

# **Microbiology Graduate Program Policies and Procedures**

**Student Handbook  
2024-2025**

**Updated November 2024**

## Table of Contents

<b>PROGRAM DESCRIPTION</b>	4
<b>PROGRAM ADMINISTRATION</b>	
Application Process and Deadlines	4
Microbiology Graduate Program Committee	5
Graduate Student Outcomes and Assessment	5
Program Objectives	5
Objective Assessment	5
Study Programs	6
Program Transfers	6
Satisfactory Academic Progress	6
Individual Student Records and Annual Progress Reports	7
Grievance Policies	7
Graduate Teaching Assistantships	8
Assignment of Students to Assistant/Associate Categories	9
Time Commitment, Holiday, Vacation and Sick Leave Policy	9
Professional Conduct	9
Student Responsibility	10
Important Links	10
Microbiology Graduate Program Curriculum	10
First Year of Graduate Program	12
<b>PROGRAMS OF STUDY</b>	
MS degree	13
Accelerated MS program (AMP)	15
Final Oral Examinations for the MS Degree	17
Applied Track MS Degree	18
PhD degree	19
Converting from MS to PhD	21
Converting from PhD to MS	21
Transfer Credit	21
Comprehensive Doctoral (Preliminary) Examination	21
Comprehensive Doctoral Written Examination	22
Comprehensive Doctoral Oral Examination	22
Dissertation Research Proposal	23
Final Oral Examinations for the PhD Degree	23
Inclusion of Published Papers and Preprints in Theses/Dissertations	24
Microbiology Minor	26
Thesis submission and defense, Recommended timeframes	27

APPENDIX A: Guidelines for Satisfactory Academic Progress	28
APPENDIX B: GradPath: Forms and Procedures	33
APPENDIX C: The Faculty-Graduate Student Relationship	37
APPENDIX D: Teaching Component	39
APPENDIX E: Checklist for Finishing Doctoral Requirements	40

## Program Description

The Microbiology Graduate Program (MGP) provides post-graduate education in the basic science disciplines, including microbiology, immunology, and food safety while embracing an integrative approach to science. Students will develop a broad academic foundation with a concentration in at least one science discipline. The general focus will be on microbiology and microbial pathogens of domestic animals and humans, with an emphasis on infectious diseases and host responses. Graduates will find employment in academic, government, and private institutions.

### Microbiology Graduate Program Degrees Offered

- Master of Science
- Accelerated Master of Science
- Doctor of Philosophy

## Application Process

Application must be made to the UA Graduate College (online at <https://apply.grad.arizona.edu>).

In addition to general Graduate College application requirements, the MGP application requires the following:

- Cumulative Grade Point Average > 3.0
- Three letters of recommendation.
- A Statement of Purpose describing research and career goals.
- Curriculum vitae.

**Unofficial** electronic copies of all college and university transcripts are to be submitted with the online application. Following acceptance into the program, applicants are required to mail official transcripts from all colleges and universities attended to the following address:

School of Animal and Comparative Biomedical Sciences  
The University of Arizona  
P.O. Box 210090  
1117 E Lowell Street  
Tucson, AZ 85721

## Application Deadlines

For domestic and international applications, the application should be received no later than January 1 to be considered for Fall admission. In general, new students are admitted for the Fall semester.

## 2024-2025 Graduate Committee

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### Director, MGP

Dr. Frank Duca, Ph.D.

[faduca@arizona.edu](mailto:faduca@arizona.edu)

(520) 621-9544

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## Graduate Student Outcomes and Assessment

The MGP will provide graduate students with an education that will result in knowledge of appropriate subject matter, communication skills, and methodological expertise that will help the student in their subsequent professional activities.

### Program Objectives

Upon completion of the MIC graduate program students should be able to:

- Demonstrate basic knowledge in the disciplines of microbiology, including aspects of bacteriology, parasitology, virology, mycology, immunology and microbial genetics.
- Conduct research in an ethical context, and in a manner consistent with maximal possible protection for human and animal subjects.
- Display proficiency in scientific inquiry, including:
  - Skills of critical thinking
  - The ability to formulate hypotheses and test them
  - The ability to analyze and interpret data
- Exhibit oral and written communication skills.
- Demonstrate engagement in self-initiated learning and discovery.
- Engage in self-criticism and self-evaluation.
- Demonstrate the ability to work as part of a team to achieve the above goals.

