Required courses for physics majors
(On next page: BS Engineering Sciences!)

<table>
<thead>
<tr>
<th>Course</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>
</tr>
</thead>
<tbody>
<tr>
<td>Phys 116: Introductory Astronomy</td>
<td></td>
<td>recommended</td>
<td></td>
<td></td>
<td>yes</td>
</tr>
<tr>
<td>Phys 151*: Phys. for Sci. and Eng. I</td>
<td>F yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
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<tr>
<td>Phys 152*: Phys. for Sci. and Eng. II</td>
<td>S yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
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<tr>
<td>Phys 212: Comp. Modeling for Sci., Eng.</td>
<td>S yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
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<tr>
<td>Phys 220: Math for Sci. and Eng.</td>
<td>F yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
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<tr>
<td>Phys 253: Modern Physics</td>
<td>F yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
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<tr>
<td>Phys 311: Astrophysics I</td>
<td>S yes</td>
<td>yes</td>
<td></td>
<td></td>
<td>(one of these two)</td>
</tr>
<tr>
<td>Phys 312: Astrophysics II</td>
<td>S yes</td>
<td>yes</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Phys 361: Classical Mechanics</td>
<td>F yes</td>
<td>yes</td>
<td>yes</td>
<td>(one of these four)</td>
<td>(one of these four)</td>
</tr>
<tr>
<td>Phys 365: Electricity and Magnetism</td>
<td>S yes</td>
<td>yes</td>
<td>yes</td>
<td></td>
<td></td>
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<tr>
<td>Phys 461: Quantum Mechanics</td>
<td>S yes</td>
<td>yes</td>
<td>yes</td>
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<tr>
<td>Phys 444W: Advanced Lab</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
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<td>yes</td>
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<tr>
<td>Phys 434, 552, 554, 556: biophysics electives</td>
<td></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:**
- Chem 150 w/lab
- Bio 141 w/lab
- Math 111: Calculus I
  - yes
- Math 112: Calculus II
  - yes
- Math 211: Multivariable Calculus
  - yes
- Math 212: Differential Equations
  - yes

*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 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 diff. eq.)
- Math 361 (prob and stats)
- Phys 422 (applied solid state phys)
- Phys 432 (optics)
- Phys 525 (solid state physics)
- Phys 564 (polymer physics)
- Phys 528 (continuum mechanics)
- Phys 495 or 499 (research†)

Materials science track
- Organic chemistry 1 & 2 (and labs)
- or Chem 202 and 203 (and labs)
- Phys 253, 421, & 444W

2 electives from:
- Chem 301 (biochem)
- Phys 422 (applied solid state phys)
- Phys 461 (quantum)
- Chem 571 (biomolecular chemistry)
- Chem 572 (adv. biophysical chem)
- Phys 525 (solid state physics)
- Phys 528 (continuum mechanics)
- 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 120 or 130
ENVS 131: Intro Environmental Studies
ENVS 331: Earth Systems Science
PHYS 253: Modern Physics
PHYS 421: Thermo & Stat Physics

5 electives, including at least one course with a lab (marked with *), from:
- ENVS 230* (Fund. Geo.) / GEOL OX 141*
- ENVS 235 (Env. Geo.)
- ENVS 229* (Meteorology) / GEOL OX 115*
- ENVS 250 (Cartography)
- GEOL OX 250* (Mineral Resources)
- ENVS 325 (Energy & Climate Change)
- ENVS 328 (Intro Atmos Chem)
- ENVS 330 (Climatology)
- ENVS 346* (Geo. Origins of Landscapes)
- ENVS 348* (Sust. Water Res.)
- CS 170* (Intro to Computer Science)
- 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