UNIVERISTY OF ARIZONA
COLLEGE OF MEDICINE
DEPARTMENT OF PHARMACOLOGY

MEDICAL PHARMACOLOGY GRADUATE PROGRAM
STUDENT HANDBOOK
2025-2026

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PREFACE

Welcome to the 2025-2026 Graduate Program in Medical Pharmacology at the University of Arizona. The **purpose of this handbook** is to guide you through the mechanics of obtaining an advanced degree in Medical Pharmacology and to explain the organization of our program. The handbook outlines the rules, regulations, and expectations of the degree process. It is intended to be used as a tool by you to understand and fulfill the requirements for obtaining your graduate degree. This handbook should be used in conjunction with current Graduate College Guidelines for current students (https://grad.arizona.edu/new-and-current-students). Most of the basic rules are policies of the Graduate College of the University of Arizona and must be followed by all programs offering graduate degrees. In those cases where the requirements are slightly different from those stated in the Graduate College, the requirements in this Handbook pertain.

The University of Arizona 2025-2026 academic calendar can be found: https://catalog.arizona.edu/calendar#2025-20261

Specialized requirements were established by the Executive Committee to ensure the quality of your training. As questions arise, good sources of information are the Director of Graduate Studies, Medical Pharmacology, Program Director of the Perfusion Sciences Graduate Program, Graduate Program Coordinator and your fellow students.

The most important component of your training will be the experience of designing, performing and evaluating your thesis/dissertation research under the direction of your mentor and committee. Courses will provide a valuable opportunity to discuss the fundamentals of pharmacology with established investigators and to learn how to approach and evaluate the scientific literature. A **critical goal** of the faculty is to teach you how to take responsibility and accountability for your own education. As a scientist, you must determine what you need to know and figure out how to get there to know it – be it in the classroom, library, laboratory or clinical care spaces. Attainment of a graduate degree in Medical Pharmacology requires outstanding scholarship and demonstration of distinguished research leading to a thesis that contributes significantly to the general fund of knowledge in the discipline. The degree is never granted solely as certification of faithful performance of a prescribed program of course study. **All degree requirements must be fulfilled**. The requirements for the degree are outlined in this Handbook.

We are pleased that you have chosen to pursue your research training here.
Best of luck as you begin your scientific careers.

GRADUATE PROGRAM ORGANIZATION

Executive Committee

The Executive Committee (EC) of the Graduate Program in Medical Pharmacology (GPMP) is charged with the administration of the Program (reporting to the Chair of the Department of Pharmacology and College of Medicine). The Graduate Program in Medical Pharmacology comprises all faculty members in the University who qualify for inclusion as Principal or Affiliated Faculty.

The Executive Committee consists of at least five members of the GPMP, appointed to renewable three-year terms by the Chair of the Department of Pharmacology. One member of the EC is appointed by the Chair of the Department of Pharmacology to serve for a renewable five-year term as Chair of the EC and Director of Graduate Studies in Medical Pharmacology.

Executive Committee Duties

- Develops and implements policies and procedures for the operation of the Graduate Program and for associated teaching and research programs of the GPMP.
- Evaluates nominations and applications for membership in the GPMP as Principal Faculty or Affiliated Faculty of the Program; Recommends GPMP faculty to the Department Chair to serve on standing or ad hoc committees of the GPMP.
- Reviews of all prospective students and acts on recommendations of the Admissions Committee regarding applications from prospective students.
- Has the right to evaluate annual progress reports of all students in the GPMP.
- Plans for future developments within the area of Medical Pharmacology at the University.
- Prepares and submits an annual report on Program activities and accomplishments to the Chair of the Department of Pharmacology.
- Ensures that regular reviews of the Program, consistent with requirements of the Arizona Board of Regents, are carried out.
- Seeks funding in support of the Program.
- Nominates GPMP faculty for EC membership to ensure continuity over time.
- Ensures that the GPMP website is revised annually.
- **Assessment of Program**: Utilizing the following methods, we continuously reevaluate our program to ensure that our goals and learning domains are appropriate.
    - Student course evaluations
    - Graduate Exit Interviews
    - Academic Program Review via self-study reports
    - Follow-up surveys (Qualtrics) on graduates to evaluate career development and success.

Current Executive Committee Members

- Tally Largent-Milnes, PhD, Chair of Executive Committee
- Todd Vanderah, PhD, Chair of the Dept of Pharmacology
- Jennifer Schnellmann, PhD
- Patrick Ronaldson, PhD
- Kathy Rodgers, PhD
- Raymond Wong, PhD, CCP

Director of Graduate Studies in Medical Pharmacology (Chair of the Executive Committee):

- With the assistance of the graduate program coordinator, administers the Program and the activities of the EC and GPMP.
- Convenes and chairs the meetings of the EC and the GPMP faculty.

- Evaluates annual progress reports of all students in the GPMP
- Acts on behalf of the EC to implement Program policies and procedures (e.g. to sign requests to schedule examinations, to approve recommendations for appointments to examination committees, etc.); and
- Serves as representative of the GPMP to the University administration, granting agencies, prospective students, etc.

Current Chairman of the Executive Committee
Tally Largent-Milnes, PhD
tlargent@arizona.edu

Graduate Program Coordinator
Works closely with the students, faculty, Executive Committee, Graduate College and standing committees to ensure timely fulfillment of UA and Graduate Program policies and flow of information, coordinate and manage department recruitment and assist faculty and students as needs arise.

Current Graduate Program Coordinator
Stephanie Schaller, MS
slschaller@arizona.edu

Department Administrator
Works closely with the students, faculty, Executive Committee, Graduate College and standing committees to ensure all financial/hiring needs are addressed.

Current Department Administrator
Amy Tary, M.Ed
atary@arizona.edu

Faculty
The faculty of the Graduate Program in Medical Pharmacology is organized into two categories: Principal Faculty and Affiliated Faculty. Appointment to one of these categories is based upon review of the candidate by the Executive Committee with respect to the criteria given below; continuation of participation is contingent upon meeting the same criteria at the annual review by the Executive Committee.

Principal Faculty: Tenure eligible or tenured faculty in the Department of Pharmacology at The University of Arizona who are admitted to membership in the GPMP by fulfilling the following criteria:
- One who is recommended by a Principal faculty to serve as Major Advisor to a graduate student conducting dissertation research in medical pharmacology.
- One who is active in research in medical pharmacology (as assessed by current record of research support, publication of recent, and referred papers based upon that research).
- One whose pharmacologic research constitutes a major component of her/his overall research program; and
- One who actively participates in any of the service or teaching activities of the GPMP.

Affiliated Faculty: Faculty who have a primary appointment in a university department or unit outside that of the Department of Medical Pharmacology and fulfill the following criteria:
- One who is active in research (as assessed by record of research support, publication of recent, and referred papers based upon that research) OR
- One who is interested and knowledgeable in pharmacology but not necessarily actively involved in current research in the field; and

- One who contributes significantly to the goals of the Graduate Program by teaching Graduate Program courses, organizing seminars, serving on Graduate program committees, etc.

Participating Faculty: Principle, Research and Affiliated Faculty presently associated with the Program and are listed below. Their research interests can be found at www.pharmacology.arizona.edu/. Students wishing to conduct research with Affiliated Faculty Members **MUST** request approval from the Executive Committee.

Current Faculty Members

Principal (Tenure Track) Faculty

Trent Anderson, Associate Professor, PhD, Queen's University, 2001. Migraine, traumatic brain injury, post-traumatic headache, neural imaging, electrophysiology, neural circuits, neuropathic pain

John W. Bloom, Associate Professor, M.D., Jefferson University, 1971. Molecular mechanisms of glucocorticoid action in the lung; mechanisms of eosinophil apoptosis; effects of genetic polymorphisms on gene expression in asthma.

Roberta (Robbie) Brinton, Professor, PhD

Thomas P. Davis, Professor, Ph.D., University of Missouri-Columbia, 1978. Neuropharmacology; molecular regulation of growth factor processing and metabolism; biotech approaches to targeting the blood-brain barrier for new drug development; effects of hypoxia, aglycemia and nicotine on endothelial cell permeability, resistance and cytoarchitecture.

Tally M. Largent-Milnes, Associate Professor, Ph.D., University of Arizona, 2010. Trigeminal (Vc) physiology; neuropathic pain; migraine, drug delivery, drugs of abuse rational design of multifunctional compounds to treat chronic pain.

Nam Lee, Professor, PhD., University of Iowa, 2005. Pancreatic Cancer, vascular biology, signaling, protein chemistry, organelle dysfunction.

Edita Navratilova, Associate Professor, Ph.D. Neuropharmacology of pain; brain circuits for pain, relief of pain and reward; opioid neurotransmission; mechanisms of acute and chronic pain.

John D. Palmer, Professor Emeritus, Ph.D., M.D., University of Minnesota, 1961. Pharmacology; cardiovascular and clinical pharmacology; studies of cardiovascular and pulmonary changes associated with acute hypersensitivity responses and systemic anaphylaxis.

Frank Porreca, Cosden Professor of Pain and Addiction Studies, Ph.D., Temple University, 1982. Pain, Migraine, Post-traumatic Headache, Female Pain Disorders, Opioids, Addiction Biology

Art Riegel, Associate Professor, Ph.D., University of Arizona, 2001. Addiction, Relapse, Chronic Pain, Stress, Neuropharmacology, Electrophysiology, Cellular Mechanisms of Behavior

Kathy Rodgers, Professor, Ph.D.

Patrick Ronaldson, Professor, Ph.D., University of Toronto, 2007. Physiology/Pathology of the Blood-Brain Barrier; drug transport; effect of pathophysiological insult on CNS drug delivery; intracellular signaling systems.

John Streicher, Professor, Ph.D., University of California – Los Angeles, 2009. Pain; Opioid; Cannabinoid; Terpene; Orphan Receptors; Adenosine; Signal Transduction

Todd W. Vanderah, Professor, Ph.D., University of Arizona, 1995. Mechanisms and pharmacology of acute and chronic models of pain; endogenous opioid systems; sensory neural systems; opioid tolerance. antinociceptive synergy between cannabinoids and opioids.

Raymond K. Wong, Assistant Professor and Perfusion Sciences Program Director, Ph.D., University of Arizona, 2001. Cardiopulmonary Bypass; ECMO: Mechanical Circulatory Assist Devices; anticoagulation/hemostasis therapy and diagnostic testing; blood management in the cardiac surgery patient population.

Fei Yin, Associate Professor, Pharmacology, Assistant Director, Center for Innovation in Brain Science, PhD in Pharmaceutical Science, University of Southern California, 2012. Alzheimer's disease, mitochondrial dysfunction, neurodegeneration, neuroinflammation, lipid metabolism, astrocyte.

Principle Research Track

Chris Cartmell, Research Assistant Professor, Ph.D., The University of St Andrews, 2019. Natural Products, Drug Discovery, Microbiology, Microfluidics

Sally Dickinson, Research Associate Professor, Ph.D., University of Arizona, 2005. Skin Cancer Prevention, Ultraviolet light, topical intervention, mouse models, signaling

Timothy Johnstone, Research Assistant Professor, Ph.D.

Carol Kopruszinski, Research Assistant Professor, Ph.D.

Jeff Lochhead, Research Assistant Professor, Ph.D.

Laurent Martin, Assistant Professor, Ph.D., University of Lyon, France, 2018. Alzheimer & Pain, Photoneuromodulation, from BioChem to Clinical Trials.

Michael H Ossipov, Research Associate Professor, Ph.D., Philadelphia College of Pharmacy & Science, 1982. Pharmacology; neurophysiology, pharmacology and neuroanatomical pathways of acute and chronic pain states; isobolographic and statistical interpretation of drug-drug interactions.

Jacob Schwartz, Associate Research Professor, Ph.D., 2010. UT Southwestern Medical Center Cancer Biology, Nucleic acids, transcription, sarcoma, fusion protein, biochemistry, drug discovery, virus infection

Primary Teaching Faculty

Jennifer Schnellmann, PhD
Paul Gordan, MD
Sigrid (Siri) Williams, MD

Affiliated Faculty

Jennifer De La Rosa, Research Assistant Professor, Director of Strategic Planning Comprehensive Center for Pain and Addiction, Ph.D., University of Arizona, 2013. Chronic pain, depression, anxiety, mental health, substance use, population neuroscience.

Mohab Ibrahim, Professor of Anesthesiology, Pharmacology, Neurosurgery, M.D., Ph.D., University of Arizona, 2008. Director of Chronic Pain Clinic & Chronic Pain fellowship, Medical Director Comprehensive Center for Pain and Addiction, Photoneuromodulation, neurodegenerative disease, Clinical Trials, Complementary medicine.

