

## UCF Degree Programs

### Photonic Science and Engineering (B.S.P.S.E.)

#### College of Optics and Photonics

**CREOL, Room: 108B**

Phone: 407-823-6376

The Bachelor of Science in Photonic Science and Engineering degree is designed to prepare the next generation of engineers for the growing optics and photonics industry, which has a broad set of applications including manufacturing, healthcare, telecommunication, defense, security and entertainment. The program draws on UCF's internationally recognized strengths in the field of optics and lasers and is matched to the strong photonics industry in Central Florida. The degree is offered jointly by the College of Optics and Photonics and the College of Engineering and Computer Science.

#### Admission Requirements

■ Students who wish to declare their major in Photonic Science and Engineering must be in good academic standing and must have a "C" (2.0) or better in each of the following courses or their equivalents: MAC 2311C, MAC 2312, PHY 2048C, and CHS 1440 or CHM 2045C.

#### Degree Requirements

■ Majors in the B.S.P.S.E. degree are required to achieve a 2.250 or greater GPA for their engineering core courses, including STA 3032 and PHY 3101, together with the photonics courses required for the major, technical elective courses, and the senior design courses.

■ Students in the Photonic Science and Engineering major are expected to make consistent good progress toward their degrees to remain enrolled in, or eligible for, any major in the College of Engineering and Computer Science (CECS) or the College of Optics and Photonics (COP). Therefore, any student majoring in Photonic Science and Engineering who repeats any UCF course and does not earn a grade of "C" (2.0) or better on the second attempt will be placed on Lack of Progress Probation and remain on Lack of Progress Probation as long as the student is enrolled in a CECS or COP major. If a student on Lack of Progress Probation does not receive a grade of "C" (2.0) or better by the third attempt in the same UCF course, the student will be excluded from all CECS and COP majors. Any student majoring in Photonic Science and Engineering who has accumulated 7 or more unsuccessful attempts (i.e., grades below "C" (2.0) and withdrawals) over all courses taken at UCF will be placed on Lack of Progress Probation and remain on Lack of Progress Probation as long as the student is enrolled in a CECS or COP major. If a student on Lack of Progress Probation has a tenth unsuccessful attempt over all courses taken at UCF, the student will be excluded from all CECS and COP majors.

■ A student who is excluded from CECS and COP majors may seek readmission to a major in CECS or COP after at least one full year has passed since exclusion. Readmission is not automatic and is dependent upon a high probability of success after readmission. Any student who is readmitted to the Photonic Science and Engineering major will be subject to all probation conditions that applied at the time of exclusion.

■ Students in the BSPSE Major must obtain a 2.0 or greater GPA in the following courses: EGN 3211, EEL 3004C, EEL 3123C, MAP 2302

#### 1. UCF General Education Program (GEP) (38 hrs)

■ Engineering students should closely study the requirements of the UCF GEP and the allowable substitutions detailed in paragraphs A through E below to minimize excess hours. Students transferring to UCF from within the Florida College System or State University System should complete the GEP and the Common Program Prerequisites before transferring.

**A: Communication Foundations (9 hrs)**  
 Required ENC 1101 Composition I 3 hrs  
 Required ENC 1102 Composition II 3 hrs

**Select 1: (3 hrs)**  
 Suggested SPC 1608 Fundamentals of Oral Communication or 3 hrs  
 SPC 1603C Fundamentals of Technical Presentations 3 hrs

**B: Cultural & Historical Foundations (9 hrs)**  
 Suggested HUM 2020 Encountering the Humanities 3 hrs

**Select 1: (3 hrs)**  
 MUL 2010 Enjoyment of Music or 3 hrs  
 Suggested PHI 2010 Introduction to Philosophy or 3 hrs  
 THE 2000 Theatre Survey 3 hrs  
 Select one additional class from either Historical or Cultural Foundations 3 hrs

**C: Mathematical Foundations (7 hrs)**  
 Required MAC 2311C Calculus with Analytic Geometry I 4 hrs  
 Required STA 3032 Probability and Statistics for Engineers 3 hrs

**D: Social Foundations (6 hrs)**  
 Suggested AMH 2020 U.S. History: 1877-Present 3 hrs

**Select 1 (3 hrs)**  
 PSY 2012 General Psychology or 3 hrs  
 Suggested SYG 2000 Introduction to Sociology or 3 hrs  
 ANT 2000 General Anthropology 3 hrs

**E: Science Foundations (7 hrs)**  
 Required PHY 2048C General Physics Using Calculus I 4 hrs  
 Choose one class from Science Foundations 3 hrs

#### 2. Common Program Prerequisites (CPP) (19 hrs)

■ These courses are specifically required for all engineering students of the Florida State University System. CPP courses are also available at other Florida postsecondary schools and may be transferred directly to UCF programs.

