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, 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 may not accumulate five or more grades of W, WP, or WF at UCF and 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 accumulates three grades of W, WP, or WF at UCF will be placed on W Probation and will remain on W Probation as long as the student is enrolled in a CECS or COP major. If a student on W Probation receives a fifth grade of W, WP, or WF, the student will be excluded from all CECS and COP majors.
- 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 receives a grade of “C” (2.0) or better on 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.

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 Fundamentals of Technical Presentations 3 hrs

B: Cultural & Historical Foundations (9 hrs)
- Select a course from Cultural Foundations 3 hrs
- Select a course 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)
- Select one class from Social Foundations 3 hrs

Select 1: 3 hrs
- Suggested ECO 2013 Principles of Macroeconomics 3 hrs
- Suggested ECO 2023 Principles of Microeconomics 3 hrs
- Select one class from Social Foundations 3 hrs

E: Science Foundations (7 hrs)
- Required PHY 2048C Physics for Engineers & Scientists I 4 hrs
- Choose one class from Science Foundations 3 hrs

Select 1: 4 hrs
- 1 CHS 1440 Principles of Chemistry or
- 1 CHM 2045C Chemistry Fundamentals I 4 hrs

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

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.

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.

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- Required ENC 1102 Composition II 3 hrs

Select 1: 3 hrs
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B: Cultural & Historical Foundations (9 hrs)
- Select a course from Historical Foundations 3 hrs
- Select a course from Cultural Foundations 3 hrs
- Select a course 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)
- Select one class from Social Foundations 3 hrs

Select 1: 3 hrs
- Suggested ECO 2013 Principles of Macroeconomics 3 hrs
- Suggested ECO 2023 Principles of Microeconomics 3 hrs
- Select one class from Social Foundations 3 hrs

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- Required PHY 2048C Physics for Engineers & Scientists I 4 hrs
- Choose one class from Science Foundations 3 hrs

Select 1: 4 hrs
- 1 CHS 1440 Principles of Chemistry or
- 1 CHM 2045C Chemistry Fundamentals I 4 hrs

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

3. Core Requirements: Basic Level (14 hrs)

Select 1: 3 hrs
- EGN 3321 Engineering Analysis and Computation 3 hrs
- EGN 3310 Engineering Analysis-Statics 3 hrs
- PHY 3101 Physics for Engineers and Scientists III 3 hrs

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

4. Core Requirements: Advanced Level (42 hrs)

Engineering Requirements 17 hrs

- EEL 3004C Electrical Networks 3 hrs
- EEL 3470 Electromagnetic Fields 3 hrs
- EEE 3350 Semiconductor Devices I 3 hrs
- EEL 3123C Networks and Systems 4 hrs
- EEE 3307C Electronics I 4 hrs
**Photonics Requirements**  
25 hrs  

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<tr>
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<tr>
<td>OSE 3052</td>
<td>Introduction to Photonics</td>
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<td>Introduction to Photonics Laboratory</td>
<td>1 hr</td>
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<tr>
<td>OSE 3053</td>
<td>Electromagnetic Waves for Photonics</td>
<td>3 hrs</td>
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<tr>
<td>OSE 4520</td>
<td>Laser Engineering</td>
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<td>OSE 4520L</td>
<td>Laser Engineering Laboratory</td>
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<td>OSE 4410</td>
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<tr>
<td>OSE 4830</td>
<td>Imaging and Display</td>
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<td>OSE 4830L</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** (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**  
- 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 Requirements**  
- 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.

**UCF Degree Programs**

- Students are assumed to have knowledge of a higher level programming language (C preferred).

**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. The credits for these two courses (one hour each) may, with prior approval of the program academic advisor, be moved to the Restricted Elective area.

**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  
- MAP 2302 Ordinary Differential Equations I 3 hrs  
- STA 3032 Probability and Statistics for Engineers 3 hrs  
- STA 3032 Probability and Statistics for Engineers 3 hrs

**Freshman Year - Spring**  
15 hrs  
- ENC 1101 Composition I 3 hrs  
- ENC 1102 Composition II 3 hrs  
- EEL 3123C Networks and Systems 3 hrs  
- ECH 1440 Principles of Chemistry 4 hrs  
- ECO 2013 Principles of Macroeconomics 3 hrs

**Sophomore Year - Fall**  
17 hrs  
- MAC 2312 Calculus with Analytic Geometry II 4 hrs  
- PHY 2048C Physics for Engineers & Scientists I 4 hrs  
- EGN 3211 Engineering Analysis and Computation 3 hrs  
- Cultural Foundation 3 hrs

**Sophomore Year - Spring**  
15 hrs  
- MAP 2302 Ordinary Differential Equations I 3 hrs  
- EEL 3004C Electrical Networks 3 hrs  
- EGN 3310 Engineering Analysis-Statics 3 hrs  
- PHY 3101 Physics for Engineers and Scientists III 3 hrs  
- Science Foundation 3 hrs

**Sophomore Year - Summer**  
10 hrs  
- EEL 3123C Networks and Systems 4 hrs  
- EEE 3350 Semiconductor Devices I 3 hrs  
- STA 3032 Probability and Statistics for Engineers 3 hrs

**Junior Year - Fall**  
14 hrs  
- OSE 3052 Introduction to Photonics 3 hrs  
- OSE 3052L Introduction to Photonics Laboratory 1 hr  
- EEL 3470 Electromagnetic Fields 3 hrs

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

**Junior Year - Spring**  
14 hrs  
- OSE 4410 Optoelectronics 3 hrs  
- OSE 4410L Optoelectronics Laboratory 3 hrs  
- OSE 4520 Laser Engineering 3 hrs  
- OSE 4520L Laser Engineering Laboratory 1 hr  
- OSE 3053 Electromagnetic Waves for Photonics 3 hrs  
- Social Foundation 3 hrs

**Senior Year - Fall**  
15 hrs  
- OSE 4470 Fiber-Optic Communications 3 hrs  
- OSE 4470L Fiber-Optic Communications Laboratory 1 hr  
- OSE 4951 Senior Design I 3 hrs  
- Restricted Elective 3 hrs  
- Restricted Elective 3 hrs

**Senior Year - Spring**  
13 hrs  
- 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
UCF Degree Programs

Program Academic Learning Compacts

- Program Academic Learning Compacts (student learning outcomes) for undergraduate programs are located at:
  http://www.oias.ucf.edu/academiclearningcompacts.html