This handbook outlines the philosophy and requirements of the Graduate Degrees offered in the disciplines of Pharmaceutics at The University of Arizona. It is intended to be used as a tool to understand the requirements for obtaining a graduate degree. This handbook should be used in conjunction with the current Graduate College Catalog. The requirements of the Graduate Program in Pharmaceutics and Pharmacokinetics outlined herein are under the authority and consistent with the rules and guidelines set forth by the Graduate Council of the University. In those cases where the requirements are slightly different from those stated in the Graduate Catalog, the requirements in this Handbook pertain. Certain general University regulations and specific Pharmaceutics Program degree requirements are only outlined in this document; consult the current Graduate College Catalog for complete details (http://grad.arizona.edu/academics/catalog).

Attainment of a graduate degree in Pharmaceutics requires outstanding scholarship and demonstration of distinguished research leading to a thesis/dissertation that contributes significantly to the general fund of knowledge in the discipline. The degrees are never granted solely as certification of faithful performance of a prescribed program of studies. All degree requirements must be fulfilled. Therefore, the requirements for these degrees are also outlined in this Handbook.
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Revised July, 2018
1.0 INTRODUCTION

The graduate program in Pharmaceutics leads to the Doctor of Philosophy degree in Pharmaceutical Sciences. Well funded research opportunities and the strong multidisciplinary nature of the program provide students with a highly interactive and personalized approach to research and education in Pharmaceutics and Pharmacokinetics.

Ph.D. Degree in Pharmaceutics

The mission of this program is to educate and prepare students for work in the pharmaceutical industry and in academia. The specific fields of study are physical Pharmaceutical Chemistry and Pharmacokinetics. These disciplines of pharmaceutics and pharmacokinetics are unique and exist only in Colleges of Pharmacy. The average time to graduation is approximately four and one half years.

1.1 Background

Pharmaceutics deals with the design and development of pharmaceutical dosage forms. At the University of Arizona, emphasis is placed on non oral (i.e., topical, injectable, and inhalation) dosage forms and novel drug delivery systems. Formulations are developed that maximize the bioavailability and/or the stability of the active ingredient. This involves the study of the factors that govern solubility in aqueous and non-aqueous vehicles. It also involves the development of stability indicating assays and the study of the effects of formulation components on physical and chemical stability.
2.0 THE GRADUATE PROGRAM ORGANIZATION

2.1 Philosophy and Goals

A primary goal is to prepare students to excel in Pharmaceutics by providing customized curriculum and constant personalized advising. In addition, the faculty provides service, education, and research in the areas of Pharmaceutics and Pharmacokinetics to best serve the students (professional and graduate), the public and professional communities.

2.2 Graduate Council in the Department of Pharmaceutical Sciences for Graduate Programs

The Graduate Council in the Department of Pharmaceutical Sciences for Graduate Programs in the College of Pharmacy is comprised of one voting faculty member from each of the program tracks, one non-voting program coordinator, and a non-voting graduate student representative from each program track. The Council formulates policies and coordinates activities of the graduate program for all disciplines within the College of Pharmacy, including the Pharmaceutics track. This council is charged with the overall evaluation of graduate student performance and also makes final decisions concerning applicants for admission to the program. The council is also charged with overseeing all curriculum matters. A chart of the organizational structure of the graduate tracks that are housed within the College of Pharmacy is shown below.

2.3 Pharmaceutics Executive Committee

The Pharmaceutics Executive Committee is comprised of the Pharmaceutics Program Faculty. One faculty member serves as the Program Track Director and sits on the College Graduate Executive Council. The Pharmaceutics faculty formulates policies and coordinates activities of the Program, evaluates and selects applicants for admission to the program, and considers curriculum matters.
### Committee Members

<table>
<thead>
<tr>
<th>Name</th>
<th>Phone</th>
<th>Email</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Samuel Yalkowsky</td>
<td>520-626-1289</td>
<td><a href="mailto:yalkowsky@pharmacy.arizona.edu">yalkowsky@pharmacy.arizona.edu</a></td>
<td>Pharmacy Bldg Rm 432</td>
</tr>
<tr>
<td>Dr. Heidi Mansour</td>
<td>520-626-2768</td>
<td><a href="mailto:mansour@pharmacy.arizona.edu">mansour@pharmacy.arizona.edu</a></td>
<td>Pharmacy Bldg Rm 434</td>
</tr>
</tbody>
</table>

#### 2.4 Graduate Student Representatives

Graduate student representatives are elected by the graduate student body of the Program in Pharmacy for two year terms. The representatives serve as an official liaison between the students and faculty of the Program with one representative being a non-voting member of the Executive Council. The representatives are responsible for organizing graduate student participation in Program endeavors, as well as serving on Program committees in an advisory capacity. Each student should seriously consider his/her choice for the graduate student representative(s) in order to maintain an effective student voice in Program issues.

