab)
- BIOPHYS 495 (Senior Seminar)

### Outside Core:
- CHEM 351 or MCDB 310 or BIOLCHEM 415
- BIO 305

### Elective*:
One of:
- BIOPHYS 430 (Medical Physics)
- BIOPHYS 435 (Biophysical Modeling)
- BIOPHYS 440 (Biophysics of Diseases)
- BIOPHYS 454 (Macromolecular Structure)
- BIOPHYS 463 (Math. Modeling in Biology)
- BIOPHYS 520 (Theory & Methods Bioph Chem)
- BIOPHYS 521 (Techniques in Biophys Chem)
- MCDB 411 (Protein Struc & Function)

*Other 400-level Physics, Chemistry or Biology courses may be accepted, per approval of the Undergraduate Chair*
Cognate*:
One of:
MATH 404
MATH 471
PHYSICS 406
PHYSICS 453
CHEM 451
MCDB 427
MCDB 428

Research:
At least two credits of BIOPHYS 399. Students wishing to do research in a laboratory outside the Program must identify a co-sponsor.

*Cognate*:
One of:
CHEM 451
MCDB 427
MCDB 428
BIOLCHEM 530
BIOLCHEM 550

Research:
At least two credits of BIOPHYS 399. Students wishing to do research in a laboratory outside the Program must identify a co-sponsor.

*Other 400-level Physics, Chemistry or Biology courses may be accepted, per approval of the Undergraduate Chair

Honors Concentration: In addition to completing all the Biophysics concentration requirements (in either track), a concentration GPA of at least 3.4 and the completion of an honors thesis (BIOPHYS 499) with a grade B or better, and a second Biophysics elective are required. Approved honors electives are all Biophysics and cognate electives above; and CHEM 453, MCDB 422 and PHYSICS 402. Other 400-level electives may be accepted, per approval of the Undergraduate Chair.

Double Majors: For students pursuing a double major, the following rules for counting towards both majors apply:

- Students double majoring in Biophysics and any Physics concentration cannot use PHYSICS 402, 406 or 453 to satisfy the Biophysics cognate or honors elective requirement
- Students double majoring in Biophysics and any Chemistry concentration cannot use CHEM 451, 452 or 453 to satisfy the Biophysics cognate or honors elective requirement
- Students double majoring in Biophysics and any Biology concentration or Neuroscience cannot use MCDB 422, 427 or 428 to satisfy the Biophysics cognate or honors elective requirement
Minor in Biophysics
At least 15 credits from the following courses are required:
  PHYSICS 340 or CHEM 210
  BIOLOGY 305 or MCDB 310 or CHEM 351
  BIOPHYS 370 or 417
  BIOPHYS 290 or 440
  BIOPHYS 450

• Only ONE COURSE may be double-counted towards both the student’s major and minor
• For more information on double-counting rules, please refer to the LSA Course Guide or speak with an advisor.
# Suggested 4-Year Course Plan - Biological Physics Track

<table>
<thead>
<tr>
<th>Year</th>
<th>Hours Pre-req</th>
<th>Major Hours Dept.</th>
<th>Major Hours non-Dept.</th>
<th>Total Hours</th>
</tr>
</thead>
</table>
| **Math 115** (4)  
**Chem 210** (4)  
**Chem 211** (1)  
**Language** (4)  
**Biophys 120** (3) | 9/0 | 0/3 | | 16 |
| **Math 116** (4)  
**Chem 215** (3)  
**Physics 135** (4)  
**Physics 136** (1)  
**Language** (4) | 12/0 | | | 16 |
| **Physics 235** (4)  
**Physics 236** (1)  
**Bio 171** (4)  
**Language** (4) | 5/4 | | | 13 |
| **Bio 172** (4)  
**Biophys 290** (3)  
**Language** (4) | 4/0 | 3 | | 16 |
| **Chem 262** (4)  
**Chem 351** (4)  
**Biophys 370** (3)  
**Distribution** (3)  
**LS&A Elective** (3) | 4 | 7/0 | 4 | 17 |
| **Bio 305** (3)  
**Biophys 417** (3)  
**Biophys 450** (3)  
**Distribution** (3)  
**LS&A Elective** (3) | | 9/0 | 3 | 15 |
| **Biophys 495** (3)  
**Biop. Cognate** (3)  
**Biophys 399** (2)  
**Distribution** (3)  
**Distribution** (3) | | 8/0 | 3 | 14 |
| **Biophys 454** (3)  
**Biophys 498** (2)  
**Biop. Elective** (3)  
**Distribution** (3)  
**LS&A Elective** (3) | | 6/2 | 0 | 14 |
| **34/4** | **33/5** | **10** | **121** |
## Suggested 4-Year Course Plan - STRUCTURAL BIOLOGY TRACK

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Hours Pre-req (req. / recomm.)</th>
<th>Major Hours Dept. (req. / recomm.)</th>
<th>Major Hours non-Dept.</th>
<th>Total Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 115 (4)</td>
<td>9/0</td>
<td>0/3</td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>Chem 210 (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chem 211 (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Language (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biophys 120 (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Math 116 (4)</td>
<td>12/0</td>
<td></td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>Chem 215 (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physics 135 (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physics 136 (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Language (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 2</th>
<th>Hours Pre-req (req. / recomm.)</th>
<th>Major Hours Dept. (req. / recomm.)</th>
<th>Major Hours non-Dept.</th>
<th>Total Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 215 (4)</td>
<td>9/4</td>
<td></td>
<td></td>
<td>17</td>
</tr>
<tr>
<td>Physics 235 (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physics 236 (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bio 171 (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Language (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bio 172 (4)</td>
<td>4/0</td>
<td>3</td>
<td></td>
<td>11</td>
</tr>
<tr>
<td>Bio 305 (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Language (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 3</th>
<th>Hours Pre-req (req. / recomm.)</th>
<th>Major Hours Dept. (req. / recomm.)</th>
<th>Major Hours non-Dept.</th>
<th>Total Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem 351 (4)</td>
<td>7</td>
<td>10/0</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>Biophys 370 (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MCDB 411 (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distribution (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LS&amp;A Elective (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biophys 440 (3)</td>
<td>6/0</td>
<td>3</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>Biophys 450 (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distribution (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LS&amp;A Elective (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 4</th>
<th>Hours Pre-req (req. / recomm.)</th>
<th>Major Hours Dept. (req. / recomm.)</th>
<th>Major Hours non-Dept.</th>
<th>Total Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biophys 495 (3)</td>
<td>8/0</td>
<td>3</td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>Biop. Cognate (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biophys 399 (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distribution (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biophys 454 (3)</td>
<td>6/2</td>
<td>0</td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>Biophys 498 (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biop. Elective (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distribution (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LS&amp;A Elective (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

41/4 33/5 10 116

**Bold:** Required for Major  **Italic:** Recommended for Major