University of Pittsburgh | Dietrich School

Photonics Certificate

www.PhysAst.Pitt.edu/~Snoke/Photonics
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Overview

University of Pittsburgh students may sign up for the program at any time. They may have any major, but the program fits most naturally with majors in Physics, Chemistry, or Electrical Engineering. As part of the certificate program, they will take courses in the other departments which will fulfill requirements in their own departments. In their junior year, they take the Photonics seminar each semester, and in their senior year, they take two newly created courses in photonics taught by faculty experts. Students completing the program will be awarded the Certificate in Photonics in addition to the Bachelor of Science degree.

Students majoring in Physics will learn more of the underlying quantum mechanics and relativity which describe light waves. Students majoring in Chemistry will learn more of spectroscopic techniques and advanced analytical methods. Students taking the suggested course sequence will also qualify for ACS certification. Students majoring in Electrical Engineering will learn more about electronics design and communications. All students in the program will have opportunities to work in the laboratories of participating faculty.

The certificate program requires at least 50 credits, described as follows. Satisfactory completion of the certificate satisfies the Dietrich School of Arts and Sciences requirement of a related area.

Introductory courses

Choose one pair of PHYS courses and one pair of CHEM courses

PHYS 0174 Introduction to Physics for Science and Engineering 1
PHYS 0175 Introduction to Physics for Science and Engineering 2

PHYS 0475 Honors Introduction to Physics for Science & Engineering 1
PHYS 0476 Honors Introduction to Physics for Science & Engineering 2

CHEM 0110 General Chemistry 1
CHEM 0120 General Chemistry 2

CHEM 0710 Honors General Chemistry 1
CHEM 0720 Honors General Chemistry 2

CHEM 0960 Chemistry for Engineers 1
CHEM 0970 Chemistry for Engineers 2

Laboratory courses

Choose one course in each of the following groups

CHEM 0250 Analytical Chemistry with Lab 1 **and**
CHEM 0260 Analytical Chemistry with Lab 2
PHYS 0219 Basic Laboratory Techniques
PHYS 0577 Modern Physical Measurement
EE 0501 Digital Systems Lab
CHEM 1255 Instruments Lab **and**
CHEM 1430 Physical Chemistry Lab
PHYS 0525 Electronics Lab
EE 1201 Electronics Lab 1 **and**
EE 1212 Electronics Lab 2

Advanced courses

PHYS 1361 Waves and Optics Lab
EE 1247 Semiconductor Devices
EE 1232 Lasers and Optronics

One of the following groups

CHEM 1410 Physical Chemistry: Quantum Mechanics and Spectrscopy
PHYS 1370 Introduction to Quantum Mechanics 1 **and**
PHYS 1371 Introduction to Quantum Mechanics 2

Two of the following courses or sequences

PHYS 1351 Electricity and Magnetism **or**
EE 1259 Electromagnetics 1 **and**
EE 1266 Applications of Fields and Waves

CHEM 1250 Instrumental Analysis
TELCOM 2222 Photonic Communication

Two of the following courses

PHYS 1374 Solid State Physics
CHEM 1620 Atoms, Molecules, and Materials
MEMS 1057 Micro/Nano Manufacturing

Grade Requirements

A minimum GPA of 2.0 is required in each course that counts toward the certificate.

Satisfactory/No Credit Option

No course that counts toward this certificate may be taken on the S/NC basis.