



THE UNIVERSITY OF ARIZONA®

GRADUATE STUDENT HANDBOOK

GRADUATE PROGRAM IN:

***HEALTH AND
PHARMACEUTICAL OUTCOMES***

Revised: February, 2017

This handbook outlines the philosophy of and requirements for the graduate degrees offered in the Pharmaceutical Economics, Policy, and Outcomes track within the Pharmaceutical Sciences Graduate Program at The University of Arizona. It is intended to be used as a resource to understand the requirements for obtaining a graduate degree. This handbook should be used in conjunction with the General catalog and the Graduate College policy site. The requirements of the graduate program in the Pharmaceutical Economics, Policy, and Outcomes track outlined herein are under the authority and consistent with the rules and guidelines set forth by the Graduate College of the University. In those cases where the requirements are slightly different from those stated in the Graduate Catalog, the requirements in this Handbook pertain.

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

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1.0 INTRODUCTION

The Pharmaceutical Sciences Graduate Program track in Pharmaceutical Economics, Policy, and Outcomes has courses of study leading to the Master of Science and Doctor of Philosophy degrees. Well-funded research opportunities and the strong multidisciplinary nature of the program provide students with a highly interactive approach to research and education in Pharmaceutical Economics, Policy, and Outcomes.

M.S. Degree in the Pharmaceutical Economics, Policy, and Outcomes Track

The growth in the biotechnological and pharmaceutical sectors has created a demand for well-trained scientists who provide technical expertise that evaluates medication therapy and pharmacy services in the context of its benefits, risks, and costs. The M.S. program provides rigorous scientific training similar to that taking place in the Ph.D. track but with different academic requirements and less extensive research training. The average time to graduation is less than three years. Many M.S. graduates pursue pharmaceutical industry or managed care careers, which involve activities such as working at the project development, design, and management level, assisting in product development, and marketing.

Ph.D. Degree in the Pharmaceutical Economics, Policy, and Outcomes Track

The objective of the Ph.D. track in Pharmaceutical Economics, Policy, and Outcomes is to impart advanced scientific knowledge relevant to the field of study and to provide training opportunities in conducting state-of-the-art approaches in research. Successful candidates will meet the requirements for a career as an independent researcher in academia, industry, or government.

1.1 Background

Pharmaceutical Economics, Policy, and Outcomes is an applied field of study that uses knowledge and analytical approaches from a variety of foundational disciplines (e.g., economics, epidemiology, finance, medicine, pharmacy, public-policy, education, statistics) to evaluate health technologies (pharmaceuticals, electronic prescribing, electronic health records and health information exchanges). The primary focus of research in Pharmaceutical Economics, Policy, and Outcomes is to improve health and healthcare delivery at the patient, health plan, and population level through the appropriate use of pharmaceuticals or pharmacy services. Studies range in scope, but include areas such as cost-benefit/cost-effectiveness analysis, comparative effectiveness research, patient safety and quality improvement research, health disparities analysis, drug-drug interaction analysis, health technology assessment, meta-analysis, quality-of-life assessment, disease management and drug use evaluation. A myriad of study designs, outcomes, and techniques are used for research in this field; the ultimate goal is to better inform health care executives, physicians, and decision makers at all levels of government regarding the value of pharmaceuticals and the impact of policy decisions that affect the utilization of and payment for medications.

Since its emergence in the 1980s, there have been rapid advances in the field of Pharmaceutical Economics, Policy, and Outcomes, characterized by evolving standards and techniques, growth in the number of studies conducted, and use of health technology assessment by governmental agencies in the United States and abroad. This program of study provides students with a firm basis to further intellectual inquiries that contribute to the development of standards, techniques, and policy.

The expanded role of Pharmaceutical Economics, Policy, and Outcomes in the health-related sciences is evidenced by the increased need for highly trained professional personnel (Ph.D., M.S., MD-Ph.D., PharmD-Ph.D. degrees). This need is reflected in the number of positions available in research-teaching-service areas of health professional schools (e.g., medicine, pharmacy, public health), university graduate and undergraduate programs, pharmaceutical and chemical industries, managed care organizations, state and federal government research and regulatory agencies, local, state, and federal healthcare financing, and delivery entities (e.g., Medicaid, Medicare).

The Pharmaceutical Sciences Graduate Program track in Pharmaceutical Economics, Policy, and Outcomes at The University of Arizona is oriented toward state-of-the-art techniques as applied to pharmaceutical economics, drug safety, quality of life, policy, and the medication use process. Students are expected to master a variety of fundamental disciplines and apply the resulting knowledge and skills in the development of a comprehensive research plan.