Ron Lynch, Professor, Ph.D., University of Cincinnati**.** Research in the Lynch lab focuses on second messenger signaling in vascular smooth muscle cells and nutrient sensing cells (e.g., Pancreatic Beta-cells) with emphasis on alterations in signaling that occur during development of Diabetes.

Aubin Moutal, Assistant Professor, Ph.D., St. Louis University

Paulo Pires Associate Professor, Ph.D., University of Arizona Physiology

Robin Polt, Professor Chemistry, PhD, 1986, Columbia University. Brain-penetrant glycopeptide drugs, pain, addiction, neurodegeneration.

F. Mazda Shirazi, M.D., Ph.D. Clinical Emergency Medicine, Medical Director Arizona Poison Control Center.

Faculty Mentor Responsibilities

This section details the expected responsibilities for Faculty as it relates to personal, financial, academic, and research. These are conversations you as a student will need to initiate iteratively until you graduate (the more you learn the more independent you become showing us progress on your path towards a goal of graduation).

As Faculty, we will be:

- Be honest and fair, respectful, and transparent
- Provide periodic and meaningful feedback on performance within the lab.
- Provide clear communication of expectations and consequences
- Be reasonably responsive, timely (including deadlines), available, and useful.
- Provide training/experience/work that aligns with our research goals and simultaneously meets your goals and prepares you to pursue your future.
- Assign tasks that are reasonable and useful in size and scope.
    - Total workload (e.g. tasks, research duties, coursework, outside commitments) will be considered when assigning tasks. The ultimate purpose (the why and the what) of any assigned task will be described by us or a delegated individual (Research Professor, Lab Manager, etc.).
- Respect (within reason) outside commitments, particularly those centering on family and health.
- Be a sounding board for professionalism and, where reasonable and desired, personal issues.
- Attend departmental functions (e.g., seminars) when able to do so.
- To teach you how to:
    - be a doctor of learning.
    - think critically.
    - ask scientific questions.
    - identify the most vital strategies to answer said questions.
    - problem solve.
    - interpret data in the context of your experiments, experience, the literature and peers.
    - manage a project.
    - find confidence in your role in STEM.

STUDENT RESPONSIBILITIES

OVERVIEW

This section details the expected responsibilities for each student as it relates to personal, financial, academic, and research.

Orientation

All students are required to attend the Pharmacology Department Orientation. The Graduate College Orientation is required only of students who plan to teach and must attend Graduate Assistant/Associate Teaching Orientation GATO with the Department of Pharmacology.

Individual Health Insurance through Campus Health Services

Students who are hired as a Graduate or Research Assistant/Associate (GA/RA) are eligible to receive individual health insurance through Campus Health Services. This benefit is not transferable.

Registration for health insurance is completed through Student Center in UAccess Student. The URL https://uaccess.arizona.edu/.

Please refer to the Graduate Assistant/Associate Health Insurance Benefit page on the Campus Health Service website for information about enrollment deadlines and coverage. The URL is https://health.arizona.edu/

Once enrolled, you will be automatically re-enrolled in future semesters upon class registration (regardless of assistantship status) unless one cancels the coverage during an Open Enrollment period. Once the enrollment period closes, students will be unable to add, cancel, or change coverage until the next enrollment period.

If you resign or are terminated from your GA/RA position during the period of coverage, you will be personally responsible for payment of the remaining coverage.

Creating an Electronic Mail/Computer Account

All students are eligible to request a computer account. Accounts can be obtained by visiting University Information Technology Services (UITS) website at: https://it.arizona.edu/

Please note that to establish an email account, students must first create a UArizona Net ID, go to https://netid.arizona.edu/

The UA NetID is a secure, efficient way for the University and its computer systems to ensure the identity of an eligible user before allowing access to potentially sensitive information. UA NetIDs allow access to a growing number of online services at the UA using a single sign-on (one username and one password) system.

Program notices, seminars, fellowship/scholarships, employment opportunities, etc. are posted on electronic mail so it is mandatory that all students immediately obtain a UArizona electronic mail/computer account.

Work Related Travel Policy, Vacation Guidelines, Out Sick

Students are required to notify both their Major Advisor and the Graduate Program Coordinator when they make vacation plans or are ill. Attendance at scientific meetings or specialized courses is not considered vacation or research conducted away from the University of Arizona. All Work related travel must have a travel authorization filled out (https://finance.arizona.edu/form/travel-authorization-

form) Graduate students are also research trainees and University employees, so interpretation of holidays can be complicated. As trainees anticipating a research career, graduate students should use the semester breaks and the summer to work in the laboratory or library. They will find that these class breaks allow long periods of uninterrupted work that are essential for the completion of research or writing projects. First year students should consult with the Graduate Program Coordinator or Director of the Graduate Program or with more advanced students for guidelines on how much vacation is considered appropriate. Once students are in the laboratory of a major professor, they should discuss with their advisor when to take vacations and how long they will be gone from the laboratory.

Leave of Absence Policy

A "Leave of Absence" (LOA) may affect the status of a graduate student's financial aid. Students are responsible for determining the requirements of their funding agency and/or academic unit prior to applying for a "Leave of Absence."

A. Academic Leaves Academic LOAs (i.e. leaves taken for coursework elsewhere, for research, field work, internships, professional development, etc.) are handled on a case-by-case basis by the student's department and the Graduate College.

B. Personal Leaves

Graduate students in degree programs may apply and be granted a "Leave of Absence" (LOA) for a maximum of one (1) year throughout the course of their degree program (cumulative). A LOA form (http://grad.arizona.edu/; https://grad.arizona.edu/policies/enrollment-policies/leave-absence) and a written recommendation by the student's advisor should be submitted to the department head for approval and forwarded to the Graduate College for final approval. A LOA may be granted retroactively for up to one (1) year. *[Refunds of tuition paid for the retroactively applied LOA will not be granted].* LOA's are granted on a case-by-case basis or compelling reasons including birth or adoption of a child, personal or family reasons, military duty, or financial hardship. Students will be re-admitted without reapplying to the department and the Graduate College. Only when the LOA is approved prior to the beginning of the semester for which the LOA is being sought will students be exempted from fees for that semester.

Only academic services or facilities available to the public can be used during the LOA. **Failure to obtain a "Leave of Absence" or remain in continuous enrollment will result in penalties, as described in the Continuous Enrollment policy requirements.**

Continuous Enrollment Policy

A student admitted to a doctoral program AND **not** in a GA- or TA-ship **MUST** register each fall and spring for a minimum of three (3) graduate units from original matriculation until the completion of all course requirements. When these requirements are met, doctoral students **MUST** register for a minimum of one (1) unit each semester until final copies of the dissertation are submitted to the Graduate Degree Certification Office. However, students receiving funding such as assistantships, fellowships, loans, grants, scholarships or traineeships may be required by their funding source to register for more than one (1) unit to meet full-time status requirements and should check with the Graduate Program Coordinator regarding such requirements to ensure they remain qualified for funding. If degree requirements are completed during the summer, Ph.D. students do not need to register. If you are an M.S. student, you **MUST** be registered for 1 unit.

Unless excused by an "Official Leave of Absence" (which in no case may exceed one year throughout the student's degree program), all graduate students are subject to the Continuous Enrollment Policy and **MUST** pay in-state or out- of-state tuition and fees to remain in the program. If the student fails to obtain a "Leave of Absence" or maintain continuous enrollment, he or she will pay all overdue tuition

and fees, including cumulative late penalties. No tuition or registration waivers will be applied retroactively.

FINANCIAL SUPPORT

Doctoral Program

Rotations are covered by the intake program (i.e., ABBS). Financial assistance in the form of a graduate research assistantship is available to all Ph.D. students admitted into the Program. Future support will include graduate research assistantships (a.k.a. GA-ship) funded by the student's research advisor. Assignment of students to training grants is a responsibility of individual training grant advisory committees. Students are highly encouraged to apply for individual pre-doctoral fellowships from sources outside the University. Appointments such as graduate research assistants provide a waiver of tuition, health insurance and in-state registration fees.

MD/PHD Program

During Rotations, Students will still be within the MED curriculum and receive their Stipend as standard through the College of Medicine. Once a lab is chosen, support will include graduate research assistantships (a.k.a. GA-ship) funded by the student's research advisor. Assignment of students to training grants is a responsibility of the grant advisory committees. Students are highly encouraged to apply for individual pre-doctoral fellowships from sources outside the University. Appointments such as graduate research assistants provide a waiver of tuition, health insurance and in-state registration fees

Students will be charged the fee/tuition of that program in which they are enrolled. For example, College of Medicine fees would be charged in years 1 and 2. The Program Coordinator for the student's first program/year will be responsible for letting the bursar's office know the enrollment status of the student.

MS Medical Pharmacology Program

There are no dedicated financial aid funding sources for master's students as there is no official Medical Pharmacology Master's program. There are several small external scholarship programs that students can apply for once enrolled in the program. Students are encouraged to submit FAFSA applications to be considered for federal student loan programs prior to matriculating. When funds are available, individual mentors may cover MS costs like a graduate assistantship for PhD students (see above).

MS Medical Pharmacology-Perfusion Sciences Program

There are no dedicated financial aid funding sources for Perfusion Sciences students. There are several small external scholarship programs that students can apply for once enrolled in the program. Students are also encouraged to submit FAFSA applications to be considered for federal student loan programs prior to matriculating.

Financial Support for International Applicants/Students

Additional requirements for financial aid eligibility apply to international applicants. Please see the following page for more information: https://international.arizona.edu/international-students/financial-guarantee-requirement-new-students.

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 as 1-800-829-1040 and ask for the scholarship/ fellowship publication or visit the IRS forms/publications website at http://www.irs.gov/forms_pubs/.

GENERAL COURESWORK INFORMATION

Course Registration

Each October (for Spring registration) and March (for Fall registration), students are responsible for enrolling themselves in the appropriate courses and credit hours using UAccess Student, available at http://uaccess.arizona.edu/.

For 900-level research or dissertation units, an Excel sheet will be distributed by the Graduate Coordinator to all GPMP graduate students. These credits are not available for self-enrollment and will be processed separately.

Students are responsible for ensuring accurate registration for all other courses and units.

For courses outside of Pharmacology, enrollment must be completed through UAccess. Detailed information on registration dates and deadlines for fall, spring, and summer terms can be found on the UAccess Student portal.

For course(s) outside of Pharmacology, registration is accomplished through UAccess which is located online at http://uaccess.arizona.edu/. Detailed information including dates and times to register is available online through UAccess Student at http://uaccess.arizona.edu/ for fall & spring semesters and for summer terms.

Waiver of Core Courses

To waive a core course, the student must submit a letter and supporting documents to the Medical Pharmacology Executive Committee, in their first year of study.

The student must first meet with the instructor of the course he/she would like to waive. It is advised that the student bring evidence of the content of the comparable course previously taken (e.g. course outline, textbook) and show proof of an acceptable grade (A or B), to the meeting.

If the instructor approves, the student should then submit a letter with the supporting documents and letter from the instructor to the Chairperson of the Executive Committee. The Chairperson will forward the above material to the Executive committee for final approval.

Transfer of Coursework

Please see this link from the Graduate College for the most up-to-date information: https://grad.arizona.edu/degree-services/degree-requirements/doctor-philosophy#credit-requirements

Graduate credit earned at other approved institutions, if accepted by the Executive Committee of the major department and the Graduate College and grade was A or B, may be counted toward the requirements of this degree, but will not be calculated in the University of Arizona G.P.A. There is no maximum as long as 30 units of residency are completed here. All required units of credit must be at the 500-level or above at The University of Arizona (or, in the case of transfer units, their equivalent at other institutions). Credits for correspondence courses or extension work obtained at other institutions will not be accepted for graduate credit at the discretion of the Executive Committee. Students who wish transfer credit **MUST** submit an **"Evaluation of Transfer Credit"** form before the end of their first year of study.

Minimum Academic Requirements

At least half of a student's total credits must have letter grades assigned (i.e., A, B). Students **MUST** maintain a 3.0 GPA. Probation will result if a student's GPA falls below this minimum. Probation on probation will receive notification from the Graduate College outlining what must be done to resume good standing. A student can be dismissed if the student's GPA does not improve in the next semester to a 3.0 GPA. An overall GPA of 3.0 must be obtained to receive the master's or doctoral degree. Individual Program (i.e., Ph.D., MS, MD/PhD, Perfusion) course credit requirements (Letter grade vs P/F/S) are listed in each individual section.

No Grade Replacement Opportunity (GROs) may be applied to graduate level work per the Graduate College policies.

Graduate Research Assistants Minimum Registration

All graduate students in the Graduate Program in Medical Pharmacology who are supported by or through the University (i.e., GA-ship, TA-ship) are full-time students. All full-time students are expected to enroll for some combination of coursework, research, or independent study that result in **twelve (12) units** of credit for the academic semester and maintain a 3.0 or above GPA. Students completing their degree in an academic semester may register for six (6) units of credit **ONLY ONCE**. If the degree is not completed, **twelve (12) units** of credit will be required during an academic semester.

