Physics (B.S.)

College of Sciences
Department of Physics,
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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 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 1603C	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)

C: Mathematical Foundations (7 hrs)

Required	MAC 2311C	Calculus with Analytic Geometry I	4 hrs
Required	COP 3502C	Computer Science I	3 hrs

D: Social Foundations (6 hrs)

E: Science Foundations

1. Physical Science; 4 hrs

Required	PHY 2048C	General Physics Using Calculus I	4 hrs

2. Life sciences; 3 hrs

Select from the E.2. GEP list. 3 hrs

2. Common Program Prerequisites (CPP) (20 hrs)

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

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	4 hrs

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. 9 hrs

4.2. Materials Physics Specialization **18 hrs**

- 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

- Directed 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. 6 hrs

4.3. Optics and Lasers Specialization **18 hrs**

PHY 4424	Optics	3 hrs

- 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

- 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. 9 hrs

4.4. Computational Physics Specialization **19 hrs**

PHZ 3151	Computer Methods in Physics	3 hrs
COP 3502C	Computer Science I	3 hrs
COP 3503C	Computer Science II	3 hrs
COT 4500	Numerical Calculus	3 hrs

- Directed 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. 6 hrs

4.5. Astronomy Specialization **18 hrs**

AST 2002	Astronomy	3 hrs

- 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

- and **6 hrs**

Select from upper division AST courses

- Directed 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. 6 hrs

5. Restricted Electives

- None

6. Capstone Requirements

- None

7. Foreign Language Requirements

Admissions

- Two years high school, or one year college language (or equivalent proficiency exam) prior to graduation.

Graduation

- None

8. Electives

- Select primarily from upper level courses after meeting with a departmental advisor. Courses may be outside the department.

9. Additional Requirements

- None

10. Required Minors

- None

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		14 hrs
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		15 hrs
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		17 hrs
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		15 hrs
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		15 hrs
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		15 hrs
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		15 hrs
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		14 hrs
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		

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: $12.40 per term
- Full-Time Student: $24.80 per term