### Objective Assessment

Current graduate assessment tools for above program objectives:

- Course grades
- Annual Microbiology Graduate Advisory Committee meetings and written meeting summaries required; recommended semi-annually but required yearly
- Annual student progress reports
- Student seminar presentations (at UA, and at national and international meetings)
- Comprehensive doctoral examinations (for PhD candidates)
- Graduate thesis (MS) or dissertation (PhD)
- Thesis/dissertation defense examinations
- Exit survey
- Publication of work derived from the graduate thesis/dissertation
- Employment history

## Study Programs

The MGP takes an integrated perspective on natural science disciplines, as reflected in the diversity of faculty research emphases. Maximum flexibility in planning programs of study for MS and PhD candidates is desirable, and no uniform core of coursework is required. Students will become accomplished in verbal and written communication through participation in ACBS courses and seminars, and through presentations at local, national, and international meetings. Students will be encouraged to gain teaching experience by acting as teaching assistants or involvement in other teaching activities. The Plan of Study should be established at the first GAC meeting and submitted electronically via GradPath.

## Program Transfers

Students wishing to transfer from a different UA Graduate Program to Microbiology will need to consult with the Microbiology Graduate Program Director. The Graduate College requires such students to go through the application and admission process to enter our program – in most cases, a direct ‘transfer’ is not possible.

## Satisfactory Academic Progress

To complete the graduate degree, students must demonstrate that they have completed the metrics laid out for fulfilling the research requirements, and this must be ratified by the student’s committee. It is critical to note that ‘time spent in program’, or completion of the coursework component alone, is not an adequate metric for receiving a graduate degree. External considerations (such as acceptance of an employment or admission offer, or a need to move out of the city) will not factor into the decision to allow a student to graduate.

A drop in the cumulative grade-point average below 3.0 will impact (a) academic status and (b) funding eligibility:

- (a) Academic status: Students whose CGPA drops below 3.0 will be placed on academic probation. Students on probation are required to meet with their major advisor to discuss steps to correct the problems that led to the probationary status, and develop a written plan of action to be submitted to the Microbiology Graduate Program Coordinator and the Director. The deadline for submission is one week prior to the start of the following semester. The plan of action should include (i) Courses and credits enrolled for the next semester (ii) Projected grades needed in the enrolled courses to elevate CGPA to above 3.0 by the end of the semester. After two consecutive semesters on probation, students will be converted automatically to Non-Degree status by the Graduate College – while in Non-Degree status, students may continue to take graduate courses. 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 course work. Such a request must be supported by the MGPC and approved by the Dean of the Graduate College.

(b) Funding eligibility: Students whose CGPA drops below 3.0 immediately become ineligible for assistantships of any kind and cannot be recommended for scholarships or for the award of an advanced degree.

In addition to Graduate College requirements listed above, students must meet the milestone deadlines as listed in Appendix A. This includes completion of annual progress reports signed by the student and the major advisor by the end of each spring semester, earning a passing grade on preliminary exams, completion of all coursework in the timely manner as previously discussed, and the passing of thesis/dissertation defense no earlier than six months after passing preliminary exams.

If a student fails to meet program guidelines for satisfactory progress, the student will receive written notification with a clear statement of what the student must do and a date by which such actions must be completed. Copies of this correspondence will be included in the student's individual file, as well as given to the Graduate College. Students who fail to remediate by the deadlines specified may be dismissed from the program.

### **Individual Student Records and Annual Progress Reports**

The School of Animal and Comparative Biomedical Sciences will maintain a central file for each student. This includes records of progress toward program milestones, completion of degree requirements, and other documents referenced in this Program Description.

Students and major professors need to complete an annual progress report (found on the ACBS website) by **March 1st**, in conjunction with a graduate committee meeting. The annual progress report, along with academic performance, will be the basis for establishing which students receive initial and continued financial support for the Microbiology Graduate Program. Upon review by the MGPC and concurrence with the ACBS Director, students not making satisfactory progress will not receive funding from the program.

