



THE UNIVERSITY OF ARIZONA

College of Pharmacy

Graduate Programs

**GRADUATE STUDENT HANDBOOK
2021-2022**

**PHARMACEUTICAL SCIENCES
GRADUATE PROGRAM TRACK**

**MASTER OF SCIENCE IN
PHARMACEUTICAL SCIENCE
DEGREE
(MSPS)**

This handbook outlines the philosophy and requirements of the MS degree in Pharmaceutical Sciences (MSPS) offered at the College of Pharmacy, 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 website. The requirements of the Graduate Program in Pharmaceutical Sciences outlined herein are under the authority and consistent with the rules and guidelines set forth by the Graduate College of the University. Some of the curricular requirements in this handbook exceed those stated in the Graduate College Catalog. Students must meet the more stringent requirements contained in this handbook. Certain general University regulations and specific Pharmaceutical Sciences Program degree requirements are only outlined in this document; consult the current Graduate College website for complete details (<https://grad.arizona.edu/new-and-current-students>).

Attainment of a graduate degree in Pharmaceutical Sciences requires outstanding scholarship. All degree requirements must be fulfilled. Therefore, the requirements for the MSPS degree are also outlined in this Handbook.

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1.0 INTRODUCTION

The graduate program in Pharmaceutical Sciences has courses of study leading to Master of Science degree in Pharmaceutical Sciences (MSPS). No thesis is required, but students must complete coursework with appropriate grades and GPA, participate in seminar and give a presentation in their final semester.

MS Degree in Pharmaceutical Sciences

The objective of the MS track in Pharmaceutical Sciences is to impart advanced scientific knowledge in Pharmaceutical Sciences in order to prepare the students for careers in the field including government, industry and academia. The average time to graduation is less than two years.

1.1 BACKGROUND

The goal of the MS program is to provide students with a broad background of courses in a variety of areas in Pharmaceutical Sciences and Pharmacology & Toxicology. Students will take courses in the areas of Drug Discovery & Development, Pharmacology & Toxicology, Pharmaceutics, and Health & Pharmaceutical Outcomes. The program is ideal for students pursuing advancement in their careers or exploring future academic opportunities in the health sciences. Those interested in the PhD programs in the College of Pharmacy will have an opportunity to pursue optional research and apply to the program in the fall of their second year. Some courses taken in the MS program can be transferred to the PhD program.

