

PHARMACEUTICS GRADUATE PROGRAM HANDBOOK

*University of Minnesota
College of Pharmacy*

Department of Pharmaceutics

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MISSION STATEMENT

The mission of the Department of Pharmaceutics is to improve human health through the creation and dissemination of knowledge. The research and teaching programs of the faculty focus on elucidation of the kinetics and mechanisms underlying drug absorption, disposition, and action, the analysis, development, and manufacture of new dosage forms and drug delivery systems and the optimization of drug therapy.

The PhD and MS Graduate Programs in Pharmaceutics prepares students for research in the development and testing of drug products, including investigating interactions of drugs with complex biological systems and the physical and chemical formulation of drugs for delivery. Specializations include:

- pharmacokinetics
- pharmacodynamics
- drug metabolism
- crystal engineering
- polymer-based drug delivery
- biophysical chemistry
- molecular biopharmaceutics

GRADUATE SCHOOL WEBSITE

grad.umn.edu/students

It is the responsibility of graduate students to familiarize themselves with the current graduate school website. This website is updated regularly and graduate school regulations, as set forth on the website, are binding and should be kept in mind.

SELECTION OF MAJOR ADVISOR

Graduate students are admitted based on their outstanding credentials, stated research interests, and the faculty's ability to support the students educationally and financially. Upon admission, each student is assigned a temporary faculty advisor by the Director of Graduate Studies (DGS). By March 1 of the first year, students should select a permanent faculty advisor, who must be willing to mentor and provide financial support for the student's research and/or stipend.

Prior to March 1, students may conduct laboratory rotations or “shadow” a senior graduate student in a particular research group. This provides an excellent means for evaluating the mutual suitability and compatibility of the student and the potential permanent faculty advisor. Arrangements for laboratory rotations should be made with faculty advisors within the first semester. A change in the permanent faculty advisor requires approval by the Pharmaceutics graduate program faculty.

CURRICULUM

The curriculum consists of required courses, required background, and other courses, and must be approved by the faculty for each student. Core curriculum may be revised from time to time with the approval of the Pharmaceutics graduate program faculty. The PhD and MS curriculum requirements are outlined in *Appendix I* and *Appendix II* of this handbook, respectively.

A. Grading Policy

The Pharmaceutics graduate program offers its 81XX-level and 82XX-level courses on an S/N basis only, and its 84XX-level courses on an A/F (with pluses and minuses) basis only. A minimum acceptable grade of B-minus is required for all courses listed on the Graduate Degree Plan. Coursework offered on both the A-F and S/N grade basis must be taken A-F.

The minimum grade point average (GPA) requirement for courses being applied toward program is 3.0 (on a 4.0 scale) for PhD students and 2.8 (on a 4.0 scale) for MS students.

For more information, please see the graduate school policies: policy.umn.edu/education/doctoralperformance and policy.umn.edu/education/mastersperformance.

B. PHM 8100 Pharmaceuticals Seminar

NOTE: ALL graduate students are required to attend ALL seminars organized by the graduate program. This includes seminars given by those students taking their final oral exams and any guest seminars.

All graduate students in Pharmaceutics, both MS and PhD candidates, are required to attend and participate in the departmental seminar program. The program will encompass seminars by faculty members, graduate students, and guest lecturers.

The Pharmaceutics faculty is responsible for organizing the seminar program and scheduling of presentations. The semester in which a given graduate student will present during the year will be announced before the start of the semester. For a given semester, each graduate student presenting in that semester must inform the faculty seminar coordinator of the seminar title two weeks prior to the beginning of the semester. Generally, PhD students in the second and third years of residence will present in the fall semesters.

1. PhD Program Requirements

Candidates for the doctoral degree should register for one credit of PHM 8100 in the semester in which they present a seminar. Candidates (both part-time and full-time) for the PhD degree will register using the S/N grade basis until they have completed three credits of PHM 8100. After the three-credit requirement has been met, students will continue to present one seminar per year of residency, but will not need to register for the course. PhD students in their final year of study are exempt from presenting a regular seminar if their thesis defense is officially scheduled in the fall or spring of that year. If not, they must present in the spring. A public seminar is also required in association with the defense of the thesis at the doctoral level.

Students scheduled to present a seminar in PHM 8100 are required to send their seminar abstract to the department via email no later than noon on the Friday before their scheduled seminar. In addition, students are responsible for securing help from their faculty advisor with finalizing the abstract. The abstract should be approximately 250 words using standard scientific guidelines to summarize the content of the presentation (background, data, discussion, future work, and conclusions, as appropriate). References should be cited on a separate page. Students do not need to send an abstract to the department before their scheduled dissertation seminar.

Students registered in the PhD program will present seminars of three types:

a. First- and Second-Year Seminars

Two seminars will be presented on topics selected by the graduate student in consultation with their advisor. First-year students are encouraged to select a topic that is distinct from research areas that are currently being investigated by program faculty.

b. Research Seminar

A research seminar, concerning the student's thesis project, will be presented in the third year of residence. This seminar should describe in depth the background, present status, and future plan for the research. The graduate student is expected to work closely with his/her research advisor in preparing this seminar.

c. Dissertation Seminar

Finally, a student will formally present his/her thesis research before taking the final examination for the PhD degree.

