PHARMACEUTICAL SCIENCES: APPLIED DRUG DEVELOPMENT, M.S.

This is a named option in the Pharmaceutical Sciences M.S. (http://guide.wisc.edu/graduate/pharmacy-school-wide/pharmaceutical-sciences-ms/)

Are you a STEM major who is interested in a career in the biopharmaceutical industry? The Division of Pharmaceutical Sciences (https://pharmacy.wisc.edu/psd/) at the School of Pharmacy offers the Master of Science (MS) in Pharmaceutical Sciences degree named option "Applied Drug Development." The program provides a rigorous background in a range of disciplines that are critical to the success of the next generation of pharmaceutical scientists. The program's accelerated one-year applied training combines relevant aspects of drug development with hands-on laboratories culminating with a capstone internship.

**Science:** The pharmaceutical sciences are emphasized in courses that cover literature comprehension, biostatistics, pharmacokinetics and pharmacodynamics, pharmacology and instrumentation methods.

**Pharmaceutical Industry:** Industry-specific content is covered in courses that describe regulatory practice, the drug development process, working in a regulated environment (GxP) and pharmaceutical economics and management.

**Capstone Project:** This final, summer course provides the opportunity for the student to utilize all of the components of the program as they work in a relevant internship position.

This degree was crafted with extensive input from the biopharmaceutical industry. The faculty are a mix of experts from industry and academia. This program may be completed in one calendar year (September–August) or at a slower pace.

**ADMISSIONS**

Please consult the table below for key information about this degree program's admissions requirements. The program may have more detailed admissions requirements, which can be found below the table or on the program’s website. Graduate admissions is a two-step process between academic programs and the Graduate School. Applicants must meet the minimum requirements (https://grad.wisc.edu/apply/requirements/) of the Graduate School as well as the program(s).

Once you have researched the graduate program(s) you are interested in, apply online (https://grad.wisc.edu/apply/).

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall Deadline</td>
<td>July 31</td>
</tr>
<tr>
<td>Spring Deadline</td>
<td>October 31</td>
</tr>
<tr>
<td>Summer Deadline</td>
<td>The program does not admit for the summer term.</td>
</tr>
<tr>
<td>GRE (Graduate Record Examinations)</td>
<td>Required.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>English Proficiency Test</th>
<th>Every applicant whose native language is not English or whose undergraduate instruction was not in English must provide an English proficiency test score and meet the Graduate School minimum requirements (<a href="https://grad.wisc.edu/apply/requirements/#english-proficiency">https://grad.wisc.edu/apply/requirements/#english-proficiency</a>).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other Test(s) (e.g., GMAT, MCAT)</td>
<td>n/a</td>
</tr>
<tr>
<td>Letters of Recommendation Required</td>
<td>2</td>
</tr>
</tbody>
</table>

Accepted students commonly have strong scientific backgrounds and a desire to work in the biopharmaceutical industry. Students with undergraduate degrees in the physical or biological sciences, engineering, pharmacy, and related fields are encouraged to apply.

Please see admissions on the program website for the application deadline and required supplemental materials. Related links describe frequently-asked admissions questions, selection criteria, and typical pharmaceutical career paths for various undergraduate majors.

**FUNDING**

**GRADUATE SCHOOL RESOURCES**

Resources to help you afford graduate study might include assistantships, fellowships, traineeships, and financial aid. Further funding information (https://grad.wisc.edu/funding/) is available from the Graduate School. Be sure to check with your program for individual policies and restrictions related to funding.

**PROGRAM INFORMATION**

Students enrolled in the Master of Science in Biotechnology Program are not allowed to accept research assistantships, teaching assistantships, project assistantships or other University appointments which grant waivers of tuition and/or academic fees. Accepting an assistantship or tuition waiver while enrolled in the program may lead to removal of the student from the M.S. in Pharmaceutical Sciences-Applied Drug Development student cohort. Corporate tuition support is not included in these categories, nor is the waiver of tuition due to veteran status.

**REQUIREMENTS**

**MINIMUM GRADUATE SCHOOL REQUIREMENTS**

Review the Graduate School minimum academic progress and degree requirements (http://guide.wisc.edu/graduate/#policiesandrequirementstext), in addition to the program requirements listed below.

**NAMED OPTION REQUIREMENTS**

**MODE OF INSTRUCTION**

<table>
<thead>
<tr>
<th>Face to Face</th>
<th>Evening/Weekend</th>
<th>Online</th>
<th>Hybrid</th>
<th>Accelerated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>
### Mode of Instruction Definitions

**Evening/Weekend:** These programs are offered in an evening and/or weekend format to accommodate working schedules. Enjoy the advantages of on-campus courses and personal connections, while keeping your day job. For more information about the meeting schedule of a specific program, contact the program.

