

## DOCTOR OF PHILOSOPHY (Ph.D.) IN PHYSICS

### A. UNDERGRADUATE PRE-REQUISITE SUBJECTS

Prospective students of the Ph.D. in Physics program should either have an undergraduate degree in physics or equivalent, and have successfully passed the equivalent mathematics (differential equations, vector calculus, linear algebra, complex analysis, and special functions) and major physics subjects (classical mechanics, electrodynamics, quantum mechanics, and statistical mechanics) associated with an undergraduate physics degree. Those with an M.S. in Physics degree can opt to have some of the major subjects they have already taken be credited toward the Ph.D. program.

### B. REQUIRED (CORE) SUBJECTS

|               |                       | UNITS     |
|---------------|-----------------------|-----------|
| PS 201        | Theoretical Mechanics | 3         |
| PS 208        | Quantum Mechanics I   | 3         |
| PS 212        | Statistical Mechanics | 3         |
| PS 271        | Electrodynamics       | 3         |
| <b>TOTAL:</b> |                       | <b>12</b> |

### C. COMPREHENSIVE EXAMINATIONS

PS COMPRE 400 Comprehensive Examinations

### D. GRADUATE SEMINARS AND COLLOQUIUM

|               |                     |          |
|---------------|---------------------|----------|
| PS 307        | Graduate Seminar    | 1        |
| PS 308.1      | Graduate Colloquium | 1        |
| PS 308.2      | Graduate Colloquium | 1        |
| <b>TOTAL:</b> |                     | <b>3</b> |

### E. ELECTIVES

A minimum of **33** units from the courses listed below chosen with the approval of the Academic Adviser.

|               |  |           |
|---------------|--|-----------|
| PS 200.XX     | Special Topics                             | 3         |
| PS 205        | Mathematical Physics                       | 3         |
| PS 210        | Quantum Mechanics II                       | 3         |
| PS 211        | Fluid Mechanics                            | 3         |
| PS 213        | Introduction to Geophysical Fluid Dynamics | 3         |
| PS 222        | Introduction to Solid State Physics        | 3         |
| PS 223        | Physical Theory of the Solid State         | 3         |
| PS 224        | Electronic Properties of Materials         | 3         |
| PS 225        | Thermodynamics and Phase Transformations   | 3         |
| PS 226        | Materials Characterization                 | 3         |
| PS 230        | Geophysical Fluid Dynamics                 | 3         |
| PS 231        | Computational Models for the Environment   | 3         |
| PS 232        | Physical Meteorology                       | 3         |
| PS 233        | Dynamic Meteorology                        | 3         |
| PS 241        | Fundamentals of Air Pollution              | 3         |
| PS 242        | Physics of the Environment and Climate     | 3         |
| PS 243        | Remote Sensing and Environmental Mapping   | 3         |
| PS 244        | Environmental Instrumentation              | 3         |
| PS 256        | Experiments in Photonics, Laboratory       | 3         |
| PS 258        | Optical Waveguides                         | 3         |
| PS 259        | Quantum Electronics and Photonic Devices   | 3         |
| PS 261        | Modern Optics                              | 3         |
| PS 265        | Lasers, Spectroscopy and Applications      | 3         |
| PS 266        | Advanced Fiber Devices                     | 3         |
| PS 268        | Optical Networks                           | 3         |
| PS 272        | Quantum Electrodynamics                    | 3         |
| PS 301        | Research Seminar I                         | 3         |
| PS 302        | Research Seminar II                        | 3         |
| PS 303        | Advanced Research Laboratory I             | 3         |
| PS 304        | Advanced Research Laboratory II            | 3         |
| <b>TOTAL:</b> |  | <b>33</b> |

**F. CANDIDACY EXAMINATION**

**G. DISSERTATION WRITING AND ORAL DEFENSE**

|          |                       |   |
|----------|-----------------------|---|
| PS 310.1 | Dissertation Research | 0 |
| PS 310.2 | Dissertation Research | 0 |

**TOTAL: 12**

Note: Units for the dissertation are credited after the student passes the oral defense and submits the final revised copy of the dissertation.

**SUMMARY**

|                                       |           |              |
|---------------------------------------|-----------|--------------|
| Required Subjects                     | 12        | Units        |
| Comprehensive Examinations            | ---       |              |
| Graduate Seminar Colloquium           | 3         | Units        |
| Electives                             | 33        | Units        |
| Candidacy Examination                 | ---       |              |
| Dissertation Writing and Oral Defense | 12        | Units        |
| <b>TOTAL:</b>                         | <b>60</b> | <b>Units</b> |