2. MS Program Requirements

Students enrolled in the MS program will present one seminar in their second year, but registration for PHM 8100 is not required.

C. Modules

During the first year of both the PhD and MS programs, students will be required to take a series of 82XX-level courses, commonly referred to as the “modules”. The modules provide foundational materials in pharmaceuticals and an equivalent educational foundation among students with varied undergraduate degrees. Pharmaceuticals modules are taken on an S/N basis. Receiving a pass in each module is required for both the PhD and MS degrees. A module may be repeated once, if needed.

D. Readings / Research Seminar

Doctoral degree candidates are required to take either PHM 8110 Readings in Pharmaceuticals, PHM 8120 Readings in CNS Drug Delivery, or PHM 8150 Pharmacokinetics Research Seminar. The course format will be decided by the instructor(s) offering the course that semester. The S/N grading system will be used in these courses. A maximum of 2 credits can be included in the PhD graduate degree plan, but students may register for as many as they wish. There is no credit requirement for MS degree candidates.

E. Other Relevant Courses

onestop.umn.edu/academics/special-registration-categories-graduate-and-professional-students

PHM 8295: Research Problems

PHM 8333: Advanced Master's Status (full-time equivalency for master's students), 1 credit*

PHM 8444: Advanced Doctoral Status (full-time equivalency for doctoral students), 1 credit**

PHM 8666: Option for graduate students who must be registered for a specific number of credits (usually to be in compliance with requirements of the University and/or external agencies such as employment as a graduate assistant, loan deferment, etc.) and for whom neither coursework registration nor other special registration categories are an option.

PHM 8777: Thesis Credits: Master's

PHM 8888: Thesis Credits: Doctoral

PHM 8990: Curricular Practical Training (CPT) (cannot be used towards degree credit requirements)

GRAD 999: Graduate School Active Status (non-graded, zero-credit mechanism to fulfill the graduate school's registration requirement for maintaining active status)

*Students must file an Application for Advanced Master's Status form with the Graduate Student Services and Progress Office (GSSP) by a specific deadline (August 15 for the following fall term, December 15 for the following spring term, and May 15 for the following summer term) before they will be able to register for the 1 credit full-time equivalency course (onestop.umn.edu/forms).

**Students must file an Application for Advanced Doctoral Status form with the department before they will be able to register for the 1 credit full-time equivalency course (onestop.umn.edu/forms).

F. Transfer of Credit from Outside the University

policy.umn.edu/education/gradcreditdegree

Graduate students who wish to transfer credits from outside the University of Minnesota for inclusion in their Graduate Degree Plan must submit appropriate course information for evaluation. Such information should include, where possible, the description, notes and syllabus, textbooks, and transcripts. The program faculty will determine if the courses satisfy the requirements of the student's Graduate Degree Plan. The number of credits that may be transferred is limited by graduate school policy.

PROGRAM EXAMINATIONS / REQUIREMENTS FOR DOCTORAL CANDIDATES

policy.umn.edu/education/doctoralperformance
onestop.umn.edu/academics/graduate-student-services-and-progress

A. Preliminary Written Exam Requirement

All doctoral students must pass the Preliminary Written Examination (PWE). This examination covers all work completed in the major field and may include any work fundamental to the field of pharmaceuticals. The examination will require knowledge in the areas of physical pharmacy, pharmacokinetics and pharmacodynamics, cell and molecular biology, and drug delivery/biopharmaceutics. The examination will also address higher order thinking/problem-solving skills and will require the ability to analyze and interpret data, process information, plan experiments, and critically examine scientific literature.

The examination will comprise a research proposal. The topic for the proposal must be approved by the student's faculty advisor, who may choose to have the proposal based on the student's thesis research or based on an independent line of research developed by the student. The internal members of the student's thesis committee will evaluate the proposal and will provide a written recommendation to the graduate program faculty with an overall assessment of a) pass, b) pass with reservations, or c) fail. In the event that a student receives an assessment of "fail", the student will be excluded from candidacy for the doctoral degree.

B. Preliminary Oral Exam

The Preliminary Oral Examination (POE) covers the major field, the minor field or supporting program, and any work fundamental thereto including possible plans for thesis research. Immediately before the POE, the committee chair stipulates the objectives of the examination and, in consultation with other members of the examining committee, determines how the examination is to be conducted.

Students are expected to complete their POE by the end of their third year of registration.

C. Final Oral Examination

onestop.umn.edu/academics/doctoral-oral-exam-scheduling

Doctoral candidates must schedule the preliminary and final oral examination (final defense) with Graduate Student Services and Progress (GSSP) online as soon as the dates are set, but no later than one week prior to the examinations. GSSP verifies that all examination requirements have been completed before releasing a doctoral oral exam form. At least one week prior to the exam, students will receive an email from GSSP with information regarding outstanding oral exam requirements, how to fulfill the requirements, and/or the status of the form. Students can use the link above to schedule examinations.