2.0 THE GRADUATE PROGRAM ORGANIZATION

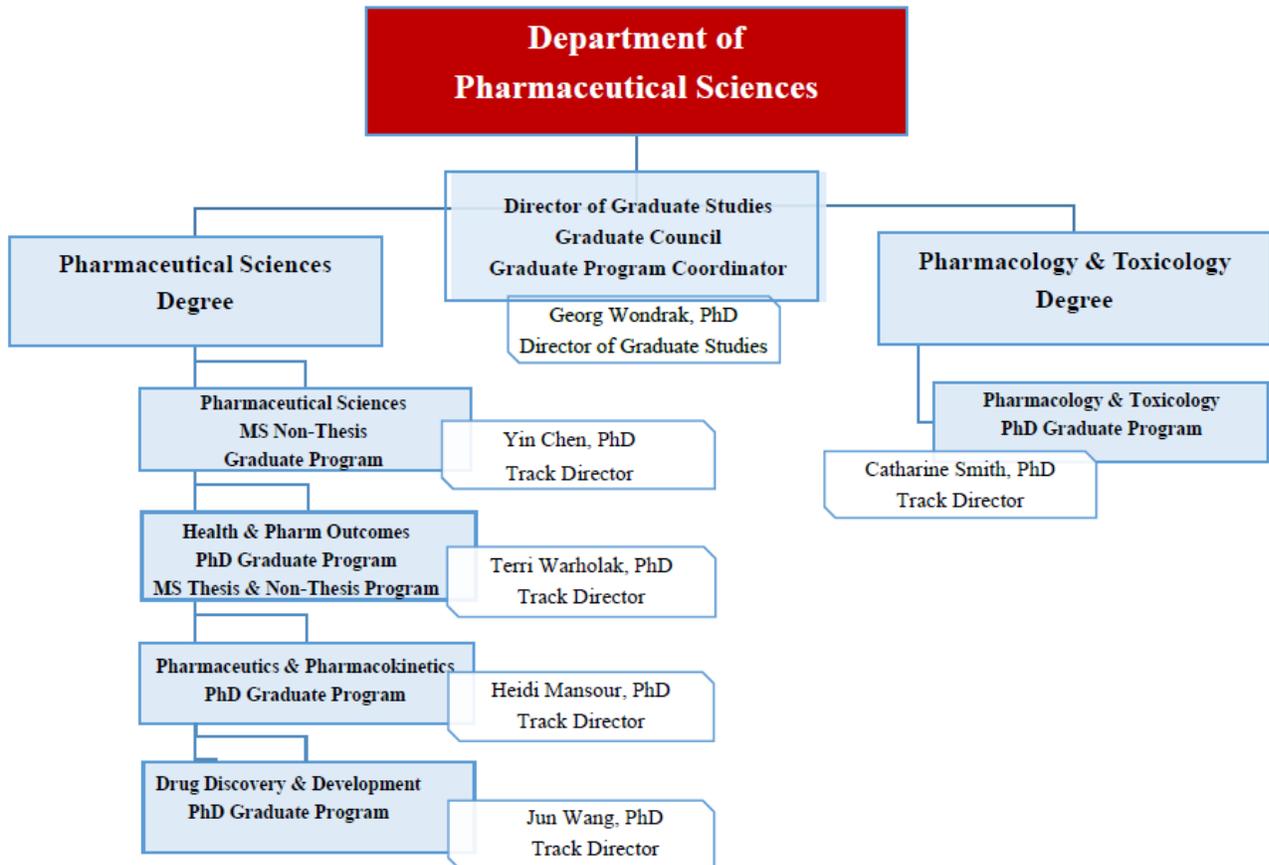
2.1 PHILOSOPHY AND GOALS

The major objective of the Graduate Program in Pharmaceutical Sciences is to train students to become scientists in various areas of Pharmaceutical Sciences. Evaluations of student performance are the responsibility of the faculty and several committees.

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. The Council formulates policies and coordinates activities of the graduate program for all disciplines within the College of Pharmacy, including the Pharmaceutical Sciences 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 student representatives are not included in the evaluation of student performance or admitting students into 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 EXECUTIVE COMMITTEE ON PHARMACEUTICAL SCIENCES

The Pharmaceutical Sciences Executive Committee consists of voting faculty members and one non-voting program coordinator. The Committee formulates policies, coordinates activities of the Pharmaceutical Sciences Program, evaluates student progress, considers curriculum matters, and evaluates and selects applicants for admission to the program.

CONTINUING COMMITTEE MEMBERS

Name	Phone	Email	Room
Yin Chen, PhD Program Track Director	520-626-4715	ychen@pharmacy.arizona.edu	Pharmacy 232
Daekyu Sun, PhD	520-626-0323	sun@pharmacy.arizona.edu	Pharmacy 234
Samuel Yalkowsky, PhD	520-626-1289	yalkowsky@pharmacy.arizona.edu	Pharmacy 426a

2.4 GRADUATE STUDENT REPRESENTATIVES

A Graduate student representative is elected by the graduate student body of the Program in Pharmaceutical Sciences for a one and a half year-term. The representatives serve as an official liaison between the students and faculty of the Program. The representative is a non-voting member of the Executive Committee. 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 FOR MSPS PROGRAM

The following is a list of full and associate faculty within the Department.

Chen, Yin, PhD, Professor, Pharmacology and Toxicology; Track Director for MSPS Program

Pathogenesis of chronic airway diseases; Innate immunity in anti-viral and anti-fungal defense; COVID-19; Metal toxicity; Drug discovery in lung diseases.

