PHARMACEUTICAL SCIENCES,
DOCTOR OF PHILOSOPHY (Ph.D.)
WITH A CONCENTRATION IN
PHARMACOECONOMICS AND
HEALTH OUTCOMES

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-reg/)
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://www.vcu.edu/academic-reg/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 concentrations as outlined below.

**Curriculum requirements**

### School of Pharmacy core curriculum

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOS 543</td>
<td>Graduate Research Methods I</td>
<td>3</td>
</tr>
<tr>
<td>or STAT 543</td>
<td>Statistical Methods I</td>
<td></td>
</tr>
<tr>
<td>MEDC 541</td>
<td>Survey of Molecular Modeling Methods (1 credit repeated)</td>
<td></td>
</tr>
<tr>
<td>MEDC 601</td>
<td>Advanced Medicinal Chemistry I (1 credit repeated)</td>
<td></td>
</tr>
<tr>
<td>IBMS 600</td>
<td>Laboratory Safety (or equivalent)</td>
<td>1</td>
</tr>
<tr>
<td>OVPR 601</td>
<td>Scientific Integrity (or equivalent)</td>
<td>1</td>
</tr>
<tr>
<td>PCEU/MEDC/PHAR 614</td>
<td>Research Techniques (variable credit)</td>
<td>1</td>
</tr>
<tr>
<td>MDE 526</td>
<td>Research Techniques in Medicinal Chemistry (variable credit)</td>
<td></td>
</tr>
<tr>
<td>Select a minimum of one credit from the following:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCEU 690</td>
<td>Pharmaceutics Research Seminar (variable credit)</td>
<td></td>
</tr>
<tr>
<td>MEDC 690</td>
<td>Departmental Research Seminar (variable credit)</td>
<td></td>
</tr>
<tr>
<td>PHAR 690</td>
<td>Pharmacy Research Seminar (variable credit)</td>
<td></td>
</tr>
<tr>
<td>PSCI 607</td>
<td>Introduction to Pharmaceutical Sciences From Bench to Shelf</td>
<td>2</td>
</tr>
<tr>
<td>&amp; PSCI 608</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

### Concentration

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOS 544</td>
<td>Graduate Research Methods II (or equivalent)</td>
<td>3</td>
</tr>
<tr>
<td>or STAT 544</td>
<td>Statistical Methods II</td>
<td></td>
</tr>
<tr>
<td>PHAR 637</td>
<td>Introduction to Research Methods in Pharmaceutical Sciences</td>
<td>3</td>
</tr>
<tr>
<td>PHAR 638</td>
<td>Pharmaceutical Benefit Management</td>
<td>3</td>
</tr>
<tr>
<td>PHAR 671</td>
<td>Applied Pharmacoeconomics and Outcomes Research</td>
<td>3</td>
</tr>
<tr>
<td>Total Hours</td>
<td></td>
<td>12</td>
</tr>
</tbody>
</table>

### Electives

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electives (see details below)</td>
<td></td>
<td>12</td>
</tr>
</tbody>
</table>

In addition to the core curriculum above, Ph.D. students in pharmacoconomics and health outcomes will typically be requested to take elective courses that exceed 24 credit hours in an area of concentration. A minimum 12 elective credit hours are recommended for the Ph.D. These courses will be selected based upon the mutual consent of 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.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Take a minimum of 30 credits in the following course:</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>PHAR 697</td>
<td>Directed Research in Pharmacy (variable credit)</td>
<td></td>
</tr>
<tr>
<td>Total Hours</td>
<td></td>
<td>30</td>
</tr>
</tbody>
</table>

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

**Graduate program director**

Aron Lichtman, Ph.D.
Associate dean for research and graduate studies
Email: alichtma@vcu.edu
Phone: (804) 628-5233

**Additional contact**

Shakim Jackson
Education coordinator
Email: sjackson29@vcu.edu
Phone: (804) 628-4408

**Program website**: pharmacy.vcu.edu (http://www.pharmacy.vcu.edu/)