<sup>1</sup> MAC 2311C	Calculus with Analytic Geometry I	GEP
<sup>1</sup> MAC 2312	Calculus with Analytic Geometry II	4 hrs
MAC 2313	Calculus with Analytic Geometry III	4 hrs
MAP 2302	Ordinary Differential Equations I	3 hrs
<sup>1</sup> PHY 2048C	General Physics Using Calculus I	GEP
PHY 2049C	General Physics Using Calculus II	4 hrs

**Select 1: (4 hrs)**  
<sup>1</sup> CHS 1440 Principles of Chemistry or 4 hrs  
<sup>1</sup> CHM 2045C Chemistry Fundamentals I 4 hrs

<sup>1</sup> A "C" (2.0) or better is required in these courses to enroll in PSE major courses.

**3. Core Requirements: Basic Level (8 hrs)**  
 EGS 1006C Introduction to the Engineering Profession 1 hr  
 EGN 1007C Engineering Concepts and Methods 1 hr  
<sup>1</sup> EGN 3211 Engineering Analysis and Computation 3 hrs  
 PHY 3101 General Physics Using Calculus III 3 hrs  
 STA 3032 Probability and Statistics for Engineers GEP

<sup>1</sup> C (2.0) or better required

#### 4. Core Requirements: Advanced Level (45 hrs)

**Engineering Requirements (17 hrs)**  
<sup>1</sup> EEL 3004C Electrical Networks 3 hrs  
 EEE 3350 Semiconductor Devices I 3 hrs  
<sup>1</sup> EEL 3123C Networks and Systems 3 hrs  
 EEE 3307C Electronics I 4 hrs  
 EEL 3552C Signal Analysis and Analog Communication 4 hrs

<sup>1</sup> C (2.0) or better required.

**Photonics Requirements (28 hrs)**  
 OSE 3200 Geometric Optics 3 hrs  
 OSE 3052 Introduction to Photonics 3 hrs  
 OSE 3052L Introduction to Photonics Laboratory 1 hr  
 OSE 3053 Electromagnetic Waves for Photonics 3 hrs  
 OSE 4520 Laser Engineering 3 hrs

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OSE 4520L	Laser Engineering Laboratory	1 hr
OSE 4410	Optoelectronics	3 hrs
OSE 4410L	Optoelectronics Laboratory	1 hr
OSE 4470	Fiber-Optic Communications	3 hrs
OSE 4470L	Fiber-Optic Communications Laboratory	1 hr
OSE 4830	Imaging and Display	3 hrs
OSE 4830L	Imaging and Display Laboratory	1 hr
OSE 4930	Frontiers of Optics and Photonics	2 hrs

### 5. Restricted Electives (12 hrs)

■ Students must select at least 3 credit hours of restricted electives with the course prefix OSE. The remaining 9 hours may be taken from approved upper level photonics, engineering, physics, mathematics, or other related electives. All electives must be approved by the program advisor. See myKnight audit for complete list of approved electives. If EGS 1006C and EGN 1007C are not completed, the restricted electives requirement increases to 14 hrs.

### 6. Capstone Requirements (6 hrs)

OSE 4951	Senior Design I	3 hrs
OSE 4952	Senior Design II	3 hrs

### 7. Foreign Language Requirements

#### Admissions

■ Two years of one foreign language in high school, or one year of one foreign language in college (or equivalent proficiency exam) prior to graduation.

#### Graduation

■ None

#### 8. Electives

■ None

#### 9. Additional Requirements

■ Photonic science and engineering students must earn at least 32 hours in residence at UCF. 24 of the 32 Residency hours must be at the 3000-5000 level, in courses taken from the College of Optics and Photonics at UCF and applicable to the degree program.

#### 10. Required Minors

■ None

#### 11. Departmental Exit Requirements

■ None

#### 12. University Minimum Exit Requirements

- A 2.0 UCF GPA
- 60 semester hours earned after CLEP awarded
- 48 semester hours of upper division credit completed
- 30 of the last 39 hours of course work must be completed in residency at UCF.
- A maximum of 45 hours of extension, correspondence, CLEP, Credit by Exam, and Armed Forces credits permitted.
- Complete the General Education Program, the Gordon Rule, and nine hours of Summer credit.