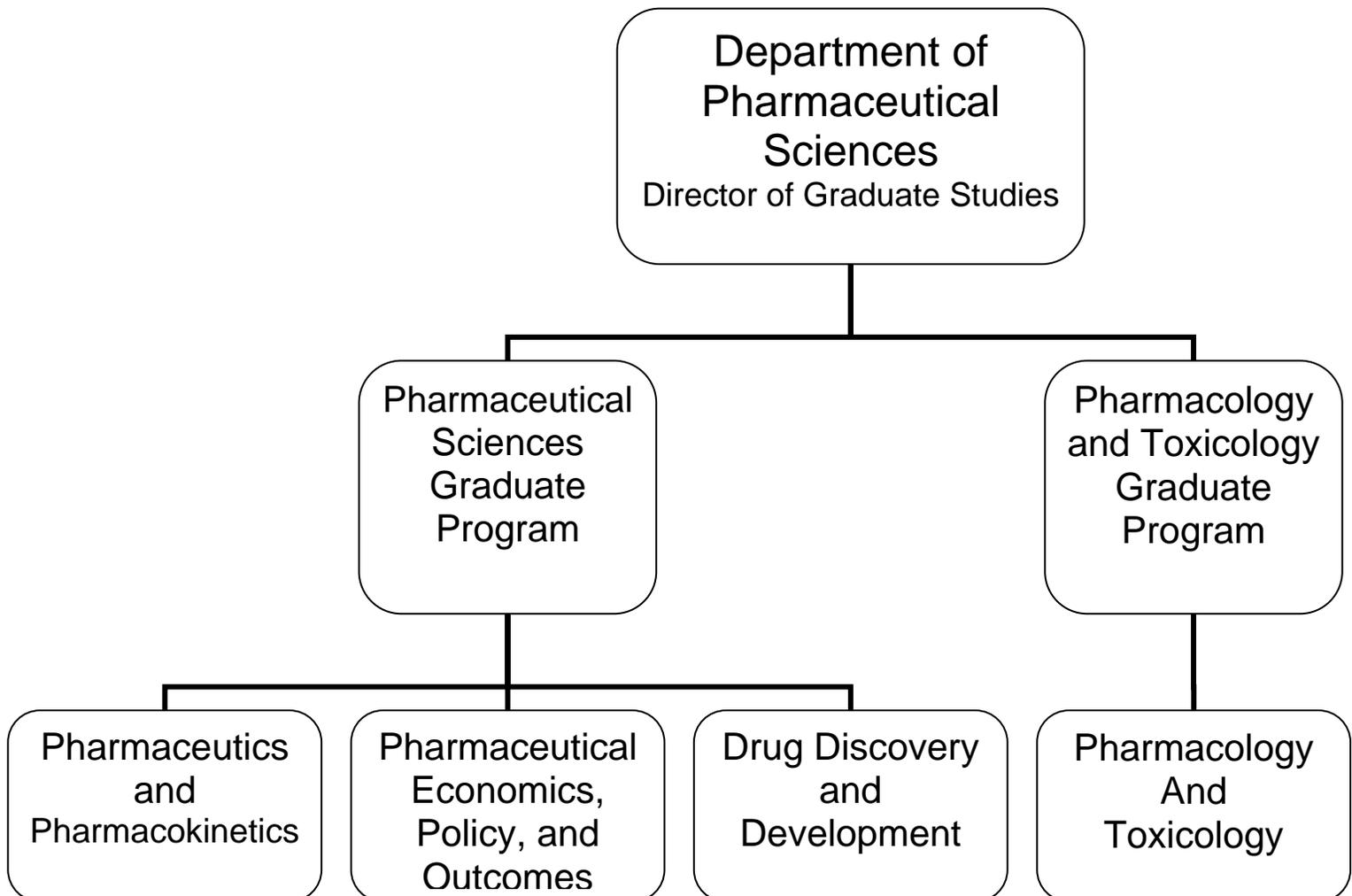
2.0 THE GRADUATE PROGRAM ORGANIZATION

2.1 Philosophy and Goals

The major objective of the Graduate Program track in Pharmaceutical Economics, Policy, and Outcomes is to train students to become scientists with broad expertise in the foundational disciplines as well as specific knowledge and skills in one or more focused areas. It is also expected that graduates of the program will have an opportunity to acquire effective teaching skills, along with the ability to present research findings in both oral presentations and print media. Evaluations of student performance are the responsibility of the faculty and, more generally, the Graduate Council.

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

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



2.3 Graduate Program Track Executive Committee

The Graduate Program Track Executive Committee is composed of three faculty from the Pharmaceutical Economics, Policy and Outcomes track. The committee is charged with overseeing development of curriculum, evaluation of students, admissions, and determining policy within the track.

2.4 Graduate Student Representatives

A graduate student representative is elected by the graduate students in the Pharmaceutical Economics, Policy, and Outcomes track for a two-year-term. The representative serves as an official liaison between the students and faculty in the track. The representative is responsible for organizing graduate student participation in Program endeavors, as well as serving on Program committees in an advisory capacity. The graduate student representative also shares service on the Graduate Council with the student representatives of other program tracks. Each student should seriously consider his/her choice for the graduate student representative(s) in order to maintain an effective student voice in Program issues.

2.5 Participating Faculty

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

Ivo Abraham, B.S., M.S., Ph.D., Professor

Clinical outcomes and effectiveness research, variability in (drug-centric) treatment regimens in patient outcomes.

Sandipan Bhattacharjee, M.S., Ph.D., Assistant Professor

Health Outcomes focus on Neurodegenerative diseases, Oncology and Diabetes.

J. Lyle Bootman, Ph.D., Sc.D., Professor

Medication errors, pharmacoconomics research, and international pharmacy systems. Research includes cost-effectiveness analysis, quality-of-life assessment, pharmaceutical policy analysis, drug-use evaluation in assessing the effectiveness of health care interventions, preventing medical errors; investigating the incidence and drug-related morbidity and mortality from a clinical and economic perspective.

Jenny Lo Ciganic, M.S., M.S.C.P., Ph.D., Assistant Professor

Pharmacopidemiology, outcomes, health services research, drug safety, medication adherence, applied novel statistical methods in pharmacoepidemiology studies.

Daniel C. Malone, Ph.D., Professor

Outcomes, health services research, decision analysis, drug safety.

Marion Kimball Slack, Ph.D., Associate Professor

Research design, public health, and methodological studies

Terri Warholak, Ph.D., Associate Professor

Quality improvement, medication safety

3.0 PHYSICAL RESOURCES AND FACILITIES

3.1 Research Space

The Graduate Program track in Pharmaceutical Economics, Policy, and Outcomes is located in the College of Pharmacy on the Health Sciences Center campus at the University of Arizona. Faculty members are also investigators in the Center for Health Outcomes and PharmacoEconomic Research, which is also located within the College of Pharmacy.

3.2 Equipment Resources

The graduate track in Pharmaceutical Economics, Policy, and Outcomes provides dedicated office space for each student and also supplies desktop computers for writing and conducting analyses. In addition, graduate students have full access to a variety of College resources, including high-speed black and white printers, color printers, and large format poster software and printer. Access to the University's library systems is accessible through the internet including on-line access to most medical, pharmacy, health services, and pharmacoeconomic journals.

3.3 Library Resources

The University of Arizona takes pride in the outstanding quality of its libraries. The Main Library and the Science Library, both on main campus, hold extensive collections of general and scientific periodicals and books. The Health Sciences Library <http://ahsl.arizona.edu/> is located 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 searches and state-of-the-art 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.

3.4 Human Subjects

The protection of human subjects is an integral component of modern research in Pharmaceutical Economics, Policy, and Outcomes. Graduate students **MUST** become familiar with human subjects protection and other relevant laws (e.g., HIPAA) and regulations. All students are **REQUIRED** to complete Conflict of Interest and obtain certification of human subjects training during the first semester of graduate study. Please visit the Office for the Responsible Conduct of Research at: <https://orcr.arizona.edu/hspp>

3.5 Center for Health Outcomes and PharmacoEconomic Research

Established in 1986 by J. Lyle Bootman, Ph.D., the Center collaborates with researchers, academic institutions, health care organizations, and pharmaceutical firms worldwide. Research activities include cost-effectiveness analysis, quality-of-life assessment, pharmaceutical policy analysis, drug-use evaluation and more. The mission of the Center for Health Outcomes and PharmacoEconomic Research is to conduct quality research, disseminate information, and provide training and service programs to enhance the application of economic and effectiveness measures to the practice of health care and the management of health systems. The vision of the Center for Health Outcomes and PharmacoEconomic Research is to become a premier source of information, training, and collaborative research in assessing the effectiveness of health care interventions.

