

Required courses for physics majors (On next page: BS Engineering Sciences!)		BS Physics	BS Physics & Astro.	BS Biophys.	BA Physics	BA Physics & Astro.	BA Physics for Life Sci.
<b>Phys 116:</b> Introductory Astronomy			recommended			yes	
<b>Phys 151*:</b> Phys. for Sci. and Eng. I	F	yes	yes	yes	yes	yes	yes
<b>Phys 152*:</b> Phys. for Sci. and Eng. II	S	yes	yes	yes	yes	yes	yes
<b>Phys 212:</b> Comp. Modeling for Sci., Eng.	S	yes	yes	yes	yes	yes	yes
<b>Phys 220:</b> Math for Sci. and Eng.	F	yes	yes	yes			
<b>Phys 253:</b> Modern Physics	F	yes	yes	yes	yes	yes	yes
<b>Phys 311:</b> Astrophysics I	S		yes			<i>(one of these two)</i>	yes
<b>Phys 312:</b> Astrophysics II	S		yes				
<b>Phys 333:</b> Phys. for Life Sciences					<i>(one of these four)</i>	<i>(one of these four)</i>	yes
<b>Phys 361:</b> Classical Mechanics	S	yes	yes	yes			
<b>Phys 365:</b> Electricity and Magnetism	F	yes	yes	yes			
<b>Phys 421:</b> Thermo. and Stat. Physics	S	yes	yes	yes			
<b>Phys 461:</b> Quantum Mechanics	S	yes	yes	yes			
<b>Phys 444W:</b> Advanced Lab	F	yes	yes	yes	yes	yes	yes
<b>Phys 434, 552, 554, 556:</b> biophysics electives				2			
<b>Phys 397R, 495R or 499R:</b> 4 credits as 1 course				yes			
<b>ADDITIONAL PHYSICS ELECTIVES:</b> (One elective may be four credits of 397R, 495R, or 499R, as a single course)							
<b>must be at 200 level or higher</b>		1			2		
<b>must be at 300 level or higher</b>		1					1
<b>COURSES IN OTHER DEPARTMENTS:</b>							
<b>Chem 141 w/lab or Chem 150 w/lab</b>				<i>(one of these two)</i>			yes
<b>Bio 141 w/lab</b>							yes
<b>Bio 142 w/lab</b>							yes
<b>QTM 100</b>							yes
<b>Math 111:</b> Calculus I		yes	yes	yes	yes	yes	yes
<b>Math 112:</b> Calculus II		yes	yes	yes	yes	yes	yes (or 116)
<b>Math 211:</b> Multivariable Calculus		yes	yes	yes	yes	yes	
<b>Math 212:</b> Differential Equations		yes	yes	yes	yes	yes	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 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 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

*Either* **Organic chemistry 1 & 2 (and labs)**  
*or* **Chem 202 and 203 (and labs)**

*Either* **P-Chem 1 & 2** (and labs; Analytical Chem lab is prereq for P-Chem labs)  
*or* **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