

PHYSICS

The laws of physics are the starting point for most scientific research and engineering applications. Students majoring in physics obtain broad-based knowledge and expertise applying these laws, as well as hands-on experience building electronic equipment and performing experiments, allowing them to pursue a wide range of educational and employment opportunities after graduation.

About this Program

- **College:** Liberal Arts and Sciences (<http://catalog.ufl.edu/UGRD/colleges-schools/UGLAS/>)
- **Degrees:** Bachelor of Arts (http://catalog.ufl.edu/UGRD/colleges-schools/UGLAS/PS_BA_BS/PS_BA/) | Bachelor of Science (http://catalog.ufl.edu/UGRD/colleges-schools/UGLAS/PS_BA_BS/PS_BS/)
- **Specializations:** Medical Physics (BS) (http://catalog.ufl.edu/UGRD/colleges-schools/UGLAS/PS_BA_BS/PS_BS03/) | Nanoscience (BS) (http://catalog.ufl.edu/UGRD/colleges-schools/UGLAS/PS_BA_BS/PS_BS02/) | Optics (BS) (http://catalog.ufl.edu/UGRD/colleges-schools/UGLAS/PS_BA_BS/PS_BS01/)
- **Credits for Degree:** 120
- **Contact:** Email (advising@phys.ufl.edu?Subject=Physics%20Major)
- **More Info**

To graduate with this major, students must complete all university, college, and major requirements.

Department Information

The Department of Physics is making strides toward becoming one of the premier physics departments in the United States. With active groups in astrophysics, biological physics, condensed matter/materials physics, and elementary particle physics, undergraduate and graduate students participate in cutting-edge research that prepares them for successful careers in a wide variety of fields.

Website (<https://www.phys.ufl.edu/wp/>)

CONTACT

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Curriculum

- Combination Degrees
- Physics
- Physics Minor

A physics major provides a wide range of career options. Many students pursue further studies in physics, other scientific disciplines, and various branches of engineering and medicine. Professional physicists work in universities and government laboratories seeking answers to fundamental questions about nature, in industry leading the development of new technologies, and in the medical sector performing clinical service and research. The analytical, problem-solving, and communications skills acquired by physics majors also lead to career opportunities in business and finance.

The Department of Physics offers two undergraduate degree programs: The Bachelor of Science (B.S.) is intended for students who wish to

pursue graduate study in physics as well as for other students with a deep interest in the subject. The Bachelor of Arts (B.A.) is intended for students who seek the benefits of a physics degree but desire greater flexibility to follow interests in other fields.

Bachelor of Arts

The B.A. degree program is for students who want to major in physics but are not presently contemplating graduate studies in physics. It provides a good foundation in the fundamentals while offering increased flexibility in the major, through fewer required courses and more electives, and opportunity for parallel studies in another discipline and/or preprofessional studies.

Bachelor of Science

The B.S. degree program is intended for students planning to do graduate work in physics or related science and engineering disciplines. The B.S. requires a minimum of 41 credits in Physics plus 28 credits of related coursework. Minimum grades of C are required for coursework counted toward the major.

In addition to the Physics BA and BS degrees, there are three optional specializations for the Physics BS degree. Each specialization consists of a specific choice of the 4000 level Physics elective plus three courses in other departments.

Medical Physics

Medical physics applies the principles and experimental techniques of physics to medical problems. A common example is the use of different forms of radiation in medical diagnosis and treatment. This specialization will help prepare students for a graduate program in medical physics.

Nanoscience

Nanoscience is the study of extremely small things – only 10 to 100 atoms wide. It is an interdisciplinary field involving physics, chemistry, and many engineering disciplines. This specialization helps prepare students for careers in industry and graduate school in engineering as well as physics.

Optics

There are applications of optics and photonics in consumer equipment, telecommunications, medicine, construction, aviation, and many more fields. This broad field involves both physics and engineering. The optics specialization will prepare students for graduate programs in optics as well as employment in industry.

Coursework for the Major

Coursework for the major will depend upon the degree program chosen.