4.0 GENERAL INFORMATION

4.1 Student Outcomes

Learning Outcome*	Assessment Strategy*
Develop testable research hypotheses.	Exams in PhSc 543 Proposal in PhSc 513 Project in PhSc 621 Exams and paper in PhSc 611 Comprehensive examinations
Design and evaluate studies that incorporate economic methodologies (e.g., cost-effectiveness analysis, cost-benefit analysis) for the evaluation of medical technologies.	Exams and proposals in PhSc 513 Exams and project in PhSc 621 Comprehensive examinations
Develop and evaluate data collection tools (e.g., questionnaires) to assess patient-reported outcomes associated with disease and/or its treatment.	Exams and papers in PhSc 612 Comprehensive examinations
Describe the ethical considerations required in research involving human subjects.	Exams in PhSc 543 Comprehensive examinations Completion of CITI Program Participation in HIPAA training
Articulate the policy development, implementation, and evaluation process as related to health care and pharmaceutical policy.	Exams and papers in PhSc 544
Develop and evaluate analytical plans for testing the statistical significance of research findings.	Comprehensive examinations Exams in PhSc 543 Proposal in PhSc 513 Project in PhSc 621
Prepare a proposal aimed at obtaining research funding.	Oral comprehensive examination
Demonstrate the ability to conduct a research project from inception to completion.	M.S. Thesis Ph.D. Dissertation
Clearly articulate the methods, findings, and implications of research projects via oral presentations.	Presentations in PhSc 596e Peer-reviewed presentations at scientific and/or professional meetings
Clearly articulate the methods, findings, and implications of research projects via written reports.	Published manuscripts in peer-reviewed scientific or professional journals
Demonstrate the ability to fulfill the roles required in an academic position, including teaching, research, and service activities.	Teaching assistantships PhSc 611 PhSc 596e
Possess a knowledge base and skill set that leads to employment and success in chosen career.	Job offers/Initial position Career advancement

*The requirement of six units of PhSc 699 (Independent Study) provides PhD students with individualized research experiences that facilitate attainment of many of the above learning outcomes and serve as assessment opportunities.

4.2 Student Responsibilities

The Graduate Program track in Pharmaceutical Economics, Policy, and Outcomes stresses the following issues of the utmost importance. Students are to conduct their research in an ethical manner; fraud related to the creation of false data or the theft of others' work will not be tolerated by this Program. Students should keep their data in a format acceptable to the research advisor and be prepared to turn over their records to the Graduate Program at any time. The student is expected to complete the required and elective coursework in a timely manner in order to comply with Graduate College time limitation policy. To view the Graduate College time limitation policy:

<http://grad.arizona.edu/gsas/degree-requirements/important-degree-dates-and-deadlines>

4.3 Orientation and Immediate Steps

All new students are required to attend the Graduate College and College of Pharmacy Orientations held prior to the first day of classes, regardless of funding source for their studies. In addition, it is recommended that students complete the "Immediate Steps" after receiving admission to the graduate program at:

<http://www.pharmacy.arizona.edu/grad-pgms/for-ms-phd-students/when-you-arrive/immediate-steps>

4.4 Individual Health Insurance through Campus Health Services

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

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

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

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

4.6 Financial Support

Financial assistance in the form of research assistantships or traineeships is available to all first year Ph.D. students admitted into the Program. Assignment of students to training grants is a responsibility of individual training grant advisory committees. Students are also encouraged to apply for individual predoctoral fellowships from sources outside the University. Appointments as research assistants provide remission on tuition and health insurance. Financial assistance for M.S. students is dependent on the availability of funds.

4.7 GRADUATE ASSISTANT/ASSOCIATE STIPEND LEVELS AND BENEFITS 2016–2017

FISCAL	50% FY	TUITION WAIVER FALL/SPRING	100% FALL/SPRING REGISTRATION REMISSION	STUDENT INSURANCE FULL YEAR
Graduate Assistant I (All 1st-Year Students) Late start in August	\$18,946 Prorated	\$19,752	\$11,372	\$2,065.43
Graduate Assistant II (2nd-Year Students, except Ph.D. with M.S.)	\$23,394	\$19,752	\$11,372	\$2,065.43
Graduate Associate I (2nd-Year Student, with M.S. or Pharm.D.)	\$23,967	\$19,752	\$11,372	\$2,065.43
Graduate Associate II (Ph.D. students completed Prelim Exam)	\$24,438	\$19,752	\$11,372	\$2,065.43

4.8 Graduate Assistantships/Associateships

Please refer to the Graduate College GA Hiring Manual for complete details regarding your GA.

<http://grad.arizona.edu/funding/ga>

4.9 Tax Information

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

Graduate students, who are in Graduate Assistant/Associate positions, must be enrolled in half-time status in order to qualify for exemption from FICA taxes. (Rev. Proc. 98-16.) *To be exempted from FICA taxes, graduate students will need to be enrolled a minimum of 6 units during the fall and spring semesters, and in at least 3 units during Summer I and II.*

4.10 Registration

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

4.11 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: <http://grad.arizona.edu/policies/enrollment-policies/minimum-enrollment> This includes any semester during which a preliminary or final examination is scheduled. The minimum enrollment allowed per semester (fall and spring) for students enrolled in the Graduate College is 3 graduate units, except for students who have met all their coursework and thesis or dissertation requirements; they may take only 1 unit.

M.S. students should enroll for thesis PHSC 910. Such registration may be used concurrently with other courses to reach the required three (3) unit minimum enrollment for academic semesters. Although only a maximum of six (6) units of PHSC 910 may be claimed for credit on a student's Plan of Study, the student may enroll for as many units as needed to complete the thesis.

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

4.12 Research/Teaching Assistants Minimum Registration

All graduate students in the Graduate Program track in Pharmaceutical Economics, Policy, and Outcomes who are supported by or through the University are considered to be full-time students. All full-time students are expected to enroll for some combination of coursework, research, or independent study that results in thirteen (13) units of credit for each academic semester and one (1) unit each summer session. Students completing their degree in an academic semester may register for (6) units of credit ONLY ONCE. If the degree, is not completed (13) units of credit will be required during an academic semester and (1) unit of credit during a summer session.

4.13 Scientific Meetings

As part of the educational process, students in training will be encouraged to attend national scientific meetings as travel support permits. Priority for travel support will be given to students presenting communications at national meetings. Students should discuss participation in meetings and travel support with their Research Advisors. Students may also apply for travel funds available from the Graduate College by contacting the Program Office. The Program Office requires a copy of any communications presented (e.g. abstracts).

4.14 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 major advisor, discuss the steps to be taken to remediate the problem(s) that led to the probationary status, and devise a written plan of action to be submitted to the Graduate Track Director. After the first semester a student completes with a cumulative GPA less than 3.0 they will be allowed to register for one additional semester. The student will be blocked from registering after that unless their cumulative GPA reaches 3.0 at the end of the second consecutive semester of probation. **Students whose GPA is below 3.0 for two consecutive semesters will be disqualified from their program.** Disqualification results in the student being blocked from registration. Students may apply for readmission to a degree program after their they have achieved a cumulative grade point average of at least 3.0 through additional graduate coursework (not more than 12 credits taken as non-degree may count toward the degree). Such a request must be supported by the program track director and the assistant dean for research and Director of Graduate Studies.