**Online:** These programs are offered primarily online. Many available online programs can be completed almost entirely online with all online programs offering at least 50 percent or more of the program work online. Some online programs have an on-campus component that is often designed to accommodate working schedules.

Take advantage of the convenience of online learning while participating in a rich, interactive learning environment. For more information about the online nature of a specific program, contact the program.

**Hybrid:** These programs have innovative curricula that combine on-campus and online formats. Most hybrid programs are completed on-campus with a partial or completely online semester. For more information about the hybrid schedule of a specific program, contact the program.

**Accelerated:** These on-campus programs are offered in an accelerated format that allows you to complete your program in a condensed time-frame. Enjoy the advantages of on-campus courses with minimal disruption to your career. For more information about the accelerated nature of a specific program, contact the program.

### CURRICULAR REQUIREMENTS

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Credit Requirement</td>
<td>32 credits</td>
</tr>
<tr>
<td>Minimum Residence Credit Requirement</td>
<td>16 credits</td>
</tr>
<tr>
<td>Minimum Graduate Coursework Requirement</td>
<td>Half of degree coursework (16 credits out of 31 total credits) must be completed graduate-level coursework; courses with the Graduate Level Coursework attribute are identified and searchable in the university’s Course Guide (<a href="https://registrar.wisc.edu/course-guide/">https://registrar.wisc.edu/course-guide/</a>).</td>
</tr>
</tbody>
</table>

**Overall**

| Graduation GPA Requirement | 3.00 GPA required. |
| Other Grade Requirements | Candidates will be dropped from the program if they receive more than 7 credits of grades at the BC level or lower. This applies to formal courses and research credits. |
| Assessments and Examinations | The program expects the M.S. candidate to complete a capstone project under guidance of an approved mentor. |
| Language Requirements | No language requirements. |

### REQUIRED COURSES

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHM SCI 750</td>
<td>The Drug Development Process</td>
<td>3</td>
</tr>
<tr>
<td>PHM SCI 751</td>
<td>Introduction to Regulatory Practice</td>
<td>3</td>
</tr>
<tr>
<td>PHM SCI 759</td>
<td>Current Trends in Drug Discovery and Development</td>
<td>1</td>
</tr>
<tr>
<td>PHM SCI 752</td>
<td>GxP (Good Practice): Working in a Regulated Environment</td>
<td>3</td>
</tr>
<tr>
<td>BM I/STAT 541</td>
<td>Introduction to Biostatistics</td>
<td>3</td>
</tr>
<tr>
<td>PHM SCI/ M&amp;ENVTOX/ MEDICINE/ ONCOLOGY/ PHMCOL-M/ POP HLTH 625 or PHM SCI 768</td>
<td>Toxicology I</td>
<td>3</td>
</tr>
<tr>
<td>PHMCOL-M 781</td>
<td>Molecular and Cellular Principles in Pharmacology</td>
<td>4</td>
</tr>
<tr>
<td>PHM SCI 755</td>
<td>Laboratory and Instrumentation Methods</td>
<td>3</td>
</tr>
<tr>
<td>PHM SCI 753</td>
<td>Pharmaceutical Economics and Project Management</td>
<td>3</td>
</tr>
<tr>
<td>PHM SCI 760</td>
<td>Capstone for Applied Drug Development</td>
<td>4</td>
</tr>
<tr>
<td>PHARMACY 800</td>
<td>Research Ethics: Scientific Integrity and the Responsible Conduct of Research</td>
<td>2</td>
</tr>
</tbody>
</table>

| Total Credits | 32 |

### POLICIES

#### GRADUATE SCHOOL POLICIES

The Graduate School’s Academic Policies and Procedures (https://grad.wisc.edu/acadpolicy/) provide essential information regarding general university policies. Program authority to set degree policies beyond the minimum required by the Graduate School lies with the degree program faculty. Policies set by the academic degree program can be found below.

#### NAMED OPTION-SPECIFIC POLICIES

### PRIOR COURSEWORK

Graduate Work from Other Institutions

No graduate work from other institutions is accepted.

**UW—Madison Undergraduate**

With program approval, students are allowed to count no more than 7 credits of UW—Madison courses numbered 500 or above (earned as a UW—Madison undergraduate) toward the M.S. degree. Coursework should be presented to the SoP graduate dean in the first semester of enrollment for consideration. Coursework earned five or more years prior to admission to a master’s degree is not allowed to satisfy requirements.

**UW—Madison University Special**

With program approval, students are allowed to count no more than 9 credits of coursework numbered 500 or above taken as a UW—Madison special student. coursework should be presented to the SoP graduate dean in the first semester of enrollment for consideration. Coursework earned five or more years prior to admission to a master’s degree is not allowed to satisfy requirements.

