

**Electrical Engineering: Lasers and Optical Engineering Concentration**  
**Technical Electives**  
**Degree Total: 12 credits**

Course Number	Course Title	Credits	Noted Prerequisites	Terms
ECE 312	Linear System Analysis II	3	ECE311 with a C or higher	S
ECE403/BIOM403	Intro to Optical Techniques in Biomedical Engineering	3	CHEM111; PH142 with a C or higher	S, Odd
ECE 415	Semiconductor Physics and Junctions	2	MATH340 or MATH345 with a C or higher; PH142 with a C or higher	S
ECE 480A8	Waves in Photonic Integrated Circuit Elements	3	CS162 or CS163 or CS164 with a C or higher; ECE340 with a C or higher or ECE342 with a C or higher; MATH340 with a C or higher; PH142 with a C or higher	F
ECE 48X	Experimental Courses in Topics of Lasers/Optics	1-4	Varies - check course for details. Verify experimental course approval with ECE Academic Advisor	F, S
ECE 495 <sup>1,2</sup>	Independent Study	1-3		F, S, SS
ECE 503	Ultrafast Optics	3	ECE342	S, Odd
ECE 504	Physical Optics	3	ECE342 with a C or higher	F, Odd
ECE 505	Nanostructures Fundamentals and Applications	3	ECE342; PH353	As needed
ECE 506	Optical Interferometry and Laser Metrology	3	ECE342; ECE441	F, Odd
ECE 507	Plasma Physics and Applications	3	ECE342	S, Even
ECE 526/BIOM 526	Biological Physics	3	MATH340 or MATH345; PH122 or PH142	F, Odd
ECE 527B/BIOM 527B	Signals and Noise in Biosensors	1	PH142, MATH340 or MATH345, may be taken concurrently	S, Even
ECE 527F/BIOM 527F	Biophotonic Sensors Using Refractive Index	1	ECE527E; PH142; MATH340 or MATH345, may be taken concurrently	S, Even
ECE 544	Silicon Photonics in Computing Systems	3	PH141; ECE303 with a C or higher	F
ECE 546	Laser Fundamentals and Devices	3	ECE441	S, Odd
ECE 572	Semiconductor Transistors	1	ECE331 with a C or higher; ECE415, may be taken concurrently or ECE471B	S
ECE 573	Semiconductor Optoelectronics Laboratory	3	ECE415	As needed
ECE 574	Optical Properties in Solids	3	ECE441 with a C or higher	S, Odd
ECE 580C7/BIOM 580C7	Machine Learning in Imaging and Spectroscopy	3	ECE312 with a C or higher or ECE457; ECE/BIOM403, may be taken concurrently or ECE441, may be taken concurrently or ECE504; ECE/STAT303 with a C or higher or ECE431; CS150B or CS152 with a C or higher	F, Even
ECE 58X	Experimental Courses in Topics of Lasers/Optics	1-4	Varies - check course for details. Verify experimental course approval with ECE Academic Advisor	F, S
MATH 419	Introduction to Complex Variables	3	MATH261	F
MATH 430/ECE 430	Fourier and Wavelet Analysis with Applications	3	MATH340 or MATH345	S
PH 315	Modern Physics Lab	2	PH314, may be taken concurrently	S
PH 425	Advanced Physics Laboratory	2	PH315; PH451	S
PH 452	Intro to Quantum Mechanics II	3	PH451	S
PH 462	Statistical Physics	3	MATH340; PH314; PH361	F

<sup>1</sup> A maximum of 3 credits of Independent Study may apply towards degree requirements. This includes credits awarded for ECE395 and ECE495 combined.

<sup>2</sup> Biomedical Engineering - Lasers & Optics (L&O) dual degree students may apply a maximum of 3 credits of independent study (ECE395 and ECE495) towards their L&O degree requirements.