PROGRAM EXAMINATIONS / REQUIREMENTS FOR MASTER'S PLAN A CANDIDATES

policy.umn.edu/education/mastersperformance
onestop.umn.edu/academics/graduate-student-services-and-progress

A. Thesis Defense

MS students must present a public seminar based on their thesis research followed by a defense. In addition to the contents of the thesis, the final defense may cover all work completed in the major field and may include any work fundamental to this field.

PROGRAM REQUIREMENTS, STANDARDS, AND CRITERIA AND PROCESS FOR CONTINUATION IN, AND TERMINATION FROM, THE GRADUATE PROGRAM

grad.umn.edu/about/policiesgovernance

A. Program Requirements and Standards for the Doctoral Degree

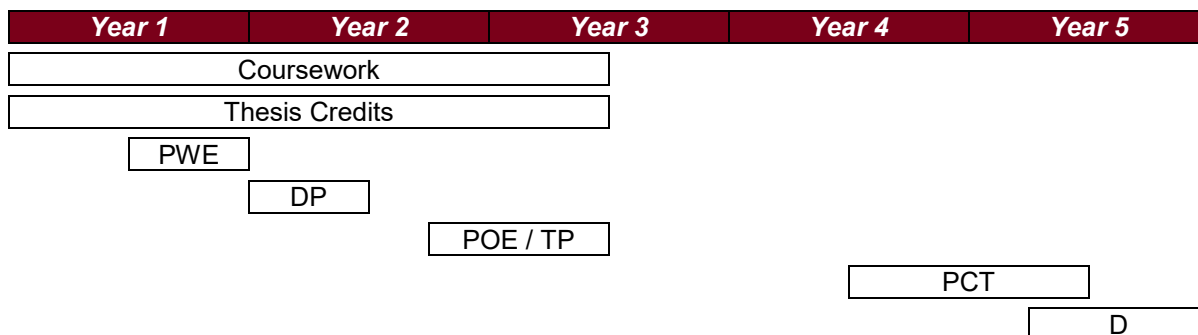
1. Program Requirements

Program requirements for the completion of a doctoral degree in Pharmaceutics are listed below. The student's performance and timeliness in completing these requirements shall collectively constitute the standard by which the student's progress in the program shall be judged.

- a. Coursework
- b. Preliminary Written Exam (PWE)
- c. Preliminary Thesis Research
- d. Degree Plan (DP)
- e. Preliminary Oral Exam (POE)
- f. Thesis Research
- g. Thesis Proposal (TP)
- h. Preparation and Completion of Thesis (PCT)
- i. Thesis Defense (D)

2. Standards

The quality in completing these requirements shall be judged by course directors, faculty advisor, program committees, and/or the program faculty. The timeliness of completion shall be judged with reference to the chart given below:



B. Program Requirements and Standards for the Master's Degree Plan A

1. Program Requirements

Program requirements for the completion of a Master's degree in Pharmaceutics are listed below. The student's performance and timeliness in completing these requirements shall collectively constitute the standard by which the student's progress in the program shall be judged.

- a. Coursework
- b. Thesis Research
- c. Degree Plan (DP)
- d. Preparation and Completion of Thesis
- e. Thesis Defense (D)

2. Standards

The quality in completing these requirements shall be judged by course directors, faculty advisor, program committees, and/or the program faculty. The timeliness of completion shall be judged with reference to the chart given below:

Year 1	Year 2
Coursework	
Thesis Credits	
DP	
	D

C. Annual Review of Progress

Each student shall receive an annual written review of his/her progress. Each student shall submit an annual review report to their permanent faculty advisor and the DGS. The student will then arrange a meeting with their faculty advisor to discuss the report. Faculty advisors must provide their students with a written review of the annual review report and indicate whether the student is making adequate progress no more than 30 days after the student has submitted their report. The student annual review reports and faculty reviews will be kept on file by the DGS.

D. Graduate Degree Plan (GDP) / Graduate Planning & Audit System (GPAS)

1. For students admitted before Fall 2017

Graduate students must submit their GDP and have it approved before scheduling their preliminary oral exam. Students need to work with their faculty advisor to finalize their degree plan prior to submission.

A copy of the form can be downloaded at onestop.umn.edu/academics/degree-completion-steps. After consulting with their faculty advisor, students may submit their completed forms to the Graduate Program Coordinator (GPC). The GPC will arrange for the department faculty to vote to approve the degree plan and, if approved, collect the necessary signatures and send it to the graduate school office for processing.

2. For students admitted Fall 2017 and later

Graduate students must submit their GPAS and have it approved before scheduling their preliminary oral exam. Students need to work with their faculty advisor to finalize their GPAS degree plan prior to submission.