Chapman, Eli, PhD, Associate Professor, Drug Discovery and Development

Our lab is a chemical biology lab that is focused on a number of disease states with a primary emphasis on cellular quality control pathways, such as proteostasis and redox homeostasis. We use chemistry, biochemistry, biophysics, structural biology, and cell and molecular biology to discover and develop targeted protein modulators.

Cherrington, Nathan, PhD, Associate Dean for Research, Director of Southwest Environmental Health Science Center and Center for Toxicology, Professor, Pharmacology and Toxicology

Molecular mechanisms of variable drug response that make certain individuals more sensitive to adverse drug reactions. We study what factors alter the expression and function of the drug metabolizing enzymes and transporters that determine the fate of drugs.

Ding, Xinxin, PhD, Department Head, Professor, Pharmacology and Toxicology

Biomarker research; chemical carcinogenesis; drug/xenobiotic metabolism; drug safety; environmental health; lung diseases; molecular/mechanistic toxicology; pharmacogenomics

Futscher, Bernard W., PhD, Professor, Pharmacology and Toxicology

Functional genomics; molecular biology of cancer; cancer pharmacology.

Galligan, James, PhD, Assistant Professor, Pharmacology and Toxicology

The Galligan lab's primary research focus is to understand the link between cellular metabolism, epigenetics, and disease etiology. Although cellular metabolism is generally efficient, metabolic processes often result in a number of intrinsically reactive by-products that are capable of modifying lipids, DNA, and proteins.

Hulme, Chris, PhD, Professor, Drug Discovery and Development

Discovery and development of novel neurodegenerative therapeutics; high-throughput Medicinal Chemistry and the development of novel chemistries with iterative efficiency to expedite the drug discovery process; Microwave Assisted Organic Synthesis (MAOS) and Multicomponent reactions (MCRs).

Karnes, Jason PharmD, MS, BCPS, FAHA, Assistant Professor, Pharmacy Practice & Science

Karnes uses translational approaches in cardiovascular pharmacogenomics to develop genotype-guided prescribing and prevent adverse drug events.

Li, Hongmin PhD, Professor & R. Ken and Donna Coit Endowed Chair in Drug Discovery, Drug Discovery and Development

My laboratory has developed a research platform that integrates virology, mycology, bacteriology, RNA, biochemistry, structural biology, cellular biology, and in vivo animal model in the same lab. We also work closely with collaborators and colleagues in the aspects of medicinal chemistry, computational biology, immunology, cancer biology, and in vivo pharmacokinetics and pharmacodynamics (PK/PD).

Lu, Jianqin, BPharm, PhD, Assistant Professor, Pharmaceutics and Pharmacokinetics

The overarching goal of the Lu lab is to apply synthetic chemistry, nanoparticle engineering, and tumor immunology to develop efficacious nanotherapeutics to address the pressing unmet needs in current cancer therapy. The Lu Lab's expertise in Pharmaceutics, Drug Delivery, Nanomedicine and Tumor Immunology paves the way to develop transformative and clinically translatable nanoimmunotherapeutics for combatting cancers.

Mansour, Heidi, PhD, Associate Professor and Track Director, Pharmaceutics and Pharmacokinetics

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.

Ooi, Aikseng, PhD, Associate Professor, Pharmacology and Toxicology

Molecular carcinogenesis; Mutation-driven transcriptional and metabolic reprogramming; Carcinogen-driven transcriptional and metabolic reprogramming; Computational biology.

Regan, John W., PhD, Professor, Pharmacology and Toxicology

Molecular pharmacology of G-protein coupled receptors: use of cloning, mutagenesis and expression to study receptor structure and the interaction of receptors with second messenger systems.

Schnellmann, Rick, PhD, Dean and Professor, Drug Discovery and Development

Identifying and developing drugs to treat acute kidney injury, diabetic kidney disease, stroke, spinal cord injury and Parkinson's disease through mitochondrial biology.

Smith, Catharine L., PhD, Associate Professor and Track Director, Pharmacology and Toxicology
Epigenetic mechanisms of gene regulation, steroid receptor action in breast cancer, signal transduction and cell cycle control, mechanism of anti-cancer drug action.