#### 2.5 Participating Faculty

The following is a list of faculty with whom students may pursue their research.

**Samuel Yalkowsky, Ph.D.** He is currently involved in basic research on the relationships between chemical structure and physical phenomena such as solubility, partitioning, and melting. He has developed the state of the art algorithm for the estimation of the aqueous solubility of organic compounds. He has also made great progress in the development of an algorithm for the estimation of the melting points of organic compounds. Dr. Yalkowsky co-authored two papers that won the Ebert Prize for the best scientific paper in the Journal of Pharmaceutical Sciences. He received the University of Arizona Graduate Teaching and Mentoring Award in 2001.

**Heidi Mansour, Ph.D.** received her Ph.D. from the University of North Carolina-Chapel Hill School of Pharmacy. Research in the Mansour lab focuses on the fundamental and applied aspects of surface and interfacial chemistry, nanotechnology, and particle engineering technologies in the design and optimization of advanced drug delivery systems. Multifunctional polymeric phospholipid (lipopolymeric) self-assemblies are optimized for targeted drug delivery, nanomedicine, and multifunctional microparticles and nanoparticles in the solid-state as dry powder inhalation aerosols in the targeted treatment and prevention of several pulmonary diseases. These microparticulate/nanoparticulate dry powders, which are targeted directly to the lung as dry powder inhalers, are biocompatible, biodegradable, mucopenetrating, and provide sustained drug release.
3.0 PHYSICAL RESOURCES AND FACILITIES

3.1 Equipment Resources

The Pharmaceutics faculty laboratories and student work areas are housed in the Skaggs College of Pharmacy building. Availability of modern scientific instruments is crucially important to research and graduate education programs. We are fortunate to possess ample instrumentation to conduct research on multiple levels of biological and physical science research. Each investigator’s laboratory is equipped with specialized instrumentation required for research in their particular field.

The Pharmaceutics laboratories are especially well equipped with instruments necessary for physical chemical analysis, including multiple high performance liquid chromatographs, a modulated DSC/TGA, spectrophotometers, time of flight particle sizer, gas chromatographs, and a mass spectrometry facility. All laboratories have networked for all computers and data processing systems. All graduate students have their own computer and desk.

3.2 Library Resources

The University of Arizona takes pride in the outstanding quality of its libraries. UA Libraries are made up of the Main Library, Science-Engineering Library, Fine Arts Library, and Health Sciences Library and they hold extensive collections of periodicals, monographs and special collections.

The Health Sciences Library http://ahsl.arizona.edu/ is located at the Arizona Health Sciences campus. It is the largest, most comprehensive health sciences library in Arizona. In addition to its holdings of pertinent health sciences periodicals and monographs, the library provides an excellent array of valuable services including bibliographic searches, librarian consults, and research support. The Health Sciences Library provides access to essential medical information, and specialized databases such as Embase, the world's largest database of drug information. Librarians participate as instructors in the curriculum of the health sciences colleges, and work in partnership with researchers and clinicians to advance health information literacy. The library also provides spaces for small group collaboration and quiet study.

3.3 Experimental Animals

The availability of high quality experimental animals is of is often employed in modern research in Pharmaceutics and Pharmacokinetics. In order to perform animal research a graduate students MUST become familiar with safe and humane animal care and handling techniques. The University Animal Care Facility procures and cares for all animals used in teaching and research by the Program. The staff of University Animal Care is available to students for consultation on problems related to the use of animals in scientific research. All students are required to complete a training course by the University Animal Care staff before the end of their first semester of residence in order to comply with federal, state and local regulations governing animal care.

