UofC Degree Programs

Physics (B.A.)
College of Sciences
Department of Physics,
Physical Sciences, Room: 430
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Physics majors can select from two curricular options: BA in Physics, which gives students the flexibility to combine physics with another focus area in an interdisciplinary program, in particular Physics Education, Nanoscale Science and Technology, Biophysics, Information Technology/Data Science, Technical Writing; and BS in Physics, which is intended to prepare students for the study of physics or a closely related subject in graduate school. In consultation with their academic advisors, students can choose between Option I and II by the end of the sophomore year.

Admission Requirements
Internal students must meet the following requirements:

1. UCF General Education Program (GEP) (39 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

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 PHI 2010 Introduction to Philosophy 3 hrs
   - Prefer HUM 2210 Humanistic Tradition I 3 hrs
   - Prefer HUM 2230 Humanistic Tradition II 3 hrs

C: Mathematical Foundations (7 hrs)
   - Required MAC 2311C Calculus with Analytic Geometry I 4 hrs
   - Suggested STA 2023 Statistical Methods I 3 hrs

D: Social Foundations (6 hrs)
   - Prefer ECO 2023 Principles of Microeconomics 3 hrs
   - Prefer PSY 2012 General Psychology 3 hrs

E: Science Foundations (8 hrs)
   - Required PHY 2048C General Physics Using Calculus I 4 hrs
   - BSC 2010C Biology I 4 hrs

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

Select one of the following sequences of courses:
- CHM 2045C Chemistry Fundamentals I 4 hrs
- or
- CHM 2040 Chemistry Fundamentals IA and 6 hrs
- CHM 2041 Chemistry Fundamentals IB 3 hrs

Take all of the following: (6 hrs)
- CHM 2046L Chemistry Fundamentals Laboratory 1 hr
- PHY 2048C General Physics Using Calculus I 3 hrs
- PHY 2049C General Physics Using Calculus II 4 hrs

3. Core Requirements: Basic Level (24 hrs)
   - 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 4 hrs
- or
- CHM 2040 Chemistry Fundamentals IA and 6 hrs
- CHM 2041 Chemistry Fundamentals IB 3 hrs

-and
- 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
1 With Department permission this course can be substituted by PHY 2053C.
2 With Department permission this course can be substituted by PHY 2054C.

Core: Additional requirements
- PHY 3101 General Physics Using Calculus III 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 4504 Wave Mechanics I 3 hrs
- PHY 3113 Introduction to Theoretical Methods of Physics 3 hrs
- MAP 2302 Ordinary Differential Equations I 3 hrs

Laboratory Requirements
- PHY 3802L Intermediate Physics Laboratory 3 hrs
UCF Degree Programs

4. Core Requirements: Advanced Level
   ■ Select one specialization

4.1 Education
   ■ Students in this specialization must declare and be admitted to the Science Education Minor.
   
   Required: 19 hrs
   PHY 4012 Teaching Introductory Physics 3 hrs
   EDG 4410 Teaching Strategies and Classroom Management 3 hrs
   EDF 4467 Learning Theory and Assessment 3 hrs
   TSL 4080 Theory and Practice of Teaching ESOL 3 hrs
   Students in Schools
   SCE 4360 Science Instructional Analysis 4 hrs
   SCE 4361 Programs in Teaching Science 3 hrs

   Restricted electives: 9 hrs
   ■ Select 9 credits from upper division PHY, PHZ, or AST courses or approved education courses to fulfill a double major or a minor in Science Education - Physics.
   ■ The courses will be selected with adviser approval.

4.2 Nanoscale Science and Technology
   Required: 12 hrs
   PHZ 3462 Nanoscience I: The Science and Societal Impacts 3 hrs
   PHZ 3464 Nanoscience II: Technological Applications 3 hrs
   PHZ 3466 Nanoscience III: A Virtual Laboratory 3 hrs
   EMA 3691 Nanomaterials Process Engineering 3 hrs

   Restricted electives: 9 hrs
   ■ Selected from upper division physics, mathematics, chemistry, computer science or engineering courses.
   
   Directed electives: 15 hrs
   ■ The elective courses will be selected with adviser approval.
   PHY 3722C Physics Laboratory-Electronics 3 hrs
   PHY 3752C Physics of Scientific Instruments 3 hrs
   EMA 3014 Nanomaterials Characterization and Applications 3 hrs
   PHZ 3151 Computer Methods in Physics 3 hrs
   BSC 3424 Nanobiotechnology 3 hrs
   OSE 3490 Nanophotonics 3 hrs
   PHY 5933 Selected topics in biophysics of macromolecules 3 hrs
   PHI 4690 Ethics in Nanoscience and Nanotechnology 3 hrs
   PHZ 5425C Electron Solid Interactions 3 hrs
   PHZ 5445 Nanofabrication using Focused Ion Beam 3 hrs
   PHY 5704 Physics of Nanoelectronics Devices 3 hrs