Sun, Daekyu, PhD, Associate Professor, Drug Discovery and Development

Discovery and development of a new therapeutic strategy to repress the transcriptional activation of the human VEGF, HIF-1 gene, RET, and other oncogenes with small molecules capable of binding selectively to non-canonical DNA structures formed within the promoter region of this gene; Study of the mechanism of action of novel anticancer agents derived from natural products: Investigation of DNA-repair interference as a potential approach for cancer treatment.

Thatcher, Greg, PhD, Professor & R. Ken and Donna Coit Endowed Chair in Drug Discovery, Drug Discovery and Development

Small molecule drug discovery projects have led to two cancer therapeutics having completed clinical trials in 2019, the result of applying modern techniques in medicinal chemistry, chemical and cell biology, and the use of animal models in an integrated multi-disciplinary approach. Students are expected to master at least one discipline in drug discovery and become conversant in all other aspects of the process. Current projects span Alzheimer's disease to COVID-19.

Vaillancourt, Richard R., PhD, Associate Professor, Pharmacology and Toxicology

Molecular and biochemical characterization of serine/threonine protein kinases that function as part of sequential protein kinase pathways.

Wang, Jun, PhD, Associate Professor and Track Director, Drug Discovery and Development

My lab is interested in developing antiviral drugs and elucidating their mechanism of action as well as resistance mechanism. We are exploring both small molecule and miniprotein-based therapeutics to target either viral proteins or host factors that are essential for viral replication. Targets of particular interest include ion channels and protein-protein interactions. We implement a wide variety of techniques for these studies including assay development (target-based and phenotypic-based), computational screening, medicinal chemistry, structural biology, virology, and in vivo animal models. The goal is to identify first-in-class drug candidates for emerging and re-emerging viruses such as influenza, enterovirus, zika and dengue viruses.

Wang, Wei, PhD, Professor, Drug Discovery and Development and Director, Arizona Center for Drug Discovery

My research aims at exploring innovative and useful chemical tools to address important and challenging biological questions in drug discovery and chemical biology. Toward this end, we take two approaches: 1) develop sustainable synthetic strategies including cascade reactions and organocatalytic and photochemical transformations to navigate new chemical space for drug discovery and 2) design functional molecular probes to understand the mechanism of action of proteins and spatiotemporally control cellular functions.

Wondrak, Georg, PhD, Director of Graduate Studies; Professor, Drug Discovery and Development

My research examines the pathological role of oxidative and proteotoxic stress in solar photodamage and melanoma/nonmelanoma skin cancer aiming at the design of novel molecular strategies for chemotherapeutic and/or cytoprotective intervention.

Yalkowsky, Samuel, PhD, Professor, Pharmaceutics and Pharmacokinetics

He is currently involved in basic research on the relationships between chemical structure and physical phenomena such as solubility, partitioning, and melting.

Zhang, Donna, PhD, Professor, Pharmacology and Toxicology

The research projects in my laboratory are focused on (1) Mechanistic studies of the Nrf2/Keap1 signaling pathway that is activated by oxidative stress and chemopreventive compounds, (2) the protective role of Nrf2 in arsenic-induced toxicity and carcinogenicity (this project is funded by NIEHS R01 award), and (3) regulation of gene expression by the ubiquitination and proteasomal degradation pathway.

Zhang, Qing-Yu, PhD, Professor, Pharmacology and Toxicology

Our main focus is to study the regulation of intestinal P450 expression and function by physiological, pathological, and environmental factors, and the P450 function in drug clearance, drug-induced toxicity, and inflammatory bowel disease.

3.0 PHYSICAL RESOURCES AND FACILITIES

3.1 LABORATORY SPACE

The Department of Pharmaceutical Sciences is housed in the College of Pharmacy building on the Health Sciences Center campus. In addition to individual research laboratories, shared laboratory space includes an autoradiography laboratory, a procedures laboratory, a general instrument laboratory, a tissue culture facility, and a pulmonary toxicology facility. We also have faculty housed in the Cancer Center, the Keating Bio5 building, and other AHSC locations.