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 Fall and Spring semester term during which requirements are completed.

Academic Probation

Students who have a cumulative grade-point average of less than 3.0 will be placed on academic probation. Students on probation are required to meet with their advisor, Graduate Program Coordinator and the Director Graduate Studies to discuss the steps to be taken to remediate the problem(s) that led to the probationary status and devise a written plan of action. **Students who are on probation for two (2) consecutive semesters will be converted automatically to non-degree status by the Graduate College.** Such students may continue to take graduate courses in non-degree status but will lose their funding. Students can apply for readmission to a degree program as early as the semester after their conversion to non-degree status if they achieve a cumulative grade point average of at least 3.0 through additional graduate coursework.
Such a request must be supported by the Chair of the major department.

Artificial Intelligence

The University policies on AI in teaching and learning can be found https://ucatt.arizona.edu/teaching/artificial-intelligence-teaching-learning. As a department, changes from the above policy will be updated as developed. Students are expected to consult with their advisor and committee members to determine appropriate use of AI as it falls within university policy.

Satisfactory Academic Progress in Medical Pharmacology Graduate Program

A high level of performance is expected of students enrolled in a graduate degree program. Students are required to demonstrate satisfactory academic progress toward degree completion. The Program's policies (see below) on what constitutes satisfactory academic progress are on file at the Graduate College in the Office of the Dean:

A. All students are required to submit an Annual Report signed by their advisor on or before **June 1st** of each calendar year while in the program. All students supported by or through the Univer-

sity are full-time students and are expected to enroll in twelve (12) units of credit for each academic semester.

B. All students are required after the formation of an advisory committee, to have at least one advisory committee meeting per year while in the Program; dates must be reported to the Graduate Coordinator.
C. Students **MUST** receive a grade of "B" or better in all required courses. Graduate students must maintain a 3.0 GPA. A grade of "D" or less in a course constitutes grounds for dismissal from the Graduate Program.

Additionally, students are expected to:

D. Complete the required and elective coursework in a timely manner under the ethical constraints of the College in which the course is being offered and in accordance with student conduct policies of the University.
E. Conduct their experiments in an ethical manner; experimental fraud related to the creation of false data, plagiarism, or the unethical 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 advisor at any time.
F. Any unauthorized use of drugs from a university laboratory will be grounds for dismissal from the Program in accordance with university procedures.

Grad Path

Each Program (Doctoral, Masters) have their own distinct GradPath forms. Please visit https://grad.arizona.edu/degree-services/gradpath to identify the correct for your path.

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: https://uaccess.arizona.edu/ > Student Center > Advising > GradPath > GradPath Forms.

FORM	TIMELINE
1. Responsible Conduct of Research	1st month
2. Code of Academic Integrity	1st month
3. Doctoral Plan of Study (see details below)	by end of 2nd semester
4. Oral Comprehensive Examination Committee Form	3rd semester
5. Announcement of Doctoral Comprehensive Exam	submit no later than one month prior to Oral Examination
6. Doctoral Dissertation Committee Appointment	submit after passing Comprehensive Exam
7. Prospectus Proposal Confirmation	print from GradPath and take to Oral Examination; submit to dept after passing Comprehensive Exam
8. Announcement of Final Oral Defense	submit no later than one month prior to defense

Plan of Study

A "Plan of Study" form MUST be completed and submitted through UAccess Grad Path and approved by the end of the third (3rd) semester in residence at The University of Arizona before the date of the written comprehensive examination. A minimum of 36 units of course work in the major subject will count towards the student's Plan of Study in Grad Path. A minimum of 9 units in the minor subject and 18 units of dissertation must also be completed. **To complete the PhD program, a total of 66 units are required.** See below for the recommended coursework schedule. This form must be approved through UAccess GradPath by the major and minor advisor, the Director of Graduate Studies and the Graduate Program Coordinator. The student should be advised that the "Plan of Study" represents a

binding agreement between the student and the department for fulfilling the doctoral requirements. **This document must not be taken lightly as the student is expected to finish all items listed therein.**

Journal Club & Research Seminar

Weekly seminars are an important component of the Graduate Program and are sponsored by the Graduate Program and the Department of Pharmacology. All students are required to attend the Research Seminar and the Journal Club. Failure to attend and participate the Research seminar constitutes valid grounds for dismissal from the Program. After completion of formal courses and during the pursuit of the dissertation or thesis research, students are required to continue to attend and present at departmental seminars for their term of residence in the Program.

PHCL 596B Research Seminar

Wednesday, 11:00 – 12:00, AHSC 8403

These seminars are presented by the students 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 PHCL 596C for the Fall and Spring Semesters for their term of residence in the Program**. The grades are calculated based on presentation quality, professionalism and attendance. First year students are not required to present a seminar, so their grade will be determined by attendance only. Ph.D. students are required to present in year 2 and every subsequent year until their term of residence is complete. MD/Ph.D. and PharmD/Ph.D. students are required to present two (2) seminars, and M.S. students are required to present a total of one (1) seminar.

PHSCL596C Critical Literature Review (Journal Club)

Wednesday, 12:00-12:50, AHSC 8403

Each student* is required to attend the weekly meeting of the Critical Literature Review and lead a discussion on a scientific topic (for example, journal articles, job talk, etc.) Presentations must be held for a minimum of 20 minutes. Students' attendance and performance in these forums will be evaluated by the course Instructor. Students are required to turn in peer evaluations no later than twenty-four hours of the seminar. If an evaluation is not turned in, it will be considered an absence, a "C" grade will be given for two unexcused absences.

*Students enrolled in Perfusion Science are exempt from journal club

DOCTORAL PROGRAM

PROGRAM OVERVIEW

The Doctoral Program in Medical Pharmacology abides by outlined information through the Graduate College for Doctoral Programs which can be viewed at https://grad.arizona.edu/degree-services/degree-requirements/doctor-philosophy. Program specific information can be found in the sections below.

Expectations and Outcomes

The Doctoral Program in Medical Pharmacology is designed to train the next generation of scientific leaders through comprehensive education, research, and professional development. Students will develop and demonstrate the following competencies:

1. **Subject Matter Expertise in a Major Field**
   Students will gain deep expertise in Medical Pharmacology. Mastery is developed through advanced coursework, mentored research, and culminates in the successful completion of the comprehensive examinations and doctoral dissertation.

2. **Comprehension of a Minor Field of Study**
   Each student selects a minor area of study to complement their primary discipline. The minor may be chosen from other appropriate Ph.D. minors across the University of Arizona. Selection should be made in consultation with the student's advisor to ensure alignment with research and career goals. Competence is demonstrated through relevant coursework and performance on the comprehensive exams.

3. **Research Competency and Scientific Rigor**
   Students will build strong research skills through a structured sequence of research methodology courses and specialized training aligned with their dissertation project. Key milestones include the completion of comprehensive exams, as well as the doctoral dissertation itself. These experiences cultivate independence, critical thinking, and the ability to design, conduct, and interpret rigorous scientific research.

4. **Proficiency in Scientific Communication**
   Clear and effective communication—both written and oral—is a critical skill for success in science. Students will hone these skills through course assignments, presentations, manuscript submissions, and active participation in conferences, seminars, and workshops. Communication proficiency is assessed through the seminars presented as part of the Departmental Seminar Series, comprehensive exams, the dissertation, and the final dissertation defense.

5. **Professionalism and Service to the Academic Community**
   Students will engage in the broader scientific and academic community by participating in departmental activities, academic conferences, and professional service. Professionalism is evaluated during seminars and through biannual reviews with research and teaching supervisors and annual faculty assessments.

First-Year Supervision

The Graduate Coordinator and Chair of the Executive Committee or umbrella program director (i.e. ABBS) advise each student during their first-year program of study. During their first year, students should meet individually with faculty whose research is of particular interest or potential interest. Students will then select a research advisor after completing laboratory rotations during their first year.

Research Laboratory Rotations

This is accomplished in two steps: (a) Either before or immediately after arrival, first-year students should examine and become familiar with the Program Faculty that is maintained on the Program's website http://www.pharmacology.arizona.edu/facultybio.cfm; and (b) Each student should meet individually, with several members of the Faculty of the Program to discuss the research activities of, and opportunities with, those faculty. It is strongly suggested that students prepare for such meeting by reading all recent manuscripts, i.e. last five years of each laboratory in which they wish to rotate.

Each student in the Medical Pharmacology Program **MUST** take two (2) and no more than three (3) research rotations in the first year of the program. The required course PHCL 586A and B provide a formal mechanism for these rotations, the purpose of which is for the student to have a "hands-on" experience in several areas of interest to her/him, to learn cutting edge methods in the field and to gain skills in critical literature, review and become familiar with critical research work and findings of the laboratory and research group of prospective dissertation advisors. Faculty members **EXPECT** a serious and conscientious effort on the part of rotation students, but successful rotations will not necessarily lead to the completion of a specific project and/or publication.

To receive credit for PHCL 586A and B the student **MUST** submit a rotation report that may be obtained at http://www.pharmacology.arizona.edu/graduateforms.cfm, and submitted to the rotation advisor at the completion of each rotation. The rotation report **MUST** be signed by both the student and the faculty member.

A grade will not be issued until the report is turned in. Students may receive credit for PHCL 586A and B during the fall and spring semesters of their first year.

Rotation Schedule

- Rotation 1 Begins: September 1 – October 30
  - (Search for Advisor: August 15-August 30)
- Rotation 2 Begins: November 1 – January 30
  - (Search for Advisor: October 15-October 31)
- Rotation 3 Begins: February 1 – April 15
  - (Search for Advisor: January 15-January 31)

Research Advisor and Advisory Committee

After 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 their decision to the Director of the Graduate Program and should occur after the 3rd rotation is complete (April 15). The Major Advisor must be a Principal or Affiliated Faculty member in the Program. If the Student is a member of an umbrella program (i.e., ABBS) both directors must be notified.

Affiliated Faculty who serve as the Major Advisor must be actively involved in research. If 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 Affiliated Faculty member, permission from the Executive Committee is required.

At the time the Research Advisor is selected, or within a year after, the selection of the remaining Research Advisory Committee is formed. The Advisory Committee consists of three (3) members from the Program Faculty and two (2) from the minor field and is chaired by his/her Research Advisor. The Research Advisor discusses membership of the Advisory Committee with the student and recommends the composition of the Advisory Committee to the Executive Committee which may modify Committee

membership. Faculty members of the Advisory Committee are selected based on 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. These members can be the same for Comprehensive Exams, Proposal and Dissertation if desired.

The Advisory Committee will meet with the student at least once a calendar year (June 1 – May 31) to review progress in coursework and research. The student is required to provide their Committee with a written report prior to each advisory Committee Meeting. Additionally, students must present an oral presentation of their research progress at each annual Advisory Committee Meeting. Students must provide this report to **all Advisory Committee Members at least two weeks before their scheduled meeting.** The student is required and will be responsible for presenting a dissertation proposal to their Advisory Committee which includes an outline of the background, preliminary data and goals of the proposed dissertation topic. The Advisory 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 their Advisory Committee shortly before scheduling their written/oral comprehensive exams and the final defense. You **MUST** indicate in your Annual Report the date of your Annual Committee Meeting. Once the Advisory Committee is formed, the student will then meet with that committee annually.

Annual Committee Meeting Format

Year I: Student completes 2-3 rotations and submits report to the Graduate Program Coordinator who will in return submit to the Director of the Graduate Program for review after each rotation.

Year II: Student completes their annual report to present to their committee or executive committee and advisor (if full committee has yet to be selected) and discuss classes/grades. The student will select a project with hypothesis and aims. The student with their committee or executive committee will discuss dates for their written comprehensive exams.

Year III: The student will discuss with their committee the complete project with hypothesis and aims for the future

Year IV: The student will discuss only new data, any problems that have arisen, dates for completion and publication progress.

Year V and Until Completion: The student will discuss only new data, any problems that have arisen, dates for completion and publication progress.

Annual Reports

Each student is required to submit an Annual Report to the Advisory Committee and the Graduate Coordinator on or before June 1. The Annual Report **MUST** be approved and signed by the Faculty Research Advisor prior to submission to the Graduate Program Coordinator who will in return submit it to the Director of the Graduate Program for review. These reports are in addition to the Research Report that is required prior to each Advisory Committee Meeting every year. Following submission, the student is expected to schedule a meeting with the DGS to review content.

If performance is substandard, the Advisory Committee may recommend a probationary period, withdrawal of program sponsorship, the possibility of dismissal, or they may request the student to fulfill the requirements for a Master's degree. The Chair and Executive Committee will evaluate overall student performance in the Program to date. If performance is satisfactory, approval will be granted.