3.4 Laboratory Safety and Environmental Health

Students are required to attend courses on these topics by end of their first semester of residence, preferably as soon after their arrival as possible. It is the responsibility of all personnel involved in scientific study to be aware of the safety precautions and the proper disposal of hazardous wastes specific to the research effort. The student has a moral obligation to not only familiarize him/herself with, but also follow, the specifics of laboratory safety associated with his/her desired area of research. The offices of Risk Management and Radiation Control offer seminars covering such subjects as fire prevention,
hazardous waste disposal, compressed gas safety, basic radiation protection, and industrial hygiene, etc. Laboratory directors and technicians are the best source for day-to-day laboratory safety techniques and advice on safety seminars required for laboratory personnel.
4.0 GENERAL INFORMATION

4.1 Student Responsibilities

The Graduate Program in Pharmaceutics stresses to the student the following issues of the utmost importance. First, any student who is found to be using drugs for non-experimental purposes will be expelled from the Program. Second, students are to conduct their experiments in an ethical manner; experimental fraud related to the creation of false data or the theft of others' work will not be tolerated by this Program. Students should keep their data in a format acceptable to the research advisor and be prepared to turn over their records to the Graduate Program at any time. Third, the student is expected to complete the required and elective coursework in a timely manner under the ethical constraints of the College in which the course is being offered.

4.2 Orientation

All new students are required to attend the Program’s Orientation held prior to the first day of classes.

4.3 Individual Health Insurance through Campus Health Services

Students who are hired as a Graduate Assistant/Associate (GA) are eligible to receive individual health insurance through Campus Health Services. The student's admission paperwork must already have been submitted to the Graduate College before they are able to enroll. Even though the charges for health insurance show up on your student account, the university will offset the charge later. You will not be responsible for health insurance costs.

Health insurance coverage for the fall semester begins the Monday prior to the beginning of classes, and continues till the beginning of the spring semester. Coverage for the spring semester starts at the beginning of the spring semester and continues through the summer. New students must register for health insurance when registering for courses on-line through the UA Student Link system. Continuing students who were enrolled in student health insurance in the previous semester will be automatically re-enrolled. Once you have enrolled in the plan, your coverage cannot be canceled, even if you resign or are terminated as a GA. If you resign or are terminated from your GA during the period of coverage, you will be personally responsible for the payment of the remaining coverage.

4.4 Creating a UA NetID, UA Email Account, and College of Pharmacy Email/Computer Account

All UA students are required to set up a UA email account (free to UA students), but first a UA Net ID must be established. The instructions on the UITS website (https://netid.arizona.edu/) will walk you through establishing your UA NetID, and then your email account. Students in the College of Pharmacy will also have a College of Pharmacy computer and email account created for them. The College of Pharmacy email will be the primary email account. Students should forward their UA email to their College of Pharmacy account so they only have to check one email account and not both.
4.5 Financial Support

Financial assistance in the form of research assistantships or traineeships may be available to Ph.D. students admitted into the Program. Assignment of students to training grants is a responsibility of individual training grant advisory committees. Later support may include either traineeships or research assistantships. Students are also encouraged to apply for individual predoctoral fellowships from sources outside the University. Appointments as research assistants provide a waiver of tuition, health insurance and a remission of in state registration fees.

4.6 Graduate Assistant/Associate Stipend Levels and Benefits

<table>
<thead>
<tr>
<th>FISCAL</th>
<th>50% FY</th>
<th>TUITION WAIVER FALL/SPRING</th>
<th>100% FALL/SPRING REGISTRATION REMISSION</th>
<th>STUDENT INSURANCE FULL YEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate Assistant I</td>
<td>$21,700</td>
<td>$20,349</td>
<td>$11,716</td>
<td>$2,088</td>
</tr>
<tr>
<td>(All 1st-Year Students)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Late start in August</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graduate Assistant II</td>
<td>$23,594</td>
<td>$20,349</td>
<td>$11,716</td>
<td>$2,088</td>
</tr>
<tr>
<td>(2nd-Year Students, except Ph.D. with M.S.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graduate Associate I</td>
<td>$24,167</td>
<td>$20,349</td>
<td>$11,716</td>
<td>$2,088</td>
</tr>
<tr>
<td>(2nd-Year Student, with M.S. or Pharm.D.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graduate Associate II</td>
<td>$24,638</td>
<td>$20,349</td>
<td>$11,716</td>
<td>$2,088</td>
</tr>
<tr>
<td>(Ph.D. students completed Prelim Exam)</td>
<td></td>
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</tbody>
</table>

4.7 Graduate Assistantships/Associateships

Please refer to the Graduate College GA Hiring Manual for complete details regarding your GA. http://grad.arizona.edu/financial-resources/ua-resources/employment/ga-manual

