### UCF Degree Programs

#### Physics (B.S.)
**College of Sciences**
**Department of Physics,**
**Physical Sciences, Room: 430**


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Phone: 407-823-2325

Physics majors can select from five distinct specializations to earn their physics degree, as described below in Section 4. Core Requirements. Advanced. While the various specializations share a common core of courses, they also enable students to prepare specifically for certain career paths. Students should consult their faculty advisors when deciding among these tracks.

#### Admission Requirements
- None

#### Degree Requirements
- Students who change degree programs and select this major must adopt the most current catalog.
- Grades below "C" (2.0) in any required physics or mathematics courses are not acceptable; they must be repeated with a higher grade.
- Students must achieve a minimum cumulative GPA of 2.0 in all courses taken that could meet major requirements.
- All attempts that could meet requirements are included in the major GPA calculation. All attempts of courses listed for the major taken beyond the minimum required are included in the GPA calculation (e.g., additional restricted electives).
- Departmental Residency Requirement consists of at least 15 semester hours of regularly scheduled 3000-4000 level courses taken from the UCF Department of Physics.
- Physics majors are discouraged from taking courses as a transient student at a Florida College System institution, except in situations where one semester of a two semester sequence has already been taken at the Florida College System institution.
- All prerequisites of courses taught within the College of Sciences will be enforced.
- Courses designated in 2 (Common Program Prerequisites) are usually completed in the first 60 hours.
- AA transfer students are expected to have completed all of the following courses before enrolling as a Physics major.

These classes are prerequisites for advanced science classes and students entering without these classes will be unable to register for most of the advanced courses.

**CHM 2045C** Chemistry Fundamentals I 4 hrs
**CHM 2046** Chemistry Fundamentals II 3 hrs
**CHM 2046L** Chemistry Fundamentals Laboratory 1 hr
**MAC 2311C** Calculus with Analytic Geometry I 4 hrs
**MAC 2312** Calculus with Analytic Geometry II 4 hrs
**MAC 2313** Calculus with Analytic Geometry III 4 hrs
**PHY 2048C** General Physics Using Calculus I 4 hrs
**PHY 2049C** General Physics Using Calculus II 4 hrs

#### 1. UCF General Education Program (GEP) (38 hrs)
- Note: Certain courses must be selected in the GEP for this major which brings the GEP hours above 36.

#### A: Communication Foundations (9 hrs)
- Prefer SPC 1003C Fundamentals of Technical Presentations 3 hrs

**Take all of the following:** 6 hrs
- Required ENC 1101 Composition I and 3 hrs
- Required ENC 1102 Composition II 3 hrs

#### B: Cultural & Historical Foundations (9 hrs)
- Prefer **MAC 2311C** Calculus with Analytic Geometry I 4 hrs

#### C: Mathematical Foundations (7 hrs)
- Required **COP 3502C** Computer Science I 3 hrs

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

#### E: Science Foundations

<table>
<thead>
<tr>
<th>1. Physical Science; (4 hrs)</th>
<th>Required PHY 2048C General Physics Using Calculus I 4 hrs</th>
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<tbody>
<tr>
<td>2. Life sciences; (3 hrs)</td>
<td>Select from the E.2. GEP list. 3 hrs</td>
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<tr>
<td>2. Common Program Prerequisites (CPP) (20 hrs)</td>
<td>MAC 2311C Calculus with Analytic Geometry I GEP</td>
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<td></td>
<td>MAC 2312 Calculus with Analytic Geometry II GEP</td>
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<tr>
<td></td>
<td>MAC 2313 Calculus with Analytic Geometry III GEP</td>
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#### Select one of the following sequences of courses:
- CHM 2045C Chemistry Fundamentals I 4 hrs
- or
- CHM 2040 Chemistry Fundamentals IA and 3 hrs
- CHM 2041 Chemistry Fundamentals IB 3 hrs

#### Take all of the following:
- CHM 2046 Chemistry Fundamentals II 3 hrs
- CHM 2046L Chemistry Fundamentals Laboratory 1 hr
- PHY 2048C General Physics Using Calculus I GEP
- PHY 2049C General Physics Using Calculus II GEP

#### 3. Core Requirements: Basic Level (36 hrs)
- Required of all specializations.
- In addition to those courses specified in the Common Program Prerequisites, students also must complete the following.

