

B.S. in Optical Sciences and Engineering

Four-Year Plan

Catalog Year 2013-2014

Below is the *advised sequence* of courses for this degree program.

The official degree requirements can be found in the University General Catalog.

Optics Track		
Course Number and Title	Units	Prerequisites
1ST SEMESTER		
MATH 122A/B or MATH 125 Calculus I with Applications	5/3	Appropriate Math Placement
CHEM 151 General Chemistry I	4	
ENGL 101 First-Year Composition	3	
ENGR 102 Introduction to Engineering	3	Concurrent enrollment or completion of MATH 122B or MATH 125
Tier I General Education	3	
2ND SEMESTER		
MATH 129 Calculus II	3	MATH 122B or 125 with C or better
MSE 110 Solid State Chemistry	4	CHEM 151
PHYS 141 Introductory Mechanics	4	MATH 122B or MATH 125; Concurrent enrollment in MATH 129
ENGL 102 First-Year Composition	3	ENGL 101
Tier I General Education	3	
3RD SEMESTER		
OPTI 201R Geometrical & Instrumental Optics I	3	MATH 129, PHYS 141, MSE 110
OPTI 201L Geometrical & Instrumental Optics Lab I	1	Concurrent enrollment in OPTI 201R
MATH 223 Vector Calculus	4	MATH 129 with a C or better
PHYS 241 Introductory Electricity and Magnetism	4	PHYS 141
Tech Elective	3	
4TH SEMESTER		
OPTI 202R Geometrical and Instrumental Optics II	3	OPTI 201R
OPTI 202L Geometrical and Instrumental Optics Lab II	1	
OPTI 280 Computer Programming	1	
OPTI 240 Semiconductor Physics and Lasers	3	PHYS 241, MATH 254
MATH 254 Intro to Ordinary Differential Equations	3	MATH 129 with C or better
ECE 220 or ECE 207	5/3	

Course Number and Title	Units	Prerequisites
Advanced Standing is required for 3xx and 4xx courses (See advisor for requirements)		
5TH SEMESTER		
OPTI 310 Physical Optics I	3	MATH 223; MATH 254; PHYS 241; OPTI 280
OPTI 380A Intermediate Optics Laboratory I	1	Concurrent enrollment in OPTI 310
Math 322 Mathematical Analysis for Engineers	3	MATH 254
Technical Elective	3	
Technical Elective	3	
Tier II General Education	3	
6TH SEMESTER		
OPTI 330 Physical Optics II	3	OPTI 310
OPTI 340 Optical Design	3	OPTI 201R, OPTI 201L, OPTI 202R, OPRI 202L, OPTI 310
OPTI 370 Laser and Photonics	3	OPTI 240; OPTI 310
OPTI 380B Intermediate Optics Laboratory II	1	Concurrent enrollment OPTI 330, OPTI 340, ECE 207 or 220
Technical Elective	3	
Tier II General Education	3	
7TH SEMESTER		
OPTI 406 Radiometry, Sources and Detectors	3	OPTI 201R; OPTI 201L; OPTI 380B; ECE 207 or ECE 220 or OPTI 360
OPTI 430 Optical Communication Systems	3	ECE 207 or 220; OPTI 380A; OPTI 380B
ENGR 498A Cross-disciplinary Design	3	Senior status
OPTI 421 Introductory Optomechanical Engineering	3	
OPTI 471A Advanced Optics Laboratory	2	OPTI 330; OPTI 370; ECE 207 or ECE 220 Concurrent enrollment in OPTI 406
Technical Elective	3	
8TH SEMESTER		
ENGR 498B Cross-disciplinary Design	3	Senior status
OPTI 415 Optical Specifications, Fabrication, and Testing	3	OPTI 330; OPTI 340
OPTI 471B Advanced Optics Laboratory	2	OPTI 471A; OPTI 406
Technical Elective	3	
Tier I General Education	3	
Tier I General Education	3	

*Tier I and II General Education Courses must meet University general education requirements. One course must be recognized by the university as meeting the Diversity Requirement.

