<table>
<thead>
<tr>
<th>Required courses for physics majors (On next page: BS Engineering Sciences!)</th>
<th>BS Physics</th>
<th>BS Physics &amp; Astro.</th>
<th>BS Biophys.</th>
<th>BA Physics</th>
<th>BA Physics &amp; Astro.</th>
<th>BA Physics for Life Sci.</th>
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</thead>
<tbody>
<tr>
<td>Phys 116: Introductory Astronomy</td>
<td></td>
<td></td>
<td>recommended</td>
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<tr>
<td>Phys 151*: Phys. for Sci. and Eng. I</td>
<td>F</td>
<td>yes</td>
<td>yes</td>
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<tr>
<td>Phys 152*: Phys. for Sci. and Eng. II</td>
<td>S</td>
<td>yes</td>
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<tr>
<td>Phys 212: Comp. Modeling for Sci., Eng.</td>
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<td>Phys 220: Math for Sci. and Eng.</td>
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<tr>
<td>Phys 253: Modern Physics</td>
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<tr>
<td>Phys 311: Astrophysics I</td>
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<tr>
<td>Phys 312: Astrophysics II</td>
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<td>Phys 333: Phys. for Life Sciences</td>
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<td>Phys 361: Classical Mechanics</td>
<td>S</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
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<tr>
<td>Phys 365: Electricity and Magnetism</td>
<td>F</td>
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<tr>
<td>Phys 421: Thermo. and Stat. Physics</td>
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<td>yes</td>
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<tr>
<td>Phys 461: Quantum Mechanics</td>
<td>S</td>
<td>yes</td>
<td>yes</td>
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<tr>
<td>Phys 444W: Advanced Lab</td>
<td>F</td>
<td>yes</td>
<td>yes</td>
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<tr>
<td>Phys 434, 552, 554, 556: biophysics electives</td>
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<tr>
<td>Phys 397R, 495R or 499R: 4 credits as 1 course</td>
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</tbody>
</table>

**ADDITIONAL PHYSICS ELECTIVES:** (One elective may be four credits of 397R, 495R, or 499R, as a single course)

- must be at 200 level or higher: 1
- must be at 300 level or higher: 2

**COURSES IN OTHER DEPARTMENTS:**

<table>
<thead>
<tr>
<th></th>
<th>BS Physics</th>
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<th>BS Biophys.</th>
<th>BA Physics</th>
<th>BA Physics &amp; Astro.</th>
<th>BA Physics for Life Sci.</th>
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<tbody>
<tr>
<td>Chem 141 w/lab or Chem 150 w/lab</td>
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<td>Bio 141 w/lab</td>
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<tr>
<td>Bio 142 w/lab</td>
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<td>QTM 100</td>
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<td>Math 111: Calculus I</td>
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<td>Math 112: Calculus II</td>
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<td>Math 211: Multivariable Calculus</td>
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<td>Math 212: Differential Equations</td>
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</tbody>
</table>

*With permission of the Director of Undergraduate Studies, Phys 141/142 may replace Phys 151/152*
BS Engineering Sciences
all engineering sciences students take the core classes, and then pick one “track” to complete

**Core classes**
- PHYS 151 & 152
- CHEM 141/141L or CHEM 150/150L
- MATH 111, 112, 211, 212
- PHYS 212: Computational modeling for scientists & engineers
- PHYS 220: Math methods for scientists & engineers
- PHYS 222: Fundamentals of engineering design

### Engineering physics track
- **Phys 253**: Modern Physics
- **Phys 234**: Digital electronics
- **Phys 361**: Classical mechanics
- **Phys 365**: Electricity & magnetism
- **Phys 421**: Thermo & stat physics
- **Phys 461**: Quantum mechanics
- **Phys 444W**: Advanced lab

**1 elective** from:
- Math 315 (numerical analysis)
- Math 345 (math modeling)
- Math 351 (partial dif. eq.)
- Math 361 (prob and stats)
- Phys 432 (optics)
- Phys 525 (solid state physics)
- Phys 564 (polymer physics)
- Phys 528 (continuum mechanics)
- Phys 495 or 499 (research†)

### Materials science track
- *Either* Organic chemistry 1 & 2 (and labs)
- or Chem 202 and 203 (and labs)

- *Either* P-Chem 1 & 2 (and labs)
- or Chem 205/205L + 6 credits p-chem tagged courses
- or Phys 253, 421, & 444W

**2 electives** from:
- Chem 301 (biochem)
- Phys 461 (quantum)
- Chem 571 (biomolecular chemistry)
- Chem 572 (adv. biophysical chem)
- Phys 525 (solid state)
- Phys 564 (polymer physics)
- Phys 562 (soft condensed matter)
- Phys 552 (biomacromolecules)

**1 elective** may be Phys or Chem 495 or 499 (research†)

### Geoscience track
- **ENVS 131**: Intro Environmental Studies
- **ENVS 331**: Earth Systems Science
- **CS 170**: Intro to Computer Science I
- **PHYS 421**: Thermo & Stat Physics

**5 electives**, including at least one course with a lab (marked with *), from:
- 230* (Fund. Geo.) / GEOL OX 141*
- 235 (Env. Geo.)
- 229* (Meteorology) / GEOL OX 115*
- 250 (Cartography)
- GEOL OX 250* (Mineral Resources)
- 325 (Energy & Climate Change)
- 328 (Intro Atmos Chem)
- 330 (Climatology)
- 346* (Geo. Origins of Landscapes)
- 348* (Sust. Water Res.)
- 328 (Intro to Atmos. Chem.)
- PHYS 528 (continuum mechanics)

**1 elective** may be 399, 494, 498, or 499 (research†)

†must be 4 research credits as a single course in a single semester