Instructions for accessing GPAS through MyU can be found at onestop.umn.edu/academics/gpas. After consulting with their faculty advisor, the student will need to notify the Graduate Program Coordinator (GPC) that they would like to submit their GPAS for department faculty approval. The GPC will arrange for the department faculty to vote to approve their GPAS. If approved, the GPC will notify the student and provide them instructions on how to submit their GPAS through MyU.

E. Criteria and Process for Termination from the Program

policy.umn.edu/education/doctoralperformance
policy.umn.edu/education/mastersperformance

Criteria for judging the performance in meeting individual requirements are given in the university's policy library website (links listed above) and this handbook. Failure to meet satisfactory performance standards with regard to quality or timeliness outlined in these cited documents can result in disciplinary action, including termination from the program. Decisions shall be rendered by the Pharmaceutics program faculty based on written documentation of performance, oral discussions, and/or transcripts. Students shall be afforded every reasonable opportunity to present arguments supporting a favorable disposition of their status in the graduate program. This can include written statements and/or oral presentations to all or individual faculty.

F. Channels for Arbitration, Appeals, and Grievances

sos.umn.edu

Students have access to arbitration or grievance proceedings through a number of channels. The actual process depends on whether the alleged activity pertains to academic, employment, or discriminatory activity. Additional information may be obtained from the DGS or the Student Conflict Resolution Center website (link listed above).

G. Part-Time Students

PhD students who are full-time employees outside the University of Minnesota and are generally taking fewer than five credits per semester (part-time enrollment) must complete their program of coursework within a 6-year window. The 6-year period must fall within the first seven years after entry into the graduate school.

MS students who are full-time employees outside the University of Minnesota and are generally taking fewer than five credits per semester (part-time enrollment) must complete their program of coursework within a 5-year window.

POLICY CONCERNING THESIS RESEARCH

Thesis research leading to MS and PhD degrees in Pharmaceutics must meet, and be governed by, the following criteria and conditions. This policy applies equally to research conducted both within and outside the laboratories of the College of Pharmacy.

1. All data generated by the research shall be freely publishable in the scientific literature without deletion or other censorship.
2. The laboratories (during normal working hours), equipment, instrumentation, data books, and other relevant areas and/or items shall be accessible to the faculty member(s) supervising the research.
3. Final decisions concerning editorial aspects of scientific publications arising from the work shall rest solely with the authors of the publications. Comments and suggestions will be sought from the scientific staff of any private sponsoring or collaborating institution, corporation, or agency.
4. Only those persons directly supervising the scientific aspects of the research and/or performing the associated laboratory work shall be authors of publications resulting from the research.
5. Employment-related work by the student, following successful completion of the preliminary examinations, and during the period of thesis research, shall not exceed 20 hours per week.
6. Any research of a proprietary nature related to the thesis research, and conducted in conjunction with it, shall be the subject of a formal written contractual agreement, and time spent on this proprietary research shall be counted toward the 20 hours of employment related research.
7. Upon completion of requirement for the degree, the original copies of the laboratory notebooks and other data are required to be left with the Pharmaceutics faculty advisor.

PROGRAM TRANSFERS

Any students considering a program transfer should consult their faculty advisor first.

MS students wishing to change their status to PhD must formally apply to the PhD program by the application deadline. For more information on application requirements, please see: pharmacy.umn.edu/departments/pharmaceutics/graduate-program/application-and-admissions. MS students admitted to the PhD program are expected to successfully defend their MS thesis.

Current PhD students who wish to transfer to the MS Plan A program must complete and submit a Change of Status form and submit it to the University of Minnesota Graduate School office. No fee is required. For more information, please visit grad.umn.edu/admissions/cos.

UNIVERSITY FUNDS AND THE PURCHASE OF SUPPLIES, EQUIPMENT, AND ANIMALS

All orders for supplies, equipment, or animals must be first cleared with the student's faculty advisor who will then designate the correct budget and authorize the purchase either orally or in writing. All requisitions asking for departmental funds must be signed by the department head or designated alternate.

RESPONSIBILITIES

policy.umn.edu/education/doctoralperformance-appd

Please review the policy on "Mutual Roles and Responsibilities for Faculty and Graduate Students: Guidelines" using the link above. The policy outlines the principles on what students should expect from their programs and what programs should expect from their students.

STANDARDS OF ETHICAL CONDUCT

Integrity is the foundation upon which the structure of the scientific enterprise is maintained. Science can fulfill its mission of advancement of knowledge and service to society only if scientists conduct themselves ethically and with mutual respect. Thus, the singular dependence of science on the trustworthiness of its practitioners necessitates that no act of dishonesty be considered minor. In an academic institution, it is the responsibility of the faculty to serve as role models by exhibiting and enforcing the highest standards of ethical conduct. Although instances of dishonesty and unethical behavior are rare, it is important that students be aware that such acts will be considered grounds for dismissal from the program.