#### Total Semester Hours Required

■ 128

#### Honors In Major

■ None

#### Related Programs

- Electrical Engineering
- Computer Engineering
- Physics

#### Certificates

■ None

#### Related Minors

- Engineering Leadership
- Mathematics
- Physics

#### Advising Notes

- Each engineering student should meet with their academic advisor in the department of their major regularly.
- Each student should seek academic advisement before registering for classes each semester to minimize excess hours.
- Students are assumed to have knowledge of a higher level programming language (C preferred).

■ Students in the BSPSE Major are required to take OSE-prefixed lab courses in the same semester as the corresponding lecture course.

■ Prior to enrolling in OSE 3200, students are required to meet with the BSPSE Academic Advisor.

#### Transfer Notes

■ Courses taken from Florida College System institutions do not substitute for upper division courses unless part of an articulated pre-engineering degree program.

■ Courses transferred must be formally evaluated for equivalency credit. The student must provide all supporting information with his/her petition for this evaluation.

■ EGS 1006C and EGN 1007C are required courses for incoming freshmen only and without completion of these courses, restricted elective requirement increases to 14 credit hours.

#### Acceptable Substitutes for Transfer Courses

■ None

#### Plan of Study (128 hrs)

##### Freshman Year - Fall 15 hrs

Historical Foundation	3 hrs	
MAC 2311C	Calculus with Analytic Geometry I	4 hrs
SPC 1608	Fundamentals of Oral Communication	3 hrs
EGS 1006C	Introduction to the Engineering Profession	1 hr
CHS 1440	Principles of Chemistry	4 hrs

##### Freshman Year - Spring 15 hrs

ENC 1101	Composition I	3 hrs
EGN 1007C	Engineering Concepts and Methods	1 hr
MAC 2312	Calculus with Analytic Geometry II	4 hrs
PHY 2048C	General Physics Using Calculus I	4 hrs
AMH 2020	U.S. History: 1877-Present	3 hrs

##### Sophomore Year - Fall 14 hrs

MAC 2313	Calculus with Analytic Geometry III	4 hrs
PHY 2049C	General Physics Using Calculus II	4 hrs
ENC 1102	Composition II	3 hrs
EGN 3211	Engineering Analysis and Computation	3 hrs

##### Sophomore Year - Spring 15 hrs

MAP 2302	Ordinary Differential Equations I	3 hrs
EEL 3004C	Electrical Networks	3 hrs
PHY 3101	General Physics Using Calculus III	3 hrs
OSE 3200	Geometric Optics	3 hrs
Science Foundation		3 hrs

##### Sophomore Year - Summer 9 hrs

EEL 3123C	Networks and Systems	3 hrs
EEE 3350	Semiconductor Devices I	3 hrs
STA 3032	Probability and Statistics for Engineers	3 hrs

##### Junior Year - Fall 15 hrs

EEE 3307C	Electronics I	4 hrs
OSE 3052	Introduction to Photonics	3 hrs
OSE 3052L	Introduction to Photonics Laboratory	1 hr
EEL 3552C	Signal Analysis and Analog Communication	4 hrs
HUM 2020	Encountering the Humanities	3 hrs

##### Junior Year - Spring 14 hrs

OSE 3053	Electromagnetic Waves for Photonics	3 hrs
OSE 4410	Optoelectronics	3 hrs
OSE 4410L	Optoelectronics Laboratory	1 hr
OSE 4520	Laser Engineering	3 hrs
OSE 4520L	Laser Engineering Laboratory	1 hr
Restricted Elective (Suggested OSE 4240 Optics and Photonics Design)		3 hrs

##### Senior Year - Fall 16 hrs

OSE 4470	Fiber-Optic Communications	3 hrs
OSE 4470L	Fiber-Optic Communications Laboratory	1 hr
OSE 4951	Senior Design I	3 hrs
OSE 4930	Frontiers of Optics and Photonics	2 hrs
OSE 4830	Imaging and Display	3 hrs
OSE 4830L	Imaging and Display Laboratory	1 hr
Social Foundation		3 hrs

##### Senior Year - Spring 15 hrs

OSE 4952	Senior Design II	3 hrs
Restricted Elective		3 hrs
Restricted Elective		3 hrs

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Restricted Elective	3 hrs
Historical Foundation	3 hrs

### **Program Academic Learning Compacts**

■ Program Academic Learning Compacts (student learning outcomes) for undergraduate programs are located at:  
[http://www.oeas.ucf.edu/alc/academic\\_learning\\_compacts.htm](http://www.oeas.ucf.edu/alc/academic_learning_compacts.htm)

### **Equipment Fees**

- Part-Time Student: \$30 per term
- Full-Time Student: \$60 per term