

PHOTONICS - GRADUATE CERTIFICATE

ECEN 5345	Introduction to Solid State Physics	3
Total Credit Hours		18

While 20th-century technology was defined by the growth of electronics, the field of photonics is coming of age in the 21st century. LEDs are lighting households powered by photovoltaic panels and connected to the internet via optical fiber. Holographic displays and virtual reality glasses are providing new forms of visualization. New microscopes are peering into living cells with resolutions that break previous limits. Photons are being used to interrogate atoms for quantum computations. Photonics graduates will command skills in theory, design, fabrication and laboratory practice to place them at the forefront of these industries and many more not yet invented.

Photonics is the electrical engineering sub-discipline concerned with the generation, modulation, radiative or guided transmission, sensing and detection of optical-frequency signals. Application areas include optical telecommunications and instrumentation, optical computing and data transmission, medical imaging, renewable energy, and environmental sensing. While some of these industries are mature, photonics continues to rapidly grow into emerging technologies such as quantum computing and cryptography, optogenetics, and virtual reality.

Photonics courses at CU Boulder engage high-caliber students from around the world. The courses typically run at a fast pace, often involving a mixture of fundamental theory, design in relevant industry standard CAD tools and individual projects.

For more information visit the department website (<https://www.colorado.edu/ecee/graduate-program/degrees/photonics/>).

Requirements

Admission to a graduate degree-seeking program in the ECEE department is not required for students pursuing the certificate.

Graduate students pursuing a photonics certificate are not required to matriculate into the program subplan through a master's degree, although degree-seeking students enrolled in the program will be given course registration priority.

Photonics certificate credit hours may be applied towards a full master's degree, provided the student is admitted to the electrical engineering graduate program as a degree-seeking student. However, credit hours may not count toward both a BS and a master's degree.

Required Courses

Nine credit hours of graduate-level coursework, made up of any three of the six core photonics courses, will be required to complete the certificate program. Students must earn at least a B in each course and a minimum GPA of 3.0 is required to remain in good academic standing.

Code	Title	Credit Hours
Photonics Core Courses		
ECEN 5616	Optoelectric System Design	3
ECEN 5606	Optics Laboratory	3
ECEN 5156	Physical Optics	3
ECEN 5696	Fourier Optics	3
ECEN 5626	Active Optical Devices	3