**Core: Required, satisfies the CPP**
- CHM 2045C Chemistry Fundamentals I CPP
- or
- CHM 2040 Chemistry Fundamentals IA and CPP
- CHM 2041 Chemistry Fundamentals IB CPP

- and
- MAC 2311C Calculus with Analytic Geometry I and GEP/CPP
- MAC 2312 Calculus with Analytic Geometry II and CPP
- MAC 2313 Calculus with Analytic Geometry III and CPP
- PHY 2048C General Physics Using Calculus I and GEP/CPP
- PHY 2049C General Physics Using Calculus II CPP

**Core: Additional requirements**
- MAP 2302 Ordinary Differential Equations I 3 hrs
- PHY 3101 General Physics Using Calculus III 3 hrs
- PHZ 3113 Introduction to Theoretical Methods of Physics 3 hrs
- PHY 3220 Mechanics I 3 hrs
- PHY 3513 Thermal and Statistical Physics 3 hrs
- PHY 3323 Electricity and Magnetism I 3 hrs
- PHY 4324 Electricity and Magnetism II 3 hrs
- PHY 4604 Wave Mechanics I 3 hrs
- PHY 4605 Wave Mechanics II 3 hrs
- PHY 4912 Directed Independent Research (in area of specialization) 3 hrs

**Laboratory Requirement** 6 hrs
- PHY 3802L Intermediate Physics Laboratory 3 hrs

**And either**
- PHY 3752C Physics of Scientific Instruments or 3 hrs
- PHY 3722C Physics Laboratory-Electronics 3 hrs

#### 4. Core Requirements: Advanced Level
- Select one specialization

**4.1. General Physics Specialization** 18 hrs
- PHY 4803L Advanced Physics Laboratory 3 hrs

- **Restricted Electives:** 6 hrs
  - Select from upper division PHY, PHZ, or AST courses 6 hrs

- **Directed Electives:** 9 hrs
  - Select courses at a 3000 level or higher, approved by the Physics Department. Courses must be chosen in Physics, Mathematics, Chemistry, Computer Science, or Engineering.
### 4.2. Materials Physics Specialization
- **Select 1**: 3 hrs
  - PHY 4803L  Advanced Physics Laboratory or 3 hrs
  - EEE 5356C  Fabrication of Solid-State Devices 4 hrs
- **Select 3**: 9 hrs
  - EEE 3350  Semiconductor Devices I or 3 hrs
  - EGN 3365  Structure and Properties of Materials or 3 hrs
  - EMA 4413  Fundamentals of Electronic Materials or 3 hrs
  - CHM 3411L  Physical Chemistry Laboratory or 2 hrs
  - PHZ 5405  Condensed Matter Physics or 3 hrs
  - EEE 5352C  Semiconductor Material and Device Characterization 3 hrs

### 4.3. Optics and Lasers Specialization
- **Selective Electives**: 6 hrs
  - Select courses at a 3000 level or higher, approved by the Physics Department. Courses must be chosen in Physics, Mathematics, Chemistry, Computer Science, or Engineering.

### 4.4. Computational Physics Specialization
- **Select 2**: 6 hrs
  - EEL 4440  Optical Engineering or 3 hrs
  - PHY 4445  Lasers or 3 hrs
  - OSE 5203  Geometrical Optics or 3 hrs
  - OSE 5312  Light Matter Interaction or 3 hrs
  - OSE 5414  Fundamentals of Optoelectronic Devices 3 hrs

### 4.5. Astronomy Specialization
- **Select one**: 3 hrs
  - AST 4700  Experimental Methods in Astronomy or 3 hrs
  - AST 4762C  Astronomical Data Analysis or 3 hrs
  - AST 5765C  Advanced Astronomical Data Analysis 3 hrs

### 11. Departmental Exit Requirements
- Grades below “C” (2.0) in any required physics or mathematics courses are not acceptable; they must be repeated with a higher grade.
- Students must achieve a minimum cumulative GPA of 2.0 in all courses taken that could meet major requirements.
- All attempts that could meet requirements are included in the major GPA calculation. All attempts of courses listed for the major taken beyond the minimum required are included in the GPA calculation (e.g., additional restricted electives).
- Students will be required to take a nationally normed test in Physics during their last semester.
- Students will have an exit interview in their last semester with a representative of the Physics Undergraduate Committee.

