Comprehensive Physics Track

Overview

The Comprehensive Track is aimed at students wishing a thorough grounding in physics. If you want to experience the breadth of physics, delve into the mathematics underlying physical theories, and be prepared to participate in a career where you are “doing physics” (with or without an advanced degree), then you should pursue the Comprehensive Track. If you are heading for graduate school in physics, astronomy, or a related field, this is the track for you. To be fully prepared for graduate school you will need to pursue additional experiences beyond the track requirements. In particular, you should take as many courses from the 300-level math and physics menu options as you have room and interest for, as well as a selection of 400-level courses in whichever field you intend to pursue. Graduate schools will also expect you to have taken full advantage of research opportunities, both at UW and beyond. The sooner you start research, the earlier you will experience the joy of physics.

Requirements (94-99 credits)

NOTE: A single course may meet at most ONE physics-specific degree requirement.

Core Requirements (55-56 cr). (See here)

Core Physics (16-19 cr)

Phys 226 (3) Particles and Symmetries
Phys 324 (4) Quantum Mechanics II
THREE course selected from:
- Phys 323 (4) Electromagnetism III
- Phys 325 (4) Quantum Mechanics III
- Phys 328 (3) Statistical Mechanics
- Phys 329 (3) Classical Mechanics

at most 2 from:
- Astr 321 (3) Solar System
- Astr 322 (3) Galaxy
- *Astr 323 (3) Cosmos

Advanced Math (7-9 cr)

Phys 228 (4) Mathematical Physics II
ONE courses (in addition to the core Math Menu requirement) selected from:
- Math 307 (3) OR AMath 351 (3) Ordinary Differential Equations
- Math 308 (3) OR AMath 352 (3) Linear Algebra
- Math 309 (3) OR AMath 353 (3) Partial Differential Equations
- Math 324 (3) Vector Calculus
- AMath 401 (4) Vector Calculus and Complex Waves
- Math *334, *335, *336 Honors Advanced Math

Advanced Laboratory (6-8 cr)

TWO lab courses selected from:
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phys 331</td>
<td>Optics Lab</td>
<td>3</td>
</tr>
<tr>
<td>Phys 335</td>
<td>Electronic Lab II</td>
<td>3</td>
</tr>
<tr>
<td>Chem 464</td>
<td>OR Phys 434 (3) Computers in Data Acquisition and Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Phys 431</td>
<td>Modern Condensed Matter Physics Lab</td>
<td>3</td>
</tr>
<tr>
<td>Phys 432</td>
<td>Modern Atomic Physics Lab</td>
<td>3</td>
</tr>
<tr>
<td>Phys 433</td>
<td>Modern Nuclear and Particle Physics Lab</td>
<td>3</td>
</tr>
<tr>
<td>Astro 480</td>
<td>OR Astro 481 (5) Astronomical Data Analysis (480) or Acquisition (481)</td>
<td>5</td>
</tr>
</tbody>
</table>

**Electives (6 cr)**

6 credits selected from: **

- PHYS 323 (4), 325 (4), 328 (3), 329 (3)
- PHYS graduate courses (requires permission of both UFA and graduate instructor)
- AMATH *383 *(3), *402 (4)
- A A *310 (4), *360 (4), *405 (3) *440 (3)
- CEE *347 (5)
- ENGR 360 (3)
- N SCI *302 (3)
- OCEAN *412 (3), 423 (3)

**Capstone**

3 credits of research and/or seminar in combination from:

PHYS 494, 495, 496, 499, ASTR 481, 499

Students receiving credit for physics-related research or independent project work in another department may petition to have it meet the capstone requirement by writing a paper describing how they applied physics to their independent project. Please see the UFA for details and pre-approval.

**NOTES**

* . Not currently coded into DARS. Please see the UFA (Prof. Olmstead) to allow this course to meet this requirement.

§ . Students taking advanced laboratories in other departments may petition the UFA to have them substitute for Astro 480.

** . Other courses may be accepted by petition to the UFA (Prof. Olmstead).