

PHYSICS (BS) + ENGINEERING (BS)

If you are a student who recognizes the value of broadening your educational experience to include one of the fundamental sciences, as well as liberal arts and engineering, Loyola University Chicago's Dual-Degree Physics/Engineering Program may be just right for you.

Through the Physics (BS) + Engineering (BS) program, students can earn two baccalaureate degrees: a BS in Physics from Loyola and a bachelor's in Engineering from an affiliated engineering school. In this five-year program, students complete a three-year degree plan in physics at Loyola and then two years of concentrated engineering studies at the partner institution. This is an excellent route for students interested in careers in aerospace, civil, electrical, and mechanical engineering.

Related Programs

Major

- Physics (BS) (<https://catalog.luc.edu/undergraduate/arts-sciences/physics/physics-bs/>)
- Physics with Computer Science (BS) (<https://catalog.luc.edu/undergraduate/arts-sciences/physics/physics-computer-science-bs/>)

Minor

- Physics Minor (<https://catalog.luc.edu/undergraduate/arts-sciences/physics/physics-minor/>)

Curriculum

The physics major includes courses in all the fundamental areas of physics at the beginning and intermediate level. 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. The engineering partner schools have minimum GPA requirements that must be met for acceptance into their programs. Additional coursework may be required by the engineering partner school to satisfy pre-requisites for engineering courses. 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 with Calculus Lecture/ Discussion and College Physics Laboratory I	4
<i>Physics II</i>		
PHYS 122 & PHYS 112L	College Physics II with Calculus Lecture/ Discussion 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. Students should consult their advisor for assistance with course selection. Completion of the physics requirements in three years is not required, but all physics and core requirements must be completed at Loyola prior to enrollment at the partner engineering school.

Course	Title	Hours
Freshman		
Fall		
PHYS 121	College Physics I with Calculus Lecture/ Discussion	3
PHYS 111L	College Physics Laboratory I	1
MATH 161	Calculus I	4
UCWR 110	Writing Responsibly	3
CORE		3
CORE		3
Hours		17
Spring		
PHYS 122	College Physics II with Calculus Lecture/ Discussion	3
PHYS 112L	College Physics Lab II	1
PHYS 126F	Freshman Projects	1
PHYS 130	Introduction to Computational Physics ¹	3
MATH 162	Calculus II	4
CORE		3
CORE		3
Hours		18
Sophomore		
Fall		
PHYS 235	Modern Physics	3
PHYS 235L	Modern Physics Laboratory	1
MATH 263	Multivariable Calculus	4
MATH 264	Ordinary Differential Equations	3
ECON 202	Principles of Macroeconomics ²	3

CORE		3
Hours		17
Spring		
PHYS 301	Mathematical Methods in Physics	3
PHYS 314	Theoretical Mechanics I	3
CHEM 160	Chemical Structure and Properties ³	3
CHEM 161	Chemical Structure and Properties Laboratory ³	1
CORE		3
CORE		3
Hours		16
Junior		
Fall		
PHYS 303	Electronics I	3
PHYS 303L	Electronics Laboratory	1
PHYS 328	Thermal Physical & Statistical Mechanics	3
PHYS 351	Electricity and Magnetism I	3
CORE		3
CORE		3
CORE		3
Hours		19
Spring		
PHYS 310	Optics	3
PHYS 310L	Optics Lab	1
PHYS 338	Advanced Physics Laboratory	2
PHYS 361	Quantum Mechanics I	3
CORE		3
CORE		3
CORE		3
Hours		18
Total Hours		105

¹ PHYS 130 Introduction to Computational Physics should be substituted with COMP 170 Introduction to Object-Oriented Programming for students interested in electrical engineering or computer engineering programs.

² ECON 202 Principles of Macroeconomics is required for students planning to apply to Columbia Engineering Program.

³ At least one semester of chemistry is generally required by engineering partner schools.

their engineering degrees at other universities such as University of Illinois Urbana-Champaign, University of Illinois at Chicago, Northwestern University, University of Michigan, and Iowa State University to complete their engineering studies.

Using as starting point the outstanding education in the Jesuit tradition offered by Loyola, which emphasizes breadth and depth of training in the liberal arts, humanities, and social sciences, upon completion of this dual degree program students will:

- Gain foundational understanding of physics, a fundamental science that has broad application in existing and emerging technologies;
- Acquire the intermediate level of mathematical tools needed to effectively address physics and engineering problems;
- Possess an understanding of the fundamental engineering fields, and the ability to apply their combined Physics/Engineering knowledge to solve real world problems in the engineering field of their choosing (mechanical, chemical, biomedical, electrical, civil industrial, computer, systems, environmental, and financial–engineering);
- Gain an understanding and appreciation of interdisciplinary approach in the physical and engineering sciences.

Learning Outcomes

In this program, a student can earn two baccalaureate degrees: a Bachelor of Science in Physics from Loyola University Chicago and a Bachelor in Engineering from an affiliated engineering school. Typically, three years of study in the social sciences, humanities, mathematics and physical sciences at Loyola are required, followed by two years of concentrated engineering studies at the school of engineering.

Loyola University Chicago has formal affiliations with Washington University in St. Louis, Columbia University in New York City, and with Notre Dame University in South Bend, Indiana.

Students can also choose other schools that suit their interest to complete the engineering degree. Many of our students have completed