Requirements for the Ph.D.

Students are required to complete the following requirements: satisfactorily pass the departmental written exam, complete five advanced graduate courses, a qualifying examination, teaching requirement, and a final defense of the thesis as described below.

1. **Departmental Examination**

Physics students are required to take the Department Examination after completing one year of graduate work at UCSD. The examination is on the level of material usually covered in upper-division undergraduate and first-year graduate courses in classical mechanics (Phys 200A&B), classical electrodynamics (Phys 203A&B), equilibrium statistical mechanics (Phys 210A), quantum mechanics (Phys 212A,B,C), and mathematical methods (Phys 201).

The examination is offered twice a year, at the beginning of the fall and spring quarters, and lasts two days, four hours per day. The examination may be repeated once the next time it is offered.

Biophysics students take this examination after completing two years of graduate work.

2. **Advanced Graduate Courses**

Physics students are required to take five advanced graduate courses (with a grade of C or better) from at least three of the groups listed below no later than the end of the third year of graduate work. A 3.0 average in four of the five courses is required. (In lieu of the course requirement, students may petition to take an oral examination covering three areas of physics.)

- **Group 1**: Phys 218A, 218B, 218C (Plasma); Phys 234 (Nonneutral Plasmas); Phys 235 (Nonlinear Plasma Th)
- **Group 2**: Phys 210B, 210C (Nonequil Stat Mech); Phys 211A, 211B (Solid State); Phys 219 (Cond. Matt. Lab.); Phys 230 (Adv Solid State); Phys 232 (Electronic Materials); Phys 236 (Many-body Th)
- **Group 3**: Phys 214 (Elem Part); Phys 215A, 215B, 215C (Part & Fields); Phys 217A, 217B (Renorm Field Th); Phys 222 (Exp Tech Phys); Phys 233 (Adv Elem Part Th)
- **Group 4**: Phys 220 (Group Th); Phys 221A, 221B (Adv Mech); Math 210A, 210B, 210C (Math Phys); Math 259A, 259B, 259C (Geom Phys)
Group 5: Phys 206 (Biophys); Phys 207 (X-ray Crystall); Phys 213A, 213B (Nucl); Phys 216 (Atomic); Phys 225A, 225B (Relativ); Phys 231 (Collision Th); Phys 271 (BioNeuro/Network); Phys 272 (Bio Materials)

Group 6: Phys 223 (Stel Str); Phys 224 (Instrstel Med); Phys 226 (Galaxies and Galactic Dynamics); Phys 227 (Cosmology); Phys 228 (High Energy Astrophysics and Compact Objects)

Biophysics students select five courses from Biology, Biochemistry, Chemistry, or Physics in consultation with their adviser. At least three of these courses must be graduate courses. Physics courses are to be selected from Groups 1-6 listed above.

3. Instruction in Physics Teaching

Students must complete at least one quarter of Teaching Assistantship, either in a lecture course or a laboratory course.

4. Qualifying Examination and Advancement to Candidacy

In order to be advanced to candidacy, students must have met the departmental requirements and obtained a faculty research supervisor. At the time of application for advancement to candidacy, a doctoral committee responsible for the remainder of the student's graduate program is appointed by the Dean of Graduate Studies & Research. The committee conducts the Ph.D. qualifying examination during which students must demonstrate the ability to engage in thesis research. Usually this involves the presentation of a plan for the thesis research project. The committee may ask questions directly or indirectly related to the project and questions on general physics which it determines to be relevant. Upon successful completion of this examination, students are advanced to candidacy and are awarded the C.Phil. Degree.

5. Thesis Defense

When students have completed their theses, they are asked to present and defend them before their doctoral committees.