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
   - Required  ENC 1102  Composition II

Select 1:

   - Suggested  SPC 1608  Fundamentals of Oral Communication
   - SPC 1603C  Fundamentals of Technical Presentations

B: Cultural & Historical Foundations (9 hrs)

   - Suggested  HUM 2020  Encountering the Humanities

Select 1:

   - MUL 2010  Enjoyment of Music or
   - Suggested  PHI 2010  Introduction to Philosophy or
   - THE 2000  Theatre Survey

Select one additional class from either Historical or Cultural Foundations

C: Mathematical Foundations (7 hrs)

   - Required  MAC 2311C  Calculus with Analytic Geometry I
   - Required  STA 3032  Probability and Statistics for Engineers

D: Social Foundations (6 hrs)

   - Suggested  AMH 2020  U.S. History: 1877-Present

Select 1:

   - PSY 2012  General Psychology or
   - Suggested  SYG 2000  Introduction to Sociology or
   - ANT 2000  General Anthropology

E: Science Foundations (7 hrs)

   - Required  PHY 2048C  General Physics Using Calculus I
   - Choose one class from Science Foundations

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.

   - MAC 2311C  Calculus with Analytic Geometry I GEP
   - 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
   - PHY 2048C  General Physics Using Calculus I GEP
   - PHY 2049C  General Physics Using Calculus II 4 hrs

Select 1:

   - CHS 1440  Principles of Chemistry or
   - CHM 2045C  Chemistry Fundamentals I

   - 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 1000C  Introduction to the Engineering Profession 1 hr
   - EGN 1007C  Engineering Concepts and Methods 1 hr
   - 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

Select 1:

   - EEE 3307C  Electronics I 4 hrs
   - EEL 3123C  Networks and Systems 3 hrs
   - EEL 3307C  Electronics I 4 hrs
   - EEL 3552C  Geometric Optics 3 hrs
   - OSE 3052L  Introduction to Photonics Laboratory 1 hr
   - OSE 3053  Electromagnetic Waves for Photonics 3 hrs

4. Core Requirements: Advanced Level (45 hrs)

   - Engineering Requirements 17 hrs

       - EEL 3004C  Electrical Networks 3 hrs
       - EEE 3350  Semiconductor Devices I 3 hrs
       - EEL 3123C  Networks and Systems 3 hrs
       - EEE 3307C  Electronics I 4 hrs
       - EEL 3552C  Signal Analysis and Analog Communication 4 hrs

   - 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
### Related Programs
- Electrical Engineering
- Computer Engineering
- Physics

### Certificates
- None

### 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).

### UCF Degree Programs

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>OSE 4520L</td>
<td>Laser Engineering Laboratory</td>
<td>1 hr</td>
</tr>
<tr>
<td>OSE 4410</td>
<td>Optoelectronics</td>
<td>3 hrs</td>
</tr>
<tr>
<td>OSE 4410L</td>
<td>Optoelectronics Laboratory</td>
<td>1 hr</td>
</tr>
<tr>
<td>OSE 4470</td>
<td>Fiber-Optic Communications</td>
<td>3 hrs</td>
</tr>
<tr>
<td>OSE 4470L</td>
<td>Fiber-Optic Communications Laboratory</td>
<td>1 hr</td>
</tr>
<tr>
<td>OSE 4830</td>
<td>Imaging and Display</td>
<td>3 hrs</td>
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<tr>
<td>OSE 4830L</td>
<td>Imaging and Display Laboratory</td>
<td>1 hr</td>
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<tr>
<td>OSE 4930</td>
<td>Frontiers of Optics and Photonics</td>
<td>2 hrs</td>
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#### 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.

#### 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 residence 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

### 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).

### Acceptable Substitutes for Transfer Courses
- None

### Plan of Study (128 hrs)

#### Freshman Year - Fall
- 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
- 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
- MAC 2313 Calculus with Analytic Geometry III 4 hrs
- EEL 3123C Networks and Systems 3 hrs
- EEE 3350 Semiconductor Devices I 3 hrs
- STA 3032 Probability and Statistics for Engineers 3 hrs

#### Sophomore Year - Spring
- MAP 2302 Ordinary Differential Equations 1 3 hrs
- EEL 3004C Electrical Networks 3 hrs
- PHY 3101 General Physics Using Calculus II 4 hrs
- ENC 1102 Composition II 3 hrs
- EGN 3211 Engineering Analysis and Computation 3 hrs

#### Junior Year - Fall
- EEE 3307C Electronics I 3 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
- 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
- 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
- OSE 4952 Senior Design II 3 hrs
- Restricted Elective 3 hrs
- Restricted Elective 3 hrs
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

Equipment Fees

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