Since the act of plagiarism is a particularly egregious affront to scientific integrity, it warrants special attention. Plagiarism is defined as the stealing and passing off as one's own the ideas or words of another. Plagiarism may occur in seminar abstracts, research proposals, term papers, theses, and similar documents. It includes not only the copying of another's writing, word for word, without the use of quotation marks and without giving an appropriate citation, but also the theft of another's ideas by paraphrasing their words without citing a reference. Plagiarism is as serious an act of dishonesty as falsifying experimental data or cheating on an exam. The faculty will recommend the dismissal of any student found guilty of plagiarism or other ethical misconduct.

The misuse of computers also represents a potential issue in this age of the Internet and information technology. The computers and computer systems of the department, college, and university are provided to support the research and scholarship of the faculty, staff, and students. Unauthorized usage of computers, computer systems, software, etc. will not be tolerated. In particular, the posting or accessing of illicit or offensive material on department, college, or university computers will be considered grounds for dismissal.

SECURITY

It is the responsibility of the graduate student not only to take proper care of the laboratory equipment and instrumentation, but also to assist in protecting these items from accidental damage and theft. In particular, graduate students working evenings or weekends should be careful to see before they leave that:

1. All gas, water, and electrical equipment (except continuously operating) are shut off. If overnight equipment is to be in operation, the department office should be notified so that the janitorial personnel are aware of the danger.
2. Office and laboratory doors are closed and locked. Propping open doors at any time is strictly prohibited.

Failure to observe these precautions may necessitate cancellation of the privilege of use of the department's facilities outside of regular hours.

LAB SAFETY DRESS CODE

Graduate students must follow lab safety dress code guidelines:

1. Long pants or skirts that extend to the ankle.
2. Shoes that have closed toes and heels (shoes can be made of any material, but permeable material is discouraged). The top of the foot needs to be covered by the shoe or socks.

3. Short or sleeveless shirts are allowed; however, be mindful of the amount of exposed skin on the arms and chest in relation to the level of hazard in your work area.
4. Loose items, such as jewelry, scarves, long hair, neck ties, etc., must be secured or removed.
5. Goggles or safety glasses, lab coats, and/or gloves may be required based on the level of hazard in the lab area.

If you are unsure of any of the above requirements, please speak with your faculty advisor, your principal investigator (PI), the Pharmaceutics department's safety officer (Dr. Timothy Wiedmann, wiedm001@umn.edu, 612-624-5457), or the Department of Environment Health and Safety (DEHS) representative for the Pharmaceutics department (Jodi Ogilvie, jogilvie@umn.edu, 612-301-1214).

Violations are reported as follows:

1. First violation, individual is informed.
2. Second violation, individual's supervisor/PI is informed.
3. Third violation, department safety officer is informed.
4. Fourth violation, DEHS representative is informed.

EMAIL COMMUNICATION

The University of Minnesota student email account is the university's and department's official method of communication. This is to ensure compliance with the strict security requirements of federal Health Insurance Portability and Accountability Act (HIPAA) laws and regulations. Students are responsible for all communications sent to their student email account.

VACATION

Graduate students who are receiving stipends should make vacation arrangements with their respective research advisors. No provision for vacations is inherent in the various grants, but institutional policy allows some time off, with the details in the hands of the research advisor.

DISABILITY ACCOMODATIONS

diversity.umn.edu/disability

The University of Minnesota is committed to providing equitable access to learning opportunities for all students. Disability Services (DS) is the campus office that collaborates with students who have disabilities to provide and/or arrange reasonable accommodations.

If you have, or think you may have, a disability (e.g., mental health, attentional, learning, chronic health, sensory, or physical), please contact DS to arrange a confidential discussion regarding equitable access and reasonable accommodations.

If you are registered with DS and have a current letter requesting reasonable accommodations, we encourage you to contact your instructor early in the semester to review how the accommodations will be applied in the course.

Additional information is available on the DS website (link listed above).

Disability Services
McNamara Alumni Center
200 Oak Street SE, Suite 180
Minneapolis, MN 55455
612-626-1333

EQUITY, DIVERSITY, EQUAL EMPLOYMENT OPPORTUNITY, AND AFFIRMATIVE ACTION

regents.umn.edu/sites/default/files/policies/Equity_Diversity_EO_AA.pdf

Please review the university policy on “Equity, Diversity, Equal Employment Opportunity, and Affirmative Action” using the link above. The policy outlines the principles that guide the University of Minnesota’s commitment to equity, diversity, equal opportunity, and affirmative action.

MENTAL HEALTH

mentalhealth.umn.edu

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating, and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student’s ability to participate in daily activities. University of Minnesota services are available to assist you with addressing these and other concerns you may be experiencing. You can learn more about the broad range of confidential mental health services available on campus via the Student Mental Health website at the link above. Student information is kept confidential.

SEXUAL HARASSMENT, SEXUAL ASSAULT, STALKING, AND RELATIONSHIP VIOLENCE POLICY

regents.umn.edu/sites/regents.umn.edu/files/policies/Sexual_Harassment_Sexual_Assault_Stalking_Relationship_Violence.pdf

Please review the university policy on “Sexual Harassment, Sexual Assault, Stalking, and Relationship Violence” using the link above. This policy governs the University of Minnesota’s commitment to preventing and addressing sexual harassment, sexual assault, stalking, and relationship violence and related retaliation (“prohibited conduct”).

