B.S. in Optical Sciences & Engineering

Catalog Year 2024-25

Below is the *advised sequence* of courses for this degree program as of 10/06/2023.

Official degree requirements and course prerequisites are found in the University General Catalog; prerequisites are subject to change.

Course Number and Title	Units	Prerequisites/Enrollment Requirements
1st Semester		
MATH 122A/B or MATH 125 Calculus I with Applications	5/3	Appropriate Math Placement
*CHEM 151 Chemical Thinking I or CHEM 161/163	4	Appropriate Math Placement
ENGL 101 or 107 or 109H First-Year Composition	3	
ENGR 102A/B Introduction to Engineering or ENGR 102	3	ENGR102A: MATH 112; ENGR102B: Pre- or Co-requisite of MATH 112 or higher; First-Year Status; College of Engineering Major
UNIV 101 Intro to the General Education Experience	1	
Semester Total	16/**14**	
2nd Semester		
MATH 129 Calculus II	3	MATH 122B or 125 with C or better
MSE 110 Solid State Chemistry	4	CHEM 151 or 161/163
*PHYS 141 Introductory Mechanics or PHYS 161H	4	MATH 122B or 125 or Appropriate Math Placement Level
ENGL 102 or 108 First-Year Composition	3	ENGL 101 or ENGL 107
General Education: Exploring Perspectives (Artist)	3	
Semester Total	**17**	
3rd Semester		
OPTI 201R Geometrical & Instrumental Optics I (Fall Only)	4	MATH 122B or 125, Concurrent enrollment or completion of MATH 129
OPTI 201L Geometrical & Instrumental Optics Lab I (Fall Only)	1	Concurrent enrollment or completion of OPTI 201R
MATH 223 Vector Calculus	4	MATH 129 with a C or better
PHYS 241 Introductory Electricity and Magnetism or PHYS 261H	4	For PHYS 241 or 261H: PHYS 141 or 140 or 161H; MATH 129 or Appropriate Math Placement Level
General Education: Exploring Perspectives (Social Scientist)	3	
General Education: Exploring Perspectives (Humanist)	3	
Semester Total	**19**	
4th Semester		
OPTI 202L Geometrical and Instrumental Optics Lab II (Spring Only)	1	Concurrent enrollment or completion of OPTI 202R
OPTI 210 Physics Optics I (Spring Only)	3	MATH 223. Completion of or concurrent enrollment in MATH 254, PHYS 241
OPTI 280 Computer Programming (Spring Only)	1	
MATH 254 Intro to Ordinary Differential Equations	3	MATH 129 or 223 with C or better
ECE 207 Elements of Electrical Engineering or ECE 220 Basic Circuits (MUST be ECE 220 for Opto-Electronics Track)	3/5	For ECE 207: PHYS 241 or 261H; For ECE 220: MATH 129 and PHYS 241 or 261H
Technical Elective (Track Course)	3/4	See Page 3
Semester Total	**14**/17	

*Each of the following foundational science courses satisfies the requirements for General Education: Exploring Perspectives (Natural Scientist): CHEM 151 or 152 or 161 or 162; or PHYS 141 or 161H.

Grade of 'C' or better is required for all OSE curriculum except General Education classes.

Advanced Standing is required for 300- and 400-level engineering courses (see your academic advisor for details).		
Course Number and Title	**Units**	**Comments**
5th Semester		
OPTI 306 Radiometry, Sources and Detectors (Fall Only)	3	
OPTI 341 Semiconductor Physics & Lasers (Fall Only)	3	
OPTI 380A Intermediate Optics Laboratory I (Fall Only)	1	
MATH 322 Mathematical Analysis for Engineers	3	
Technical Elective (Track Course)	3/4	See Page 3
†General Education: Building Connections	3	
Semester Total	**16**/17	
6th Semester		
OPTI 330 Physical Optics II (Spring Only)	3	
OPTI 340 Optical Design (Spring Only)	3	
OPTI 370 Laser and Photonics (Spring Only)	3	
OPTI 380B Intermediate Optics Laboratory II (Spring Only)	1	
Technical Elective (Track Course)	3/4	See Page 3
†General Education: Building Connections	3	
Semester Total	**16**/17	
7th Semester		
ENGR 498A Interdisciplinary Capstone	3	Senior Status
OPTI 421 Introductory Optomechanical Engineering (Fall Only)	3	
OPTI 430 Optical Communication Systems (Fall Only)	3	
OPTI 471A Advanced Optics Laboratory (Fall Only)	2	
Technical Elective (Track Course)	3/4	See Page 3
†General Education: Building Connections	3	
Semester Total	**17**/18	
8th Semester		
ENGR 498B Interdisciplinary Capstone	3	Senior Status
OPTI 415 Optical Specifications, Fabrication and Testing (Spring Only)	3	
OPTI 471B Advanced Optics Laboratory (Spring Only)	2	
Technical Elective (Track Course)	3/4	See Page 3
Technical Elective (Track Course)	3/4	See Page 3
UNIV 301 General Education Portfolio	1	
Semester Total	**15**/17	

†Students should work closely with their academic advisor to select General Education: Building Connections courses; some course work in the major, such as some Technical Elective courses, may also fulfill General Education: Building Connections requirements.

Grade of 'C' or better is required for all OSE curriculum except General Education classes.

Course Number and Title	Typical Term Taken	Units	Prerequisites/Enrollment Requirements
Opto-Electronics Track – 16 units (Students in this track must take ECE 220 instead of ECE 207 in Term 4.)			
ECE 175 Computer Programming for Engineering Applications	4	3	Concurrent enrollment or completion of MATH 122B or 125
ECE 274A Digital Logic	7	4	ECE 175. Prerequisite or concurrent enrollment in MATH 129.
ECE 381A Introductory Electromagnetics	6	4	
ECE Upper Division (300+) Electives	5/8	5	See Advisement Report or Consult Advisor
Opto-Materials Track – 18 units			
MSE 365 Physical Properties of Materials (Fall Only)		3	
MSE 345 Thermodynamics (Spring Only)		4	
MSE 434 Electrical and Optical Properties of Materials (Fall only)		3	
MSE 480 Advanced Characterization Methods in Material Science and Engineering		3	
MSE Upper Division (300+) Electives		5	See Advisement Report or Consult Advisor
Opto-Mechanics Track – 18 units			
CE 214 Statics		3	PHYS 141 or 161H; MATH 129
AME 250 Dynamics		3	CE 214; Concurrent enrollment or completion of MATH 254
AME 324A Mechanical Behavior of Engineering Materials		3	
AME 324B Engineering Component Design		3	
AME Upper Division (300+) Electives		6	See Advisement Report or Consult Advisor
Biomedical Optics Track – 18 units			
BME 330 Biomedical Instrumentation (Spring Only)		4	
OPTI 420 Biophotonics		3	
Related Technical Electives		11	See Advisement Report or Consult Advisor
Optics Track – 18 units			
At least 6 units from any department in the College of Engineering		6	
Remaining units from any STEM field (course must be technical in nature)		12	
No more than 6 units at the 200 level. Exceptions to this rule are CSC 110, ECE 175, OPTI 100H, and SFWE 101.			
MINORS AND CERTIFICATES			

Course Number and Title	Typical Term Taken	Units	Prerequisites/Enrollment Requirements
Opto-Electronics Track – 16 units (Students in this track must take ECE 220 instead of ECE 207 in Term 4.)			
Find out how to use your technical electives to earn a minor or certificate!			