Opto-Materials Track

Course Number and Title	Units	Prerequisites
1ST SEMESTER		
MATH 122A/B or MATH 125 Calculus I with Applications	5/3	Appropriate Math Placement
CHEM 151 General Chemistry I	4	
ENGL 101 First-Year Composition	3	
ENGR 102 Introduction to Engineering	3	Concurrent enrollment or completion of MATH 122B or MATH 125
Tier I General Education	3	
2ND SEMESTER		
MATH 129 Calculus II	3	MATH 122B or 125 with C or better
MSE 110 Solid State Chemistry	4	CHEM 151
PHYS 141 Introductory Mechanics	4	MATH 122B or MATH 125; Concurrent enrollment in MATH 129
ENGL 102 First-Year Composition	3	ENGL 101
Tier I General Education	3	
3RD SEMESTER		
OPTI 201R Geometrical & Instrumental Optics I	3	MATH 129, PHYS 141, MSE 110
OPTI 201L Geometrical & Instrumental Optics Lab I	1	Concurrent enrollment in OPTI 201R
MATH 223 Vector Calculus	4	MATH 129 with a C or better
PHYS 241 Introductory Electricity and Magnetism	4	PHYS 141
MSE 345 Thermodynamics	4	MATH 129
4TH SEMESTER		
OPTI 202R Geometrical and Instrumental Optics II	3	OPTI 201R
OPTI 202L Geometrical and Instrumental Optics Lab II	1	
OPTI 280 Computer Programming	1	
OPTI 240 Semiconductor Physics and Lasers	3	PHYS 241, MATH 254
MATH 254 Intro to Ordinary Differential Equations	3	MATH 129 with C or better
MSE 365 Structure and Properties of Materials I	4	

Course Number and Title	Units	Prerequisites
Advanced Standing is required for 3xx and 4xx courses (See advisor for requirements)		
5TH SEMESTER		
OPTI 310 Physical Optics I	3	MATH 223; MATH 254; PHYS 241; OPTI 280
OPTI 380A Intermediate Optics Laboratory I	1	Concurrent enrollment in OPTI 310
Math 322 Mathematical Analysis for Engineers	3	MATH 254
ECE 207 Elements of Electrical Engineering or ECE 220 Basic Circuits	3/5	MATH 129; PHYS 241, concurrent enrollment MATH 254
MSE 434 Electrical and Optical Properties of Materials	3	PHYS 241
Tier I General Education	3	
6TH SEMESTER		
OPTI 330 Physical Optics II	3	OPTI 310
OPTI 340 Optical Design	3	OPTI 201R, OPTI 201L, OPTI 202R, OPRI 202L, OPTI 310
OPTI 370 Laser and Photonics	3	OPTI 240; OPTI 310
OPTI 380B Intermediate Optics Laboratory II	1	Concurrent enrollment OPTI 330, OPTI 340, ECE 207 or 220
MSE 480 Experimental Methods for Microstructural Analysis	3	
Tier II General Education	3	
7TH SEMESTER		
OPTI 406 Radiometry, Sources and Detectors	3	OPTI 201R; OPTI 201L; OPTI 380B; ECE 207 or ECE 220 or OPTI 360
OPTI 430 Optical Communication Systems	3	ECE 207 or 220; OPTI 380A; OPTI 380B
ENGR 498A Cross-disciplinary Design	3	Senior status
OPTI 421 Introductory Optomechanical Engineering	3	
OPTI 471A Advanced Optics Laboratory	2	OPTI 330; OPTI 370; ECE 207 or ECE 220 Concurrent enrollment in OPTI 406
MSE Technical Elective	1	
8TH SEMESTER		
ENGR 498B Cross-disciplinary Design	3	Senior status
OPTI 415 Optical Specifications, Fabrication, and Testing	3	OPTI 330; OPTI 340
OPTI 471B Advanced Optics Laboratory	2	OPTI 471A; OPTI 406
MSE Technical Elective	3	
Tier I General Education	3	
Tier II General Education	3	

*Tier I and II General Education Courses must meet University general education requirements. One course must be recognized by the university as meeting the Diversity Requirement.

