

A. PHD CORE COURSE REQUIREMENTS

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A total of 7 or 8 courses from the following lists are needed to fulfill a student's core course requirements.

Group I: Select **2 courses** from the following (3 units each):

- OPTI 503A: Mathematical Methods for Optics and Photonics
- OPTI 508: Probability and Statistics in Optics
- OPTI 512R: Linear Systems, Fourier Transforms
- OPTI 570: Quantum Mechanics
- Certain advanced OPTI courses or broad mathematically-heavy non-OPTI courses may be approved by the Associate Dean for Graduate Academic Affairs

Group II: Select **1 course per numbered topics 1-6.**

- **Students who take OPTI 511R will not need OPTI 541A (Topic 5)**
- **Topic 6 will not appear on the Qualifying Exam**

1. Electromagnetic Waves

- OPTI 501: Electromagnetic Waves

2. Geometrical Optics

- OPTI 502: Optical Design and Instrumentation

3. Quantum Optics

- OPTI 511R: Optical Physics and Lasers (prerequisite: OPTI 501 strongly recommended) *OR*
- OPTI 544: Foundations of Quantum Optics (prerequisites: OPTI 570, OPTI 501)

4. Physical Optics

- OPTI 505R: Diffraction and Interferometry (prerequisites: OPTI 501 and OPTI 512R; OPTI 570 will partially satisfy the prerequisites)

5. Introduction to Lasers (testable on qualifying exam beginning August 2025)

- OPTI 541A: Introduction to Laser Physics (1 unit.) **Not required for students have taken OPTI 511R or who took OPTI 544 prior to Spring 2023. OPTI 541A is identical to the last ~5 weeks of OPTI 511R.**

6. Solid-State Optics (not on qualifying exam)

- OPTI 507: Solid-State Optics (prerequisite: OPTI 511R or OPTI 570) *OR*
- OPTI 537: Imaging Physics and Devices (prerequisites: OPTI 501; OPTI 511R strongly recommended)