The completed report should be signed by the student and the student's major advisor and sent to the MGP program Coordinator so that it can be filed in the student's records. A signed copy will also be given to the major advisor and the student.

### **Grievance Policy**

Students should first attempt to resolve difficulties informally by bringing concerns directly to the student's major advisor, the chair of their graduate committee, the School Director, or the immediate supervisor of the person responsible for the action. If the problem cannot be resolved through these approaches, an appeal should be made in writing to the Microbiology Graduate Program Director. The GPD will try to resolve the issue directly, or choose to constitute a grievance committee to address the issue. The grievance committee will consist of three MGP tenure or tenure-track faculty and two graduate students in the MGP. If the major advisor of the student with a grievance is on the committee at the time the grievance is made, then the faculty member will be excused, and a replacement elected by the ACBS faculty from other eligible MGP faculty members. The MGP grievance committee will need

to meet within thirty days of the written request from the student and deliver a decision within one week of meeting. A letter will be sent to notify the student once a decision has been rendered. Terms and additional requirements may be placed on the student as a prerequisite for continuing in the program. A copy of this letter will be kept on file with the MGP Coordinator.

Students can appeal the Executive Committee decision with a written request to the Director of The School of Animal and Comparative Biomedical Sciences. If the School Director has any potential conflict of interest, the appeal may be submitted to the Assistant Dean of Graduate Education. The written appeal must include the original appeal to the Executive Committee, the conclusion of the Executive Committee, and the rationale or response to the Executive Committee decision.

### **Graduate College Grievance Policy**

While the Graduate College is available to discuss any academic concern, only grievances that allege violation of a specific University rule, regulation, policy or practice will be considered for formal review as stated below. A grievance procedure is available to graduate students who have complaints that:

1. Allege violation of a specific University rule, regulation, policy or practice;
2. Are not remediable by other university grievance policies and procedures; and
3. Are within the decision-making jurisdiction of the Graduate College.

The Associate Dean of the Graduate College or other delegate of the Dean of the Graduate College (hereinafter "Associate Dean") shall determine whether a complaint is within the decision-making jurisdiction of the Graduate College. A summary of types of grievances and responsible parties can be found on the Graduate College website: <https://grad.arizona.edu/policies/academic-policies/summary-grievance-types-and-responsible-parties>.

To pursue a formal grievance, students must follow the steps as listed on the Graduate College website (<https://grad.arizona.edu/policies/academic-policies/grievance-policy>).

### **Graduate Teaching Assistantships**

Graduate assistantships (GTA's) funded from the College of Agriculture and Life Sciences (CALs) are awarded competitively through the MGPC, with the amount of each stipend set by CALs, in keeping with university policy. The monies for the GTA's will be administered through the ACBS accounting office by the Business Manager.

CALs GTA's will assist faculty in teaching the laboratories of MIC 205: General Microbiology, MIC421B: Microbial Techniques, and MIC 428: Microbial Genetics. Applicants for assistantships will be rated on letters of recommendation, GPA, scores on GRE, TOEFL, and SPEAK test, previous teaching experience, **knowledge of course content**, and references from course instructors.

All GTA's and RA's must be enrolled for  $\geq 10$  units, maintain a GPA  $\geq 3.0$ , and make satisfactory progress toward the target degree. Teaching assistants must also complete the Teaching Assistant Training Online



(TATO) and are strongly encouraged to complete the annual teaching seminar offered by the Bart Cardon Scholars in CALS. **Mentors of GTA's must be a faculty member of the MGP and must be actively teaching in one of the Undergraduate/Graduate Microbiology courses.** Students are advised to check at least annually for current versions of Graduate College documents (<http://grad.arizona.edu/new-and-current-students>) and guidelines.

