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

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)

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-reggs/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-reggs/grad/graduation-info)

Other information
School of Pharmacy policies and procedures for graduate students
pharmacy.vcu.edu/programs/pharmd/current/statements_and_policies
(http://www.pharmacy.vcu.edu/programs/pharmd/current/
statements_and_policies)
Website for current students:
pharmacy.vcu.edu/programs/graduate/current-students (http://
www.pharmacy.vcu.edu/programs/graduate/current-students)
Website for prospective students:
pharmacy.vcu.edu/programs/graduate/prospective-students (http://
www.pharmacy.vcu.edu/programs/graduate/prospective-students)

Apply online at graduate.admissions.vcu.edu (http://
www.pharmacy.vcu.edu/programs/graduate/current/
statements_and_policies)

Admission requirements

<table>
<thead>
<tr>
<th>Degree:</th>
<th>Semester(s) of entry:</th>
<th>Deadline dates:</th>
<th>Test requirements:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ph.D.</td>
<td>Fall</td>
<td>Jan 1</td>
<td>GRE, TOEFL (international applicants)</td>
</tr>
</tbody>
</table>

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.

Pharmaceutical Sciences, Doctor of Philosophy (Ph.D.) with a concentration in medicinal chemistry
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

School of Pharmacy core curriculum

Select one of the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</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>3</td>
</tr>
<tr>
<td>MEDC 541</td>
<td>Survey of Molecular Modeling Methods (1 credit repeated)</td>
<td>1-3</td>
</tr>
<tr>
<td>MEDC 601</td>
<td>Advanced Medicinal Chemistry I (1 credit repeated)</td>
<td>2</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>
</tbody>
</table>

Select a minimum of one credit from the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCEU/MEDC/PHAR 614</td>
<td>Research Techniques (variable credit)</td>
<td>1</td>
</tr>
<tr>
<td>MEDC 526</td>
<td>Research Techniques in Medicinal Chemistry (variable credit)</td>
<td>1</td>
</tr>
</tbody>
</table>

Select a minimum of one credit from the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCEU 690</td>
<td>Pharmaceutics Research Seminar (variable credit)</td>
<td>1</td>
</tr>
<tr>
<td>MEDC 690</td>
<td>Departmental Research Seminar (variable credit)</td>
<td>1</td>
</tr>
<tr>
<td>PHAR 690</td>
<td>Pharmacy Research Seminar (variable credit)</td>
<td>1</td>
</tr>
<tr>
<td>PSCI 607 &amp; PSCI 608</td>
<td>Introduction to Pharmaceutical Sciences From Bench to Shelf</td>
<td>2</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 Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 504</td>
<td>Advanced Organic Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>MEDC 526</td>
<td>Research Techniques in Medicinal Chemistry</td>
<td>1-4</td>
</tr>
<tr>
<td>MEDC 541 or CHEM 510</td>
<td>Survey of Molecular Modeling Methods</td>
<td>1-3</td>
</tr>
</tbody>
</table>

Electives

Select a minimum of 12 elective credit hours (recommended for the Ph.D.)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEDC 591</td>
<td>Special Topics in Medicinal Chemistry</td>
<td>1-3.5</td>
</tr>
<tr>
<td>MEDC 601</td>
<td>Advanced Medicinal Chemistry I</td>
<td>2</td>
</tr>
</tbody>
</table>

Total graduate credit hours required (minimum) 60

Graduate program director
Aron Lichtman, Ph.D.
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Email: alichtma@vcu.edu
Phone: (804) 628-5233

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