4.8 Tax Information

Students should be aware of current tax laws which impact salaries or stipends from graduate teaching/research assistantships, fellowships, and stipends. Contact the IRS at (800) 829-1040 and ask for the scholarship/fellowship publication or visit the IRS forms/publications website at http://www.irs.gov/

Graduate students, who are in Graduate Assistant/Associate positions, must be enrolled in half-time status in order to qualify for exemption from FICA taxes. (Rev. Proc. 98-16.) Graduate students in graduate positions, who are enrolled in less than 6 units during the current semester, will have FICA taxes deducted from their pay. To be exempted from FICA taxes, graduate students will need to be enrolled in at least 6 units during the fall and spring semesters, and in at least 3 units during Summer I and II.
5.0 GRADUATE STATUS AND ADMISSION

5.1 Regular Graduate Status

Students who meet all admission requirements may be admitted to Regular Graduate Status to undertake work leading to an advanced degree.

5.2 Graduate Non-Degree Status

Individuals holding a bachelor’s degree, or its equivalent, from a college or university which grants degrees recognized by The University of Arizona, may attend graduate-level courses without being admitted to a graduate degree program. Such students may enroll in graduate level coursework as their qualifications and performance permit. It is advisable to contact the department(s) offering courses of interests, to insure that the courses are available to non-degree students. Up to thirteen (13) units of graduate credit, earned in non-degree status and/or transferred from other institutions, may be petitioned for application toward an advanced degree once the student obtains regular admission to a degree program. International applicants requiring a student visa are not eligible for graduate non-degree admission.

5.3 Conditional Admission

Although The College of Pharmacy does not generally admit students conditionally, the program’s admissions faculty may recommend conditional admission on a case-by-case basis. Prospective students applying for conditional admission must meet all Graduate College requirements except for the minimum 550 TOEFL requirement (or 213 in the computerized version or 79 in the IBT version).

Conditional Admission requires that the student apply to and enroll at the UA Center for English as a Second Language (CESL) at their own expense (or their sponsor’s) with the expectation of achieving TOEFL-equivalent English proficiency within one year. The initial 1-20 will be generated by CESL to allow the student to attend CESL classes. Once CESL certifies that the student has achieved English proficiency at the TOEFL minimum, he or she will be admitted as a regular standing student.

5.4 Transfer of Coursework

In order to transfer coursework, an evaluation of transfer credit form must be submitted to the Graduate College in GradPath, before the end of the first year of study. This allows the Graduate College to evaluate the transfer credit while the transcripts are still in the Graduate College, and ensures that students will know early in their studies whether or not the credits are acceptable. The Graduate College evaluation simply determines whether or not the courses are eligible for transfer; departments must still decide which courses should be part of the Program of Study.

The transfer of coursework must also be approved by the student’s major advisor. The courses being transferred will be listed on the Doctoral Plan of Study, which requires the major advisor’s signature verifying his/her approval of the courses being transferred as well as the courses required for the major.

The Doctoral Plan of Study is to be submitted in GradPath no later than the second year in residence.
6.0 Ph.D. PROGRAM IN PHARMACEUTICS

6.1 Administration

If a student does not have a specific advisor identified upon enrolling the first year then the Pharmaceutics Track Director will help the first year student plan his/her program with an emphasis on the first year's courses. In succeeding years, the student's Major Advisor and Dissertation Committee tailors the coursework to fit specific needs and objectives. The faculty encourages the student to take advanced courses in pharmaceutics, pharmacokinetics, chemistry, material science, pharmacology, toxicology, biochemistry to diversify his/her program. The Major Advisor and Dissertation Committee will help the student plan an educational program in which coursework is completed as quickly as possible. Because of individual interests or conflicts in scheduling, some formal coursework may extend into the third year of graduate study.

6.2 Registration

Registration is accomplished through the University of Arizona UAccess Student Center System. UAccess Student Center can be accessed from the UA homepage: (http://www.arizona.edu). Contact the Program office for registration of courses that are not open to web registration.

6.3 Graduate Assistants Minimum Registration

All graduate students in the College of Pharmacy who are supported by or through the University are considered to be full-time students. All full-time students are expected to enroll for some combination of coursework, research, or independent study that results in thirteen (13) units of credit for the academic semester. Students completing their degree in an academic semester may register for less than (13) units as determined by the Graduate Program Office.