3.2 EQUIPMENT RESOURCES

Availability of modern scientific instruments is crucially important to research and graduate education programs. We are fortunate to possess ample instrumentation to conduct research at all levels of biological organization. Each investigator's laboratory is equipped with specialized instrumentation required for research in their particular field.

Pharmaceutical Sciences laboratories are especially well equipped with instruments necessary for biological analysis, including spectrophotometers, amino acid analyzers, high performance liquid chromatographs, gas chromatographs, and a mass spectrometry facility. All laboratories have access to modern computers and data processing systems. The number of liquid scintillation counters, gamma counters, preparative centrifuges, as well as behavioral, neuropharmacological instruments is ample.

3.3 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.

3.4 EXPERIMENTAL ANIMALS

The availability of high-quality experimental animals is of great importance to modern research in Pharmaceutical Sciences. 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 who are involved in animal studies 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.

3.5 LABORATORY SAFETY AND ENVIRONMENTAL HEALTH.

Students who are engaged in laboratory research 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.

3.6 THE ARIZONA CENTER FOR DRUG DISCOVERY

The center was created to catalyze new drug treatment discoveries by connecting the right people with the right projects at the right time. By translating current research into commercialisable opportunities, the ACDD aims to create a portfolio which spans biologic targets, therapeutic areas, and modalities. The Center is advised by a Scientific Advisory Board, a highly collaborative, interdisciplinary group who oversees all the Center's initiatives.

3.7 CENTER FOR TOXICOLOGY SOUTHWEST ENVIRONMENTAL HEALTH SCIENCES CENTER

The Center for Toxicology was established in 1988. Funding is provided by the National Institute of Environmental Health Sciences established the Southwest Environmental Health Sciences Center (SWEHSC). The mission of the Center for Toxicology and SWEHSC, with over 50 investigators, is to expand and strengthen education, research and service in toxicology and environmental health sciences. For more information regarding the Center for Toxicology visit the website at:

<http://swehsc.pharmacy.arizona.edu/>

4.0 GENERAL INFORMATION

4.1 STUDENT RESPONSIBILITIES

Students are expected to fully comply with the Code of Academic Integrity as detailed by the University of Arizona Dean of Students: https://deanofstudents.arizona.edu/policies-and-codes/code-academic-integrity#student_responsibility

Students engaging in academic dishonesty diminish their education and bring discredit to the academic community. Students shall not violate the Code of Academic Integrity and shall avoid situations likely to compromise academic integrity. Students shall observe the generally applicable provisions of this Code whether or not faculty members establish special rules of academic integrity for particular classes. Students are not excused from complying with this Code because of faculty members' failure to prevent cheating.

The Graduate Program in Pharmaceutical Sciences emphasizes the following issues of the utmost importance to students. First, any student who is found to be using drugs for non-experimental purposes will be expelled from the Program. Second, 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. Third, students who choose the optional research 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.

Students must also be aware of Graduate College requirements and general University policies and deadlines. University policies can be reviewed at <https://catalog.arizona.edu/>.

4.2 ORIENTATION

All new students must attend an orientation session held prior to the first day of classes. The program coordinator will inform the incoming students of the time and location of this orientation in advance.

4.3 INDIVIDUAL HEALTH INSURANCE THROUGH CAMPUS HEALTH SERVICES

All Students at the University of Arizona are required to have health insurance.

Health insurance coverage for the fall semester begins the Monday prior to the beginning of classes and continues until 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 UAccess system. Continuing students who were enrolled in student health insurance in the previous semester will be automatically re-enrolled.

4.4 CREATING A UA EMAIL ACCOUNT AND NET ID, AND PHARMACY EMAIL 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.

After the UA student has created a UA Net ID, the student may access the University of Arizona UAccess Student Center System, also known as GradPath. Deadlines for the submission of paperwork pertaining to doctoral programs, as well as all forms, are available online through GradPath and can be accessed from: <https://uaccess.arizona.edu/>

4.5 FINANCIAL SUPPORT

The Department encourages students to work with the Office of Scholarships & Financial Aid and pursue outside funding as needed.

