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 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 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 BS PSE Major must obtain a 2.0 or greater GPA in the following courses: EGN 3211, EEL 3004C, and EEL 3123C.

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:  

Suggested SPC 1608  Fundamentals of Oral Communication or SPC 1603C  Fundamentals of Technical Presentations  3 hrs

B: **Cultural & Historical Foundations** (9 hrs)

Suggested HUM 2020  Encountering the Humanities  3 hrs

Select 1:  

- 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

Select 1:

Suggested AMH 2020  U.S. History: 1877-Present  3 hrs

D: **Social Foundations** (6 hrs)

- Required MAC 2312C  Calculus with Analytic Geometry II  4 hrs
- Required STA 3032  Probability and Statistics for Engineers  3 hrs

Select 1:

Suggested 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 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.

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAC 2311C</td>
<td>Calculus with Analytic Geometry I</td>
</tr>
<tr>
<td>MAC 2312</td>
<td>Calculus with Analytic Geometry II</td>
</tr>
<tr>
<td>MAC 2313</td>
<td>Calculus with Analytic Geometry III</td>
</tr>
<tr>
<td>MAP 2302</td>
<td>Ordinary Differential Equations I</td>
</tr>
<tr>
<td>PHY 2048C</td>
<td>General Physics Using Calculus I</td>
</tr>
<tr>
<td>PHY 2049C</td>
<td>General Physics Using Calculus II</td>
</tr>
<tr>
<td>Suggested SPC 1608</td>
<td>Fundamentals of Oral Communication</td>
</tr>
<tr>
<td>Suggested SPC 1603C</td>
<td>Fundamentals of Technical Presentations</td>
</tr>
<tr>
<td>Suggested SPC 1608</td>
<td>Fundamentals of Oral Communication</td>
</tr>
<tr>
<td>Suggested SPC 1603C</td>
<td>Fundamentals of Technical Presentations</td>
</tr>
</tbody>
</table>

Select 1:

Suggested SPC 1608 | Fundamentals of Oral Communication | 3 hrs
- Suggested SPC 1603C | Fundamentals of Technical Presentations | 3 hrs

A “C” (2.0) or better is required in these courses to enroll in PSE major courses.

3. **Core Requirements: Basic Level** (14 hrs)

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGS 1006C</td>
<td>Introduction to the Engineering Profession</td>
</tr>
<tr>
<td>EGN 1007C</td>
<td>Engineering Concepts and Methods</td>
</tr>
<tr>
<td>EGN 3211</td>
<td>Engineering Analysis and Computation</td>
</tr>
<tr>
<td>EGN 3310</td>
<td>Engineering Analysis-Statics</td>
</tr>
<tr>
<td>PHY 3101</td>
<td>General Physics Using Calculus III</td>
</tr>
<tr>
<td>STA 3032</td>
<td>Probability and Statistics for Engineers</td>
</tr>
</tbody>
</table>

Select 1:

- EGN 3321 | Engineering Analysis-Dynamics | 3 hrs |
- EGN 3358 | Thermo-Fluids-Heat Transfer | 3 hrs |

A “C” (2.0) or better required.

4. **Core Requirements: Advanced Level** (42 hrs)

**Engineering Requirements** 14 hrs

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEL 3004C</td>
<td>Electrical Networks</td>
</tr>
<tr>
<td>EEE 3350</td>
<td>Semiconductor Devices I</td>
</tr>
<tr>
<td>EEL 3123C</td>
<td>Networks and Systems</td>
</tr>
<tr>
<td>EEE 3307C</td>
<td>Electronics I</td>
</tr>
</tbody>
</table>

A “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
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 (9 hrs)
- Students must select at least 3 credit hours of restricted electives with the course prefix OSE. The remaining 6 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.

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
129

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.
- Students in the BSPSE Major are required to take OSE 3200 Geometric Optics either concurrently or prior to enrollment in OSE 3052 Introduction to Photonics.

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 count towards the required 11 credit hours of restricted electives.

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
SPA 1008 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 2049C General Physics Using Calculus I 4 hrs
ASH 1000C U.S. History: 1865-Present 3 hrs

Sophomore Year - Fall
MAC 2313 Calculus with Analytic Geometry III 4 hrs
EEL 3123C Networks and Systems 4 hrs
EGN 3310 Engineering Analysis-Statics 3 hrs
PHY 3101 General Physics Using Calculus III 3 hrs
Science Foundation 3 hrs

Sophomore Year - Summer
EEE 3323C Electrical Networks 4 hrs
EEE 3350 Semiconductor Devices I 3 hrs
STA 3024 Probability and Statistics for Engineers 3 hrs

Junior Year - Fall
OSE 3052 Introduction to Photonics 3 hrs
OSE 3052L Introduction to Photonics Laboratory 1 hr
EEE 3307C Electronics I 4 hrs
OSE 3200 Geometric Optics 3 hrs

Select 1:
EGN 3321 Engineering Analysis-Dynamics or 3 hrs
EGN 3358 Thermo-Fluids-Heat Transfer 3 hrs

Junior Year - Spring
OSE 4410 Optoelectronics 3 hrs
OSE 4410L Optoelectronics Laboratory 1 hr
OSE 4520 Laser Engineering 3 hrs
OSE 4520L Laser Engineering Laboratory 1 hr
OSE 3053 Electromagnetic Waves for Photonics 3 hrs
Science Foundation 3 hrs
# UCF Degree Programs

## 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
- Restricted Elective  3 hrs

## Senior Year - Spring
- OSE 4952  Senior Design II  3 hrs
- OSE 4830  Imaging and Display  3 hrs
- OSE 4830L  Imaging and Display Laboratory  1 hr
- 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