### **Assignment of Students to Assistant/Associate Categories**

Assignment of graduate students to categories is for the purpose of maintaining a differential, experience-based pay scale, and will be based on the following criteria:

#### **Graduate Assistant Level**

- Master's student with < 30 credit hours
- PhD student without a Master's degree, and < 30 credit hours

#### **Graduate Associate I Level**

- PhD student without a Master's degree, and with  $\geq 30$  credit hours
- PhD student with a Master's degree

#### **Graduate Associate II Level**

- PhD students who have passed the comprehensive doctoral examination and have  $\geq 30$  credit hours.

Students who change their status during a semester or over the summer will be paid at the lower rate until the beginning of the next semester.

### **Time Commitment, Holiday, Vacation and Sick Leave Policy**

Competition for post-graduate positions is becoming more intense. Those who complete their graduate program with a firm grasp of their scientific discipline, a practical basis for obtaining and maintaining financial support of a research program, and a strong work ethic will be best situated for success.

Students should expect to invest a minimum of 40 hours per week in graduate study. This time includes any paid duties as a GTA or GRA and any classes attended for graduate program credit, but the majority of these hours should be invested in thesis or dissertation research. Under University personnel policy, graduate students are appointed in a non-benefit accruing position, and as such do not formally accrue vacation or sick leave. Vacation leave should be arranged with the faculty mentor in advance. No sick leave will be formally assigned, but may be used as necessary, with approval of the faculty mentor.

### **Professional Conduct**

Professional conduct involves both a commitment to follow the letter of the assistantship contract and the requirements outlined in the Handbook. Award of a TA or RA is a privilege, not a right. Irresponsible actions exhibited while enrolled in the Animal Sciences Graduate Program and the University risks damaging the student's own reputation and the reputation of the Program. TA and RA positions are

exciting opportunities for graduate students to develop professional skills that will carry through the rest of their careers. Enjoy the benefit from these assistantships and do not abuse the privilege.

### Student Responsibility

Graduate Students are expected to follow the policies and procedures for both the UA Graduate College and for the Microbiology Graduate Program. Policies are updated frequently, and it is the student's responsibility to comply with current policies. Relevant links are provided below:

### Important Links

- Graduate College policies, contacts, information about resources, deadlines, and other useful information): <http://grad.arizona.edu/>
- Resources for parents, for professional development, for health and wellness, etc.: <http://grad.arizona.edu/new-and-current-students>
- General catalog: <http://catalog.arizona.edu/>
- Academic integrity: <http://deanofstudents.arizona.edu/codeofacademicintegrity>
- Responsible Conduct of Research: <http://www.orcr.arizona.edu/>

### Microbiology Graduate Program Curriculum

Beyond the few required courses, each student will work with his research mentor and graduate committee to develop a curriculum tailored to individual needs. The following list includes courses that have been taken by current/former students in the program. Note: course offerings may be in flux – please refer to the course catalog to make sure that specific courses in the following list are still being offered. Courses marked with an asterisk\* are highly recommended for all MGP students.

#### REQUIRED COURSES

Course #	Description	Units	Semester
MIC 595A	Critical Evaluation/ Scientific Literature	3	Spring
ACBS 696A	Research Seminar or Equivalent	1	Fall/Spring

#### STATISTICS & COMPUTATION

Course #	Description	Units	Semester
BE 513	Applied Biostatistics	3	Fall
PSY 510	Statistics Fundamentals	3	Fall
BIOS 576A	Biostatistics for Public Health		
MCB 516A	Statistics Bioinfo and Genomic Analysis	3	Spring
RNR 620	Working with Ecological Data with R	2	Spring

#### MICROBIAL GROUPS

Course #	Description	Units	Semester
MIC 520	Pathogenic Bacteriology (online/hybrid)	3	Fall

PLP 527R	General Mycology (in-person/online)	3	Fall
PLP 611	Comparative Virology	3	Fall
MIC 533	Medical and Molecular Virology	4	Spring
MIC 503R	Biology of Animal Parasites	3	Spring

### GENETICS, CELL & MOLECULAR BIOLOGY

Course #	Description	Units	Semester
*PLP 528R	Microbial Genetics (in-person/online)	3	Spring
MCB 573	Recombinant DNA Methods and Techniques	4	Spring
BIOC 568	Nucleic Acids, Metabolism, and Signaling	4	Spring
MCB 539	Methods in Cell Biology and Genomics	3	Fall-even Y
MCB 577	Principles of Cell Biology	4	Fall
MCB 572A	Cell Systems	4	Fall