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 applied for and received, and a succinct and lucid summary of research progress. The Annual Report **MUST** be approved and signed by the Advisor of the Program and before the year's work is considered complete. **Students who do not meet this deadline will receive a one-time email requesting the information be provided immediately or the student will be dropped from the Program for failure to meet Program degree requirements.**

Candidacy for an Advanced Degree

Admission to graduate study does not imply admission to candidacy for an advanced degree. Candidacy is determined after the student has demonstrated, at The University of Arizona, the ability to accomplish graduate quality work with originality and independence including passing written and oral comprehensive exams and completing major (36, not dissertation) and minor (9) units. Until admitted to candidacy, a student should not plan to take the final examination (i.e., dissertation defense) at a particular time.

COURSEWORK

Please see the Student Responsibilities section for information regarding registration and regulations.

A minimum of 36 units of course work in the major subject will count towards the student's Plan of Study in Grad Path. A minimum of 9 units in the minor subject and 18 units of dissertation must also be completed. **To complete the PhD program, a total of 66 units are required.** See below for the recommended coursework schedule.

Required Courses

BIOS576A	Biostatistics in Public Health	3
PHCL601A	Pharmacology: General Principles	2
PHCL601B	Endocrine & Immune System Drugs	2
PHCL601C	Cardio, Pulmonary, GI & CNS Drugs	2
PHCL551A	Molecular Targets of Pharm Agents	3
PHCL553	Neuropharmacology/Drug Abuse	3
PHCL595B	Scientific Writing Strategies, Skills, and Ethics	2
PHCL596B	Research Seminar (1 unit for 10 semesters)	10
PHCL596C	Critical Literature Review (Journal Club) (1 unit each for 10 semesters)	10
PHCL692	Directed Research (2 units each for Semesters 1-3/1 unit each for Semesters 4-6)	9
PHCL900	Research (9 units for Semesters 3-4)	18
TOTAL MAJOR SUBJECT UNITS		**51**
Minor Requirement		9
PHCL920 Dissertation (9 units each for last 2 semesters)		18
TOTAL UNITS for PhD as listed		**78**

** A minimum of 66 units are required for granting of PhD.

All Courses available in Pharmacology and are offered based on enrollment numbers can be found in the UA catalog: https://catalog.arizona.edu/courses?subjectCode=PHCL&page=1&cq= . A screen shot is provided below.

Minor Requirement

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 student's major advisor and the Executive Committee. The minor department must be contacted to find out specific requirements

for that minor as some programs may require more than 9 units and some minors require 6 of the 9 units to be taken prior to the comprehensive oral exam.

Suggested Minors

- Multidisciplinary
- Physiology
- Molecular and Cellular Biology
- Immunobiology
- Cellular and Molecular Medicine
- Cancer Biology
- Neuroscience
- Drug Discovery and Development
- Pharmacology and Toxicology
- Biochemistry and Molecular and Cellular Biology

Course ID	Subject code	Catalog Number	Offering Unit	Course Title	Min Units	Max Units	Repeatable for Credit	Total Completions Allowed	Total Units Allowed	Grading Basis	Components
41909	PHCL	386	Pharmacology	Introduction to Tech Transfer in Medicine	3	3	No	1	3	GRD - Regular Grades A, B, C, D, E	Lecture
35360	PHCL	392	Pharmacology	Directed Research	1	6	Yes	99	12	GRD - Regular Grades A, B, C, D, E	Independent Study
26097	PHCL	399	Pharmacology	Independent Study	1	5	Yes	99	5	SPF - Alternative Grading S, P, F	Independent Study
35427	PHCL	399H	Pharmacology	Honors Independent Study	1	3	Yes	99	12	GRD - Regular Grades A, B, C, D, E	Independent Study
36006	PHCL	412	Pharmacology	Introduction to Pharmacology	3	3	No	1	3	GRD - Regular Grades A, B, C, D, E	Lecture
42980	PHCL	420	Pharmacology	High Times: Cannabis in Science, Medicine, and Society	3	3	No	1	3	GRD - Regular Grades A, B, C, D, E	Lecture
39687	PHCL	422	Pharmacology	Introduction to Toxicology	3	3	No	1	3	GRD - Regular Grades A, B, C, D, E	Lecture
40812	PHCL	430	Pharmacology	Pain/Neuropharmacology	2	2	No	1	2	GRD - Regular Grades A, B, C, D, E	Lecture
39645	PHCL	442	Pharmacology	Human Performance Pharmacology	3	3	No	1	3	GRD - Regular Grades A, B, C, D, E	Lecture
41205	PHCL	444	Pharmacology	Human Neurobiology Basics	2	2	No	1	2	GRD - Regular Grades A, B, C, D, E	Lecture
40356	PHCL	445	Pharmacology	Drugs of Abuse	3	3	No	1	3	GRD - Regular Grades A, B, C, D, E	Lecture
42087	PHCL	452	Pharmacology	Substance Use Disorder and Addiction	3	3	No	1	3	GRD - Regular Grades A, B, C, D, E	Lecture
40319	PHCL	460	Pharmacology	Designing Drugs - from Chemistry to Cure	3	3	No	1	3	GRD - Regular Grades A, B, C, D, E	Lecture
43646	PHCL	467	Pharmacology	Medicines to Market: Drug Discovery and Development	3	3	No	1	3	GRD - Regular Grades A, B, C, D, E	Lecture
35420	PHCL	492	Pharmacology	Directed Research	1	3	Yes	99	12	GRD - Regular Grades A, B, C, D, E	Independent Study
26104	PHCL	499	Pharmacology	Independent Study	1	6	Yes	99	6	SPF - Alternative Grading S, P, F	Independent Study
35428	PHCL	499H	Pharmacology	Honors Independent Study	1	3	Yes	99	12	GRD - Regular Grades A, B, C, D, E	Independent Study
40509	PHCL	504	Pharmacology	Human Neurosciences	2	2	No	1	2	GRD - Regular Grades A, B, C, D, E	Lecture
36007	PHCL	512	Pharmacology	Introduction to Pharmacology	3	3	No	1	3	GRD - Regular Grades A, B, C, D, E	Lecture
42981	PHCL	520	Pharmacology	High Times: Cannabis in Science, Medicine, and Society	3	3	No	1	3	GRD - Regular Grades A, B, C, D, E	Lecture
35086	PHCL	522	Biomedical Engineering	Contrast Agents, Molecular Imaging, and Kinetics	3	3	No	1	3	GRD - Regular Grades A, B, C, D, E	Lecture
40813	PHCL	530	Pharmacology	Pain/Neuropharmacology	2	2	No	1	2	GRD - Regular Grades A, B, C, D, E	Lecture
41203	PHCL	544	Pharmacology	Human Neurobiology Basics	2	2	No	1	2	GRD - Regular Grades A, B, C, D, E	Lecture
39787	PHCL	545	Pharmacology	Drugs of Abuse	3	3	No	1	3	GRD - Regular Grades A, B, C, D, E	Lecture
26115	PHCL	551A	Pharmacology	Molecular Targets of Pharmacological Agents	3	3	No	1	3	GRD - Regular Grades A, B, C, D, E	Lecture
42088	PHCL	552	Pharmacology	Substance use Disorder and Addiction	3	3	No	1	3	GRD - Regular Grades A, B, C, D, E	Lecture
35206	PHCL	553	Pharmacology	Neuropharmacolgy	3	3	No	1	3	GRD - Regular Grades A, B, C, D, E	Lecture
40648	PHCL	555	Cancer Biology, GIDP	Cancer Therapeutics	3	3	No	1	3	GRD - Regular Grades A, B, C, D, E	Lecture
43647	PHCL	567	Pharmacology	Medicines to Market: Drug Discovery and Development	3	3	No	1	3	GRD - Regular Grades A, B, C, D, E	Lecture
26122	PHCL	586A	Pharmacology	Introduction to Medical Pharmacology Research	1	1	Yes	4	4	GRD - Regular Grades A, B, C, D, E	Laboratory, Lecture
26123	PHCL	586B	Pharmacology	Introduction to Medical Pharmacology Research	1	1	No	1	1	GRD - Regular Grades A, B, C, D, E	Laboratory, Lecture
26125	PHCL	595B	Pharmacology	Scientific Writing, Presentation and Bioethics	2	2	No	1	2	GRD - Regular Grades A, B, C, D, E	Colloquium
36002	PHCL	596B	Pharmacology	Critical Literature Review	1	1	Yes	10	10	GRD - Regular Grades A, B, C, D, E	Seminar
26130	PHCL	596C	Pharmacology	Critical Literature Review & Research Seminar	1	1	Yes	7	7	GRD - Regular Grades A, B, C, D, E	Seminar
26131	PHCL	599	Pharmacology	Independent Study	1	4	Yes	17	68	SPF - Alternative Grading S, P, F	Independent Study
38334	PHCL	601A	Pharmacology	Pharmacology: General Principles	2	2	No	1	2	GRD - Regular Grades A, B, C, D, E	Lecture
38335	PHCL	601B	Pharmacology	Pharmacology of Chemotherapeutics, Endocrine & Immune System Drugs	2	2	No	1	2	GRD - Regular Grades A, B, C, D, E	Lecture
38336	PHCL	601C	Pharmacology	Pharmacology of Cardiovascular, Pulmonary, GI & CNS Drugs	2	2	No	1	2	GRD - Regular Grades A, B, C, D, E	Lecture
35593	PHCL	670	Pharmacology	Principles of Perfusion Techniques I	5	5	No	1	5	GRD - Regular Grades A, B, C, D, E	Lecture
41211	PHCL	670A	Pharmacology	Principles of Perfusion Sciences I	1	1	No	1	1	GRD - Regular Grades A, B, C, D, E	Lecture
41204	PHCL	670B	Pharmacology	Principles of Perfusion Sciences I	4	4	No	1	4	GRD - Regular Grades A, B, C, D, E	Lecture
26143	PHCL	671	Pharmacology	Perfusion Technology Laboratory	1	1	No	1	1	GRD - Regular Grades A, B, C, D, E	Laboratory
26144	PHCL	672	Pharmacology	Perfusion Technology II	2	2	No	1	2	GRD - Regular Grades A, B, C, D, E	Lecture
26151	PHCL	691L	Pharmacology	Perfusion Science	1	3	Yes	99	25	SPF - Alternative Grading S, P, F	Independent Study
41106	PHCL	692	Pharmacology	Directed Research	1	6	Yes	10	6	GRD - Regular Grades A, B, C, D, E	Independent Study
39736	PHCL	695L	Immunobiology	Advanced Topics: Modulation of the Biology of Aging by Inflammation, Infection and Immunity	1	1	Yes	2	2	GRD - Regular Grades A, B, C, D, E	Colloquium
26153	PHCL	696A	Pharmacology	Research Seminar	1	12	Yes	99	12	GRD - Regular Grades A, B, C, D, E	Seminar
24956	PHCL	696E	Ophthalmology & Vision Science	Current Research in Vision and Neurodegeneration	1	1	Yes	99	6	GRD - Regular Grades A, B, C, D, E	Seminar
42158	PHCL	697	Pharmacology	Perfusion Sciences Lab	1	1	Yes	4	4	GRD - Regular Grades A, B, C, D, E	Workshop
26155	PHCL	699	Pharmacology	Independent Study	1	6	No	1	6	SPF - Alternative Grading S, P, F	Independent Study
26156	PHCL	800	Pharmacology	Research	1	16	Yes	99	999	CLK - Clerkship H,HP,P,F	Independent Study
26168	PHCL	899	Pharmacology	Independent Study	1	16	Yes	99	999	CLK - Clerkship H,HP,P,F	Independent Study
26169	PHCL	900	Pharmacology	Research	1	12	Yes	11	999	SPF - Alternative Grading S, P, F	Independent Study
26170	PHCL	910	Pharmacology	Thesis, Masters	1	12	Yes	11	999	SPF - Alternative Grading S, P, F	Independent Study
26171	PHCL	920	Pharmacology	**Dissertation**	1	9	Yes	11	999	SPF - Alternative Grading S, P, F	Independent Study

Medical Pharmacology Minor Requirement for Other Doctoral Students

The GPMP encourages students from other disciplines to minor in Medical Pharmacology. Nine credits in Medical Pharmacology are required for the minor. Ordinarily, these will include PHCL 601A, 601B and 601C (6 units) with the remainder of the units from other GPMP courses of the 500 level or above.

Students planning to minor in Medical Pharmacology must have at least two members of the GPMP faculty on their Comprehensive Exam Committee.

Successful completion of 9 units of approved course work in Medical Pharmacology constitutes passage of the written comprehensive examination in the minor area.

If you are in the department and would like to Minor inside the dept. you will need 9 units as elective course availability allows. You and your advisor should decide which courses to take to make up the 9 units and you cannot count units used in the major.