Opto-Electronics Track

Course Number and Title	Units	Prerequisites
1ST SEMESTER		
MATH 122A/B or MATH 125 Calculus I with Applications	5/3	Appropriate Math Placement
CHEM 151 General Chemistry I	4	
ENGL 101 First-Year Composition	3	
ENGR 102 Introduction to Engineering	3	Concurrent enrollment or completion of MATH 122B or MATH 125
Tier I General Education	3	
2ND SEMESTER		
MATH 129 Calculus II	3	MATH 122B or 125 with C or better
MSE 110 Solid State Chemistry	4	CHEM 151
PHYS 141 Introductory Mechanics	4	MATH 122B or MATH 125; Concurrent enrollment in MATH 129
ENGL 102 First-Year Composition	3	ENGL 101
Tier I General Education	3	
3RD SEMESTER		
OPTI 201R Geometrical & Instrumental Optics I	3	MATH 129, PHYS 141, MSE 110
OPTI 201L Geometrical & Instrumental Optics Lab I	1	Concurrent enrollment in OPTI 201R
MATH 223 Vector Calculus	4	MATH 129 with a C or better
PHYS 241 Introductory Electricity and Magnetism	4	PHYS 141
ECE 274A Digital Logic	4	Completion or Concurrent enrollment PHYS 241 and MATH 129
4TH SEMESTER		
OPTI 202R Geometrical and Instrumental Optics II	3	OPTI 201R
OPTI 202L Geometrical and Instrumental Optics Lab II	1	
OPTI 280 Computer Programming	1	
OPTI 240 Semiconductor Physics and Lasers	3	PHYS 241, MATH 254
MATH 254 Intro to Ordinary Differential Equations	3	MATH 129 with C or better
ECE 220 Basic Circuits	5	MATH 129; PHYS 241, concurrent enrollment MATH 254

Course Number and Title	Units	Prerequisites
Advanced Standing is required for 3xx and 4xx courses (See advisor for requirements)		
5TH SEMESTER		
OPTI 310 Physical Optics I	3	MATH 223; MATH 254; PHYS 241; OPTI 280
OPTI 380A Intermediate Optics Laboratory I	1	Concurrent enrollment in OPTI 310
Math 322 Mathematical Analysis for Engineers	3	MATH 254
ECE Technical Elective	3	
Tier I General Education	3	
Tier II General Education	3	
6TH SEMESTER		
OPTI 330 Physical Optics II	3	OPTI 310
OPTI 340 Optical Design	3	OPTI 201R, OPTI 201L, OPTI 202R, OPRI 202L, OPTI 310
OPTI 370 Laser and Photonics	3	OPTI 240; OPTI 310
OPTI 380B Intermediate Optics Laboratory II	1	Concurrent enrollment OPTI 330, OPTI 340, ECE 207 or 220
ECE 381 Introductory Electromagnetics	3	MATH 223
Tier II General Education	3	
7TH SEMESTER		
OPTI 406 Radiometry, Sources and Detectors	3	OPTI 201R; OPTI 201L; OPTI 380B; ECE 207 or ECE 220 or OPTI 360
OPTI 430 Optical Communication Systems	3	ECE 207 or 220; OPTI 380A; OPTI 380B
ENGR 498A Cross-disciplinary Design	3	Senior status
OPTI 421 Introductory Optomechanical Engineering	3	
OPTI 471A Advanced Optics Laboratory	2	OPTI 330; OPTI 370; ECE 207 or ECE 220 Concurrent enrollment in OPTI 406
ECE Technical Elective	3	
8TH SEMESTER		
ENGR 498B Cross-disciplinary Design	3	Senior status
OPTI 415 Optical Specifications, Fabrication, and Testing	3	OPTI 330; OPTI 340
OPTI 471B Advanced Optics Laboratory	2	OPTI 471A; OPTI 406
Technical Elective	3	
Tier I General Education	3	

