

# PHOTONICS, PHD

## Requirements for Students Matriculating in or before Academic Year

**2023-2024.** Learn more about Graduate College Academic Regulation 7.0 (<http://catalog.okstate.edu/graduate-college/#70>).

**Total Hours:** 60 (Beyond the Master's Degree)

Code	Title	Hours
<b>Course Requirements<sup>1</sup></b>		
Select 3 hours from Electromagnetics:		3
PHYS 5313	Electromagnetic Theory	
ECEN 5613	Electromagnetic Theory	
PHYS 4813	Electromagnetic Radiation	
Select 3 hours from Lasers:		3
PHYS 5163	Lasers	
ECEN 4843	Design of Lasers and Systems	
Select 6 hours from Optics:		6
ECEN 4823	Design of Optical Systems	
PHYS 3213	Optics	
PHYS 5123	Geometrical Optics	
or ECEN 5803	Geometrical Optics	
PHYS 5303	Physical Optics	
or ECEN 5823	Physical Optics	
Select 3 hours from Quantum Mechanics:		3
PHYS 5613	Quantum Mechanics I	
PHYS 4513	Introductory Quantum Mechanics	
Select 12 Hours from Advanced Topics (Optoelectronics, Spectroscopy, Quantum and Nonlinear Optics, Solid State, Photonics Systems, Electromagnetics, Bio/Nano Photonics, and Additional Laboratory Courses		12
ECEN 5853	Ultrafast Optoelectronics	
PHYS 5133	Laser Spectroscopy	
PHYS 6413	Nonlinear Optics	
PHYS 6423	Quantum Optics	
PHYS 5663	Solid State Physics I	
PHYS 6243	Semiconductors I	
PHYS 4263	Introduction to Solid State Physics	
ECEN 5333	Semiconductor Devices	
ECEN 5833	Fiber-Optic Communication Systems	
PHYS 6713	Advanced Electromagnetic Radiation	
ECEN 5613	Electromagnetic Theory	
PHYS 4313	Molecular Biophysics <sup>2</sup>	
PHYS/ECEN 68X0 Photonics Lab courses: Topics Vary (Lab)		
ECEN 5843	Microelectronic Fabrication	
Select at least one additional elective course.		3
<b>Hours Subtotal</b>		<b>30</b>
<b>Dissertation<sup>1</sup></b>		
Thirty hours from:		30
PHYS 6000	Doctoral Dissertation Research	
<b>Hours Subtotal</b>		<b>30</b>
<b>Total Hours</b>		<b>60</b>

1

Combined Coursework and Dissertation to total 60 hours beyond the Master's Degree and 72 hours beyond the Bachelor's Degree.

2

For students pursuing the bio/nano photonics option, additional courses from departments other than ECEN and PHYS may be included.

**Total Hours:** 72 (Beyond the Bachelor's Degree)

Code	Title	Hours
<b>Course Requirements<sup>1</sup></b>		
Select 3 hours from Electromagnetics:		3
PHYS 5313	Electromagnetic Theory	
ECEN 5613	Electromagnetic Theory	
PHYS 4813	Electromagnetic Radiation	
Select 3 hours from Lasers:		3
PHYS 5163	Lasers	
ECEN 4843	Design of Lasers and Systems	
Select 6 hours from Optics:		6
ECEN 4823	Design of Optical Systems	
PHYS 3213	Optics	
PHYS 5123	Geometrical Optics	
or ECEN 5803	Geometrical Optics	
PHYS 5303	Physical Optics	
or ECEN 5823	Physical Optics	
Select 3 hours from Quantum Mechanics:		3
PHYS 5613	Quantum Mechanics I	
PHYS 4513	Introductory Quantum Mechanics	
Select 12 Hours from Advanced Topics (Optoelectronics, Spectroscopy, Quantum and Nonlinear Optics, Solid State, Photonics Systems, Electromagnetics, Bio/Nano Photonics, and Additional Laboratory Courses		12
ECEN 5853	Ultrafast Optoelectronics	
PHYS 5133	Laser Spectroscopy	
PHYS 6413	Nonlinear Optics	
PHYS 6423	Quantum Optics	
PHYS 5663	Solid State Physics I	
PHYS 6243	Semiconductors I	
PHYS 4263	Introduction to Solid State Physics	
ECEN 5333	Semiconductor Devices	
ECEN 5833	Fiber-Optic Communication Systems	
PHYS 6713	Advanced Electromagnetic Radiation	
ECEN 5613	Electromagnetic Theory	
PHYS 4313	Molecular Biophysics <sup>2</sup>	
PHYS/ECEN 68X0 Photonics Lab courses: Topics Vary (Lab)		
ECEN 5843	Microelectronic Fabrication	
Select at least one additional elective course.		3
<b>Hours Subtotal</b>		<b>30</b>
<b>Dissertation<sup>1</sup></b>		
Forty-two hours from:		42
PHYS 6000	Doctoral Dissertation Research	
<b>Hours Subtotal</b>		<b>42</b>
<b>Total Hours</b>		<b>72</b>

1

Combined Coursework and Dissertation to total 60 hours beyond the Master's Degree and 72 hours beyond the Bachelor's Degree.

2

For students pursuing the bio/nano photonics option, additional courses from departments other than ECEN and PHYS may be included.

## **Graduate College Doctor of Philosophy (PhD) Requirements**

Learn more about Graduate College 2023-2024 Doctor of Philosophy (PhD) Degree Program Requirements (<http://catalog.okstate.edu/graduate-college/>). Check the General Graduate College academic regulations for minimal GPA, language proficiency and other general requirements.