Suggested Coursework Schedule

Students must have 36 major credits, 9 minor credits, 18 dissertation credits to graduate. Additionally, a minimum of 22 credits must be letter grades. https://grad.arizona.edu/degree-services/degree-requirements/doctor-philosophy#credit-requirements

Listing	Course	Units	Type	Listing	Course	Units	Type
Year 1 – Fall Semester				**Year 1 – Spring Semester**			
BIOS 576A	Biostatistics in Public Health	3	letter	PHCL 551A	Molecular Targets of Pharm Agents	3	letter
PHCL 596C	Critical Literature Review (Journal Club)	1	letter	PHCL 553	Neuropharmacology / Drug Abuse	3	letter
PHCL 596B	Research Seminar	1	letter	PHCL 595B	Scientific Writing Strategies Skill and Ethics	2	letter
PHCL 601A	Pharmacology: General Principles	2	letter	PHCL 596C	Critical Literature Review (Journal Club)	1	letter
PHCL 601B	Endocrine & Immune System Drugs	2	letter	PHCL 596B	Research Seminar	1	letter
PHCL 601C	Cardio, Pulmonary, GI & CNS Drugs	2	letter	PHCL 692	Directed Research	2	letter
PHCL 692	Directed Research	2	letter	Minor	Minor Course	3	letter
Total Credits: 13				**Total Credits: 15**			
Year 2 – Fall Semester				**Year 2 – Spring Semester**			
PHCL 596C	Journal Club	1	letter	PHCL 596C	Journal Club	1	letter
PHCL 596B	Seminar	1	letter	PHCL 596B	Seminar	1	letter
PHCL 692	Directed Research	2	letter	PHCL 692	Directed Research	1	letter
PHCL 900	Research	3	P/F	PHCL 900	Research	9	P/F
Minor	Minor Course	3	letter				
Minor	Minor Course	3	letter				

Total Credits: 13				**Total Credits: 12**			
Year 3 – Fall Semester				**Year 3 – Spring Semester**			
PHCL 596C	Journal Club	1	letter	PHCL 596C	Journal Club	1	letter
PHCL 596B	Seminar	1	letter	PHCL 596B	Seminar	1	letter
PHCL 692	Directed Research	1	letter	PHCL 692	Directed Research	1	letter
PHCL 900 OR 920	Research OR Dissertation	9	P/F	PHCL 900 OR 920	Research OR Dissertation	9	P/F
Total Credits: 12				**Total Credits: 12**			
Year 4 – Fall Semester				**Year 4 – Spring Semester**			
PHCL 596C	Journal Club	1	letter	PHCL 596C	Journal Club	1	letter
PHCL 596B	Seminar	1	letter	PHCL 596B	Seminar	1	letter
PHCL 692	Directed Research	1	letter	PHCL 692	Directed Research	1	letter
PHCL 900 OR 920	Research OR Dissertation	9	P/F	PHCL 900 OR 920	Research OR Dissertation	9	P/F
Total Credits: 12				**Total Credits: 12**			
Year 5 – Fall Semester				**Year 5 – Spring Semester**			
PHCL 596B	Journal Club	1	letter	PHCL 596B	Journal Club	1	letter
PHCL 596C	Seminar	1	letter	PHCL 596C	Seminar	1	letter
PHCL 692	Directed Research	1	letter	PHCL 692	Directed Research	1	letter
PHCL 920	Dissertation	9	P/F	PHCL 920	Dissertation	9	P/F
Total Credits: 12				**Total Credits: 12**			

COMPREHENSIVE EXAMINATION

To advance to formal candidacy in the Ph.D. degree, the student **MUST** pass both the written and oral portions of the Comprehensive Examination AND meet all minor requirements. After residency (see Graduate College guideline) and course requirements have been fulfilled, the Advisory Committee instructs the student to prepare for the Comprehensive Examination. Students are advised to consult the Graduate College website (https://grad.arizona.edu/degree-services/degree-requirements/doctor-philosophy) and the Graduate Program Coordinator regarding the forms and scheduling requirements of the Graduate College. The examination shall consist of written and oral parts, in accordance with regulations of the Graduate College. To sit for the Comprehensive Exam the student will have:

A. Selected a dissertation advisor and finalized the composition of the Advisory Committee,
B. Complete and submit, through UAccess Student GradPath "Responsible Conduct of Research Statement."
C. Complete and submit, through UAccess Student GradPath, "Plan of Study"
D. Complete and submit through UAccess Student GradPath, "Comp Exam Committee Appointment Form."
E. Received a grade of B (3.00) or better in all coursework.

Objectives of the Comprehensive Examination

The objectives are:

A. To determine if the student has attained adequate breadth of knowledge in the pharmacological

sciences. An adequate breadth of knowledge includes the material covered in the required courses (601A, 601B, 601C, 551A, 553 and 595C), as well as in the courses that satisfy the minor degree.

B. To determine whether the student has attained sufficient depth of knowledge in selected sub-disciplines of pharmacological sciences, including knowledge of the literature, concepts and experimental approaches in the field of specialization.
C. To assess the student's ability to think critically and independently about topics in the pharmacological sciences and to express these thoughts both orally and in writing.
D. To satisfy Graduate College requirements.

Timing of the Comprehensive Examination

The Comprehensive Examination should take place at the end of the student's 4th semester (Spring of Year 2) and before the beginning of the 5th semester in the Program (Fall of Year 3). To remain eligible for funding from the Program, students **MUST** complete the written and oral portions of the Comprehensive Examination by the end of the Summer between their 4th and 5th semesters. In exceptional circumstances, such as illness, or a family crisis, students may petition the Director of the Graduate Program via the Advisory Committee to extend the deadline. The Table below outlines the recommended timeline and documents needed.

Submit Doctoral Plan of Study	by end of 2nd semester
Select Comprehensive Examination Committee Members & Submit Oral Comprehensive Examination Committee to GradPath	End of 3rd semester
Meeting with Committee to schedule Comprehensive Exam	beginning of 4th semester
Take the Written Comprehensive Exam	end of 4th semester
Submit Announcement of Doctoral Comprehensive Exam on GradPath	no later than one month prior to Oral Examination
Take the Oral Comprehensive Exam & bring Prospectus Proposal* Confirmation to submit to dept after passing	by start of 5th semester

*****A separate requirement of the Medical Pharmacology Program: the Dissertation Proposal (i.e. Prospectus) must be completed with three months of passing your Oral Comprehensive Exams. Upon petition from the student, the Advisory Committee may request an extension from the Director of Graduate Studies.

Deadlines for submission of paperwork pertaining to doctoral programs are available in departments, in the Graduate Degree Certification Office, or online at http://grad.arizona.edu/current-students/deadlines.

Comprehensive Examination Committee

During the 3rd semester in the program (Fall of Year 2) students will select a Comprehensive Examination Committee. This committee will consist of five (5) members (including the advisor), selected to reflect the student's minor and area of interest in Medical Pharmacology (see Graduate College rules: https://grad.arizona.edu/degree-services/degree-requirements/doctor-philosophy#comprehensive-exam-committee). A member of the committee other than the major research advisor will serve as chair. This chair will be responsible for:

A. Chairing meetings of the Comprehensive Exam Committee
B. Collecting the written questions from the other members for the written portion of the Examination
C. Submitting the questions to the Program Committee for review
D. Submitting the questions to the Graduate Program Coordinator for distribution to the student.

This committee may or may not be identical to the student's Dissertation Committee, in which the research advisor must serve as chair (see below). The student will provide each member of the committee with the "Oral Comprehensive Examination Guidelines" which outlines the goals and format of the Comprehensive Examination.

Special Committee Members

First Committee Meeting

The student will arrange a meeting of the Comprehensive Examination Committee at least 4-6 weeks prior to the anticipated date of the Written Comprehensive Examination date. At this meeting, the format should reflect the student's:

1. Academic background (rotations, courses taken, overall GPA) including minor
2. Background of anticipated project
3. A desired timeline for written and oral exam

The Committee will inform the student of its general expectations and help the student to prepare for the Examination by suggesting review articles or other readings. Questions for the Written Comprehensive Examination will be submitted to the Chair of the student's Comprehensive Examination Committee at least 2 weeks before the examination. The Comprehensive Chair with the DGS or Education committee will review the questions to ensure that there is a reasonable degree of uniformity among the examinations given to all students.

Once the sets of questions are completed, the Graduate Program Coordinator distributes to the members and makes a copy. The Chair of the Committee must ensure that the exam is graded in a timely manner.

Once the exam is graded the Graduate Program Coordinator collects the graded questions from the student's exam committee and notifies the Committee of the results. A letter will be sent to the students notifying them of their Written Comp results. The members of the Committee will give the graded exam to the Program Office to be filed.

If the result is **"Pass",** the student proceeds to plan for taking the Oral Exam. If the result is **"Failed",** the Chair of the Committee follows the guidelines for repeating the written exam. Should the students fail any portion of the exam at their 2nd attempt, if a repeat of the exam was allowed by the guidelines, they will be dismissed from the Program.

Oral Comprehensive Examination Committee Form

Once the Written Comprehensive Examination is passed, students must submit the "Doctoral Dissertation Committee Appointment Form" which be accessed through UAccess – Student – GradPath. This will include the date of the Oral Comprehensive Exam.

Exam Format

Written Comprehensive Examination

Students **MUST** be registered during the semester the written and oral examinations are taken, and these examinations **MUST** take place between three weeks and six months of one another.

The Examination will have a closed-book format. The Examination must evaluate the student's breadth of knowledge in pharmacology but should reflect the specialized interests that each student has developed by this stage. To ensure that all levels of understanding in pharmacology are addressed, the examination is divided into:

1. Principles of Pharmacology
2. Systems Pharmacology
3. Molecular Pharmacology

The Examination will be taken over a period of three days, with the student receiving the Principles of Pharmacology questions on day one, Systems Pharmacology questions on day two, and Molecular Pharmacology questions on day three. The student MUST answer 2 of 3 questions in each area. Each day the student will be provided with a quiet room containing a computer with a word processing program that the student is familiar with. Students will have 3 hours to answer 2 questions each day. The student will be expected to develop in-depth arguments using practical examples in his/her answers to demonstrate critical thinking skills and professional writing.

The answers will be graded by the Committee member who wrote the question. Students will receive a grade of pass (P) or fail (F) and written comments, which the student is encouraged to discuss with the grader. A failure on two questions of the 6 answered will constitute failure of the Written Comprehensive.

During the oral examination, the student will be required to retake the sections in which the fails were given. Should the student fail three questions, a retake of the entire Examination will be required, after mentoring by Committee members (ordinarily within three months). In both circumstances students will be required to answer a new set of questions. Failure of four or more questions will result in dismissal from the Ph.D. program without opportunity to retake the exam.

After the written portion of the Comprehensive Examination has been completed successfully, the student is required to submit "Doctoral Dissertation Committee Appointment," through UAccess – Student – GradPath**.**

See the Graduate College Degree Certification website located at https://grad.arizona.edu/degree-services/degree-requirements/doctor-philosophy for further information pertaining to "steps to completing your degree."

Oral Examination

Upon successful completion of the Written Comprehensive Examination, the student and Committee may schedule the oral portion. The Graduate College describes the Oral Comprehensive exam as follows:

> "Upon successful completion of the written examinations in the major and minor(s), the Oral Comprehensive Examination is conducted before the Examining Committee of the faculty. This is the occasion when faculty committee members have both the opportunity and obligation to require the student to display a broad knowledge of the chosen field of study and sufficient depth of understanding in areas of specialization. Although a discussion of proposed dissertation research may be of importance, such a discussion cannot be used to satisfy the requirements of the Oral Comprehensive Examination. The examining committee must attest that the student has demonstrated the professional level of knowledge expected of a junior "academic colleague."

The Oral Comprehensive Examination **MUST** be completed not less than 3 weeks and not more than 6 months after the written comprehensive examination. The examination will last a minimum of 1 hour but not to exceed 3 hours. The exam will begin with those questions not answered by the student on the Written Comprehensive Examination. The student should be prepared to answer questions not only

related to topics previously discussed with the committee but also related to material covered in the required core courses.

Students have found that an excellent way to prepare for the oral exam is to hold mock exams in their laboratory. The students can work with their mentor or peers to organize these mock exams including others who have advanced toward candidacy students can serve as questioners.

Students may not bring any notes into the examination room. Graduate College requirements for passing the Oral Comprehensive Examination will be followed. Students may be permitted to retake the Oral Comprehensive Examination once should they fail in the first attempt.

The student's committee chair (not their advisor) now serves in the capacity of the Reporter during the oral exam.

Prospectus Proposal

It is recommended that the student bring the Prospectus Proposal document to the Oral Comprehensive Exam to be signed by all committee members. The student is required to file a Prospectus with the Graduate Program Coordinator through GradPath within three months of passing the student oral comprehensive examination.