4.6 CHILD CARE SUBSIDIES AND FAMILY FRIENDLY INFORMATION

The Graduate College is dedicated to promoting and strengthening family relationships. Many resources have been designed to help graduate students balance and manage family, work, and school.

- Graduate Assistant/Associate Parental Leave at <https://grad.arizona.edu/funding/ga/benefits-appointment>
- Temporary Alternative Duty Assignments (TADA) for Teaching Assistants/Associates at <https://grad.arizona.edu/funding/ga/temporary-alternative-duty-assignments-graduate-assistantsassociates>
- Extension of Time to Degree Policy at <https://grad.arizona.edu/policies/academic-policies/extension-time-degree>
- Life & Work Connections - Child and Elder Care Resources <https://lifework.arizona.edu>

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 ensure that the courses are available to non-degree students. Up to twelve (12) 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 faculty may recommend conditional admission on a case-by-case basis. Prospective students applying for conditional admission must meet all Graduate College requirements including those referring to language skills as specified at the following link: <https://grad.arizona.edu/admissions/requirements/international-applicants#english-proficiency>

Conditional Admission due to an English deficiency 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.

6.0 MS PROGRAM IN PHARMACEUTICAL SCIENCES

6.1 ADMINISTRATION

The MSPS track director and Graduate Studies Programs Coordinator help the student plan his/her program.

6.2 RESEARCH

Research is not required for the MSPS degree. Students interested in pursuing a research opportunity are encouraged to speak with faculty directly to inquire about openings in labs. Students may then follow up with the graduate coordinator to sign up for PHSC 900 units.

6.3 REQUIRED COURSES FOR MS IN PHARMACEUTICAL SCIENCES (MSPS) DEGREE

A minimum of **33** units of course work in the area of the major subject including 2 seminar units will be counted towards the student's Plan of Study. Please note that seminar registration is required every semester.

REQUIRED COURSES

PHSC 501	Introduction to Pharmacology, Drug Discovery & Pharmaceutics (Fall)	4
PHSC 502	Pharmaceutics (Fall)	3
PHSC 511	Topics in Pharmaceutical Solids, Nanotechnology and Solid-State Particle Engineering Design in Drug Delivery (Spring)	3
PCOL 520a	Cellular Communications and Signal Transduction (Spring)	4
PCOL 530	Topics in Drug Discovery (Fall)	2
PCOL 535	General and Systems Toxicology (Fall)	3
PCOL 596a	Student Seminar (1 credit/semester)	2
PHSC 670	Principles in Drug Discovery, Design and Development (Spring)	4
<u>TOTAL</u>		<u>25</u>

ELECTIVE COURSES (8 UNITS)

PCOL 505	Current Techniques in Pharmaceutical Sciences (Fall)	3
PCOL 515	Mechanisms of Human Diseases (Spring)	4
BIOS 576a	Biostatistics (Fall, Spring)	3
PCOL 509c	Statistics for Research (Spring, even years)	
PCOL 550	Drug Disposition & Metabolism (Spring)	2
PCOL 595H	Problems in the Biology of Complex Diseases (Spring)	2
PHSC 543	Health Services Research Methods (Fall, odd years)	3
PHSC 513	Health Technology Assessment (Fall, odd years)	3
MCB 516a	Bioinformatics and Genomic Analysis (Spring)	3
PCOL 601a	Epigenetics in Development and Disease (Fall)	2

RESEARCH OPTION:

PCOL 900	Research (Fall/Spring/Summer)	1-4
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MINOR

A minor is **not required** for MSPS students.

6.4 SEMINAR PCOL/PHSC 596A

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. MSPS students are not required to present since research is optional. **Students are required to register for PCOL/PHSC 596a for the fall and spring semesters for their term of full-time residence in the Program.** Grades are calculated based on attendance.