6.4 Minimum Registration Requirements for Students NOT Receiving Funding

Each student who is associated with the University in any capacity that utilizes University facilities or faculty time during any academic semester must be registered for at least three (3) units of graduate credit. Each student completing requirements for an advanced degree must be registered during the semester or summer term during which requirements are completed, or the previous semester or term if requirements are completed during an intercession. This includes any semester during which a preliminary or final examination is scheduled.

Ph.D. students who have completed all the degree course requirements but have not completed the comprehensive examination should enroll for Research (PHSC 900). After completion of the comprehensive examination Ph.D. students should enroll for dissertation (PHSC 920). Although a minimum of eighteen (18) units of PHSC 920 is required, the student may enroll for as many units as needed to complete.
6.5 Courses for Pharmaceutics Major

*CHEM480a  Physical Chemistry  3
PHSC 502  Pharmaceutics  3
PHSC 507a,508a  Pharmacokinetics\Discussion  3,1
PHSC 555  Drug Delivery Systems  3
PHSC 601  Advanced Physical Pharmacy  3
PHSC 602  Physical Chemical Factors influencing Drug Action  3
PHSC 603  Topics in Pharmaceutics  2
PHSC 610  Topics in Pharmaceutical Solids, Nanotechnology and Solid-State Particle Engineering Design in Drug Delivery
PHSC 596C  Pharmaceutics Research Lab Meeting  4
PHSC 596D  Pharmaceutics Seminar  4
PHSC 699/601  Independent Study or PHSC 601  3
BIOS 576a  Bio Statistics  3
MCB 695e  Ethics  1

Choose one elective course from the list below

CHEM 501A  Instrumental Analysis (3 units)
CHEM 502A  Introduction to Organic Reaction Mechanisms (3 units)
CHEM 503  Intermediate Physical Chemistry (3 units)
CHEM 521A  Advanced Analytical Chemistry (3 units)
CHEM 521B  Advanced Analytical Chemistry (3 units)
CHEM 527  Analytical Separations (2-3 units)
CHEM 541  Mechanisms of Organic Reactions (3 units)
CHEM 543  Structural Organic Chemistry (3 units)
MSE 503  Applied Surface Chemistry
MSE 512  Physical Chemistry of Materials (3 units)
PCOL 537A  Medicinal Chemistry II (3 units)
PCOL 537B  Medicinal Chemistry III (2 units)
PCOL 571A  Pharmacology I (4 units)
PCOL 571B  Pharmacology II (3 units)
PCOL 574  Clinical Toxicology (2 units)

* Credits do not count towards major

MINIMUM TOTAL FOR MAJOR  38-39
MINOR  9
DISSERTATION  18
### 6.6 Seminar (PHSC 596c) Spring Semester

These seminars are presented by the students, faculty and invited speakers in the Graduate Program. Seminars are an opportunity for students to practice presentation skills and to update the faculty and students on their research progress. Students are required to register for PHSC 596c for the spring semester for their term of residence in the Program. Grades are calculated based on presentation and attendance. First year students are not required to present a seminar, so their grade will be determined by attendance only. PharmD/Ph.D. students are required to present a seminar each academic year beginning in the second year until the final defense (final defense will be counted as a seminar presentation).

### 6.7 Minor Requirements for Pharmaceutics Majors

One minor is required. Students may choose from among the following approved minor list. Other options will be considered but must be approved individually by the Pharmaceutics Executive Committee and Track Director of the Program.

**Suggested Minors (minimum of 9 units)**

1. Interdisciplinary
2. Chemistry
3. Biochemistry
4. Pharmacology
5. Drug Discovery and Development
6. Materials Science and Engineering
7. Cancer Biology
8. Applied Biosciences

### 6.8 Annual Reports

Annual Reports need to be submitted to: [http://gradstudent.pharmacy.arizona.edu](http://gradstudent.pharmacy.arizona.edu) on or before June 1. The Annual Report will list courses taken and grades received, committee meeting(s) held, abstracts and papers published, seminars and report presentations, honors, outside funding, and a succinct and lucid summary of research progress. The Annual Report must be approved by the Executive Committee before the year's work is considered complete. Students who do not meet this deadline will receive a one-time letter requesting the information be provided immediately or the student will be dropped from the Program for failure to meet Program degree requirements.