4.15 Satisfactory Academic Progress

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

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

Student Evaluation – The program faculty committee annually evaluates each student on the basis of accomplishments in formal courses and performance in other areas of the Program including research as well as attendance and participation in seminars. Satisfactory performance in courses and research are required. **Failure to meet performance criteria in any of these areas is grounds for recommendation of dismissal from the Program.**

Annual Reports - All students will submit an annual report to the Graduate Program Coordinator, on or before June 1. The Annual Report must be approved and signed by the Track Director (first year students) or the Research Advisor (all other students) prior to submission to the Program office. Annual Reports for every year matriculating in the program are mandatory.

Sponsorship - By June 15 the program faculty make a determination if each first year student will be sponsored for the following year (based on performance criteria). This determination will be assessed yearly thereafter. Poor performance in assigned duties may result in the loss of sponsorship. Sponsorship decisions after the first year are made by the student's major advisor and or the Director of Graduate Studies.

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

Dissertation/Thesis Committee Meetings - All students are required, after the formation of a dissertation/thesis committee, to have at least one committee meeting per year while in the program.

Completion Timeline – Each College of Pharmacy graduate track will include a table of completion of degree requirements in their student handbook, which is posted on the College of Pharmacy graduate programs Website.

Notification of Failure To Meet Academic Progress Guidelines

When it is determined by the graduate track faculty that a student is not meeting academic progress, the student will receive written notification with a clear statement of what he/she must do and a date by which such actions must be completed. The Graduate College will receive a copy of the letters of unsatisfactory progress. Students who fail to remediate by the deadlines specified may be dismissed from the program. Students will be given an opportunity to appeal or rebut.

Appeals Process

If a student wishes to appeal any of the requirements mentioned above, the appeal should be made in writing to the director of the student's research track (Pharmaceutical Economics, Policy, and Outcomes). The appeal will be reviewed by the entire program faculty and may include a collective meeting with the student. A decision to accept the appeal of the program faculty will be based on a majority vote. The program faculty may place additional requirements/deadlines on the student as a prerequisite for continuing in the program.

Students who wish to appeal the decision of the program faculty must submit an appeal in writing to the director of graduate studies in the College of Pharmacy.

4.16 M.S. Completion Suggested Guidelines

YEAR	TIME-FRAME GUIDELINES
YEAR 1 and Summer	<ul style="list-style-type: none"> • Complete Deficiency Coursework (if applicable) • Complete First Year Core Coursework • Selection of Major Advisor • Form Thesis Committee • Begin Thesis Research
YEAR 2 and Summer	<ul style="list-style-type: none"> • Complete Second Year Core Coursework • Submit Master/Specialist Plan of Study to Program Office • Present and defend thesis research proposal • Present Seminar • Thesis Research (register for a minimum of 3 units in that given semester) • Pass Final Examination (Thesis Defense) • Graduate Programs Office submits Completion of Degree Requirements in UAccess
YEARLY	<ul style="list-style-type: none"> • Complete Annual Report (on or before June 1) • Attend Weekly Seminar Program • Thesis Research Advisory Committee Meeting • Students supported by or through the University are expected to enroll for 13 units of credit each academic semester and 1 unit each summer session

4.17 Ph.D. Completion Suggested Guidelines

YEAR	TIME-FRAME GUIDELINES
YEAR 1 And Summer	<ul style="list-style-type: none"> • Complete first year core coursework • Begin research projects with faculty • Present in graduate seminar • Select thesis committee and commence with MS research project
YEAR 2	<ul style="list-style-type: none"> • Continue research • Complete second year core coursework • Complete thesis research • Present in graduate seminar both semesters • Present research at national or international meeting(s) • Submit Plan of Study • After taking 33 units of core-coursework, students will begin preparation towards PhD candidacy with the completion of either an MS Thesis or Qualifying Exam.
YEAR 3	<ul style="list-style-type: none"> • Completed all or almost all of minor course requirements • Completed all or almost all of core course requirements • Submit Comprehensive Exam Committee Appointment Form • Pass minor comprehensive exam • Assemble dissertation committee • Present research at national or international meeting(s)
YEARS 4 and 5	<ul style="list-style-type: none"> • Pass major written and oral comprehensive examinations • Submit Doctoral Dissertation Committee Appointment Form • Initiate development of Ph.D. research • Present and defend research proposal to dissertation committee • Present and pass final examination (Dissertation Defense) • Present research at national or international meeting(s) • Identify employment opportunities
YEARLY	<ul style="list-style-type: none"> • Receive at least a B letter grade in all core courses • Attend weekly seminar • Complete annual report (on or before June 1) • Students supported by or through the University are expected to enroll for 13 units of credit each academic semester and one unit each summer session

5.0 M.S. PROGRAM

5.1 Coursework Requirements

The Graduate College requires a minimum of 30 units of graduate credit. The Graduate Program track in Pharmaceutical Economics, Policy, and Outcomes requires at least 33 units. At least half of the units must have letter grades assigned (i.e., A, B, C, etc.). A 3.0 grade point average must be maintained. Probation will result if a student's GPA falls below 3.0. Students are responsible for knowing and understanding the contents of the catalog they are following and are strongly encouraged to read the UA's student responsibility policy at:

<http://catalog.arizona.edu/2015-16/>

Required Courses for M.S. in Pharmaceutical Economics, Policy, and Outcomes

PHSC 513	Health Technology Assessment	3
PHSC 543	Health Services Research Methods	3
PHSC 506	Economic Foundations for Health Sciences	3
EPID 576a	Biostatistics in Public Health	3
EPID 576b	Biostatistics for Research	3
PHSC 621a	Applied Health Technology Assessment	4
Electives	(Approved by major advisor)	6
PHSC 596e	Student Seminar	2
PHSC 910	Thesis	6
TOTAL REQUIRED		33

5.2 M.S. Course of Study: Pharmaceutical Economics, Policy, and Outcomes

Fall Semester – First Year		Units	Total
PHSC 543	Health Services Research Methods	3	
EPI 573a optional or elective	Basic Principles of Epidemiology	3	
EPI 576a	Biostatistics in Public Health	3	
PHSC 513	Health Technology Assessment	3	
PHSC 596e	Graduate Seminar	1	13
Spring Semester – First Year			
PHSC 506* (ECON 550/BNAD 510 optional**)	Economic Foundations for Health Sciences	3	
PHSC 621a	Applied Health Technology Assessment	4	
PHSC 612 optional or elective	Patient-Reported Health Outcomes	3	
EPI 576b	Biostatistics for Research	3	
PHSC 596e	Graduate Seminar	1	14
Fall Semester – Second Year			
PHSC 910	Thesis	3	3
CPH 507/574/617 (Required-PhD level)	Advanced PH Policy	(3)	
PHSC 596e	Graduate Seminar	1	
Spring Semester – Second Year			
PHSC 910	Thesis	3	3
PHSC 596e	Graduate Seminar	1	
Total Required Units			33

* May be taken in Spring Semester of First Year if available

** ECON 550 or equivalent (e.g., BNAD 510 – Business for Scientists) or with permission of instructor

5.3 Seminar

Students completion must register for seminar PHSC 596e each semester. Although only two units of seminar count toward the M.S. degree study plan, students must attend and participate in seminar each semester they are enrolled.