6.5 CREDIT REQUIREMENTS AND TRANSFER CREDIT

A minimum of 33 units of course work in the area of the major subject must be completed. No more than 20% of the minimum number of units required for a master's degree can be transferred from other accredited institutions (e.g., if a Master's degree requires 30 units, then no more than 6 units can be transferred from another university). Such transfer credit can be applied to an advanced degree only upon satisfactory completion of deficiencies as prescribed by the head of the major department in which the student seeks a degree. Transfer of credit toward an advanced degree will not be made unless the grade earned was A or B, and unless it was awarded graduate credit at the institution where the work was completed. Grades of transfer work will not be used in computing the student's grade-point average.

Students who wish to transfer credit must submit a Transfer Credit form in GradPath before the end of their first year of study.

Grades and the number of units for transfer credits may be adjusted so that they are consistent with the University of Arizona grading and credit system. Transfer credits used on a fully approved Plan of Study appear with a grade of "T" on the University of Arizona transcript and are not calculated in the University of Arizona GPA. The name of the transfer institution appears on the University of Arizona transcript with the number of transfer units from that institution that were brought in towards the graduate degree.

6.6 REGISTRATION

Registration is accomplished through the University of Arizona UAccess Student Center System. UAccess Student Center can be accessed from: <https://uaccess.arizona.edu/> Contact the Program office for registration of courses that are not open to web registration.

6.7 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.

Full-time Graduate Student Status: Full-time status consists of a minimum enrollment in 9 units of graduate credit.

Non-credit courses, audited courses or courses from which the student withdraws do not count towards the determination of continuous enrollment. Unless excused by an official graduate Leave of Absence (which except under exceptional circumstances may not exceed one year throughout the student's degree program), all graduate students are subject to the Continuous Enrollment Policy. If the student fails to obtain a Leave of Absence or maintain continuous enrollment, he or she will be required to apply for re-admission and to pay the Graduate College application fee. There is no guarantee of re-admission. Tuition or registration waivers cannot be applied retroactively.

Please note that "continuous enrollment" is not the same as "full time enrollment" for financial aid purposes. Please refer to the University policy on [Full-Time Status](#).

Continuous Enrollment and Incompletes

Students who have maintained continuous enrollment, fulfilled all their other degree requirements and are only completing a grade of “Incomplete” in coursework (a class other than 900 level) are not required to enroll while they complete the “Incomplete.” If, however, students need library privileges or plan to use other University facilities or need significant faculty time while they complete their course requirements, enrollment is required.

6.8 EXAMPLE COURSE SCHEDULE MS IN PHARMACEUTICAL SCIENCES (FALL ADMISSION)

FALL - FIRST YEAR		SPRING - FIRST YEAR	
<u>Course</u>	<u>Units</u>	<u>Course</u>	<u>Units</u>
PHSC 501 Introduction to Pharmacology, Drug Discovery & Pharmaceutics	4	PHSC 511 Topics in Pharmaceutical Solids, Nanotechnology and Solid-State Particle Engineering Design in Drug Discovery	3
PCOL 530 Topics in Drug Discovery	2	PCOL 520a Cellular Communications and Signal Transduction	4
PHSC 502 Pharmaceutics	3	PHSC 670 Principles in Drug Discovery, Design and Development	4
PCOL 596a Student Seminar	1	PCOL 596a Student Seminar	1
<u>Total</u>	<u>10</u>	<u>Total</u>	<u>12</u>
SUMMER – FIRST YEAR (OPTIONAL)		FALL – SECOND YEAR	
PCOL/PHSC 900 Research	4	PCOL 535 General and Systems Toxicology	3
		PCOL 505 Current Techniques in Pharmaceutical Sciences	3
		BIOS 576a Biostatistics	3
		PCOL 601a Epigenetics in Development and Disease	2
		<u>Total</u>	<u>11</u>