### 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
- 120

### Honors in Major
- None

### Related Programs
- Mathematics - Engineering/Physics Track
- Mathematics - Applied Track
- Mathematics - Pure Track
- Electrical Engineering
- Mechanical Engineering

### Certificates
- None

### Related Minors
- Mathematics
- Physics
- Astronomy

### Advising Notes
- None

### Transfer Notes
- Lower division courses do not substitute for upper division courses.
- Courses transferred from private and out-of-state schools must be evaluated for equivalency credit. The student must provide all supporting information.

### Acceptable Substitutes for Transfer Courses
- The following substitutions for common program prerequisites are acceptable if taken prior to transferring to UCF:
  - CHM 2045C: may use CHM 1040 plus CHM 1041 or CHM 2040C plus CHM 2041C

### Plan of Study
- This is one of numerous possible plans of study. See program description for all requirements. Consult a departmental advisor for alternate, new or more appropriate selections.
- Prior to enrolling in Chemistry, take Chemistry Placement Test ~ http://knightsource.sdes.ucf.edu/placement
- Prior to enrolling in Math, take Math Placement Test ~ http://utc.sdes.ucf.edu
- Although all classes are listed during the academic year, you may be required to complete 9 hours of them during the Summer. Consult with an advisor to determine if you are exempt.
### Freshman Year - Fall
- **MAC 2311C**: Calculus with Analytic Geometry I  
  4 hrs  
- **CHM 2045C**: Chemistry Fundamentals I  
  4 hrs  
- **GEP**:  
  3 hrs  
- **GEP**:  
  3 hrs  

### Freshman Year - Spring
- **PHY 2048C**: General Physics Using Calculus I  
  4 hrs  
- **MAC 2312**: Calculus with Analytic Geometry II  
  4 hrs  
- **CHM 2046**: Chemistry Fundamentals II  
  3 hrs  
- **CHM 2046L**: Chemistry Fundamentals Laboratory  
  1 hr  
- **Note**: Lab may be taken later if seats are not available  
- **GEP**:  
  3 hrs  

### Sophomore Year - Fall
- **PHY 2049C**: General Physics Using Calculus II  
  4 hrs  
- **MAC 2313**: Calculus with Analytic Geometry III  
  4 hrs  
- **COP 3502C**: Computer Science I  
  3 hrs  
- **GEP**:  
  3 hrs  
- **GEP**:  
  3 hrs  

### Sophomore Year - Spring
- **PHY 3101**: General Physics Using Calculus III  
  3 hrs  
- **PHZ 3113**: Introduction to Theoretical Methods of Physics  
  3 hrs  
- **MAP 2302**: Ordinary Differential Equations I  
  3 hrs  
- **GEP**:  
  3 hrs  
- **GEP**:  
  3 hrs  

### Junior Year - Fall
- **PHY 3802L**: Intermediate Physics Laboratory  
  3 hrs  
- **PHY 3323**: Electricity and Magnetism I  
  3 hrs  
- **PHY 3513**: Thermal and Statistical Physics  
  3 hrs  
- **Core Course**:  
  3 hrs  
- **Restricted Elective**:  
  3 hrs  

### Junior Year - Spring
- **PHY 3220**: Mechanics I  
  3 hrs  
- **PHY 4324**: Electricity and Magnetism II  
  3 hrs  
- **Restricted Elective**:  
  3 hrs  
- **Restricted Elective**:  
  3 hrs  
- **GEP**:  
  3 hrs  

### Senior Year - Fall
- **PHY 4604**: Wave Mechanics I  
  3 hrs  
- **PHY 4912**: Independent Research  
  3 hrs  
- **Restricted Elective**:  
  3 hrs  
- **Restricted Elective**:  
  3 hrs  
- **Free Elective**:  
  3 hrs  

### Senior Year - Spring
- **PHY 4605**: Wave Mechanics II  
  3 hrs  
- **Restricted Elective**:  
  3 hrs  
- **GEP**:  
  3 hrs  
- **Free Elective**:  
  2 hrs  
- **Free Elective**:  
  3 hrs  
- **Physics Test-Nationally normed**

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**Program Academic Learning Compacts**
- Program Academic Learning Compacts (student learning outcomes) for undergraduate programs are located at: [http://www.oee.ucf.edu/alc/academic_learning_compacts.htm](http://www.oee.ucf.edu/alc/academic_learning_compacts.htm)

**Equipment Fees**
- Part-Time Student: $12.40 per term
- Full-Time Student: $24.80 per term