5.4 Major Advisor

The M.S. student must choose a major advisor within the first year. By the conclusion of their first semester in residence, it is recommended that students meet with the graduate program faculty to assist in the selection of the major advisor.

5.5 Student Evaluation

On behalf of the Graduate Program, the Program track faculty evaluates each student on the basis of accomplishments in formal courses and performance in other areas of the Program including attendance and participation in seminars as well as performance on research projects. Satisfactory performance in courses and research is expected. **Failure to meet performance criteria in any of these areas is grounds for dismissal from the Program.**

5.6 Annual Reports

Each student is required to submit an Annual Report to the Program office, College of Pharmacy room 336, **on or before June 1**. An email notice will be sent out from the Program Office to students at least one month prior to the Annual Report due date, which will include an attachment of the Annual Report form for the student to fill out.

The Annual Report must be approved and signed by the Program Track Director (first year students) or the Major Advisor (all other students). The Program Track Director reviews and approves all reports after they have been submitted to the Program office. Annual Reports for every year matriculating in the program are mandatory.

The Graduate Program Track Committee may determine eligibility for future support after the first year. Second year students are evaluated for satisfactory progress towards the M.S. or Ph.D. degree. If performance is substandard, the Graduate Program Track Committee may recommend a probationary period, withdraw program sponsorship, seek dismissal, or other appropriate action.

The Annual Report will list courses taken and grades received, committee meeting(s) held, abstracts and papers published, seminar and report presentations, honors, outside funding, and a succinct and lucid summary of research progress. The Annual Report must be approved by the Graduate Council. **Students who do not meet this deadline will receive a one-time letter requesting the information be provided immediately or the student will be dropped from the Program for failure to meet Program degree requirements.**

5.7 Time Limitation

All requirements for the master's degree must be completed within 6 years. Time-to-degree begins with the earliest course to be applied toward the degree, including credits transferred from other institutions. Coursework more than 6 years old is not accepted toward degree requirements.

5.8 Transfer Coursework Credit

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

who wish transfer courses must submit an evaluation of transfer credit via GradPath before the end of their first year of study.

5.9 Plan of Study

In conjunction with his/her major advisor, each student is responsible for developing a Plan of Study as early as possible during the first year in residence, to be submitted to the Graduate College no later than the third semester in residence.

Provisional Graduate Status must be converted to Regular Graduate Status and all deficiencies must be satisfied before the Plan of Study is approved.

The Plan of Study identifies (1) courses the student intends to transfer from other institutions; (2) courses already completed at The University of Arizona which the student intends to apply toward the graduate degree; and (3) additional course work to be completed to fulfill degree requirements. The Plan of Study must have the approval of the student's major advisor, Graduate Program Track Committee, and Assistant Dean for Research and Graduate Affairs in the College of Pharmacy, before it is submitted to the Graduate College.

5.10 M.S. Committee Members

M.S. committees consist of at least three (3) members. At least two (2) members must be tenure-track faculty at the rank of Assistant Professor or higher, and two must be faculty members in the major field. Tenure-track faculty with appointments in the academic unit of the major must direct or co-direct all M.S. theses. Permission is required from the Program Track Committee if a student's Major Advisor holds an Associate Faculty membership.

5.11 Thesis Committee Meetings

The Thesis 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 will be responsible for preparing a thesis proposal which will outline the background and objectives, review of the relevant literature, and research design and methods (i.e., the first three chapters) of the proposed thesis project. The student will present the proposal to the Thesis Committee at a private seminar. The Thesis Committee will be helpful in focusing the objectives of the proposed thesis as well as limiting the scope. It is strongly recommended that the student meet with the advisory committee shortly before scheduling the final defense. **You must indicate in your Annual Report the date of your annual committee meeting.**

5.12 Manual for Format and Writing Thesis

Graduate College website: <http://grad.arizona.edu/gsas/dissertations-theses/dissertation-and-thesis-formatting-guides>

5.13 Scheduling Thesis Defense

Student's scheduling their M.S. thesis defense should first contact the Graduate Programs Office. The student will also be required to provide a format correct draft copy of the thesis to the defense committee at least fourteen (14) working days before the examination date.

5.14 Thesis Defense

The student is expected to present and defend the first three chapters before preceding to data collection analyses etc. All five chapters will be orally defended as part of the final exam. A written thesis is required. After submission of the thesis, the student must defend it during an oral examination. Preparation of the written thesis follows the Graduate College rules, (**Student's Manual for Theses and Dissertations** which is available on the Graduate College website:

<https://arizona.app.box.com/v/grad-gsas-thesisformat>

The oral examination is administered by the three (3) member student's advisory committee.

The results of the examination must be reported in UAccess GradPath within ten (10) working days. A candidate who fails a final oral examination may, upon the recommendation of the major department, will be granted a second examination. The results of the second oral examination are final.

The Completion of Degree Requirements must be received by graduate student academic services (GSAS) upon completion of the examination. Note that the department should **not** hold the Completion of Degree Requirements until all requirements are due: items such as current grades, thesis, can remain to be completed. A student completing a master's thesis (with enrollment in course number 910) is required to [archive the thesis](#) upon final approval of the thesis committee. The thesis will be added to the University of Arizona Campus Repository and to the national archive of dissertations and theses maintained by ProQuest/UMI. There is no charge to the student for archiving the thesis.

5.15 Formal Documentation

Three (3) forms must be completed during the interval in which the work for the M.S. degree is in progress.

Annual Report - submitted to the Program office on or before June 1 of each year.

Plan of Study - must be submitted no later than the third semester in residence.

Completion of Degree Requirements - is completed after the examination by the Graduate Program Office.

5.16 Ph.D. Qualifier Examination

Upon entry into Master's program and at the completion of at least two years of required coursework, a graduate student with a clinical bachelor's degree (e.g., Bachelor of Science in Pharmacy) or advanced clinical doctorate or terminal master's degree (e.g., Doctor of Pharmacy/Pharm.D., Doctor of Medicine/M.D., MPH) may opt to take a Ph.D. Qualifying Examination ("Qualifiers") to gain entry into the Ph.D. program. While successfully passing the Qualifiers thereby waives the requirement of a Master's Thesis, the successful completion of the Ph.D. Comprehensive Examination is still necessary for the student to enter Ph.D. Candidacy.

The Qualifiers shall consist of three parts:

- 1) Closed book examination spanning a range of required graduate track coursework (e.g., health technology assessment, applied health technology assessment, research methodology), wherein one hour will be allotted for each section;
- 2) Empirical data analysis with accompanying research report, lasting one week in duration; and
- 3) Concept/White paper, lasting one week in duration.