UNIVERSITY OF MINNESOTA TITLE IX STATEMENT

eoaa.umn.edu/resources

As required by Title IX, the University does not discriminate on the basis of sex in any of its education programs or activities, including in admissions and employment. Inquiries about the application of Title IX can be directed to the Title IX Coordinator or to the U.S. Department of Education, Office of Civil Rights. The Title IX Coordinator for the University’s Twin Cities campus may be contacted at:

Tina Marisam
Title IX Coordinator, Twin Cities
Equal Opportunity and Affirmative Action (EOAA)
274 McNamara Alumni Center
200 Oak Street SE
Minneapolis, MN 55455
marisam@umn.edu or eoaa@umn.edu
612-626-9357 or 612-624-9547

Please see the University’s policy (policy.umn.edu/hr/sexharassassault) for information about 1) how to report or file a formal complaint of sexual harassment, gender-based harassment, sexual assault, stalking or relationship violence; and 2) the University’s procedures for responding to reports and formal complaints.

OPPORTUNITIES FOR STUDENT INVOLVEMENT

There are many opportunities for students to develop professionally through active involvement in departmental committees and student organizations, such as:

1. **Pharmaceutics Graduate Student Representatives**

The Pharmaceutics Graduate Student Representatives facilitate social and creative activities with the goal of accomplishing a fulfilling graduate student experience and building a sense of community among the members of the Department of Pharmaceutics. Each academic year, two Pharmaceutics graduate students are elected by their peers.

2. **The American Association of Pharmaceutical Scientists (AAPS) Student Chapter**

The University of Minnesota's AAPS Student Chapter enables students to increase their awareness of career opportunities in the pharmaceutical sciences, gain access to education opportunities where they will learn various aspects of drug development, take advantage of opportunities for professional advancement and leadership development, enhance their knowledge of the latest advances and discoveries in the pharmaceutical sciences, and participate in AAPS outreach activities at the local, regional, and national levels. Please contact Andrew Zhou, Chapter President, at zhoux760@umn.edu for more information about the AAPS Student Chapter.

3. **Council of Graduate Students (COGS)**

COGS is the student organization that represents, advocates for, informs, facilitates communications among, and supports graduate students. All students in good standing are eligible to serve as a COGS representative. More information about COGS can be found at cogs.umn.edu.

4. **Safety Committee**

Graduate student representatives work with departmental safety officers to implement safety policies and regulations.

5. **Research Advisory Committee**

The committee serves in an advisory capacity to the College of Pharmacy Associate Dean for Research and Graduate Education. Responsibilities include discussing challenges to ongoing research programs and suggesting solutions; prioritizing the replacement and maintenance of shared equipment; discussing research compliance issues; coordinating approaches to enhance research collaborations, particularly intercollegiate; and planning the annual research retreat.

6. **Committee on Equity, Diversity, and Inclusion**

The committee discusses issues of equity, diversity, and inclusion which impact students, faculty, and staff in the College of Pharmacy.

ATTENDANCE OF THE HOODING CEREMONY

The Hooding Ceremony for College of Pharmacy graduate students is held each spring, usually in early May. Participation is not required. You are eligible for the hooding ceremony even if you have not completed all the degree requirements, and may attend the ceremony if you are certain that you will defend your thesis (final oral examination) before the next scheduled ceremony.

The office of the College of Pharmacy Associate Dean for Graduate Education will announce the date for the ceremony and solicit names of participants from each program. If you plan to attend, you must inform your advisor, DGS, and Graduate Program Coordinator (GPC).

REQUIREMENTS FOR GRADUATION

In addition to those requirements for graduation imposed by the graduate school, the Pharmaceutics graduate program requires the following:

1. All books or other materials checked out must be returned to the appropriate library.
2. All University keys must be returned.
3. All equipment and unused supplies must be checked in or returned, after consultation with the faculty advisor, to the appropriate storage area.
4. The research bench and study desk must be cleared, cleaned, and made ready for use by other personnel.
5. The official **Exit Form** (available from the department office) indicating that these items have been addressed must be completed and signed by the appropriate parties.

Satisfactory completion of these requirements must be demonstrated to the DGS.

DISCLAIMER

This handbook is subject to change with Pharmaceutics faculty approval.

Appendix I Curriculum for PhD

The following requirements are intended as a base of fundamental coursework and are not to be interpreted as satisfying the major. Additional courses should be selected in consultation with the major advisor and must be approved by the Graduate School. The Graduate Education Catalog is accessible at catalogs.umn.edu/grad/index.html. The total program of coursework will consist of major, other coursework, and/or minor. A minimum 24 credits is required by the Graduate School (in addition to 24 Thesis Credits).