### 6.9 Scientific Meetings

As part of the educational process, students in training will be encouraged to attend national scientific meetings as travel support permits. Priority for travel support will be given to students presenting communications at national meetings such as American Association of Pharmaceutical Scientists.
Students should discuss participation in meetings and travel support with their Research Advisors. Students may also apply for travel funds available from the Graduate College.

6.10 Minimum Academic Requirements

A student cannot receive a graduate degree unless he or she has achieved a grade-point average of 3.00 or higher on all course work taken for graduate credit, whether or not the courses are offered in satisfaction of the specific requirements for a specific graduate degree. A student whose cumulative GPA is below 3.0 for two consecutive semesters will be converted to non-degree status. Programs may allow students to take additional course work while in non-degree status. In order to graduate, the student must apply for readmission to the Graduate College through their graduate department. Readmission is not guaranteed.

6.11 Satisfactory Academic Progress

In addition to maintaining a minimum 3.0 grade-point average, students are required to demonstrate satisfactory academic progress toward degree completion. The Program’s policies on what constitutes satisfactory academic progress are listed below.

- **Minimum Grades in a Required Course** - Students must receive a grade of "B" or better in all core courses. A student who receives a grade of "C" or less in a required course must repeat that course. Students failing to obtain a “B” or higher in a required course that is repeated must petition the graduate program faculty to remain in the program. The decision to allow the student to continue in the program requires a majority approval of the program faculty, with two negative votes sufficient for termination.

- **Student Evaluation** – The Program Executive Committee evaluates each student on the basis of accomplishments in formal courses and performance in other areas of the Program including attendance and participation in seminars as well as performance in laboratory rotations. Satisfactory performance in courses and research are also required. Failure to meet performance criteria in any of these areas is grounds for dismissal from the Program.

- **Annual Reports** - All students will submit an annual report to the Graduate Program Coordinator, on or before June 1. The Annual Report must be approved and signed by the graduate track director (first year students) or the Major Research Advisor (all other students) for submission to: [http://gradstudent.pharmacy.arizona.edu/](http://gradstudent.pharmacy.arizona.edu/)
  Annual Reports for every year matriculating in the program are mandatory.

- **Sponsorship** - By June 15 the Pharmaceutics Executive Committee makes a determination if each first year student should be sponsored for the following year. This determination will be assessed yearly thereafter. Poor performance in assigned duties may result in the loss of sponsorship. Sponsorship decisions after the first year are made by the student’s major advisor.

- **Advancement to Candidacy** - Students are evaluated for Advancement to Candidacy at the time of their comprehensive examination. If performance has been satisfactory, approval will be granted. If performance is substandard, the Executive Committee may recommend a probationary period, withdraw program sponsorship, seek dismissal, or may request the student to fulfill the requirements for a Master's degree. The Executive Committee will evaluate overall student performance in the Program to date.

- **Dissertation Committee Meetings** – After the second year, all students are required, after the formation of a dissertation committee, to have at least one committee meeting per year while in the Program.

- **Completion Guidelines** – Students will complete the following according to the time frame listed below.
YEAR 1
And Summer
• Complete Deficiency Coursework (if applicable)
• Complete First Year Core Coursework
• End of First Year - Selection of Mentor/Research Advisor
• End of First Year – Begin Doctoral Research

YEAR 2
• Continue Doctoral Research
• Complete Second Year Core Coursework
• Submit Doctoral Plan of Study to Program Office – Fall Semester
• Select Dissertation Committee
• Present Seminar – Spring Semester

YEAR 3
• Continue Doctoral Research
• Schedule Written & Oral Comprehensive Examination
• Submit Committee Appointment Form
• Present Seminar – Spring Semester
• Dissertation Major Committee Meeting

YEARS 4 and 5
• Present Seminar – Spring Semester
• Continue Doctoral Research
• Dissertation Major Committee Meeting
• Pass Final Examination (Dissertation Defense)
• Identify Employment Opportunities

6.12 Appeals Process:

If a student wishes to appeal any of the aforementioned requirements the appeal should be made in writing to the Director of the Program Track (Pharmaceutics). The appeal will be reviewed by the program faculty and may include a collective meeting with the student. A decision to accept the appeal of the program faculty will be based on a majority vote. The program faculty may place additional requirements/deadlines on the student as a prerequisite for continuing in the program. Students who wish to appeal the decision of the program faculty must submit an appeal in writing to the Director of Graduate Programs in the College of Pharmacy.

