

PHARMACEUTICAL SCIENCES, BACHELOR OF SCIENCE (B.S.)

The Bachelor of Science in Pharmaceutical Sciences program within the VCU School of Pharmacy will equip students with the knowledge, technical and functional skills essential for the development of innovative pharmaceutical products and therapies that will help improve the quality of human life.

With a strong foundation in basic and applied sciences and hands-on training in teaching laboratories, students will be prepared to tackle real-world problems during on and off-campus experiential learning opportunities while pursuing their degrees. These opportunities include an externship and a yearlong capstone project where student teams, under the supervision of a faculty expert, will work to address open-ended problems in pharmaceutical sciences.

Graduates of the program will be prepared to seek entry-level positions in life sciences industry, research and development, service laboratories and government agencies or to pursue advanced graduate and professional studies. Students will be prepared to work in areas related to the development, formulation, characterization, manufacturing, quality control and assurance, marketing and sales, clinical research coordination, drug safety and pharmacovigilance, medical writing and communication, and regulatory affairs of pharmaceutical products and therapies.

Student learning outcomes

- Demonstrate professionalism and ethical conduct expected of pharmaceutical scientists.
- Explain the fundamental principles of pharmaceutical sciences as they relate to the discovery, development, manufacturing and approval of pharmaceutical products and therapies.
- Employ basic and advanced pharmaceutical sciences knowledge, skills and attitudes to design and test drug products and therapies.
- Apply critical thinking, team science, innovative mindset and advanced problem-solving skills to address problems in pharmaceutical sciences.
- Compare the strengths and limitations of different processes, methods and tools in the discovery, development, manufacturing and approval of drug products and therapies.
- Create solutions to "real world" problems in pharmaceutical sciences using basic and advanced pharmaceutical sciences knowledge, skills and appropriate attitudes.
- Demonstrate effective oral and written communication skills.

For more information, please visit the [B.S. in Pharmaceutical Sciences website](http://bulletin.vcu.edu/undergraduate/undergraduate-study/general-education-curriculum/).

Degree requirements for Pharmaceutical Sciences, Bachelor of Science (B.S.)

Course	Title	Hours
General education (http://bulletin.vcu.edu/undergraduate/undergraduate-study/general-education-curriculum/)		30
Major requirements		
• Major core requirements		
PSCI 101	Career Exploration in Pharmaceutical Sciences I	1

PSCI 102	Career Exploration in Pharmaceutical Sciences II	1
PSCI 201	Introduction to Pharmaceutical Sciences and Pharmaceutical Product Development I	1
PSCI 202	Introduction to Pharmaceutical Sciences and Pharmaceutical Product Development II	1
PSCI 320	Molecules to Medicine I	2
PSCI 330	Molecules to Medicine II	2
PSCI 370	Drug Dosage Form Development	2
PSCI 395	Experiential Rotation	2
PSCI 420	Molecules to Medicine III	2
PSCI 430	Principles of Drug Action	2
PSCI 450	Molecular and Cellular Therapy	2
PSCI 481	Capstone Experience in Pharmaceutical Sciences I	2
PSCI 482	Capstone Experience in Pharmaceutical Sciences II	2
PSCI 493	Seminar in Pharmaceutical Sciences I	1
PSCI 494	Seminar in Pharmaceutical Sciences II	1
PSCZ 355	Analytical Methods in Pharmaceutical Sciences	2
PSCZ 375	Drug Dosage Form Development Laboratory	1
PSCZ 425	Molecules to Medicine Laboratory	2
Ancillary requirements		
BIOL 151	Introduction to Biological Sciences I (satisfies general education BOK for natural science and AOI for scientific and logical reasoning)	3
BIOZ 151	Introduction to Biological Science Laboratory I	1
BIOL 152	Introduction to Biological Sciences II	3
BIOZ 152	Introduction to Biological Science Laboratory II	1
BIOL 205	Basic Human Anatomy	4
BIOL 300	Cellular and Molecular Biology	3
BIOL 303	Microbiology	3
BIOL 455	Immunology	3
CHEM 101	General Chemistry I (satisfies general education BOK for natural science and AOI for scientific and logical reasoning)	3
CHEZ 101	General Chemistry Laboratory I	1
CHEM 102 & CHEZ 102	General Chemistry II and General Chemistry Laboratory II	4
CHEM 301 & CHEZ 301	Organic Chemistry and Organic Chemistry Laboratory I	5
CHEM 302 & CHEZ 302	Organic Chemistry and Organic Chemistry Laboratory II	5
CHEM 403	Biochemistry I	3
ECON 203	Introduction to Economics (satisfies general education BOK for social/behavioral sciences and AOI for global perspectives)	3