### FOCUSED COURSES FOR SPECIFIC ACBS MICROBIOLOGY LABORATORIES

Course #	Description	Units	Semester
MIC 530	Food Microbiology & Biotechnology	3	Spring
MIC 530L	Advanced Food Science & Microbiology Laboratory	2	Spring
ENVS 525	Environmental Microbiology	3	Fall
ENVS 526	Environmental Microbiology Lab	2	Fall
MIC 550	Veterinary Microbiology	3	Fall
ACBS 556	Aquaculture	3	Spring
ACBS 543	Research Animal Methods	3	Spring

### MICROBES, IMMUNITY & DISEASE

Course #	Description	Units	Semester
*MIC 519	General Immunological Concepts	4	Fall
PLP 552	Antibiotics- A Biological Perspective	3	Fall
IMB 501	Medical Microbiology and Immunology	4	Spring
IMB 548	Basic and Advanced Immunology	3	Spring
IMB 565	Principles and Molecular Mechanisms of Microbe-Host Interactions	3	Spring
IMB 605	Medical Immunology & Infectious Disease (hybrid)	4	Fall
ENTO 532	Comparative Immunology	3	Fall

**EPIDEMIOLOGY & PUBLIC HEALTH**

Course #	Description	Units	Semester
EPID 573A	Basic Principles in Epidemiology (in-person/online)	3	Fall
EPID 573B	Epidemiologic Methods	3	Spring
HPS 529	Project Design & Implementation in Global Health (online)	3	Fall
PHPM 574	Public Health Policy and Management	3	Fall/Spring
EHS 575	Environmental and Occupational Health (online)	3	Fall/Spring
ENTR 548	Healthcare Entrepreneurship	3	Spring

**OTHER PROFESSIONAL DEVELOPMENT COURSES**

Course #	Description	Units	Semester
*ENVS 508	Scientific Writing for Environmental, Agricultural and Life Sciences	3	Spring
*SLHS 649	Survival Skills and Ethics	3	Spring
CMM 696B	Research Seminar	1	Fall/Spring
CHEM 595A	Professional Development	1	Fall

**OTHER SPECIALIZED COURSES**

Course #	Description	Units	Semester
ABS 593A	Internship in Applied Bioscience	1-6	Fall/Spring
BIOC 548A	Plant Biochemistry and Metabolic Engineering (online)	3	Fall
ENVS 564	Environmental Organic Chemistry	3	Fall
ACBS 571	Risk Assessment, Management, and Communication	3	Fall
NSC 696B	Nutrition Seminar	3	Fall
MCB 696E	Science, Society and Ethics	1	Spring

**First Year of Graduate Program**

For all incoming Microbiology Graduate Students (MS, AMP, and PhD). Students are expected to attend a 1-day Orientation organized by the Graduate Program Coordinator and mandated to complete Responsible Conduct of Research form via GradPath in their first semester.

## MS Degree

The MS degree requires completion of advanced coursework and research in microbiology. The degree also requires one semester of teaching as a graduate assistant. The MS degree is usually completed in two to three years, but must, by Graduate College policy, be completed in six years. A seventh year may be available under extenuating circumstances.

The degree program requires  $\geq 30$  units of specified graduate coursework with an overall GPA  $\geq 3.0$ , and includes the following:

- At least 15 units of graded coursework in the major (completed by the end of the 4<sup>th</sup> semester)
- MIC 595a (Critical Evaluation of Scientific Literature). This course is offered in the Spring semesters.
- At least 9 research units (MIC 900)
- 6 thesis units (MIC 910)
- ACBS 696a (Research Seminar) or Equivalent Seminar of interest. If enrolled in a seminar other than ACBS 696a, the student must be able to present at least once in the seminar. If this is not possible, please contact the Program Coordinator to discuss other options.

Students entering the program with a strong foundation of coursework in microbiology, pathology, epidemiology, parasitology, virology, mycology, food safety and/or other health science disciplines will have greater flexibility in preparing a Plan of Study within the program.