Graduate Examination Appeal Procedure

A student can appeal the decisions of an examining committee for Qualifying, Comprehensive (written and oral), and Final Oral Defense examinations. If no resolution is obtained after appealing to the committee chair and formally meeting with the entire examining committee, the student may request in writing that the head or chair of the department investigate. Such written requests must be initiated during the first regular semester after the term in which the examination was held. If there is still no resolution, the student may then request that the Dean of the Graduate College convene a committee to review the case and report its recommendations in writing. Final action will be taken by the Dean of the Graduate College and may include directing that a new examination or reexamination be held by the student's department.

Advancement to Candidacy

When a student passes the comprehensive examination and completes all coursework on his/her Plan of Study, he/she advances to doctoral candidacy. At that time, the student's Bursar account will be billed the candidacy fees. The current fee schedule can be found https://grad.arizona.edu/funding/costs-fees. These are one-time fees, and the student will not be billed again if the anticipated graduation date is changed.

FINAL EXAM: DISSERTATION AND DEFENSE

Dissertation Advisor and Dissertation Committee

By the end of the first year, the student is expected to choose a dissertation advisor (Major Research Advisor) from among the Principal or Affiliated Faculty of the Program and, having obtained the concurrence of the faculty member, communicate this decision in writing to the Graduate Program Coordinator and the Director of the Graduate Program.

Major Advisor's Responsibilities include:

- Supervising the student's dissertation research; and
- Advising the student on the selection of a Dissertation Committee, on the preparation of the "Plan of Study", on the preparation of a dissertation proposal, and on research toward and preparation of a dissertation.
- Mentoring students as they develop into independent scientists

The Dissertation Committee should consist of at least five members, including at least three members of the Faculty (Principal/Affiliate/Research) of the Program (one of whom is the major advisor), and two faculty members from the student's minor field. Note that since a Graduate Program in Medical Pharmacology faculty may also be associated with the minor program, more than three members of the committee may belong to the GPMP. The student proposes the composition of the Dissertation Committee to the Director of the Graduate Program, ordinarily by the end of May of the first year. Please note, this committee composition may be the same as that of the Comprehensive exam committee

Dissertation Committee Responsibilities include:

- Accepting the dissertation and conducting the final examination (dissertation final defense).

Dissertation Proposal

Having passed the Comprehensive Examination, the student and her/his advisor will develop a realistic plan of research that will lead to the completion of the dissertation. Once this research plan has been decided, the student will arrange a meeting of the Committee for an oral defense of, as well as critical advisory input about the research plan. Once this has been completed the Student's Advisor/Student should notify the Program Coordinator to submit through UAccess – Student Center – GradPath, Prospectus approved.

Dissertation

Preparation of the written dissertation shall follow the regulations of the Graduate College's Degree Certification Office. After writing and correcting the draft of the complete dissertation, the candidate **MUST** submit the draft to each member of the Dissertation Committee. **The Dissertation Committee MUST receive the final draft 3 weeks before completing through GradPath "Announcement of Final Oral Defense"** to facilitate time to read the final submission. However, the exact timing of the submission is at the discretion of the Dissertation Committee.

Candidates **MUST** file the "Announcement of Final Oral Defense" with the Graduate College seven (7) days prior to the date of the Final Oral Dissertation Defense. This form requires approval of all members of the Dissertation Committee, signifying their assessment that the dissertation is ready to defend – although revisions may still be required. Committee members will then provide the candidate with detailed suggestions or requirements for revision before commencement of the final examination.

Instructions/Templates for Format and Writing of the Thesis/Dissertation

Instructions and templates describing proper format for the thesis/dissertation is available at the Graduate Degree Certification Office at http://grad.arizona.edu/degreecert/samples-templates. It is recommended that every student review this before attempting to prepare a thesis/dissertation. In addition,

the student should discuss the thesis format or dissertation format with his/her advisor as technical writing requires additional constraints. For the title page the Program's correct names are "**GRADUATE PROGRAM IN MEDICAL PHARMACOLOGY**" or "**GRADUATE PROGRAM IN MEDICAL PHARMACOLOGY-PERFUSION SCIENCES"**

Use of Copyrighted Material in Theses and Dissertations

The use of copyrighted materials in a thesis, dissertation or document usually requires formal permission. Any exceptions, sometimes pertaining to small fractions of other documents, are governed by the concept of "fair use" and the following factors must be weighed: the purpose and character of the use, including whether such use is of a commercial nature or is for non-profit educational purposes; the nature of the copyrighted work as a whole; and the effect of the use upon the potential market for or value of the copyrighted work.

According to the Association of American University Presses, permission is required for quotations that are reproduced as complete units (poems, letters, short stories, essays, journal articles, complete chapters or sections of books, maps, charts, graphs, tables, drawings, or other illustrative materials). **IF THERE IS ANY DOUBT, THE STUDENT SHOULD OBTAIN PERMISSION FROM THE COPYRIGHT HOLDER.**

Permission to use copyrighted material should be in writing and retained by the author. The release letters should indicate that permission extends to microfilming and publication by University Microfilms International (UMI) and the copyright owners are aware that UMI may sell on demand single copies of the thesis, dissertation, or document, including their materials, for scholarly purposes. UMI requires copies of permission letters to be attached to the publication agreement and assumes no liability for copyright violations. If permission letters are not supplied, copyrighted materials may not be filmed.

The process of obtaining permission to use copyrighted material may be both time-consuming and expensive and should be initiated as early as possible during the conduct of the thesis, dissertation or document preparation. It does no harm and is good practice to obtain permission to use non-copyrighted material, which may or may not be acknowledged in the text (note phraseology in Statement by Author required for any thesis, dissertation or document).

Inclusion of Published Papers in Dissertations and Theses

Students are encouraged to publish the results of their thesis/dissertation in a timely fashion. This usually means any manuscripts included in the thesis/dissertation are peer reviewed and accepted for publication by the time the student reaches his/her final defense. To facilitate the inclusion of manuscripts in the thesis/dissertation the following policy governs such inclusion:

Types of Publications

Manuscripts for inclusion MUST be peer reviewed and accepted for publication. The final decision concerning whether the manuscript is appropriate and acceptable for inclusion resides with the student's advisory committee.

Authorship

If, except for the introduction and conclusion sections, the entire thesis/dissertation consists of peer-reviewed manuscripts, then the student **MUST** be first author on at least one of these works. In the event the peer-reviewed manuscripts represent only a part of the thesis/dissertation, they may consist of manuscripts on which the student is not first author *if the committee feels that the student's contribution is significant and if such inclusion adds substantively to the thesis/dissertation.*

Papers in which the student is first author and the thesis/ dissertation advisor is the senior author are generally considered to be appropriate for inclusion in the thesis/dissertation. In those cases in which the student is first author on a manuscript that has two or more co-authors, or when the student is not recognized as the primary author, *the committee will assess whether inclusion in the thesis/dissertation of a part or all the published work is appropriate*. The committee will provide the Executive Committee with a written statement indicating that they have considered and found to be appropriate any multiple author papers or manuscripts for inclusion in the thesis/dissertation. In all cases the student must disclose their percent contribution, for example if a student is first author in a manuscript in which one or more laboratory colleges are co-authors the student must state that they performed XX% of the experimental work and wrote XX% of the manuscript.

Conflict of Interest

While all students are encouraged to enlist the assistance and collaboration of their committee members, there is a risk of an appearance of a conflict of interest if all committee members are also co-authors with the student. Thus, at least one member of a student's final examination committee must be a non-co-author and/or not have contributed significantly to the material contained in the thesis/dissertation.

Final Examination: Defense

Formal defense of the thesis/dissertation constitutes the Final Defense. The defense comprises two parts:

- One-hour public colloquium in which the candidate presents her/his research and explains how it contributes to the advancement of understanding pharmacology, and
- An oral examination by the candidate's Committee and other qualified people acceptable by the committee. There is no minimum time limit for the Final Defense, but the Examination may not exceed three hours.

After successful completion of the Final Defense, the candidate makes any revisions required and submits to the Graduate Degree Certification Office **two (2) signed original of the Approval pages**. It's recommended that the student take these approval pages to the Final Defense for signatures. The candidate also provides a final copy of the thesis/dissertation and signature page to the Graduate Program Coordinator to be bound for the Department of Pharmacology Graduate Program's library.

DOCTORAL PROGRAM CHECKLIST

Use the following timetable as a checklist for completion of all program coursework and materials.

Year 1 – Fall Semester	✓
GRADPATH Complete Responsible Conduct of Research and Code of Academic Integrity	
COURSEWORK Complete core coursework with at least a B grade	
ROTATIONS Complete two of three laboratory rotations	
Year 1 – Spring Semester	✓
GRADPATH Complete Doctoral Plan of Study by the end of the semester	
COURSEWORK Complete core coursework with at least a B grade	
ROTATIONS Complete final laboratory rotation	
MENTORSHIP Select your Research Advisor	
ANNUAL REPORT Complete and submit by June 1	
Year 2 – Fall Semester	✓
GRADPATH Complete Oral Comprehensive Examination Committee Form	
PRESENT in Journal Club	
MENTORSHIP Select your Comprehensive Examination Committee Members	
PREPARE Study for Written Portion of Comprehensive Examination	
Year 2 – Spring Semester	✓
MEET Present to your Comprehensive Examination Committee and plan exam dates	
PASS Written Portion of the Comprehensive Examination	
GRADPATH Complete Announcement of Doctoral Comprehensive Exam	
GRADPATH Complete Prospectus Proposal Confirmation at Oral Comprehensive Exam	
PASS Oral Portion of the Comprehensive Examination	
GRADPATH Complete Doctoral Dissertation Committee Appointment	
PRESENT in Seminar	
ANNUAL REPORT Complete and submit by June 1	
Year 3 – Fall Semester	✓
PRESENT in Seminar	
CONTINUE Doctoral Research	
Year 3 – Spring Semester	✓
PRESENT in Journal Club	
MEET Propose your dissertation plan to your Dissertation Committee	
ANNUAL REPORT Complete and submit by June 1	
Year 4- Fall Semester	✓
PRESENT in Seminar	
Year 4 – Spring Semester	✓
PRESENT in Journal Club	
ANNUAL REPORT Complete and submit by June 1	
Year 5	✓
GRADPATH Complete Announcement of Final Oral Defense	
DEFENSE OF DISSERTATION	

MD/PHD DUAL DEGREE PROGRAM

PROGRAM OVERVIEW

The MD/PhD Dual Degree Program in Medical Pharmacology (MP) prepares students for academic careers involving research, teaching and clinical service, as well as other careers where pharmacological research training is required (pharmaceutical industry, government (i.e., NIH, FDA)).
The Association of American Medical College summarizes the objective of an advanced dual degree: "The MD/PhD training organizes the experimental and clinical thinking of the physician-scientist. This synergy enables a physician-scientist to recognize new ways that clinical care or the understanding of disease mechanisms will benefit from research and to mount appropriate effort. Likewise, the synergy achieved in dual-degree training enables the physician-scientist to see how the results of research discoveries and insights can be converted into clinically significant outcomes."

The goal of the University of Arizona MD and the Medical Pharmacology PhD Dual Degree Program is to provide outstanding aspiring physician scientists with biomedical training so that they emerge as leaders in both academic medicine and research. Students accomplish this by spending the first two academic years exclusively in the College of Medicine, followed by 3-4 years of interdisciplinary doctoral training in Medical Pharmacology. Upon successful completion of a PhD dissertation, students then return to the College of Medicine MD program and complete their final two years of clinical training.

Candidates are admitted independently to the College of Medicine and the MP Graduate Program. Although the time to completion of both programs, combined is usually nine years, the MP PhD/MD Dual Degree Program makes it possible to complete both degree objectives in 7-8 years. This is accomplished by giving credit for certain units of College of Medicine courses in the MP study program.

Approved by Grad College, Curricular Affairs and Grad Council Review Team, REVISED 8/6/2025

Expectations and Outcomes

The MD/PhD Program in Medical Pharmacology is designed to train the next generation of scientific leaders through comprehensive education, research, and professional development. Students will develop and demonstrate the following competencies:

1. **Subject Matter Expertise in a Major Field**
   Students will gain deep expertise in Medical Pharmacology. Mastery is developed through advanced coursework, mentored research, and culminates in the successful completion of the comprehensive examinations and doctoral dissertation.

2. **Comprehension of a Minor Field of Study**
   Each student selects a minor area of study to complement their primary discipline. The minor may be chosen from other appropriate Ph.D. minors across the University of Arizona. Selection should be made in consultation with the student's advisor to ensure alignment with research and career goals. Competence is demonstrated through relevant coursework and performance on the comprehensive exams.

3. **Research Competency and Scientific Rigor**
   Students will build strong research skills through a structured sequence of research methodology courses and specialized training aligned with their dissertation project. Key milestones include the completion of comprehensive exams, as well as the doctoral dissertation itself. These experiences cultivate independence, critical thinking, and the ability to design, conduct, and interpret rigorous scientific research.