MATH 151	Precalculus Mathematics (satisfies general education quantitative foundations)	4
MATH 200	Calculus with Analytic Geometry I	4
PHIS 206 & PHIZ 206	Human Physiology and Human Physiology Laboratory	4
PHYS 201	General Physics I (satisfies general education BOK for natural science and AOI for scientific and logical reasoning)	4
STAT 210	Basic Practice of Statistics	3
Open electives		
Select any course.		12
Total Hours		120

The minimum number of credit hours required for this degree is 120.

What follows is a sample plan that meets the prescribed requirements within a four-year course of study at VCU. Please contact your adviser before beginning course work toward a degree.

Freshman year

Fall semester		Hours
BIOL 151	Introduction to Biological Sciences I (satisfies general education BOK for natural science and AOI for scientific and logical reasoning)	3
BIOZ 151	Introduction to Biological Science Laboratory I	1
CHEM 101	General Chemistry I (satisfies general education BOK for natural sciences and AOI for scientific and logical reasoning)	3
CHEZ 101	General Chemistry Laboratory I	1
MATH 151	Precalculus Mathematics (satisfies general education quantitative foundations)	4
PSCI 101	Career Exploration in Pharmaceutical Sciences I	1
UNIV 111	Focused Inquiry I (satisfies general education UNIV foundations)	3
Play course video for Focused Inquiry I		
Term Hours:		16
Spring semester		
BIOL 152	Introduction to Biological Sciences II	3
BIOZ 152	Introduction to Biological Science Laboratory II	1
CHEM 102	General Chemistry II	3
CHEZ 102	General Chemistry Laboratory II	1
MATH 200	Calculus with Analytic Geometry I	4
PSCI 102	Career Exploration in Pharmaceutical Sciences II	1
UNIV 112	Focused Inquiry II (satisfies general education UNIV foundations)	3
Play course video for Focused Inquiry II		
Term Hours:		16

Sophomore year

Fall semester		
BIOL 205	Basic Human Anatomy	4
CHEM 301 & CHEZ 301	Organic Chemistry and Organic Chemistry Laboratory I	5
STAT 210	Basic Practice of Statistics	3
PSCI 201	Introduction to Pharmaceutical Sciences and Pharmaceutical Product Development I	1
UNIV 200	Advanced Focused Inquiry: Literacies, Research and Communication (satisfies general education UNIV foundations)	3
Term Hours:		16

Spring semester

CHEM 302 & CHEZ 302	Organic Chemistry and Organic Chemistry Laboratory II	5
ECON 203	Introduction to Economics (satisfies general education BOK for social/behavioral sciences and AOI for global perspectives)	3
PHIS 206 & PHIZ 206	Human Physiology and Human Physiology Laboratory	4
PSCI 202	Introduction to Pharmaceutical Sciences and Pharmaceutical Product Development II	1
Term Hours:		13

Junior year

Fall semester		
BIOL 300	Cellular and Molecular Biology	3
BIOL 303	Microbiology	3
CHEM 403	Biochemistry I	3
PSCI 320	Molecules to Medicine I	2
General education courses		6
Term Hours:		17

Spring semester

BIOL 455	Immunology	3
PHYS 201	General Physics I (satisfies general education BOK for natural science and AOI for scientific and logical reasoning)	4
PSCI 330	Molecules to Medicine II	2
PSCZ 355	Analytical Methods in Pharmaceutical Sciences	2
PSCI 370	Drug Dosage Form Development	2
PSCZ 375	Drug Dosage Form Development Laboratory	1
Term Hours:		14

Summer semester

PSCI 395	Experiential Rotation	2
Term Hours:		2

Senior year

Fall semester		
PSCI 420	Molecules to Medicine III	2
PSCI 430	Principles of Drug Action	2
PSCI 481	Capstone Experience in Pharmaceutical Sciences I	2

PSCI 493	Seminar in Pharmaceutical Sciences I	1
PSCZ 425	Molecules to Medicine Laboratory	2
Open electives		5
Term Hours:		14
Spring semester		
PSCI 450	Molecular and Cellular Therapy	2
PSCI 482	Capstone Experience in Pharmaceutical Sciences II	2
PSCI 494	Seminar in Pharmaceutical Sciences II	1
Open electives		7
Term Hours:		12
Total Hours:		120

The minimum number of credit hours required for this degree is 120.