PHARMACEUTICAL SCIENCES, BS

Campus: Westchester

Pharmaceutical sciences is a dynamic and interdisciplinary field that aims to integrate fundamental principles of natural, physical and organic chemistry, biochemistry, and biology to understand how to synthesize de novo medicine and to its optimize delivery to human body and translate this integrated understanding into new and improved therapies against human disease. Pharmaceutical sciences is a liberal arts and science major, and thus should be clearly distinguished from Pharmacy in that the former prepares students to pursue postgraduate education if they wish to be a licensed practitioner. Pharmaceutical sciences can be broadly classified into the following main categories, with many specialized fields within each category, such as: *Drug Discovery and Design, Drug Delivery, and Drug Action (Pharmaceutics & Pharmacology.*) The BS in Pharmaceutical Sciences program (PHS) provides students with the background for further post-baccalaureate study as well as the ability to work as professionals in research and development laboratories in the fields of pharmaceutical science, which can involve routine or innovative work for drug testing and development. Pharmaceutical scientists can also work in production or quality control in a laboratory or production line, as well as assisting pharmacists, chemists, and engineers to put more efficient methods of production and testing into practice. In some cases, pharmaceutical scientists can work independently on more complex projects. The PHS degree can also provide students with the formal educational preparation to be successful in employment in sales and marketing sectors of the pharmaceutical industry, or to apply for medical or dental schools or health allied sciences degrees.

Requirement	Credits
University Core Requirements	44-55
Major Requirements	64-65
Open Electives	1-5
Total Credits	**120-124**

University Core Requirements (44-55 Credits)

See complete University Core (https://catalog.pace.edu/undergraduate/university-core-curriculum/) requirements.

Includes several of the major required Math, Biology and Physics courses listed in the Major Requirements.

Code	Title	Credits
Required Math and Science Courses		
The following University Core courses satisfy several Math and Science foundation requirements of the Pharmaceutical Sciences Major, BS:		
BIO 101	General Biology I	4
BIO 102	General Biology II	4
BIO 251	Principles of Human Anatomy	4
MAT 131	Calculus I	4
MAT 132	Calculus II	4
MAT 141	Introductory Statistics for the Life Sciences	4
PHY 111	General Physics I	4
PHY 112	General Physics II	4

Major Requirements (64-65 credits)

Code	Title	Credits
Required Major Courses		
CHE 111	General Chemistry I	4
CHE 112	General Chemistry II	4
CHE 223	Organic Chemistry I	4
CHE 224	Organic Chemistry II	4
CHE 300	Introduction to Physical Chemistry	4
CHB 232	Bioanalytical Chemistry and Instrumentation (or PLS 232)	0-4
CHE 326	Biochemistry	4
or BIO 327	Cellular Biochemistry	
PLS 200	Fundamentals of Pharmaceutical Sciences	3
PLS 300	Pharmaceutics	3
PLS 310	Pharmaceutical Manufacturing and Regulations	3
BIO 346	Introduction to Basic Pharmacology	3

BIO 334	General Physiology	4
BIO 335	Molecular and Cellular Biology	4
PLS 480	Research in Pharmaceutical Sciences	3
PLS 392	Pharmaceutical Sciences Seminar I	1
PLS 492	Pharmaceutical Sciences Seminar II	1

Code	Title	Credits
Major Electives		
BIO 264	Microbiology	4
BIO 359	Immunology	4
BIO 325	Neurobiology	3
BIO 231	Genetics	4
CHE 331	Instrumental Analysis	4
CHE 370	Advanced Biophysical Chemistry: Membrane Transport and Ionic Channels	3
BIO 232	Developmental Biology	4
CHE 221	Analytical Methods and Techniques	3
Total Credits		3-4

1 Take credit-bearing lecture and its 0-credit lab in the same semester.
2 Reduced credits (effective from Spring, 2025) shown.

Open Electives

Code	Title	Credits
UNV 101	First-Year Seminar: Introduction to University Community	1
Total Credits		1-5

1 Select 1-5 credits, including UNV 101 First-Year Seminar: Introduction to University Community and Major-required Biology, Math, and Physics courses not taken for University Core credit.
2 Take credit-bearing lecture an 0-credit lab in the same semester.
3 In-depth sequence.

In addition to the courses listed below, students are required to complete two courses with the Anti-Racism Education attribute attached. These courses may be taken during any semester of their education. See advisor for more information.

Course	Title	Credits
First Year		
Fall		
ENG 110	Composition	3
CHE 111	General Chemistry I	4
BIO 101	General Biology I	4
MAT 131	Calculus I	4
UNV 101	First-Year Seminar: Introduction to University Community	1
	Credits	**16**
Spring		
ENG 120	Critical Writing	4
CHE 112	General Chemistry II	4
BIO 102	General Biology II	4
MAT 132	Calculus II	4
	Credits	**16**
Second Year		
Fall		
CHE 223	Organic Chemistry I (Required Lab component carries zero credits)	4
BIO 251	Principles of Human Anatomy	4
BIO 231	Genetics	4

Second Language I		3
	Credits	**15**
Spring		
BIO 335	Molecular and Cellular Biology	4
CHE 224	Organic Chemistry II	4
MAT 141	Introductory Statistics for the Life Sciences	4
Second Language II		3
	Credits	**15**
Third Year		
Fall		
PHY 111	General Physics I	4
CHE 300	Introduction to Physical Chemistry	4
CHE 326 or BIO 327	Biochemistry or Cellular Biochemistry	4
ENG 201	Writing in the Disciplines	3
	Credits	**15**
Spring		
PHY 112	General Physics II	4
PLS 200	Fundamentals of Pharmaceutical Sciences	3
BIO 334	General Physiology	4
COM 200	Public Speaking	3
Take any one remaining Area of Knowledge course		3
	Credits	**17**
Fourth Year		
Fall		
CHB 232	Bioanalytical Chemistry and Instrumentation (or PLS 232)	0-4
PLS 300	Pharmaceutics	3
CIS 101	Introduction to Computing	3
PLS 392	Pharmaceutical Sciences Seminar I	1
Take any one remaining Area of Knowledge course		3
	Credits	**10-14**
Spring		
PLS 310	Pharmaceutical Manufacturing and Regulations	3
BIO 346	Introduction to Basic Pharmacology	3
PLS 480	Research in Pharmaceutical Sciences	3
PLS 492	Pharmaceutical Sciences Seminar II	1
Take any one remaining Area of Knowledge course		3
Take any one remaining Area of Knowledge course		3
	Credits	**16**
	Total Credits	**120-124**

1 Reduced credits (effective from Spring 2025) shown

2 Students must take one Civic Engagement (CE) course. Many AoK II-V courses also counts as CE.

3 Take the lecture and its corresponding lab in the same semester.