4. **Proficiency in Scientific Communication**
   Clear and effective communication—both written and oral—is a critical skill for success in science. Students will hone these skills through course assignments, presentations, manuscript submissions, and active participation in conferences, seminars, and workshops. Communication proficiency is assessed through the comprehensive exams, the dissertation, and the final dissertation defense.

5. **Professionalism and Service to the Academic Community**
   Students will engage in the broader scientific and academic community by participating in departmental activities, academic conferences, and professional service. Professionalism is evaluated through biannual reviews with research and teaching supervisors and annual faculty assessments.

Dual Degree Requirements

Dual degree applicants must meet the application deadlines and testing requirements for each program (i.e., MD/PhD) independently. Students pursuing the dual degree will spend the first two academic years exclusively at medical school followed by completion of graduate course work and dissertation research. Once all requirements for the PhD degree are completed, the student will return to medical school to finish the MD degree via completion of University of Arizona College of Medicine clinical requirements.

Fees

Students will be charged the fee/tuition of that program in which they are enrolled. For example, College of Medicine fees would be charged in years 1 and 2. The Program Coordinator for the student's first program/year will be responsible for letting the Bursar's office know the enrollment status of the student.

DUAL DEGREE COURSEWORK

Doctoral students must complete 36 units of graduate-level coursework. 18 units must be in the major subject area, must be taken as letter-grade, and must be courses at the 500-level or greater. Additionally, 18 dissertation units are required. To complete the PhD program, a total of 66 units are required.

Combined Credit – Units credited to both degrees.

A total of 8-9 units of Medical School curriculum will be accepted by the Graduate College as counting towards the PhD in Medical Pharmacology for the Major and 11-13 for the Minor. Medical course credits will be counted as 1/1 to graduate credits.

PhD Courses to take	**Units**
BIOS 576A: Biostatistics in Public Health	3 (A/B)
PHCL551A: Molecular Targets	3 (A/B)
PHCL 692: Directed Research	6 (A/B)
PHCL 595B: Scientific Writing Strategies, Skills, and Ethics	2 (A/B)
PHCL 596B: Critical Literature Review	4 (A/B)
PHCL 596C: Research Seminar	4 (A/B)
Subtotal Number of Graded Units	**22 (all letter grade)**
MD Courses that can be used for the PHD Major:	**Need 7-9 Units total**
MED 802 (Foundations). replaces PHCL601a Principles of Pharmacology	Maximal to list 8

MED 803 (Nervous system). replaces PHCL553 Neuropharmacology	Maximal to list 8
MED 806 (Digestion, Metabolism & Hormones). replaces PHCL601c Cardiovascular, pulmonary, GI, and CNS drugs	Maximal to list 9
MED 807 (Immunity and Infection). replaces PHCL601b Pharmacology of chemotherapeutic, endocrine, and immune system drugs	Maximal to list 9
MED810 (Clinical Reasoning)	Maximal to list 2
Subtotal Number of Ungraded Units	**27-28 Units (P/F)**
MD Courses used for the PhD Minor	**11-13+**
MED804; Musculoskeletal System	5
MED805; Cardiovascular, Pulmonary, Renal Systems	11
MED808; Life Cycle	9
Total Minor Units	**11-13+ Units needed**
Subtotal Major and Minor Units	**27-29 Major; 11-13 + Minor units**
TOTAL ACADEMIC UNITS	**36 + units**
PHCL 900 Research Units	12 (S/P/F)
PHCL 920 Dissertation Units	18 (S/P/F)
Total Research Units	**30**
TOTAL (including Research and Dissertation units)	**66+ units**

Sample Plan of Study for Dual Degree MD/PhD in Medical Pharmacology

Year One	First Year of Medical School Curriculum **MED 802** - Foundations (9 weeks) **MED 803** – 8 units - Nervous System (9 weeks) **MED 804** – 5 units - Musculoskeletal System (5 weeks) **MED 805** – 11 units - Cardiovascular, Pulmonary, Renal Systems (12 weeks) **MED 806A DMH A** - Digestion, Metabolism & Hormones (3 weeks) Courses may be used for graduate credit upon request and approval.
Year Two	Second Year Medical School Curriculum **MED 806B DMH B** - Digestion, Metabolism & Hormones (12 weeks) **MED 807 -** Immunity and Infection (9 weeks) **MED 808 -** Life Cycle (9 weeks) **MED 809** - Advanced Topics (7 weeks) **MED 810** – Clinical Reasoning Complete Step 1 United States Medical Licensing Exam (USMLE) Courses may be used for graduate credit upon request and approval.
Year Three (Year 1 PhD)	**Fall** BIOS 576A **-** Biostatistics in Public Health (3 units - Fall) PHCL 596B - Critical Literature Review (1 unit) PHCL 596C - Research Seminar (1 unit) PHCL 692 - Directed Research (2 units) PHCL 900 - Research (3 units) **Spring** PHCL551 Molecular Targets (3 units) PHCL 595B Scientific Writing Strategies, Skills, and Ethics (2 units) PHCL 596B Critical Literature Review (1 unit) PHCL 596C Research Seminar (1 unit) PHCL 692 Directed Research (2 units) PHCL 900 Research (3 units) Form Comprehensive Exam Committee Submit Plan of Study Complete Comprehensive Exams by end of summer of 1st year in PhD program.
Year Four (Year 2 PhD)	**Fall** PHCL 596B Critical Literature Review (1 unit) PHCL 596C Research Seminar (1 unit) PHCL 692 Directed Research (2 units) PHCL 900 – Research (1 units) PHCL 920 Dissertation (9 units) **Spring** PHCL 596B Critical Literature Review (1 unit) PHCL 596C Research Seminar (1 unit) PHCL 900 – Research (1 units) PHCL 920 Dissertation (9 units) Form Dissertation Committee, Complete Dissertation Proposal

Year Five (as needed)	PHCL 596B - Critical Literature Review (1 unit – Fall/Spring = 2 units) PHCL 596C - Research Seminar (1 unit – Fall/Spring = 2 units) PHCL 920 Dissertation (9 units – Fall/Spring = 18)
Year Six (as needed)	PHCL 596B Critical Literature Review (1 unit – Fall/Spring = 2 units) PHCL 596C Research Seminar (1 unit – Fall/Spring = 2 units) PHCL 920 Dissertation (9 units – Fall/Spring = 18)

COMPREHENSIVE EXAMINATION

For advancement to the status formal candidacy in the Ph.D. degree, the Dual Degree student MUST pass both the written and oral portions of the Comprehensive Examination as outlined in the Doctoral Program Section above. MD/PhD students are recommended to include at least 1 clinician on their committees.

FINAL EXAM: DISSERTATION AND DEFENSE.

All Final Exam content required for the Doctoral Program as described above applies to Dual-Degree students as provided.

Dual Degree, PhD Portion CHECKLIST

Use the following timetable as a checklist for completion of all program coursework and materials as outlined in the Doctoral or Dual Degree sections above.

Year 1 – Fall Semester	✓
GRADPATH Complete Responsible Conduct of Research and Code of Academic Integrity	
COURSEWORK Complete core coursework with at least a B grade	
ROTATIONS Complete two of three laboratory rotations	
Year 1 – Spring Semester	✓
GRADPATH Complete Doctoral Plan of Study by the end of the semester	
COURSEWORK Complete core coursework with at least a B grade	
ROTATIONS Complete final laboratory rotation	
MENTORSHIP Select your Research Advisor	
ANNUAL REPORT Complete and submit by June 1	
Year 2 – Fall Semester	✓
GRADPATH Complete Oral Comprehensive Examination Committee Form	
PRESENT in Journal Club	
MENTORSHIP Select your Comprehensive Examination Committee Members	
PREPARE Study for Written Portion of Comprehensive Examination	
Year 2 – Spring Semester	✓
MEET Present to your Comprehensive Examination Committee and plan exam dates	
PASS Written Portion of the Comprehensive Examination	
GRADPATH Complete Announcement of Doctoral Comprehensive Exam	
GRADPATH Complete Prospectus Proposal Confirmation at Oral Comprehensive Exam	
PASS Oral Portion of the Comprehensive Examination	
GRADPATH Complete Doctoral Dissertation Committee Appointment	
PRESENT in Seminar	
ANNUAL REPORT Complete and submit by June 1	
Year 3 – Fall Semester	✓
PRESENT in Seminar	
CONTINUE Doctoral Research	
Year 3 – Spring Semester	✓
PRESENT in Journal Club	
MEET Propose your dissertation plan to your Dissertation Committee	
ANNUAL REPORT Complete and submit by June 1	
Year 4- Fall Semester	✓
PRESENT in Seminar	
Year 4 – Spring Semester	✓
PRESENT in Journal Club	
ANNUAL REPORT Complete and submit by June 1	
Year 5	✓
GRADPATH Complete Announcement of Final Oral Defense at least 10 days before examination	
DEFENSE OF DISSERTATION	

MASTERS' DEGREE IN MEDICAL PHARMACOLOGY

PROGRAM OVERVIEW

An M.S. in Medical Pharmacology degree is awarded only in rare instances in which a student who has passed the core required courses is unable, for whatever reason, to continue in the Program. In such instances the Executive Committee shall determine whether an M.S. degree is merited and fulfils all the requirements of the Graduate College (https://grad.arizona.edu/degree-services/degree-requirements/masters-degrees#credit-requirements) for that degree. Note that the completion of these requirements will ordinarily demand two years of work. Except for the M.S. in Medical Pharmacology-Perfusion Science track, **the Program generally accepts only students seeking Ph.D. degree.**

In-House M.S Medical Pharmacology Graduate Students Transfer to Ph.D. Program

The M.S. degree is a terminal degree and will require reapplying for admission to the Ph.D. Program. Regardless of the option chosen, the Executive Committee will vote for acceptance or rejection of the application.

Option One

Compete with outside applicants by having a completed application submitted on or before the December 1st deadline. The application will be judged relative to all other applications.

Option Two

Completion of all M.S. degree requirements, first author of a published or accepted peer-reviewed publication, and a letter from the student's advisor supporting a transfer into the Ph.D. program. If this option is chosen, your file can be acted upon immediately.

MS in MEDICAL PHARMACOLOGY - PERFUSION SCIENCES GRADUATE PROGRAM

PROGRAM OVERVIEW

Vision: To educate and train competent, safe perfusionists who can continue to grow professionally after their training and who will also place patients' well-being as their highest priority.

Goals:

1. Teach excellent and compassionate patient care in the operating room, ICU and beyond by a progressive increase in skills, knowledge, and responsibilities with appropriate feedback on a regular basis.
2. Expand the level of medical, surgical, technical, pharmacological, pathological, and physiological knowledge of our specialty by using an array of teaching forms, including one-on-one apprenticeship, didactic, simulation training, literature reviews and research.
3. Establish a practice-based program that teaches the student, monitors the student's progress, and provides feedback by periodic evaluation instruments including written and verbal formats.
4. Recognize that open-heart surgery – as in life – requires the best possible levels of communication in both verbal and written forms. Emphasize the importance of effective communication and interactive skills at all levels with patients, surgeons, nurses, peers, administrators, and other professionals.
5. Teaching professionalism is the caring and respecting of others and to do one's best in honest, ethical, moral, and dedicated manners.
6. Incorporate a system-based practice using the best resources available including attendance at meetings and seminars, utilizing the internet, reviewing literature, self-learning; and advancing personally and professionally as improved tools, knowledge, and techniques become available.
7. Being aware that as teachers and students of cardiovascular perfusion, there is much to be learned about how to teach and how to be trained. The expectation is that improved ways of assessing and assuring competence will be continually improved.

Assessment of Goals and Learning Domains

Utilizing the following methods, we continuously reevaluate our program to ensure that our goals and learning domains are appropriate and we continue to maintain our accreditation with the Commission on Accreditation of Allied Health Education Programs (CAAHEP):

- Student course evaluations
- Student surveys of preceptors via Medatrax
- Graduate Exit Interviews
- Post Graduate Surveys via Accreditation Committee-Perfusion Education (AC-PE) forms
- Post Graduate Employer Surveys via AC-PE forms
- Academic Program Review via self-study reports

Findings are to be reported to the appropriate subcommittee of the program's Advisory Board to determine appropriate action with the final outcomes reported at annual Advisory Board meetings.

Minimum Expectations

The following statement reflects the minimum expectation required of our students to graduate this program.

To prepare competent entry-level perfusionists in the cognitive (knowledge), psychomotor (skills), and affective (behavior) learning domains

Criteria to ensure students meet such expectations are reflected in minimum grades (e.g. GPA>3.0, no grade less than 'B' in major courses), rubrics used to evaluate clinical performances (recurrent grades of '1' and '2's in any clinical learning domain being evaluated, and annual Comprehensive Mock Board exams (75% passing grade). These criteria are defined in the program policies conveyed to all enrolled students.