4.3 Biophysics
   Required: 18 hrs
   BSC 2011C Biology II 4 hrs
   CHM 2210 Organic Chemistry I 3 hrs
   CHM 2211 Organic Chemistry II 3 hrs
   CHM 2211L Organic Laboratory Techniques I 2 hrs
   MCB 1310 Introduction to Biotechnology and Genetic Engineering 3 hrs
   BSC 3424 Nanobiotechnology 3 hrs

   Restricted electives: 9 hrs
   ■ Select 9 credits from upper division PHY, PHZ, or AST courses.
   ■ The elective courses will be selected with adviser approval.
   Directed electives: 9 hrs
   ■ Select 9 credits from upper division biology or chemistry
   ■ The elective courses will be selected with adviser approval.

Pre-meds are advised to take:
   PCB 3063 Genetics 3 hrs
   PCB 3063L Genetics Laboratory 1 hr
   PCB 3703C Human Physiology 4 hrs
   BCH 4053 Biochemistry I 3 hrs
   BCH 4054 Biochemistry II 3 hrs

4.4 Information Technology / Data Science
   Required: 18 hrs
   COP 3223C Introduction to Programming with C 3 hrs
   COP 3502C Computer Science I 3 hrs
   COP 3330 Object Oriented Programming 3 hrs
   COP 4710 Database Systems 3 hrs
   CIS 3362 Cryptography and Information Security 3 hrs

   Select 1:
   COT 3100C Introduction to Discrete Structures or MAD 2104 Foundations of Discrete Math 3 hrs

   Restricted electives: 9 hrs
   ■ Select 9 credits from upper division PHY, PHZ, or AST courses.
   ■ The elective courses will be selected with advisor approval.

   Directed electives: 6 hrs
   ■ Select 6 credits from the following, or other approved upper division computer science, mathematics or engineering:
   ■ The elective courses will be selected with advisor approval.
   CDA 3103C Computer Logic and Organization 3 hrs
   COP 3402 Systems Software 3 hrs
   COP 4516C Problem Solving Techniques and Team Dynamics 3 hrs

4.5 Technical Writing
   Required: 15 hrs
   ENC 3241 Writing for the Technical Professional 3 hrs
   ENC 4280 Technical Writing Style 3 hrs
   ENC 4293 Documentation and the Collaborative Process 3 hrs
   ENC 4290 Usability Testing for Technical Communication 3 hrs
   ENC 4218 The Visual in Technical Documentation 3 hrs

   Restricted electives: 9 hrs
   ■ Select 9 credits from upper division PHY, PHZ, or AST courses.
   ■ The elective courses will be selected with adviser approval.

   Directed electives: 6 hrs
   ■ Select 6 credits from upper division writing or communication courses:
   ■ The elective courses will be selected with advisor approval.
   ENC 3455 Writing about Science and Technology 3 hrs
   LIT 4433 Literature of Science and Technology 3 hrs
   ENC 3314 Writing and Rhetoric Foundations 3 hrs
   ENC 3250 Professional Writing 3 hrs
   ENC 3351 Writing for Publication 3 hrs
   ENC 4282 International Technical Communication 3 hrs

5. Restricted Electives
   ■ None

6. Capstone Requirements
   ■ None

7. Foreign Language Requirements
   Admissions
   ■ Met by graduation requirement

   Graduation
   ■ Proficiency equivalent to one year of college instruction in a foreign language taught by the Department of Modern Languages and Literatures or Judaic Studies. Standardized examinations for foreign languages may be used to meet the requirement.

8. Electives
   ■ None

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 year.
- 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
- None

### Certificates
- None

### Related Minors
- None

### 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/math
- 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

#### 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
- **GEP**: 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
- **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
- **Directed Elective**: 3 hrs
- **Free Elective**: 3 hrs

#### Junior Year - Spring
- **PHY 3220**: Mechanics I 3 hrs
- **Restricted Elective**: 3 hrs
- **Directed Elective**: 3 hrs
- **Directed Elective**: 3 hrs
- **GEP**: 3 hrs

#### Senior Year - Fall
- **PHY 4604**: Wave Mechanics I 3 hrs
- **Restricted Elective**: 3 hrs
- **Directed Elective**: 3 hrs
- **Directed Elective**: 3 hrs
- **Free Elective**: 1 hr

#### Senior Year - Spring
- **Restricted Elective**: 3 hrs
- **Directed Elective**: 3 hrs
- **GEP**: 3 hrs
- **Free Elective**: 3 hrs
- **Directed Elective**: 3 hrs
- **Directed Elective**: 3 hrs
- **Physics Test - Nationally Normed**: 15 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