

PHARMACEUTICAL SCIENCES, DOCTOR OF PHILOSOPHY (PH.D.) WITH A CONCENTRATION IN PHARMACEUTICS

Program goal

The School of Pharmacy offers the highest quality of graduate training in pharmaceutical sciences research and mentorship at the doctoral level.

Student learning outcomes

1. Knowledge of research in pharmaceutical sciences

The candidate should demonstrate a general knowledge of the elements of the pharmaceutical sciences and a detailed knowledge of his/her area of research, including an appropriate familiarity with the research literature, policies and procedures, and methodology pertaining to their field.

2. Design experiments in pharmaceutical sciences

The candidate should demonstrate an appropriate level of skill in the design of experimental protocols and the technical conduct of experimentation related to his/her research.

3. Demonstrate appropriate communication skills

The candidate should demonstrate that an appropriate level of oral, written and visual communication skill has been acquired.

4. Identify problems in pharmaceutical sciences

The candidate should demonstrate an appropriate level of skill in the identification of meaningful problems in the pharmaceutical sciences and the design of and implementation of appropriate problem-solving methods.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (<http://www.graduate.vcu.edu>) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the [academic regulations section for additional information on academic regulations for graduate students](http://bulletin.vcu.edu/academic-regs). (<http://bulletin.vcu.edu/academic-regs>)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for

continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the [academic regulations section for additional information on degree candidacy requirements](http://bulletin.vcu.edu/academic-regs/grad/candidacy). (<http://bulletin.vcu.edu/academic-regs/grad/candidacy>)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the [academic regulations section for additional information on graduation requirements](http://bulletin.vcu.edu/academic-regs/grad/graduation-info). (<http://bulletin.vcu.edu/academic-regs/grad/graduation-info>)

Other information

See the School of Pharmacy website for the process handbook (<https://pharmacy.vcu.edu/media/pharmacy/documents/GraduateHandbook.pdf>). Current graduate students (<https://pharmacy.vcu.edu/admissions/graduate/students>) may visit the school's website for additional resources, and prospective students (<https://pharmacy.vcu.edu/admissions/graduate>) may apply online.

Apply online at graduate.admissions.vcu.edu (<http://www.graduate.admissions.vcu.edu>).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	May 1 (priority consideration for financial aid Feb 1)	GRE, TOEFL (international applicants)
	Spring	Oct 1	

Special requirements

- Pharm.D. or bachelor's degree in a related area

In addition to the general admission requirements of the VCU Graduate School (<http://bulletin.vcu.edu/graduate/study/admission-graduate-study/admission-requirements>), applicants must have received a baccalaureate from an accredited institution in a related area demonstrating the ability to perform at the graduate level. Prerequisite and foundation course work may be required, depending upon the applicant's discipline.

Degree requirements

In addition to general VCU Graduate School graduation requirements (<http://bulletin.vcu.edu/academic-regs/grad/graduation-info>), Ph.D. students in pharmaceutical sciences must complete a minimum of 30 graduate credit hours beyond the master's degree of required (both school and department core) and elective hours. All Ph.D. students must pass the comprehensive exam in each department in order to advance to candidacy. The exam consists of a written and oral component and is administered by either the student advisory committee (oral and written) and/or department faculty (written), depending on which option the student chooses. All Ph.D. students must pass the dissertation review and defense in each department in order to graduate.

All School of Pharmacy graduate students must fulfill curricular requirements of the School of Pharmacy core curriculum and the core curriculum required by their respective options. Course work taken as part of a master's degree program may be waived; however, students must replace those courses with additional course work or directed research to meet the minimum 30 credit hour requirement for the Ph.D.

Curriculum requirements

Prerequisites

All students should have prerequisite knowledge in chemistry, mathematics and biology. The following departmental courses or their equivalents are required for admission into the Department of Pharmaceutics option. If a prospective student has not met any of the prerequisites, the course(s) may be included in the student's core course requirements upon recommendation by the prospective graduate adviser and approval by the respective course coordinator (see below).

Course	Title	Hours
CHEM 409 & CHEZ 409	Instrumental Analysis and Instrumental Analysis Laboratory ¹	5
PCEU 508	Pharmacokinetics	3
PCEU 509	Pharmaceutics and Biopharmaceutics II	3

¹

Undergraduate prerequisite course work may not count toward the minimum 30 graduate credit hours required for the degree and may not be included in the calculation of graduate statistics, i.e., GPA, 20 percent C or below rule, etc.

School of Pharmacy core curriculum

Course	Title	Hours
Select one of the following:		3
BIOS 543 or STAT 543	Graduate Research Methods I Statistical Methods I	
MEDC 541	Survey of Molecular Modeling Methods (1 credit repeated)	
MEDC 601	Advanced Medicinal Chemistry I (1 credit repeated)	
IBMS 600	Laboratory Safety (or equivalent)	1
OVPR 601	Scientific Integrity (or equivalent)	1
Select a minimum of one credit from the following:		1
PCEU/MEDC/ PHAR 614	Research Techniques (variable credit)	

MEDC 526	Research Techniques in Medicinal Chemistry (variable credit)	
Select a minimum of one credit from the following:		1
PCEU 690	Pharmaceutics Research Seminar (variable credit)	
MEDC 690	Departmental Research Seminar (variable credit)	
PHAR 690	Pharmacy Research Seminar (variable credit)	
PSCI 607 & PSCI 608	Introduction to Pharmaceutical Sciences From Bench to Shelf and Introduction to Pharmaceutical Sciences From Bench to Shelf	2
Total Hours		9

In addition to the pharmaceutical sciences core courses, students must fulfill course and other degree requirements in their respective concentrations as outlined below.

Concentration

Course	Title	Hours
BIOS 543 or STAT 543	Graduate Research Methods I Statistical Methods I	3
PCEU 612	Advanced Physical Pharmacy and Biopharmaceutics	3
PCEU 625	Pharmaceutical Analysis	2
PCEU 690	Pharmaceutics Research Seminar	1
Total Hours		9

Electives

Course	Title	Hours
Electives (see details below)		12

In addition to the core curriculum above, Ph.D. students will be encouraged but not required to take elective courses. A minimum 12 elective credit hours are recommended for the Ph.D. These courses will be selected based upon individual research program needs and will be chosen through mutual consultation with the student and major adviser.

Research

Students are required to complete a dissertation. The 30 credit-hour minimum directed research requirement may be waived for circumstances such as a prior M.S. degree. If waived, students must still complete minimum number of hours required for the degree.

Course	Title	Hours
Take a minimum of 30 credits in the following:		30
PCEU 697	Directed Research in Pharmaceutics (variable credit)	

The minimum total of graduate credit hours required for this degree is 60.

Graduate program director

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Program website: [pharmacy.vcu.edu \(http://www.pharmacy.vcu.edu\)](http://www.pharmacy.vcu.edu)