COURSEWORK SCHEDULE

10 Week Summer Session - Year 1

Required	Perfusion Preceptorship	PHCL 691L	1	S/P
Required	Principles of Perfusion I	PHCL 670A	1	GRD
TOTAL			**2**	

Summer YEAR 1 - TIME-FRAME GUIDELINES
• **COMPLETE** If lab animal work is planned, University Animal Care training is required to comply with federal, state and local regulations governing animal care. Please visit: http://www.iacuc.arizona.edu/training/ for information on obtaining IACUC training and certification. If planning a clinical study, Human Subjects Safety Program training is required to satisfy IRB requirements. Please visit: https://research.arizona.edu/compliance-public/human-subjects-protection-program • **ATTEND AND COMPLETE** Laboratory Safety and Environmental Health by end of the first semester of residence, preferably as soon after your arrival as possible. Please visit the Risk Management website at http://risk.arizona.edu/training/index.shtml to sign up for the training programs. Radiation Safety training: UAccess>Edge Learning>Fluoroscopy>Animal fluoroscopy module • **COMPLETE** the College of Medicine Policy, Arizona Fingerprint Clearance

Fall Semester – Year 1

Required	Pharmacology Seminar	PHCL 596C	W 11:00-Noon	1	GR
Required	Pharmacology: General Principles Endocrine, & Immune System Drugs Cardio, Pulmonary, GI & CNS Drugs	PHCL 601A PHCL 601B PHCL 601C	MWF 9:00-11	2 2 2	GR
Required	Principles of Perfusion I	PHCL 670B	MF 1:00-3	4	GR
Required	Perfusion Colloquium	PHCL 697	W 1:30-2:30	1	S/P
Required	Perfusion Preceptorship	PHCL 691L	W 12:30-1:30	3	GR
Required	Laboratory Meetings	PHCL 696A		1	GR
TOTAL				**16**	

Fall Semester YEAR 1 - TIME-FRAME GUIDELINES
• **COMPLETE** Core Coursework

Spring Semester - Year 1

Required	Physiology	PSIO 511	M W 9:00	3	GR
Required	Pharmacology Seminar	PHCL 596 C	W 11:00-Noon	1	GR
Required	Perfusion Colloquium	PHCL 697	W 1:30-2:30	1	GR
Required	Principles of Perfusion II	PHCL 672	W 12:30-1:30	2	GR
Required	Perfusion Preceptorship	PHCL 691L	W 12:00-1:00	1	GR
Required	Laboratory Meetings	PHCL 696A		3	S/P
Required	Scientific Writing Strategies Skill and Ethics	PHCL 595B	TBD	2	GR
TOTAL				**14**	

Spring Semester YEAR 1 - TIME-FRAME GUIDELINES
• **COMPLETE** Core Coursework • **Form** Thesis Committee • **BEGIN** Thesis Research • **COMPLETE AND SUBMIT** Annual Report (on or before June 1). The annual report form may be found at http://www.pharmacology.arizona.edu/graduateforms.cfm

10 Week Summer Session - Year 2

Required	Perfusion Preceptorship	PHCL 691L	1	S/P
TOTAL			**1**	

Fall Semester – Year 2

Required	Pharmacology Seminar	PHCL 596C	W 11:00-Noon	1	GR
Required	Perfusion Colloquium	PHCL 697	W 1:30-2:30	1	S/P
Required	Perfusion Preceptorship	PHCL 691L	W 12:30-1:30	3	GR
Required	Laboratory Meetings	PHCL 696A		1	GR
Required	Independent Study-Research	PHCL 900		3	S/P
TOTAL				**9**	

Fall Semester Year 2 - TIME-FRAME GUIDELINES
• **COMPLETE** Core Coursework • **COMPLETE AND SUBMIT** Master's / Specialist Plan of Study (log in to Student Center - GradPath • **PRESENT** in Seminar (PHCL 596C). One presentation must be completed prior to completion of program of study • **CONTINUE** Thesis Research

Spring Semester – Year 2

Required	Biostatistics (can be taken earlier)	EPID 576A	Online	3	GR
Required	Pharmacology Seminar	PHCL 596C	W 11:00-Noon	1	GR
Required	Perfusion Colloquium	PHCL 697	W 1:30-2:30	3	S/P
Required	Perfusion Preceptorship	PHCL 691L	W 12:30-1:30	1	GR

Required	Laboratory Meetings	PHCL 696A		1	GR
Required	Thesis Research	PHCL 910		3	S/P
TOTAL				**12**	

Spring Semester Year 2 - TIME-FRAME GUIDELINES
• **COMPLETE** Core Coursework • **PRESENT** in Seminar (PHCL 596C). One presentation must be completed prior to completion of program of study • **CONTINUE** Thesis Research (PHCL 910) • **SCHEDULE AND DEFEND THESIS** Master's / Specialist Plan of Study (log in to UAccess - Student Center - GradPath • **COMPLETE AND SUBMIT** Annual Report on or before June 1 (if not finished by the end of Spring semester). The annual report form may be found at http://www.pharmacology.arizona.edu/graduateforms.cfm

REMEMBER: If you have not defended by the end of your Spring semester Year 2, you must enroll for 1 unit the semester you defend (or summer session).
https://grad.arizona.edu/degree-services/degree-requirements/masters-degrees#credit-requirements

- The total number of units required for a master's program = 30 credits
- At least 22 of the required units must receive a letter grade per the graduate college
- 24 credits must be non-thesis

APPENDIX I: Resources

Facilities Management

For any heating/cooling/building issues, please call 520-621-3000. All other facility information is available from https://fm.ufs.arizona.edu/.

Equipment Resources

Availability of modern scientific instruments is crucially important to research and graduate education programs. We are fortunate to possess state-of-the-art instrumentation to conduct research at all levels of biological organization. Each investigator's laboratory is equipped with specialized instrumentation required for research in their field. A List of shared departmental resources can be found in UA Box (https://arizona.app.box.com/s/gwnz93hbuh2f0vc7tyw5rbdr5odq8gci).

Library Resources

The University of Arizona takes pride in the outstanding quality of its libraries. The General Library and the Science Library, both on the main campus, hold extensive collections of general and scientific periodicals and books. The Health Sciences Library (https://lib.arizona.edu/hsl) is in the Arizona Health Sciences Center. In addition to its holdings of pertinent periodicals and books, the library provides an excellent array of valuable services including computerized bibliographic databases and modern electronic information retrieval services with related on-line and off-line nationwide linkups. A vast selection of supplemental audio-visual teaching aids is available in the media section. Use of online materials requires UANetID login.

Experimental Animals

The availability of high-quality experimental animals is of great importance to modern research in pharmacology. Graduate students **MUST** become familiar with safe and humane animal care and handling techniques. The University Animal Care Facility (https://uac.arizona.edu/) procures and cares for all animals used in teaching and research by the Program. The staff of University Animal Care are available to students for consultation on problems related to the use of animals in scientific research.

***All students are required** to complete an online training course by the University Animal Care staff before the end of their first semester of residence to comply with federal, state and local regulations governing animal care. Please visit https://research.arizona.edu/compliance-public/animal-welfare-program for information on obtaining IACUC training and certification.

Laboratory Safety and Environmental Health

Students are required to attend courses on these topics by end of their first semester of residence, preferably soon after their arrival. It is the responsibility of all personnel involved in scientific study to be aware of the safety precautions and the proper disposal of hazardous waste 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 their desired area of research (https://research.arizona.edu/compliance). The offices of Research Laboratory Safety Services (https://research.arizona.edu/compliance-public/RLSS), 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. Others can be found on https://edgelearning.arizona.edu/.

Laboratory directors and technicians are the best source for day-to-day laboratory safety techniques and advice on safety seminars required for laboratory personnel. Please visit the Risk Management website at https://risk.arizona.edu/ to sign up for the training programs described above.

APPENDIX II: Relevant University Links

Collection of fees: https://catalog.arizona.edu/policy/registration-tuition-fees/fees-financial/collection-fees

Grading policies: https://catalog.arizona.edu/grading-policies

- https://catalog.arizona.edu/policy/courses-credit/grading/grading-system

Auditing: https://catalog.arizona.edu/policy/registration-tuition-fees/registration-enrollment/audit

Grade appeal: https://registrar.arizona.edu/records-enrollment/petitions-appeals/grade-appeal https://catalog.arizona.edu/policy/courses-credit/grading/grade-appeal

Incompletes: https://registrar.arizona.edu/faculty-staff-resources/grading/grading-policies/incomplete

Pass/fail option for graduate students: https://catalog.arizona.edu/policy/courses-credit/grading/grading-system

Repeating courses: : https://registrar.arizona.edu/records-enrollment/enrollment/repeating-course-grading-repeated-courses

- https://catalog.arizona.edu/policy/courses-credit/grading/course-repeat

Withdrawal/dropping from a course and complete withdrawal: https://registrar.arizona.edu/faculty-staff-resources/grading/grading-policies/withdrawals

- https://registrar.arizona.edu/records-enrollment/enrollment/leave-absences/complete-withdrawal-term#:~:text=You%20can%20drop%20classes%20before,or%20WC%20on%20your%20transcript

Retroactive Withdrawal: https://grad.arizona.edu/policies/academic-policies/retroactive-withdrawal

Dismissal from courses or from the university: https://medicine.arizona.edu/internal-resources/student-affairs/policies-and-forms/dismissal-policy-effective-class-2026-and-prior-classes

Enrollment: https://registrar.arizona.edu/records-enrollment/enrollment
Graduate College: https://grad.arizona.edu/new-and-current-students/navigating-your-degree

Student services:

Campus health: https://health.arizona.edu/
Career services office https://gradcenter.arizona.edu/career-services https://career.arizona.edu/
Campus recreation https://rec.arizona.edu/
Disability resource center https://drc.arizona.edu/
International student programs and services https://international.arizona.edu/iss
Counseling and psychological services https://caps.arizona.edu/
Dean of students https://deanofstudents.arizona.edu/

Housing https://housing.arizona.edu/
Multicultural programs and services https://hsi.arizona.edu/student-resources/cultural-resource-centers
Speech clinics https://slhs.arizona.edu/clinic/ua-speech-language-hearing-clinic
Testing office https://testing.arizona.edu/

University Regulations:

Equal Employment Policy:https://policy.arizona.edu/employment-human-resources/equal-employment-policy
Code of Academic Integrity: https://deanofstudents.arizona.edu/policies/code-academic-integrity
code of conduct: https://deanofstudents.arizona.edu/student-rights-responsibilities/student-code-conduct
Release of Student Information: https://registrar.arizona.edu/privacy-ferpa/student-parent-information#:~:text=Release%20of%20Information%20(FERPA)%20Authorization,which%20the%20access%20is%20available.
Student Records Privacy Guidelines https://registrar.arizona.edu/privacy-ferpa/ferpa#:~:text=In%20general%2C%20students%20have%20a,to%20anyone%20other%20than%20the
Records of Requests and Disclosures https://policy.arizona.edu/employment-human-resources/access-and-release-personnel-records-and-information
Rights of Access and Challenge to Personal Education Records

Nondiscrimination and anti-harassment: https://policy.arizona.edu/employment-human-resources/nondiscrimination-and-anti-harassment-policy

Telephone Directory

Equal Opportunity and Affirmative Action	621-9449
Multicultural/Academic Student Affairs	621-1094
Career Services	621-2588
Parking and Transportation	621-3550, Citation Appeals: 621-1207
Dean of Students	621-7057
Housing and Residential Life	621-6501
Disability Resource Center	621-3268
Speech Clinic	621-186
Hearing Clinic	621-7070
Financial Aid	621-1858
Student Campus Health Services	621-6490
Legal Services ASUA	621-2782
Student Information and Records	621-3113
Residency Classification (Domicile)	621-3636
Women's Resource Center	621-3919
Counseling & Psychological Services (CAPS)	621-3334
Veterans Certification	621-9501
Emergency (Fire, Police, Medical):	911

Arizona Poison and Drug Information Center:	626-6016

Diversity Resources

African American Student Affairs	621-3419
Africana Studies	621-5665
American Indian Graduate Center	621-3535
APEX (Academic Preparation for Excellence)	626-2307
Asian Pacific American Student Affairs	621-3481
Pride Alliance	621-7585
Center for English as a Second Language	621-1362
Center for Middle Eastern Studies	621-5450
Chicano/Hispanic Student Affairs	621-5627
East Asian Studies	621-7505
Hillel (serving UA/Tucson Jewish Community)	624-6561
International Affairs	621-1900
Latin American Area Center	626-7242
Native American Student Affairs	621-3835
S.A.L.T. Center for Learning Disabilities	621-1242
Women’s Resource Center	621-3919