

PHYSICS (BS)

The Physics major provides rigorous training in mathematics and physics with courses in statistical thermodynamics, electricity and magnetism and quantum mechanics as well as labs in optics, and electronics. Physics graduates pursue careers in industry, government labs, economics, and medicine. The program also prepares students for graduate education in physics, computer science, engineering, and law. Pre-health physics majors often receive high placement scores on the MCAT and other entrance exams.

Curriculum

The physics major includes courses in all the fundamental areas of physics at the beginning and intermediate level. Students have the opportunity to take special topics courses that provide an advanced background in specific areas of physics. The curriculum includes a strong background in mathematics, laboratory experience, and computer methods. A minimum grade of C- must be earned to satisfy a course requirement and a 2.0 minimum overall GPA is required for each major or minor. Final confirmation of degree requirements is subject to department, school, and university approval.

Code	Title	Hours
Required Courses		
<i>Physics I</i>		
PHYS 121 & PHYS 111L	College Physics I Lec/Dis and College Physics Laboratory I	4
<i>Physics II</i>		
PHYS 122 & PHYS 112L	College Physics II Lec/Dis and College Physics Lab II	4
<i>Required Physics Courses</i>		
PHYS 126F	Freshman Projects	1
PHYS 130	Introduction to Computational Physics	3
PHYS 235	Modern Physics	3
PHYS 235L	Modern Physics Laboratory	1
PHYS 301	Mathematical Methods in Physics	3
PHYS 303	Electronics I	3
PHYS 303L	Electronics Laboratory	1
PHYS 310	Optics	3
PHYS 310L	Optics Lab	1
PHYS 314	Theoretical Mechanics I	3
PHYS 328	Thermal Physical & Statistical Mechanics	3
PHYS 338	Advanced Physics Laboratory	2
PHYS 351	Electricity and Magnetism I	3
PHYS 361	Quantum Mechanics I	3
<i>Ancillary Math</i>		
MATH 161	Calculus I	4
MATH 162	Calculus II	4
MATH 263	Multivariable Calculus	4
MATH 264	Ordinary Differential Equations	3
Total Hours		56

Suggested Sequence of Courses

The below sequence of courses is meant to be used as a suggested path for completing coursework. An individual student's completion of

requirements depends on course offerings in a given term as well as the start term for a major or graduate study. Students should consult their advisor for assistance with course selection.

Course	Title	Hours
First Year		
Fall		
PHYS 121	College Physics I Lec/Dis	3
PHYS 111L	College Physics Laboratory I	1
MATH 161	Calculus I	4
UCWR 110	Writing Responsibly	3
Core		3
Hours		14
Spring		
PHYS 122	College Physics II Lec/Dis	3
PHYS 112L	College Physics Lab II	1
PHYS 126F	Freshman Projects	1
MATH 162	Calculus II	4
PHYS 130	Introduction to Computational Physics	3
Core		3
Hours		15
Second Year		
Fall		
PHYS 235	Modern Physics	3
PHYS 235L	Modern Physics Laboratory	1
MATH 263	Multivariable Calculus	4
MATH 264	Ordinary Differential Equations ¹	3
Core		3
General Elective		2
Hours		16
Spring		
PHYS 301	Mathematical Methods in Physics	3
PHYS 314	Theoretical Mechanics I	3
Core		3
Core		3
Core		3
Hours		15
Third Year		
Fall		
PHYS 351	Electricity and Magnetism I	3
PHYS 328	Thermal Physical & Statistical Mechanics	3
Core		3
Core		3
Core		3
Hours		15
Spring		
PHYS 361	Quantum Mechanics I	3
PHYS 310	Optics	3
PHYS 310L	Optics Lab	1
Core		3
Core		3
Core		3
Hours		16

Fourth Year**Fall**

PHYS 303	Electronics I ²	3
PHYS 303L	Electronics Laboratory ²	1
Core		3
General Electives		3
General Electives		3
General Electives		2
Hours		15

Spring

PHYS 338	Advanced Physics Laboratory	2
General Electives		3
General Electives		3
General Electives		3
General Electives		3
Hours		14
Total Hours		120

¹ Students can take MATH 264 in the spring semester of their second year, but it would be best taken before PHYS 301.

² Students can take PHYS 303 & PHYS 303L in the fall semester of their third or fourth year. Many choose to take it in the fourth year if the third year spring is already challenging.

College of Arts and Sciences Graduation Requirements

All Undergraduate students in the College of Arts and Sciences are required to take two Writing Intensive courses (6 credit hours) as well as complete a foreign language requirement at 102-level or higher (3 credit hours) or a language competency test. More information can be found here (<https://www.luc.edu/cas/college-requirements/>).

Additional Undergraduate Graduation Requirements

All Undergraduate students are required to complete the University Core, at least one Engaged Learning course, and UNIV 101. SCPS students are not required to take UNIV 101. Nursing students in the Accelerated BSN program are not required to take core or UNIV 101. You can find more information in the University Requirements (<https://catalog.luc.edu/undergraduate/university-requirements/>) area.

Learning Outcomes

- Demonstrate foundational knowledge in the physical sciences and the acquisition of new knowledge via the scientific method
- Understand and be able to employ laboratory techniques and computer skills used in physical science labs.
- Use mathematical techniques to model physical systems and extract both quantitative and qualitative descriptions of their behavior.
- Collect and analyze data to develop, refine, or falsify scientific theories.
- Learn effective and ethical methods for collaborating with others on scientific and technical projects.