If the student does not successfully pass all sections of the Qualifiers, one additional opportunity is provided wherein the examination is taken in entirety. The student will not progress to the Ph.D. program if the Qualifier is failed or if the examination is not completed.

6.0 Ph.D. PROGRAM

For Ph.D. students, the major advisor and dissertation committee will help the student plan an educational program in which coursework is completed as quickly as possible. Because of individual interests or conflicts in scheduling, the guidelines below present a recommended sequence of coursework. Some courses may not be offered every year. Consequently, in the absence of prerequisites, the student should enroll in courses when available to prevent delays in completing studies.

6.1 Core Courses for Ph.D. track in Pharmaceutical Economics, Policy, and Outcomes

REQUIRED COURSES

MAJOR

PHSC 513	Health Technology Assessment	3	
PHSC 506	Economic Foundations for Health Sciences (or equivalent)	3	
PHSC 543	Health Services Research Methods	3	
CPH 617	Advanced Health Policy Analysis (or equivalent CPH 507/574)	3	3
EPID 573a	Basic Principles of Epidemiology	3	
EPID 576a	Biostatistics in Public Health	3	
EPID 576b	Biostatistics for Research	3	
PHSC 621a	Applied Health Technology Assessment	4	
PHSC 612	Patient-Reported Health Outcomes	3	
PHSC 611	Pharmaceutical Education Research	3	
PHSC 596e	Student Seminar (1 credit/semester until defense)	4	
PHSC 699	Independent Study (only take 3 units if taking CPH 652)	6	(3)
CPH/EPI 652	Grant Writing Course (Optional) in lieu of 3 research units	(3)	

MINOR and Electives 21

PHSC 920	Dissertation	18	
PHSC 900	Research (as needed to fulfill 13 units per semester)		

TOTAL REQUIRED: 80

6.2 Course of Study Ph.D. Pharmaceutical Economics, Policy, and Outcomes

<u>Fall Semester –</u>		<u>Units</u>	<u>Total</u>
PHSC 543	Health Services Research Methods	3	
EPI 573a	Basic Principles of Epidemiology	3	
EPI 576a	Biostatistics in Public Health	3	
PHSC 596e	Graduate Seminar	<u>1</u>	
	Elective or Minor	3	13
<u>Spring Semester –</u>			
PHSC 506 (or equivalent)	Economics Foundations for Health Sciences	3	
PHSC 513	Health Technology Assessment (1)	3	
EPI 576b	Biostatistics for Research	3	
PHSC 596e	Graduate Seminar	<u>1</u>	
	Elective or Minor	3	13
<u>Fall Semester –</u>			
CPH 617	Advanced Health Policy Analysis (or equivalent)*	3	
PHSC 611	Theory and Practice in Pharmacy Education	3	
PHSC 596e	Graduate Seminar	<u>1</u>	
	Elective or Minor	6	13
<u>Spring Semester –</u>			
PHSC 612	Patient-Reported Health Outcomes	3	
PHSC 621a	Applied Health Technology Assessment (2)	4	
PHSC 699	Independent Study	3	
PHSC 596e	Graduate Seminar (Max 4 for Plan of Study)	<u>1</u>	
	Elective or Minor	3	14
<u>Fall Semester –</u>			
PHSC 699 OR	Independent Study	3	
CPH 652 (optional)	Grant Writing Course	3	
PHSC 596e	Graduate Seminar	<u>(1)</u>	
	Elective or Minor	6	13
<u>Spring Semester –</u>			
PHSC 920	Dissertation	9	
PHSC 596e	Graduate Seminar	(1)	
PHSC 900	Research	(3)	13
<u>Fall Semester-</u>			
PHSC 920	Dissertation	<u>9</u>	
PHSC 596e	Graduate Seminar	(1)	
PHSC 900	Research	(3)	13

All graduate students in the Graduate Program track in Pharmaceutical Economics, Policy, and Outcomes who are supported by or through the University are considered to be full-time students. All full-time students are expected to enroll for some combination of coursework, research, or independent study that results in a minimum of thirteen (13) units of credit for each academic semester (Fall/Spring). Once required coursework is completed, students should continue enrolling in dissertation, research and seminar units until final oral examination is accomplished.

6.3 Seminar PHSC 596E

These seminars are presented by the students, faculty and invited speakers in the Graduate Program. Seminars are an opportunity for students to practice presentation skills and to update the faculty and students on their research progress. **Students are required to register for PHSC 596E each Fall and Spring Semester.** Grades (A, B,C,D,E), are calculated based on presentation and attendance, and other criteria as specified by the course instructor.

6.4 Minor Requirements

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 Program Track Committee and Program Track Director.

6.5 Suggested Minor Programs for Pharmaceutical Economics, Policy, and Outcomes Majors

1. **Epidemiology**
2. **Educational Psychology**
3. **Marketing**
4. **Biostatistics**
5. **Economics**
6. **Health Policy**

6.6 Minor in Pharmaceutical Economics, Policy, and Outcomes

A minor in the *Pharmaceutical Economics, Policy, and Outcomes* track within the Pharmaceutical Sciences graduate program is available to Ph.D. students in other departments at the University of Arizona. The minor in this area requires a total of 16 units of course work. At the completion of the course work, a four-hour written comprehensive examination must be successfully completed.

The course of study for the minor includes core courses plus an additional course from Public Health.

PHSC 513	Health Technology Assessment	3
PHSC 612	Patient-Reported Health Outcomes	3
PHSC 621a	Applied Health Technology Assessment	4
PHSC 543	Health Services Research Methods	3
CPH 617	Advanced PH Policy	3

6.7 Transfer of Coursework

Graduate credit earned at other approved institutions, if accepted by 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. 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). At least one half the units used on the Doctoral Plan of Study must be in courses in which regular grades (A, B, C) have been earned. A minimum of 12 units of regular grades taken at The University of Arizona are required to establish a University of Arizona G.P.A. Credit for correspondence courses or extension work obtained at other institutions will not be accepted for graduate credit.

Students who wish to use transfer credit must first submit the transfer request form to the Graduate College (GradPath Forms) before the end of their first year of study. This allows the Graduate College to evaluate the transfer credit while the transcripts are still in the Graduate College, and ensures that students will know early in their studies

whether or not the credits are acceptable. The Graduate College evaluation simply determines whether or not the courses are eligible for transfer; the PharmEPO Graduate Track Committee will still decide which courses should be part of the Program of Study. ***Any core course requested for transfer to the committee will require a foundational knowledge assessment by the instructor.***

6.8 Grades Listed in Plan of Study

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

6.9 Major Advisor and Dissertation Committee

Prior to the selection of a major advisor, the student must become familiar with the research interests of the faculty. Students should meet individually with the faculty whose research is of particular interest or potential interest. Additional familiarity is gained through research and class projects.