### Graduate Committees

Students will finalize their Graduate Advisory Committee (GAC) of no less than 3 members by March 1st, or before the submission of the first Annual Research Progress Report, whichever is earlier (end of the first spring semester after admission).

- At least 2 members should be active research-track (tenure-eligible) faculty members within ACBS (includes Joint faculty members).
- The Chair of the committee should NOT be the primary advisor in whose laboratory the student is working.
- The students should meet with the GAC at least once a semester, starting in the second semester. A one-page committee report, signed by all three committee members, should be submitted to the Graduate Program Coordinator before the end of each semester. A minimum of 2 committee meetings (excluding the final Defense) are anticipated before degree completion – one of the two meetings may occur as individual interactions with the various committee member (a signed committee meeting form should still be submitted).

### Plan of Study

The Plan of Study will be developed by the student and his or her Major Advisor and selected Graduate Advisory Committee and submitted electronically via GradPath by the end of the student's second semester.

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.

Once the Plan of Study has been agreed upon by the student and their graduate committee, the student should submit the Plan of Study Form via GradPath. After submission, The Plan of Study must have the approval of the following people in this order: The Microbiology Graduate Program Coordinator, The Major Advisor, The Microbiology Graduate Committee Chair and lastly the Graduate College (Degree Counselor). All approvals are completed in GradPath. Once the Graduate Program Coordinator has approved the Plan of Study, he/she will notify the student and it is their responsibility to notify their Major Advisor to do the same.

There is a Fee associated with submission of the Plan of Study.

All graded coursework should be completed by the end of the fourth semester. Courses numbered 599, 900 and 910 are not included in computation of GPA. Courses in which the student earns a grade of D will not count toward graduate credit, but the grade will be included when computing the GPA. As stated by the Graduate College, 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. Work more than 6 years old is not accepted toward degree requirements. A thesis-formatting guide can be found on the Graduate College website: <https://grad.arizona.edu/gsas/dissertations-theses/dissertation-and-thesis-formatting-guides>

### **Academic Performance**

The Graduate College Policies and Procedures states that “No student will be recommended for award of an advanced degree unless he/she has achieved a grade average of 3.0 or better on: (a) on all coursework taken for graduate credit and (b) on all coursework included specifically in his graduate program.” Any student who fails to achieve a GPA of 3.0 for two consecutive semesters is in very serious academic trouble. The graduate committee of such a student should meet at the earliest possible time to determine whether a student should be continued on in their degree program or withdrawn from the program.

### **Graduate Transfer Credits**

Graduate credit earned at other institutions, if accepted by the major advisor and Graduate Advisory Committee and approved by the MGPC and the Graduate College, may be counted toward degree requirements. More information on transfer credits accepted by the University of Arizona for MS students can be found on the Graduate College website (<http://grad.arizona.edu/gsas/degree-requirements/masters-degrees>). A defensible thesis and a final oral examination are required. The candidate should generate sufficient data from the thesis research to write at least one full-length manuscript suitable for publication in a refereed journal in the field of specialization. This manuscript must be submitted for consideration prior to the final examination, unless this is waived by agreement of the student’s mentor and GAC.

# Accelerated MS program (AMP)

Eligibility criteria include:

- Applicant must be a continuing University of Arizona undergraduate with a minimum CGPA of  $\geq 3.3$ .
- Completion of  $\geq 75$  undergraduate units at the time of application and  $\geq 90$  undergraduate units at the time of entry into the program.
- Completion of  $\geq 12$  undergraduate major credits at The University of Arizona.
- Completion or near completion of general education requirements.
- Students should have identified a Microbiology faculty member willing to serve as their research mentor for the AMP.

Admission to the AMP involves two steps:

1. Students in their undergraduate junior (3<sup>rd</sup>) year will submit an application and fees to the graduate college in the standard manner prior to the deadline (January 1<sup>st</sup>). If approved by the MGP committee, students will receive a 'Conditional admit' email from the graduate college. The email will provide information about registering for graduate classes, and other information relevant to the transition to the graduate.
2. The email will include instructions for submission of a secondary application to the regular Master program. The secondary application is simplified, and the fee is automatically waived by the system; it should be submitted by January 1<sup>st</sup> of the Senior year. The secondary application will be reviewed by the department and, if recommended, the student will receive all the normal communications that any other Master's applicant would.