6.9 EXAMPLE COURSE SCHEDULE MS IN PHARMACEUTICAL SCIENCES (SPRING ADMISSION)

SPRING- FIRST YEAR

<u>Course</u>	<u>Units</u>
PHSC 511 Topics in Pharmaceutical Solids, Nanotechnology and Solid-State Particle Engineering Design in Drug Discovery	3
PCOL 520a Cellular Communications and Signal Transduction	4
BIOS 576a Biostatistics	3
PCOL 596a Student Seminar	1
<u>Total</u>	<u>11</u>

SUMMER – FIRST YEAR (OPTIONAL)

<u>Course</u>	<u>Units</u>
PCOL/PHSC 900 Research	4

FALL - FIRST YEAR

PHSC 501 Introduction to Pharmacology, Drug Discovery & Pharmaceutics	4
PHSC 502 Pharmaceutics	3
PCOL 530 Topics in Drug Discovery	2
PCOL 535 General and Systems Toxicology	3
<u>Total</u>	<u>12</u>

SPRING – SECOND YEAR

PHSC 670 Principles in Drug Discovery, Design and Development	4
PCOL550 Drug Disposition & Metabolism	2
MCB 516a Bioinformatics and Genomic Analysis	3
PCOL 596a Student Seminar	1
<u>Total</u>	<u>10</u>

6.10 GRADES IN REQUIRED COURSES

Students must receive a grade of "B" or better in all required courses. A student who receives a grade of "C" or less in a required course must repeat that course. A student may submit a petition to the Pharmaceutical Sciences Executive Committee to have this repeat requirement waived; a waiver can be granted only with the written approval of the course instructor and approval from the Pharmaceutical Sciences (MSPS) Executive Committee. A grade of "C" or less in a required course constitutes grounds for dismissal from the Graduate Program.

6.11 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 were taken to satisfy the specific requirements for the MSPS degree. A student whose cumulative GPA is below 3.0 for two consecutive semesters will be dismissed. However, a student may take additional course work while in non-degree status. In order to further pursue the degree after dismissal from the Program, the student may apply for readmission to the Graduate College through their graduate department. Readmission is not guaranteed.

6.12 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.
- Student Evaluation – The Program Executive Committee evaluates each student based on accomplishments in formal courses and performance in other areas of the Program including attendance and participation in seminars as well as performance in courses. Failure to meet performance criteria in any of these areas is grounds for dismissal from the Program.

6.13 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 (MSPS). 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 may also appeal any Program decision. Students who wish to appeal the decision of the program faculty must submit an appeal in writing to the Director of Graduate Studies in the College of Pharmacy. For additional information regarding appeals and complaints, please refer to the Graduate College webpage here: <https://grad.arizona.edu/policies/academic-policies/summary-grievance-types-and-responsible-parties>

6.14 STUDENT EVALUATION

On behalf of the Program Faculty, the 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. Satisfactory performance in courses and research are also required. Failure to meet performance criteria in any of these areas will result in a written warning with an opportunity to remediate. Continued failure to meet performance criteria is grounds for recommendation to the Graduate College that the student be dismissed from the Program.

6.15 PLAN OF STUDY

Each student is responsible for developing a Plan of Study during their first year in residence, to be submitted in GradPath no later than the student's second 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 MSPS Track Director and Director of Graduate Studies before it is submitted to the Graduate College.

6.16 LIMITATION ON TIME SPANS

The MSPS degree can be completed in as little as 3 semesters (or 1.5 years). Students may attend part time as needed but are responsible to accurately plan their schedules in conjunction with the graduate coordinator. The Graduate College allows students 6 years to complete an MS program. Any extension beyond 6 years will require a petition.

6.17 TIMETABLE, FORMAL DOCUMENTATION, AND DEADLINES

The following forms and deadlines are required by the Program Office and Graduate Student Academic Services. All forms are submitted in GradPath through the University of Arizona UAccess Student Center System. UAccess Student Center can be accessed from: <https://uaccess.arizona.edu/>

- a. Responsible Conduct of Research (1st month in residence)
- b. MS Plan of Study (2nd semester in residence)