After these preliminary meetings, the student decides with whom he/she would like to do his/her research. After consultation with, and agreement of the faculty member, the student must communicate this decision to the Program Track Director before the end of the Spring Semester during the first year. Faculty and graduate students should avoid making commitments earlier than April or May of the first year. The major advisor must be a tenure track full faculty member in the Program. In the event that the research project is carried out under the direction 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 under the direction of an associate faculty member, permission from the Program Track Committee is required. Upon agreeing to supervise a student, it is incumbent upon the student's major advisor to provide financial support through a research assistantship.

The dissertation committee consists of three members from the Program faculty and one or two from the minor field, with a total of five members. The committee is chaired by the major advisor. The major advisor discusses membership of the dissertation committee with the student. The functions of the committee are to:

- advise the student on his or her doctoral program with regard to coursework and research,
- administer written and oral comprehensive examinations, and
- administer the dissertation defense.

The Dissertation committee will meet with the student at least once a calendar year and as necessary to review progress in coursework and research. The student will be responsible for presenting and defending their research proposal, which will consist of a private seminar to the dissertation committee which outlines the background, preliminary data, goals, and study methods of the proposed research. The committee will assist the student in focusing the objectives of the proposed research. It is strongly recommended that the student meet individually with members of the committee if necessary while conducting the research if unexpected problems or issues arise and before scheduling the final defense. **The students must indicate in his or her Annual Report the date(s) of the dissertation committee meeting(s).**

6.10 Annual Reports

Each student is required to submit an Annual Report to the Program office, College of Pharmacy room 336, **on or before June 1.** The Annual Report must be approved and signed by the Program Track Director (first year students) or the Major Advisor (all other students). The Program Track Director reviews and approves all reports after they have been submitted to the Program office. Annual Reports for every year matriculating in the program are mandatory. The Annual Report form can be found on the College of Pharmacy Graduate Program Website: <http://www.pharmacy.arizona.edu/programs/graduate/>

The Graduate Program Track Committee may determine eligibility for future support after the first year. Second year students are evaluated for satisfactory progress towards the M.S. or Ph.D. degree. If performance is

substandard, the Graduate Program Track Committee may recommend a probationary period, withdraw program sponsorship, seek dismissal, or other appropriate action.

The Graduate Council approves the annual reports for each student. Satisfactory performance in formal courses, seminars, research and other areas of the Program is required. **Failure to meet performance criteria in any of these areas is grounds for dismissal from the program.**

The Annual Report will list courses taken and grades received, committee meeting(s) held, abstracts and papers published, seminars and report presentations, honors, outside funding, and a succinct and lucid summary of research progress. **Students who do not meet this deadline will receive a one-time letter requesting the information be provided immediately or the student will be dropped from the Program for failure to meet Program degree requirements.**

6.11 Plan of Study

In conjunction with his/her major advisor, each student is responsible for developing a Plan of Study as early as possible during the first year in residence, to be submitted to the Graduate College no later than the third semester in residence.

Provisional Graduate Status must be converted to Regular Graduate Status and all deficiencies must be satisfied before the Plan of Study is approved.

The Plan of Study identifies (1) courses the student intends to transfer from other institutions; (2) courses already completed at The University of Arizona which the student intends to apply toward the graduate degree; and (3) additional course work to be completed to fulfill degree requirements. The Plan of Study must have the approval of the student's major advisor, Graduate Program Track Committee, and Program Chair before it is submitted to the Graduate College.

6.12 Comprehensive Examination

The Comprehensive Examination consists of two parts: the written examination, and the oral examination. The comprehensive exam is scheduled after the student has completed all of required courses. Students must complete the comprehensive examination within three (3) years from admission to the Ph.D. Program. Failure to comply is grounds for dismissal from the Program. See College of Pharmacy Program Requirements: <http://www.pharmacy.arizona.edu/grad-pgms/for-ms-phd-students/program-requirements> for additional information.

Each student's dissertation committee serves as the comprehensive examination committee. When the student thinks he/she is ready to schedule oral exams he/she should:

- 1) Discuss the proposed timeline with his/her major professor. If the student is not ready for the oral exam it is the major professor's responsibility to let the student know that. Once the proposal is approved, the student can then set the date with the other committee members.
- 2) Work with his/her committee members to select a date and time for the Oral (at least one month before the proposed date).
- 3) Once that date/time is determined, the student should see Sonya in the Graduate Studies Office to schedule a room and to submit the Oral paperwork with the Graduate College and
- 4) Send out the reports from the written open-book data analysis; and the second written open-book assignment and a confirmation of the Oral defense date and time to the committee.

Written Examination

The written portion of the examination consists of three closed-book examinations, each lasting approximately four hours. The content areas include but are not limited to: health technology assessment, research methods and statistics, and an area of interest as determined by the student's Major Advisor in consultation with the student. Question for the written exam can be derived from ANY topic covered in the in ANY component of ANY of the required classes. Use of notes, references, Internet, books, or other materials is strictly forbidden unless specific permission is granted by the faculty responsible for writing and grading the assigned section. The written examination should be scheduled

no later than 3 months after the student has completed didactic coursework listed on his/her plan of study.

Oral Examination

Oral examinations contain three parts: 1) A written report based on a data analysis assignment to be completed within a 14-day time period using any references or materials except another student or living individual; 2) a second open-book assignment with the topic to be determined by the faculty of the Program to be completed in a 28-day time period; and 3) an oral defense. The oral examination must be started no later than 1 month after completing the written examination described directly above.

- 1) A written open-book data analysis assignment to be completed within a 14-day time period; The student will be provided a research question, data dictionary, and data set to answer the research question(s). The student will be expected to identify the correct observations of interest, identify and conduct any data cleaning or recoding, select the appropriate statistical test, and report and interpret the findings of the statistical analysis.
- 2) A second open-book assignment to be completed in a 28-day time period; This assignment will consist of a original research paper with the topic to be selected by program faculty. Examples of topics include: 1) conduct a systematic review of a narrowly defined research question; 2) draft a policy paper on a contemporary issue; 3) critique existing research and develop a mini-proposal to address the same research question. These are examples. Other types of questions may be given to the student depending on the student's interests and coursework. *See Oral Exam Written Report example.*
- 3) An oral defense to present the results from (1) and (2) to the committee and answer questions from the committee. The first component of the oral exam will consist of the presentation and defense of the data analysis and second open book assignment. The presentation should include no more than 25 slides and be no more than 30 minutes long. The student should be ready to answer questions after the presentation.

All students should also be expected to answer questions related to any component of their coursework as well as deficiencies identified in the written examination and areas of interest specified by the student. The line of questions can include all aspects of the graduate program. Students should be prepared to discuss topics, methods, and procedures necessary to be an independent researcher in the field of Pharmaceutical Economics, Policy, and Outcomes. At the conclusion of the oral examination the committee will make a determination of the student's performance.

