Applied Physics Track

Overview

The Applied Track is aimed at students who plan to enter a technical job with their physics B.S. This is the most common track for students who arrived at UW thinking they were interested in engineering, but who decided to get a broader grounding in the physics underlying engineering before going on the job market. This track has fewer required courses to allow students to broaden their skills and knowledge sets in areas such as climate science, data science, programming, electrical engineering, aerospace, or entrepreneurship, and it is relatively straightforward to build a double major. The unique requirements of the Applied Track include a laboratory with a focus on statistics and error analysis, as well as a computer programming class relevant to data analysis. The Applied Track is the only degree option that does not require Phys 228 or Phys 324, although both can meet the elective requirements, and thus can be less mathematically intense than the other tracks. However, Physics 228 is required for several upper division physics classes, including Optics Lab (Phys 331), Classical Mechanics (Phys 329), Quantum Mechanics 2 (Phys 324), and Phys 324 is a pre-requisite for Physics 325 as well as the 400-level electives for nuclear, condensed matter, and atomic physics (422, 423 and 421). The Applied Track also allows you to use one of specific introductory science classes and/or a laboratory for your electives.

Requirements (90-95 credits)

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

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

Data Acquisition and Analysis (7 cr)

Phys 231 (3) Introductory Experimental Physics
†AMath 301 (4) Beginning Scientific Computing (Matlab)

Core Physics (3-4 cr)

ONE course selected from:

Phys 226 (3) Particles and Symmetries
Phys 323 (4) Electromagnetism III
Phys 324 (4) Quantum Mechanics II
*Phys 328 (3) Statistical Mechanics
Phys 329 (3) Classical Mechanics

Advanced Math (6-8 cr)

TWO courses (in addition to the core Math Menu requirement) selected from:

Phys 228 (4) Mathematical Physics II
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:

- **Phys 331** (3) Optics Lab
- **Phys 335** (3) Electronic Lab II
- **Chem 464** (3) OR **Phys 434** (3) Computers in Data Acquisition and Analysis
- **Phys 431** (3) Modern Condensed Matter Physics Lab
- **Phys 432** (3) Modern Atomic Physics Lab
- **Phys 433** (3) Modern Nuclear and Particle Physics Lab

**Astro 480** (5) OR **Astro 481** (5) Astronomical Data Analysis (480) or Acquisition (481)

Electives (9 cr)

9 credits selected from:**

*At least 1 (upper-division lecture) of:*

- **PHYS 323** (4), **324** (4), **325** (4), **328** (3), **329** (3)
- **PHYS 407** (5), **408** (5), **409** (5), **421** (3), **422** (3), **423** (3), **427** (3), **428** (3), **429** (3)
- **PHYS graduate courses (requires permission of both UFA and graduate instructor)**
- **ASTR *301** (3), **321** (3), **322** (3), **323** (3), **419** (3), **421** (3), **423** (3), **425** (3), **427** (3)
- **AMATH *383** *(3), *402 (4)
- **A A *310** (4), **360** (4), **405** (3) **440 (3)
- **AMAT S 301** (5), **321** (3), **340** (3), **341** (3), **431** (3), **442** (5), **460** (3)
- **CHEM 418** (3), **425** (3), **453** (3), **455** (3), **452** (3), **456** (3), **457** (3), **460** (3), **466** (3), **475** (3), **484** (3), **485** (3), **486** (3)
- **CHEM E 310** (4), **326** (4), **330** (5), **340** (5), **435** (4), **440** (3)
- **CEE *347** (5)
- **E E 361** (5), **462** (4), **464** (4), **465** (4), **482** (4), **484** (4), **485** (4)
- **ENGR 360** (3)
- **ESS *311** (5), **314** (5), **412** (3), **414** (3), **415** (3), **424** (3), **471** (3)
- **M E 323** (5), **331** (4), **333** (5), **373** (5), **431** (4), **469** (4), **470** (4), **473** (4)
- **MSE *322** (4), **331** (3), **351** (3), **450** (3), **452** (3), **462** (3), **466** (3), **471** (3), **473** (3), **476** (3), **477** (3), **481** (3), **484** (3)
- **N SCI *302** (3)
- **OCEAN *412** (3), **423** (3)

*At most 1 (lab) of:*

- **PHYS 331** (3), **335** (3), **431** (3), **432** (3), **433** (3), **434** (3), **CHEM *464** (3), **ASTR 480** (5), **ASTR 481** (5), **ESS *472** (2-4)

*At most 1 (intro science) of:*

- **A A 198** (1-5), **ASTR 115** (5), **ASTR *160** (3), **ATM S 211** (5), **BIOL *130** (5), **CEE 220** (4), **CHEM *145** (5), **E E 135** (4), **ESS 102** (5), **ESS 210** (5), **M E 123** (4), **MSE 170** (4), **NME 220** (4), **OCEAN 200** (3), **PHYS *217** (5)

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 preapproval.

**NOTES**

† Astronomy students may substitute Astro 300 or 427 for AMath 301; please contact the UFA to have this entered into your DARS.

Students may petition the UFA for other upper-division data science / computing / statistics classes to substitute for AMath 301. Note
that STAT 311, CS 142, and CS 143 do NOT meet this requirement.

* . 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 (Prof. Olmstead) to have them substitute for Astro 480.

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

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