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Opto-Mechanics Track

Course Number and Title	Units	Prerequisites
1ST SEMESTER		
MATH 122A/B or MATH 125 Calculus I with Applications	5/3	Appropriate Math Placement
CHEM 151 General Chemistry I	4	
ENGL 101 First-Year Composition	3	
ENGR 102 Introduction to Engineering	3	Concurrent enrollment or completion of MATH 122B or MATH 125
Tier I General Education	3	
2ND SEMESTER		
MATH 129 Calculus II	3	MATH 122B or 125 with C or better
MSE 110 Solid State Chemistry	4	CHEM 151
PHYS 141 Introductory Mechanics	4	MATH 122B or MATH 125; Concurrent enrollment in MATH 129
ENGL 102 First-Year Composition	3	ENGL 101
Tier I General Education	3	
3RD SEMESTER		
OPTI 201R Geometrical & Instrumental Optics I	3	MATH 129, PHYS 141, MSE 110
OPTI 201L Geometrical & Instrumental Optics Lab I	1	Concurrent enrollment in OPTI 201R
MATH 223 Vector Calculus	4	MATH 129 with a C or better
PHYS 241 Introductory Electricity and Magnetism	4	PHYS 141
CE 214 Statics	3	PHYS 141; MATH 129
4TH SEMESTER		
OPTI 202R Geometrical and Instrumental Optics II	3	OPTI 201R
OPTI 202L Geometrical and Instrumental Optics Lab II	1	
OPTI 280 Computer Programming	1	
OPTI 240 Semiconductor Physics and Lasers	3	PHYS 241, MATH 254
MATH 254 Intro to Ordinary Differential Equations	3	MATH 129 with C or better
AME 250 Dynamics	3	CE 214; Concurrent enrollment MATH 254
Tier I General Education	3	

Course Number and Title	Units	Prerequisites
Advanced Standing is required for 3xx and 4xx courses (See advisor for requirements)		
5TH SEMESTER		
OPTI 310 Physical Optics I	3	MATH 223; MATH 254; PHYS 241; OPTI 280
OPTI 380A Intermediate Optics Laboratory I	1	Concurrent enrollment in OPTI 310
Math 322 Mathematical Analysis for Engineers	3	MATH 254
ECE 207 Elements of Electrical Engineering or ECE 220 Basic Circuits	3/5	MATH 129; PHYS 241, concurrent enrollment MATH 254
AME 324A Mechanical Behavior of Engineering Materials	3	CE 214
Tier II General Education	3	
6TH SEMESTER		
OPTI 330 Physical Optics II	3	OPTI 310
OPTI 340 Optical Design	3	OPTI 201R, OPTI 201L, OPTI 202R, OPRI 202L, OPTI 310
OPTI 370 Laser and Photonics	3	OPTI 240; OPTI 310
OPTI 380B Intermediate Optics Laboratory II	1	Concurrent enrollment OPTI 330, OPTI 340, ECE 207 or 220
AME 324B Engineering Component Design	3	AME 324A
Tier II General Education	3	
7TH SEMESTER		
OPTI 406 Radiometry, Sources and Detectors	3	OPTI 201R; OPTI 201L; OPTI 380B; ECE 207 or ECE 220 or OPTI 360
OPTI 430 Optical Communication Systems	3	ECE 207 or 220; OPTI 380A; OPTI 380B
ENGR 498A Cross-disciplinary Design	3	Senior status
OPTI 421 Introductory Optomechanical Engineering	3	
OPTI 471A Advanced Optics Laboratory	2	OPTI 330; OPTI 370; ECE 207 or ECE 220 Concurrent enrollment in OPTI 406
AME Technical Elective	3	
8TH SEMESTER		
ENGR 498B Cross-disciplinary Design	3	Senior status
OPTI 415 Optical Specifications, Fabrication, and Testing	3	OPTI 330; OPTI 340
OPTI 471B Advanced Optics Laboratory	2	OPTI 471A; OPTI 406
AME Technical Elective	3	
Tier I General Education	3	

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