MAJOR - Required Courses

- Pharmaceutics Modules
 - First Year Fall
 - PHM 8210 Pharmacokinetics Module (1 credit)
 - PHM 8220 Physical Pharmacy Module I (1 credit)
 - First Year Spring
 - PHM 8230 Physical Pharmacy Module II (1 credit)
 - PHM 8240 Biopharmaceutics Module (1 credit)
- PHM 8100 Pharmaceutics Seminar (3 credits)
 - Register for 1 credit in the semester in which presenting a seminar
- A total of 2 credits from the following:
 - PHM 8110 Readings in Pharmaceutics (1 credit)
 - PHM 8120 Readings in CNS Drug Delivery (1 credit)
 - PHM 8150 Pharmacokinetics Research Seminar (1 credit)
- Two Pharmaceutics PHM 84XX-level graduate courses

MAJOR - required background and available course that satisfies requirement

- Pharmacology Background
 - PHCL 5110 Introduction to Pharmacology (3 credits), or
 - PHAR 6726 Principles of Pharmacology (2.3 credits), or
 - PHAR 6762 Medicinal Chemistry and Neuropharmacology (2.8 credits), or
 - NSC 5461 Cell and Molecular Neuroscience (4 credits)
- Mathematics Background
 - MATH 4512 Differential Equations with Applications (3 credits)
- Statistics Background
 - PUBH 6450 Biostatistics I (4 credits), or
 - STAT 5021 Statistical Analysis (4 credits), or
 - STAT 5101 Theory of Statistics I (4 credits) and STAT 5102 Theory of Statistics II (4 credits), or
 - STAT 5302 Applied Regression Analysis (4 credits), STAT 5303 Designing Experiments, and STAT 5401 Applied Multivariate Methods (3 credits)

Note: Equivalent coursework and/or previous background experience may be considered in lieu of some or all of the courses in the required background section. This determination will be made by the program faculty.

MINOR AND OTHER COURSE WORK OUTSIDE MAJOR

- The Pharmaceutics PhD program requires a minimum of 8 credits of courses outside the major (non-PHAR- and non-PHM-designated coursework), which are selected in consultation with the major advisor. Courses taken to satisfy the required background can also be used to satisfy the 8 credit requirement provided they do not have a PHAR or PHM designator.
- Students who choose to complete a minor must complete at least 12 credits, in consultation with the minor field director of graduate studies (these minor credits can also be counted towards the 8 credits outside the major requirement).

A 4XXX-level course must be taught by faculty with an appointment in the Graduate School in order to contribute to the required credit count on the Graduate Degree Plan, and no more than 9 credits of 4XXX-level courses may be listed on the Graduate Degree Plan.

Appendix II

Curriculum for MS Plan A

The following requirements are intended as a base of fundamental coursework and are not to be interpreted as satisfying the major. Additional courses should be selected in consultation with the major advisor and must be approved by the Graduate School. The Graduate Education Catalog is accessible at catalogs.umn.edu/grad/index.html. The total program of coursework will consist of major, other coursework and/or minor. A minimum 20 credits is required by the Graduate School (in addition to 10 Thesis Credits).

MAJOR - Required Courses

- Pharmaceutics Modules
 - First Year Fall
 - PHM 8210 Pharmacokinetics Module (1 credit)
 - PHM 8220 Physical Pharmacy Module I (1 credit)
 - First Year Spring
 - PHM 8230 Physical Pharmacy Module II (1 credit)
 - PHM 8240 Biopharmaceutics Module (1 credit)
- One Pharmaceutics PHM 84XX-level graduate course (4 credits)
 - PHM 8421 Advanced Pharmacokinetics
 - PHM 8431 Drug Delivery/Controlled Release
 - PHM 8441 Solid-State Drugs
 - PHM 8481 Advanced Neuropharmaceutics

MAJOR - required background and available courses that satisfies requirement

- Pharmacology Background
 - PHCL 5110 Introduction to Pharmacology (3 credits), or
 - PHAR 6726 Principles of Pharmacology (2.3 credits), or
 - PHAR 6762 Medicinal Chemistry and Neuropharmacology (2.8 credits), or
 - NSC 5461 Cell and Molecular Biology (4 credits)

Note: Equivalent coursework and/or previous background experience may be considered in lieu of PHCL 5110/PHAR 6726/PHAR 6762/NSC 5461.

ELECTIVE CREDITS

- The Pharmaceutics MS program requires a minimum of 12 elective credits, with a minimum of 6 of these credits being outside the major (non-PHAR- and non-PHM-designated courses), which are selected in consultation with the major advisor. Courses taken to satisfy the required background above can also be used to satisfy the elective credits requirement.

A 4XXX-level course must be taught by faculty with an appointment in the Graduate School in order to contribute to the required credit count on the Graduate Degree Plan, and no more than 9 credits of 4XXX-level courses may be listed on the Graduate Degree Plan.

APPENDIX III

Application for Pharmaceutics Fellowships

DEADLINE: FEBRUARY 15

Submit the following items to the DGS in a **single** PDF format for each fellowship you are applying for:

1. Cover letter (1 page):
 - a. Scholarship for which you are applying
 - b. Why you believe you are qualified for the fellowship
2. Summary of research work planned or in progress (1 page) or progress report (1 page text and 1 page figures/data) (Not required for the Rippie Fellowship)
3. Curriculum Vitae (CV)
4. Transcript of grades (unofficial is acceptable)

A letter of recommendation from your permanent faculty advisor should be sent separately to the DGS.