Students conditionally admitted into the Accelerated Masters Program register to take a combination of undergraduate and graduate courses during their final year to complete their Bachelor's degree. After completing the undergraduate degree, student will focus on their remaining graduate coursework and their research-based thesis in order to complete the requirements for the Master's degree.

During this first year in the AMP, students will meet with their Major Advisor to plan their graduate research and finalize their Graduate Advisory Committee. Note: They may take up to 12 units of graduate coursework, which may apply toward **both** their Bachelor's degree and their Master's degree. During this time students will be charged at the undergraduate rate and retain undergraduate scholarship eligibility.

## Graduate Committees

Students will finalize their Graduate Advisory Committee (GAC) of no less than 3 members, by the beginning of their senior year.

- At least 2 members should be active research-track (tenure-eligible) faculty members within ACBS (includes Joint faculty members).
- The Chair of the committee should NOT be the primary advisor in whose laboratory the student is working

- The students should meet with the GAC at least once a semester, starting in the second semester. A one-page committee report, signed by all three committee members, should be submitted to the Graduate Program Coordinator before the end of each semester. A minimum of 2 committee meetings (excluding the final Defense) are anticipated before degree completion – one of the two meetings may occur as individual interactions with the various committee member (a signed committee meeting form should still be submitted).

## Plan of Study

The Plan of Study will be developed by the student and his or her GAC and submitted electronically via GradPath by the end of the student's third semester.

To register for graduate level courses as an undergraduate an Undergraduate Enrollment in Graduate Courses form (<https://grad.arizona.edu/gcforms/sites/gcforms/files/page/undergradenrollment.pdf>) must be completed. Students must mark that they wish to receive **undergraduate credit** for their course work, obtain instructor permission, and have their academic advisor sign off on the form before submitting it to the Graduate College and then finally to the Registrar's Office. One form must be used for each semester the student wishes to register for graduate level courses.

Graduate status will be granted once the student has completed their undergraduate degree. Students are then charged at the graduate rate and will be eligible for graduate assistantships. Those who complete 12 graduate units, but not the undergraduate degree, will be considered as graduate students for financial aid and tuition purposes. They will no longer be eligible for undergraduate scholarships, nor will they be eligible for graduate assistantships. Undergraduate requirements should be completed as early as possible but must be completed at least one semester before receiving the MS degree. The program retains the right to reevaluate a candidate's transition to graduate status at the termination of their undergraduate degree.

At least 12 graduate credits must be taken while in graduate status, after completing all degree requirements for the Bachelor's. The degree program requires a minimum total of 30 units of graduate coursework. This will include the Master's Thesis and at least 15 regularly graded units of course work, as well as a minimum cumulative GPA of 3.0. The MGP requires completion of the following:

- At least 15 units of graded graduate coursework
- MIC 595a, Critical Evaluation of Scientific Literature (offered in the Spring semester only)
- ACBS 696a (Research Seminar) or Equivalent Seminar of interest. If enrolled in a seminar other than ACBS 696a, the student must be able to present at least once in the seminar. If this is not possible, please contact the Program Coordinator to discuss other options.
- 6 thesis units (MIC 910)
- At least 9 research units (MIC 900)

A thesis-formatting guide can be found on the Graduate College website:

<https://grad.arizona.edu/gsas/dissertations-theses/dissertation-and-thesis-formatting-guides>



## **Final Oral Examinations for the MS Degree**

The student will present a research seminar, consisting of a brief introduction and literature review, statement of the hypothesis tested and its significance, specific objectives, methods, results, and conclusions. After questions from the audience, there will be further examination by the GAC in closed session. The seminar and questioning will not exceed three hours in length. The final examination is a defense of the thesis. He or she will be questioned on methods, results, interpretation and significance of data, as well as the relevance of data to the acceptance or rejection of the hypothesis. The examination also may include general questioning related to the field(s) of study encompassed by the thesis or and/or general knowledge of the discipline. The Committee on Graduate Study (convened by the Graduate College) will be involved only in the event of a second examination, following failure of a first attempt. The student will arrange an agreeable date with the GAC and notify the graduate program Coordinator so that an announcement can be made to the school. The student should send subsequent reminders to their committee members in the weeks following up to the final defense.