6.13 Research Advisor and Dissertation Committee

Prior to the selection of a Major Research Advisor, the student should become familiar with the research interests of the faculty. Students should meet individually with the faculty whose research is of particular interest or potential interest.

After these preliminary interviews and research laboratory experiences, the student decides with whom he/she would like to do his/her dissertation research. After consultation with, and agreement of the faculty member, the student must communicate this decision to the Track Director of the Program before the end of the Spring Semester. The Major Research Advisor must be a tenure track full faculty member in the Program. In the event that the research project is carried out in the laboratory of an individual who is not a member of the Program Faculty, a co-director from the Program Faculty must be appointed. Also, in the event the research project is carried out in the laboratory of an associate faculty member, permission from the Pharmaceutics Executive Committee is required.
At the time of Major Research Advisor selection, or shortly thereafter, a Dissertation Committee is formed. The Dissertation Committee consists of at least five (4) members. At least three (3) members from the Program faculty, and at least one (1) from the minor field. The Dissertation Committee is chaired by the Major Research Advisor. The Major Research Advisor discusses membership of the Dissertation Committee with the student and recommends the composition of the Dissertation Committee to the Pharmacetics Executive Committee which may modify Committee membership. Faculty members of the Dissertation Committee are selected on the basis of their ability to provide useful advice about the research problem, to assist in selection of appropriate coursework, and to help guide the student to successful completion of degree requirements.

The Dissertation Committee will meet with the student at least once a calendar year (June 1 - May 31) to review progress in coursework and research. Additionally, the Dissertation Committee will be helpful in focusing the objectives of the proposed dissertation as well as limiting the scope. It is strongly recommended that the student meet with the dissertation committee shortly before scheduling the final defense. You must indicate in your Annual Report the date of your annual meeting with your committee members.

6.14 Plan of Study

In conjunction with his/her major professor or advisor, each student is responsible for developing a Plan of Study during their first year in residence, to be filed with the Graduate College no later than the student's third semester in residence. The Plan of Study identifies (1) courses the student intends to transfer from other institutions; (2) courses already completed at The University of Arizona which the student intends to apply toward the graduate degree; and (3) additional course work to be completed in order to fulfill degree requirements. The Plan of Study must have the approval of the student's major professor and department head (or Director of Graduate Studies) before it is submitted to the Graduate College.

6.15 Comprehensive Examination

The Comprehensive Examination consists of two parts: the written examination, and the oral examination. After required courses are completed, usually at the end of the second academic year, the comprehensive examination should be scheduled. Students must complete the comprehensive examination within three and one half (3.5) years from admission to the Program. Each student’s dissertation committee serves as the comprehensive examination committee.

Eligibility

Only students who have completed all required core courses, as listed in the Graduate Student Handbook, are eligible to take the exam.

Written Examination

Each student will take a written exam from each advisor for the major committee. Minor committee members are also given the opportunity to test the student via a written exam; however, minor committee members can opt to waive this exam. The written exams will cover material germane to the coursework a student has taken from a faculty member. Students must successfully pass each exam prior attempting the oral examination.

Oral Examination
The student will have identified a topic and submit the title and abstract to their dissertation committee. The topic can be related or unrelated to the student’s dissertation research. Once the topic is approved, a proposal is prepared according to the format of the National Institutes of Health: http://grants1.nih.gov/grants/funding/phs398/phs398.html

The sections to be included are abstract; specific aims; background and significance; preliminary data; research plan and references. Margins and font size are detailed on the NIH website. A minimum of 18 single spaced pages and a maximum of 25, excluding references are required. Data from published literature will be used in place of preliminary data generated by the student. The proposal is submitted to each committee member two weeks prior to the oral examination. The student is expected to display scientific proficiency.

The faculty strongly emphasizes that the responsibility for the quality of the proposal, be it originality, approach, or significance, rests completely with the student. The student selects the area, prepares the written proposal, submits it to his/her advisory committee, and defends it at the oral. At the time of the oral defense, the committee judges the acceptability of the proposition by the extent to which the student demonstrates scientific maturity, originality, and ability to explain and defend his/her proposal.

6.16 Failure of the Second Attempt of the Oral Comprehensive Examination

Students who fail a second attempt of the oral comprehensive examination are automatically dismissed from the Ph.D. Program. It is possible, with a recommendation from the comprehensive examination committee, to convert the student to the M.S. Program. The student will be required to complete an M.S. thesis.