Students may apply for a single, one-year renewal using the above application process

DAVID J.W. GRANT & MARILYN J. GRANT FELLOWSHIP IN PHYSICAL PHARMACY

- Research focused in physical pharmacy
- Two semesters of full-time graduate coursework completed in the PhD program (minimum of 20 credits)
- Students may apply for a single, one-year renewal using this application process

RORY P. REMMEL AND CHERYL L. ZIMMERMAN FELLOWSHIP IN DRUG METABOLISM AND PHARMACOKINETICS

- For second-year students that have chosen a thesis advisor whose research encompasses drug metabolism or pharmacokinetics
- Award will be announced in the year that it will be available

EDWARD G. RIPPİE FELLOWSHIP IN PHARMACEUTICS

- Consistent and outstanding academic record
- Two semesters of full-time graduate coursework completed
- A summary of research/progress report is not required

RONALD J. SAWCHUK FELLOWSHIP IN PHARMACOKINETICS

- Research focused in pharmacokinetics
- Two semesters of full-time graduate coursework completed in the PhD program
- Students may apply for a single, one year renewal using this application process

APPENDIX IV

Other Fellowships

THEODORE H. ROWELL GRADUATE FELLOWSHIP

- One year of graduate school completed
- Full-time University of Minnesota College of Pharmacy student working toward a PhD
- Good academic standing with exceptional potential in their field
- Preference is given to PhD students that are in basic and applied pharmaceutical sciences and who are working with faculty with demonstrated world-class excellence that is collaborative/interdisciplinary in nature

Applications are distributed to graduate students via email in late April and completed applications and attachments (unofficial UMN transcript, a letter of recommendation from your advisor, and a one page description of your research) are due in early May each year.

LYLE D. AND SHARON BIGHLEY GRADUATE FELLOWSHIP

- One year of graduate school completed
- Full-time University of Minnesota College of Pharmacy student working toward a PhD
- Good academic standing with exceptional potential in their field
- Preference is given to PhD students that are in basic and applied pharmaceutical sciences and who are working with faculty with demonstrated world-class excellence that is collaborative/interdisciplinary in nature

Applications are distributed to graduate students via email in late April and completed applications and attachments (unofficial UMN transcript, a letter of recommendation from your advisor, and a one page description of your research) are due in early May each year.

PHARMACEUTICAL RESEARCH AND MANUFACTURERS OF AMERICAN FOUNDATION (PhRMA) PRE-DOCTORAL FELLOWSHIP IN PHARMACEUTICS

www.phrmafoundation.org/2018-awards/pre-doctoral-fellowship-awards/pharmaceutics/

- Must hold a PharmD, BS, or MS from an accredited school in pharmacy or related area
- Expect to complete the requirements for a PhD in two years or less from the time the fellowship begins

Deadline: September 1

AMERICAN FOUNDATION FOR PHARMACEUTICAL EDUCATION (AFPE) PRE-DOCTORAL FELLOWSHIP IN PHARMACEUTICAL SCIENCES

afpepharm.org/index.php/contact/grants-scholarships-and-awards/

- US citizen or permanent resident
- Enrolled full-time
- At least three semesters of study completed in the current PhD program
- No more than three-and-a-half years remaining to obtain PhD degree

Deadline: Part 1 due in November and Part 2 due the following January

DR. PAUL B. MYRDAL MEMORIAL PRE-DOCTORAL FELLOWSHIP IN PHARMACEUTICS

afpepharm.org/index.php/contact/grants-scholarships-and-awards/

- Students who meet all eligibility requirements for the AFPE Pre-Doctoral Fellowship in Pharmaceutical Sciences and are researching pharmaceuticals are eligible to apply

To apply for the Myrdal Memorial Fellowship, please use the application link provided for the AFPE Pre-Doctoral Fellowship and select “Dr. Paul B. Myrdal Memorial Pre-Doctoral Fellowship in Pharmaceuticals” under “Fellowship type.” Students who are not selected for the Myrdal Memorial Fellowship will be automatically considered for the AFPE Pre-Doctoral Fellowship in Pharmaceutical Sciences.

HERB AND NINA DEMUTH MEMORIAL AWARD

afpepharm.org/index.php/contact/grants-scholarships-and-awards/

- Students who meet all eligibility requirements for the AFPE Pre-Doctoral Fellowship in Pharmaceutical Sciences and are researching parenteral drugs are eligible to apply

To apply for the Demuth Memorial Award, please use the application link provided for the AFPE Pre-Doctoral Fellowship and select “Herb and Nina Demuth” under “Fellowship type.” Students who are not selected for the Demuth Memorial Award will be automatically considered for the AFPE Pre-Doctoral Fellowship in Pharmaceutical Sciences.