

Electrical Engineering: Lasers and Optical Engineering Concentration (prior to Fall 2025)
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
ECE 403/BIOM 403	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	As Needed
ECE 430/MATH 430	Fourier and Wavelet Analysis with Applications	3	MATH340 or MATH345	S, Odd
ECE 480A8	Waves in Photonic Integrated Circuit Elements	3	CS162 with a C or higher or CS163 with a C or higher 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 ^{1,2}	Independent Study	1-3		F,S,SU
ECE 503	Ultrafast Optics	3	ECE342	S, Odd
ECE 504	Physical Optics	3	ECE342 with a C or higher	F, Odd
ECE 506	Optical Interferometry and Laser Metrology	3	ECE342; ECE441	F, Odd
ECE 507	Plasma Physics and Applications	3	ECE342	S, Odd
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 or concurrent registration	As Needed
ECE 527F/BIOM 527F	Biophotonic Sensors Using Refractive Index	1	ECE527E; PH142; MATH340 or MATH345 or concurrent registration	As Needed
ECE 544	Silicon Photonics in Computing Systems	3	PH141; ECE303 with a C or higher or STAT303 with a C or higher	F
ECE 546	Laser Fundamentals and Devices	3	ECE441	S, Even
ECE 559/BIOM 559 ^(580C7)	Machine Learning in Imaging and Spectroscopy	3	ECE312 with a C or higher or ECE457; ECE403 or BIOM403 or concurrent registration or ECE441 or concurrent registration or ECE504; ECE303 with a C or higher or STAT303 with a C or higher or ECE431 or BIOM431; CS150B with a C or higher or CS152 with a C or higher or CS163 with a C or higher or CS164 with a C or higher	F, Even
ECE 572	Semiconductor Transistors	1	ECE331 with a C or higher; ECE415 or concurrent registration or ECE471B	As Needed
ECE 573	Semiconductor Optoelectronics Laboratory	3	ECE415	As Needed
ECE 574	Optical Properties in Solids	3	ECE441 with a C or higher	S, 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
PH 315	Modern Physics Lab	2	PH314 or concurrent registration	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

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

² 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.

Courses used to fulfill major and concentration requirements will not be counted as Technical Elective credits.