6.17 Advancement to Candidacy

When the student has an approved doctoral Plan of Study on file, has satisfied all course work, language, and residence requirements, and passed the written and oral portions of the Comprehensive Examination, he or she will automatically advance to candidacy. The Candidacy fee, the dissertation processing fee, and the archiving fee (total of $135) will be assessed when the student passes the Oral Comprehensive Exam.

After passing the Oral Comprehensive Exam, the student is required to submit the Committee Appointment Form to the Graduate Degree Certification Office. The Final Oral Defense Examination cannot be scheduled until at least six months after the form is received. Deadlines for the submission of paperwork pertaining to doctoral programs, as well as all forms, are available online through GradPath from the Graduate College Website: http://grad.arizona.edu/

6.18 Dissertation

This begins when the student picks a laboratory and advisor. Planning the research program begins in meetings with the Major Research Advisor and the Dissertation Committee. The Committee reviews the goals and experimental approaches summarized by the candidate, particularly in relation to the objectives set out in the dissertation proposal, and helps formulate and approve any changes or new plans deemed appropriate. At this time it may become necessary to increase the frequency of Dissertation Committee meetings. The candidate is expected to fulfill specific goals recommended by the Committee.

Preparation of the written dissertation follows the Graduate College rules, Student's Manual for Theses and Dissertations (http://grad.arizona.edu/academics/degree-certification/diss-theses/manuals). When
the dissertation is written, the candidate submits a copy to each member of his/her committee ten (10) working days prior to the final examination. The Announcement of Final Examination must be filed with the Graduate Degree Certification seven (7) working days before the examination date.

6.19 Final Examination

Upon the completion of the dissertation, the candidate is to submit to a Final Oral Defense Examination. A student must be in good academic standing to schedule the defense. The examination focuses on the dissertation itself but can include general questioning related to the field(s) of study within the scope of the dissertation.

The exact time and place of this examination must be scheduled with the Graduate Degree Certification Office at least 7 working days in advance. Announcement of Final Oral Examination form must be filed with Graduate Degree Certification. A format correct copy of the dissertation must be delivered by the candidate to each committee member at least ten (10) working days before the examination. The student should print out two (2) dissertation approval pages, and bring them to the defense. It is expedient to get all signatures at the defense.

The dissertation director presides over the examination. The examination is open to the public. There is no minimum time limit for the Final Oral Examination, but the entire proceedings may not exceed three hours. Members of the committee must be present for the entire examination.

6.20 Limitation on Time Spans

The Ph.D. degree with a major in Pharmaceutics usually requires approximately 4.5-5 years of education beyond the baccalaureate degree. As the success of laboratory experiments or the time required for their completion cannot be predicted accurately, more time may be required for completion of degree requirements. Students who enter the Program with advanced degrees (M.S., MD, Pharm.D., D.V.M.) should complete requirements for the Ph.D. degree in less than four (4) years.

Note: Graduate coursework credit, to be applicable toward a degree, must have been earned not more than ten (10) years prior to the completion of the requirements for the degree. This includes graduate credit earned for a master’s degree, if applicable.

The Graduate Council has instructed that petitions for time-limitation waivers should only be entertained under circumstances that are judged to be extraordinary and extenuating.

6.21 Timetable, Formal Documentation, and Deadline Dates
The following forms and deadlines are required by the Program Office and Graduate Degree Certification. All forms can be downloaded off the Graduate College website: (http://grad.arizona.edu/)

**Doctoral Plan of Study** - The Doctoral Plan of Study is submitted to Graduate Degree Certification no later than the third semester of residence at The University of Arizona.

**Results of the Oral Comprehensive Examination** – This form is filled out on-line through the Graduate College forms website. Print out the form and take it to your oral exam.

**Committee Appointment form** - After satisfactory completion of the Comprehensive Examination, the Committee Appointment form is completed, and must be submitted no later than six (6) months before the Oral Defense Examination (Dissertation Defense) is scheduled. The Program recommends submitting the Committee Appointment form immediately following completion of the Oral Comprehensive Examination.

**Announcement of Oral Defense Examination** - The Announcement of Oral Defense Examination must be submitted to Graduate Degree Certification no later than seven (7) working days before the date of the Final Oral Examination. A format correct copy of the dissertation must be given to each committee member and the Program Office, ten (10) working days before the examination.