### PROBATION

The Graduate School regularly reviews the record of any student who earned grades of BC, C, D, F, or Incomplete in a graduate course (300 or above), or grade of U in research credits. This review could result in academic probation with a hold on future enrollment or in being suspended from the Graduate School.
1. Good standing (progressing according to standards).
2. Probation (not progressing according to standards but permitted to enroll; specific plan with dates and deadlines in place in regard to removal of probationary status).
3. Unsatisfactory progress (not progressing according to standards; not permitted to enroll, dismissal, leave of absence or change of advisor).

ADVISOR / COMMITTEE
Students will be assigned an advisor within the program; students will have an approved mentor for their capstone project.

CREDITS PER TERM ALLOWED
15 credits

TIME CONSTRAINTS
Master's degree students who have been absent for five or more consecutive years lose all credits that they have earned before their absence; that coursework may not count toward Graduate School credit requirements.

GRIEVANCES AND APPEALS
These resources may be helpful in addressing your concerns:

- Bias or Hate Reporting (https://doso.students.wisc.edu/bias-or-hate-reporting/)
- Graduate Assistantship Policies and Procedures (https://hr.wisc.edu/policies/gapp/#grievance-procedure)
- Hostile and Intimidating Behavior Policies and Procedures (https://hr.wisc.edu/hib/)
  - Office of the Provost for Faculty and Staff Affairs (https://facstaff.provost.wisc.edu/)
- Dean of Students Office (https://doso.students.wisc.edu/) (for all students to seek grievance assistance and support)
- Employee Assistance (http://www.eao.wisc.edu/) (for personal counseling and workplace consultation around communication and conflict involving graduate assistants and other employees, post-doctoral students, faculty and staff)
- Employee Disability Resource Office (https://employeedisabilities.wisc.edu/) (for qualified employees or applicants with disabilities to have equal employment opportunities)
- Graduate School (https://grad.wisc.edu/) (for informal advice at any level of review and for official appeals of program/departmental or school/college grievance decisions)
- Office of Compliance (https://compliance.wisc.edu/) (for class harassment and discrimination, including sexual harassment and sexual violence)
- Office of Student Conduct and Community Standards (https://conduct.students.wisc.edu/) (for conflicts involving students)
- Ombuds Office for Faculty and Staff (http://www.ombuds.wisc.edu/) (for employed graduate students and post-docs, as well as faculty and staff)
- Title IX (https://compliance.wisc.edu/titleix/) (for concerns about discrimination)

Students should contact the department chair or program director with questions about grievances.

OTHER
n/a

PROFESSIONAL DEVELOPMENT

GRADUATE SCHOOL RESOURCES
Take advantage of the Graduate School's professional development resources (https://grad.wisc.edu/pd/) to build skills, thrive academically, and launch your career.

PEOPLE
A list of Pharmaceutical Sciences graduate faculty and their respective areas of research specialization is available from the division website (https://pharmacy.wisc.edu/psd/faculty-research/) and related links. The Pharmaceutical Sciences Graduate Program has educated generations of scientists for challenging positions in industry, academia, and government.

The Pharmaceutical Sciences Graduate Program has educated generations of scientists for challenging positions in industry, academia, and government. The faculty for the MS Applied Drug Development consists of experts in industry and academia affiliated with the School of Pharmacy. Some of our faculty are listed below:

- Sharon Ayd, PhD, MBA
  CEO & Founder
  Ayd Biopharma Consulting Group
- Terrance Ocheltree, PhD, RPh
  PharmTree Consultants, LLC
- Pamela Swatkowski
  President, PLS Consulting, LLC
  Regulatory & Compliance IVD & Medical Device Industry
- Wm. Trey Putnam, PhD, RAC
  Professor, Department of Pharmaceutical Sciences
  Professor, Department of Pharmacy Practice
  Director, Clinical Pharmacology and Experimental Therapeutics Center
  School of Pharmacy, Texas Tech University Health Sciences Center
- Tom Guilliams, PhD
  VP of Science and Regulatory Affairs
  Ortho Molecular Products
  Adjunct Assistant Professor
- Daniel Gonzalez Kapp, PharmD, BCPS
  Clinical Pharmacist, Drug Policy Program
  UW Health
- Glen Kwon, PhD
  Professor, School of Pharmacy
  University of Wisconsin-Madison
- Ross O. Meyers, PhD
  Director of Cell Manufacturing
  Program for Advanced Cell Therapy (PACT)
  University of Wisconsin-Madison
  School of Medicine and Public Health/Carbone Cancer Center/Hematology
- Robert D. White, PhD
  Assistant Professor
Department of Chemistry
Virginia State University

Abigail Davis, MS
Senior QA Manager – Quality Systems
Promega

John Hill, PhD
Director, BioProcess Technology Group
BDO

Gina Patel, MPharm, PhD
President and Chief Executive Officer
Patel Kwan Consultancy LLC

For more information please contact Eric Buxton (eric.buxton@wisc.edu).