Courses for the B.S. or B.A. degree include four pairs of alternative courses:

Code	Title	Credits
PHY 2048	Physics with Calculus 1	3
or PHY 2060	Enriched Physics with Calculus 1	
PHY 2049	Physics with Calculus 2	3
or PHY 2061	Enriched Physics with Calculus 2	
PHY 3101	Introduction to Modern Physics	3
or PHY 3063	Enriched Modern Physics	
PHY 3221	Mechanics 1	3
or PHZ 3113	Introduction to Theoretical Physics	

In each case, the second course includes selected advanced topics not covered in the first. While both courses prepare students for upper-level physics classes, students should see a department advisor to determine which course meets their needs.

Required coursework for each degree can be found below in the Critical Tracking section. Transfer students must take a minimum of 15 credits of required physics courses at UF.

Course Details

Several courses meet the criteria for the general education physical sciences (P) requirement. Some mathematical training (indicated in parentheses) is desirable or required for many of these courses. Of the courses below, only PHY 2048/PHY 2049 count toward the major.

Code	Title	Credits
MET 1010	Introduction to Weather and Climate	3
PHY 1033C	Discovering Physics	3
PHY 2020	Introduction to Principles of Physics ¹	3
Select one general physics sequence: ²		6-8
PHY 2004 & PHY 2005	Applied Physics 1 and Applied Physics 2	
PHY 2048 & PHY 2049	Physics with Calculus 1 and Physics with Calculus 2	
PHY 2053 & PHY 2054	Physics 1 and Physics 2	

¹ MAC 1147 provides mathematical training desirable or required for this course.

² Students should check the prerequisites carefully before enrolling in a general physics course.

Placement

Students with Advanced Placement credit should consult the catalog's Academic Advising section for course equivalencies. Sequences for advanced students are available from any physics advisor or the department website.

Research

All undergraduate majors are encouraged to participate in research activities. Many physics majors participate in research during the academic year and/or through summer research programs. Advanced students may also be eligible to enroll in certain graduate courses, thereby accelerating their education. Physics majors are urged to confer with a department advisor as early as possible and especially as their educational goals evolve.

Academic Learning Compact

The laws of physics are the starting point for most scientific research and engineering applications. Students majoring in physics obtain broad-based knowledge and experience applying these laws as well as hands-on experience building electronic equipment and performing experiments. Many students go on to graduate study in physics, and a considerable number pursue advanced degrees in other science disciplines, all branches of engineering and medical school. Physics majors are employed in industry doing applied work and in academia seeking the answers to fundamental questions.

Before Graduating Students Must

- Pass the UF physics field test, which consists of five parts. One part is given in each of these required courses:

Code	Title	Credits
PHY 2060 or PHY 3221	Enriched Physics with Calculus 1 Mechanics 1	3
PHY 3323	Electromagnetism 1	3
PHY 3513	Thermal Physics 1	3
PHY 4604	Introductory Quantum Mechanics 1	3
PHY 4802L	Laboratory Physics 1	3

- Complete requirements for the baccalaureate degree, as determined by faculty.

Students in the Major Will Learn to Student Learning Outcomes (SLOs)

Content

1. Identify, define and describe the core fields of physics: classical mechanics, electricity and magnetism, thermal physics and quantum mechanics.
2. Identify, define and explain experimental physics and data analysis.

Critical Thinking

3. Formulate, solve problems and draw conclusions from data.

Communication

4. Effectively and clearly communicate ideas in speech and in writing in an accepted style.

Curriculum Map

I = Introduced; R = Reinforced; A = Assessed

Courses	SLO 1	SLO 2	SLO 3	SLO 4
PHY 2048 or PHY 2060	I		I	
PHY 2048L	I	I	I	I
PHY 2049 or PHY 2061	I		I	
PHY 2049L	I	I	I	I
PHY 3101 or PHY 3063	I, R		I, R	R
PHY 3221 or PHZ 3113	R, A		R, A	R
PHY 3323	R, A		R, A	R
PHY 3513	R, A		R, A	R
PHY 4604	R, A		R, A	R
PHY 4802L	R, A	R, A	R, A	R, A

Assessment Types

- Field test
- Report
- Presentation