Outcomes of the Comprehensive Examination

Three outcomes are possible: 1) pass; 2) fail – with recommendations for additional study and re-examination; and 3) fail – dismissal from the program. Each of the five committee members shall vote via secret ballot. Failure of the oral exam is denoted by at least two committee members indicating a failed performance. If the student fails the examination with recommendation for additional study, the earliest the exam may be repeated is 90 days. Students who fail an oral exam may be ineligible for funding, as the discretion of the student's Major Advisor. The student must also submit a Graduate Path form.

See <https://grad.arizona.edu/gsas/degree-requirements/doctor-philosophy#comprehensive-exam> for additional information.

6.13 Failure of the Second Attempt of the Oral Comprehensive Examination

Students who fail a second attempt of the oral comprehensive examination are automatically dismissed from the Ph.D. Program.

6.14 Advancement to Candidacy

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

After passing the Oral Comprehensive Exam, the student is required to submit the **Dissertation Committee Appointment** Form via GradPath. The Final Oral Defense Examination should be scheduled at least one month in advance to submit the form via GradPath. Deadlines for the submission of paperwork pertaining to doctoral programs, as well as all forms, are available online from the Graduate College Website: <http://grad.arizona.edu/>

6.15 Dissertation

Preparation of the written dissertation follows the Graduate College formatting guides at: <http://grad.arizona.edu/gsas/dissertations-theses> When the dissertation is written, the candidate submits a copy to each member of his/her committee.

After a student has successfully completed his/her written and oral examinations, he/she may begin dissertation research. The student must prepare and submit a proposal to his/her dissertation committee for approval. The proposal must contain the problem to be studied, specific objectives, a review of the pertinent literature, research procedures to be used, suggested method of analysis, estimated cost, and a tentative timetable (Chapter 1 and Chapters 2,3,4 through Methods if using format option 1 or the first three chapters if using format option 2). Planning the research program begins in meetings with the Major Advisor and the Dissertation Committee. The Committee reviews the goals and experimental approaches summarized by the candidate, particularly in relation to the objectives set out in the dissertation proposal, and helps formulate and approve any changes or new plans deemed appropriate. At this time it may become necessary to increase the frequency of Dissertation Committee meetings. The candidate is expected to fulfill specific goals recommended by the Committee. The student is expected to present and defend the proposal before proceeding to data collection analyses etc. All five chapters will be orally defended as part of the final exam

Dissertation format option #1 - “Three manuscript” option for the PhD

- The general format would be:
 - Chapter 1 – Introduction and overview
 - Chapter 2 – Manuscript 1 (but more detailed than would be needed for submission. A theoretical framework is necessary as are hypotheses)
 - Chapter 3 – Manuscript 2 (but more detailed than would be needed for submission. A theoretical framework is necessary as are hypotheses)
 - Chapter 4 – Manuscript 3 (but more detailed than would be needed for submission. A theoretical framework is necessary as are hypotheses)
 - Chapter 5 – Discussion and Conclusion (Will wrap all three chapters together and will include results of formal hypothesis testing)

For the proposal: The student would need to produce Chapter 1 (in total) and Chapters 2, 3, and 4 (through Methods)

- If the student does a masters – 1 manuscript thesis and 2 for PhD
- If the student skips the MS then 3 manuscripts are needed for the for PhD

See *Dissertation example one* and *Dissertation example two*.

Dissertation format option #2 – Dissertation Proposal

Table of Contents:

List of chapters and subheadings
List of tables
List of figures

Chapter 1:

- **Define the topic, esp. define it in the context of this study**
- Background (i.e., what’s been done)
- Statement of the Problem (i.e., why is it important)
- Theoretical framework [What theory will be used and why it could provide insight into this problem]
- Study Purpose (i.e., what’s left to do)
- Study Objective(s)

- Hypothesis(es)
 - Correct way to write a hypothesis statement: There is no difference between X and Y with respect to Z
- Abbreviations

Chapter 2:

- Literature review
 - Introduction to the issue
 - What previous research has examined the issue
 - Major findings from previous research
 - Limitations of previous research
 - Unresolved issues or unanswered questions
- Theoretical model
 - Describe the model or models most relevant to the issue
 - Provide justification for selection of this particular model
 - Discuss limitations using a particular model in studying the issue of interest

Chapter 3:

- Methods
- Statement of goals, purpose, aims, and hypotheses
- Data Source
- Eligibility criteria
- Study Design
- Human Subjects
- Sample size
- Data Collection Tool/Data Dictionary [if tool was developed specifically for this study, describe the development process here]
- Be sure independent and dependent variables are clearly identified and defined
- Data Analysis—Be sure to clearly connect data analysis to specific hypotheses and variables
- Limitations anticipated with methodological approach

Chapter 4:

- Results
 - Selection of study participants (if analysis of second data)
 - Demographics of study participants
 - Results by Hypothesis
 - Include diagnostic evaluation of models after principle findings are discussed
 - Summary of Findings by Hypothesis: Reject or Fail to Reject – in a Table

Chapter 5:

- Discussion
 - How does this study fit in with what is already known in the area?
 - What are the most important findings
 - How do the findings support or fail to support the theoretical framework
- Limitations
- Study implications
- Conclusions
- Future research recommendations

Appendices

- Data Collection Tool
- IRB Approval Letter

6.16 Final Examination

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

The exact time and place of this examination must be scheduled with the graduate student academic services (GSAS) at least 7 working days in advance. Schedule a meeting with the Graduate Coordinator at least one month prior to your defense to fill out the required forms via GradPath. The student should print out two (2) dissertation approval pages, and bring them to the defense. It is expedient to get all signatures at the defense.

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

6.17 Limitation on Time Spans

The Ph.D. degree with a major in Pharmaceutical Economics, Policy, and Outcomes usually requires approximately 4 to 5 years of education beyond the baccalaureate degree. As interests and coursework for each student differs, the time required for his or her completion cannot be predicted accurately, more time may be required for completion of degree requirements. Students who enter the Program with advanced degrees (M.S.) should complete the requirements for the Ph.D. degree in less than three (3) years.

Note: Graduate coursework credit, to be applicable toward a degree, must have been earned not more than five (5) of passing the Comprehensive Exam. This includes graduate credit earned for a master's degree, if applicable.

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

6.18 Timetable, Formal Documentation, and Deadline Dates

The following forms and deadlines are required by the Program Office and Graduate Student Academic Services. All forms must be submitted in GradPath: <http://grad.arizona.edu/gsas/degree-requirements>

Ph.D. Plan of Study - In conjunction with his/her major advisor, each student is responsible for developing a Plan of Study as early as possible during the first year in residence, to be submitted to the Graduate College no later than the third semester in residence.

Results of the Oral Comprehensive Examination – The committee chair is responsible for submitting the Results of Oral Comprehensive Exam form in GradPath.

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

Announcement of Final Oral Defense Examination - Announcement of Final Oral Examination form must be filed with the Graduate Student Academic Services office no later than 7 working days prior to the defense.

PhD Checklist – After the final defense has been completed, refer to the Checklist for Finishing Your Doctoral Requirements.