Once the exam has been completed and passed, and the student has submitted their thesis, the Chair of the Committee will need to notify the MGP Coordinator that the student has completed their degree requirements. After notification and a copy of the thesis has been turned in to the MGP Coordinator along with a signed copy of the Statement by the Author (<http://grad.arizona.edu/degrecert/samples-templates>), the MGP Coordinator will submit a Completion of Degree Requirements form to the Graduate College via GradPath. No additional faculty signatures will be necessary for this for

## Applied Track MS degree

Students need to complete  $\geq 30$  units of specified graduate coursework with an overall GPA  $\geq 3.0$ , including the following:

- $\geq 15$  units in core classes, including  $\geq 3$  units in professional skills and conduct
- 6 - 9 units of elective classes (micro related courses from across campus that are chosen with advice from student's committee)
- MIC 595a, Critical Evaluation of Scientific Literature (offered in the Spring semester only)
- ACBS 696a (Research Seminar) should be enrolled in annually. MGP graduate students are required to attend seminar each semester regardless of registration for the course, unless there is a course scheduling conflict on the days that seminar is scheduled. Attendance will be monitored and recorded in the student's annual progress report.
- $\geq 3$  units of internship credits (ACBS 693) or research credits (MIC 900)
- 3 units of MS report credits (MIC 909)

Core classes may be chosen from the following:

ACBS 523	Mechanisms of Disease
ACBS 543	Research Animal Methods
MIC 519	Immunology
MIC 530	Food Safety and Biotechnology
MCB 573	Recombinant DNA Methods and Applications

Professional skills and conduct courses may include any of the following:

BNAD 510	Foundations of Business for Scientists
ENGR 512a	Management of Technology I

The applied track MS degree terminates with a project, which may be an internship, followed by a report and defense of the project in a seminar format. The Plan of Study will be developed by the student and his or her GAC and submitted electronically via GradPath by the end of the student's second semester. All graded coursework must be completed by the end of the fourth semester. Courses numbered 693, 900, and 909 are not included in computation of the GPA. Any course with a grade of D will not count toward graduate credit but is included in computation of the GPA. All degree work must be completed within 6 years, with possible extension of one year under extenuating circumstances, although the applied track MS degree is usually completed in two years. *Applied track MS students are not eligible for GTA's.*

## PhD degree

The PhD degree is conferred on individuals who have demonstrated proficiency in research, experimental design, and scientific achievement in a microbiology discipline. The degree also requires two semesters of teaching as a graduate assistant. The degree is not granted merely as a certificate of faithful performance of a prescribed program of study and research. The PhD degree requires completion of a minimum of 63 credit hours of graduate coursework with an overall GPA  $\geq 3.0$ , and includes the following:

- $\geq 18$  graded units in the major
- $\geq 9$  graded units in the minor
- MIC 595a, Critical Evaluation of Scientific Literature (offered in the Spring semester only)
- ACBS 696a (Research Seminar) or Equivalent Seminar of interest. If enrolled in a seminar other than ACBS 696a, the student must be able to present at least once in the seminar. If this is not possible, please contact the Program Coordinator to discuss other options.
- $\geq 18$  research units (MIC 900)
- $\geq 18$  dissertation units (MIC 920) ( $\leq 9$  in any semester)

Typically, students are directly matched with a specific mentor/laboratory. Under specific circumstances, and at the discretion of the Graduate Committee, students may be allowed to go through up to three rotations prior to choosing a laboratory. Where permitted, rotations will be for 6-weeks starting in Sep. 3rd; all rotations should be completed by Jan. 30th, and laboratory choices finalized by Feb. 10th.

### Graduate Committees

Student will finalize their Graduate Advisory Committee (GAC) of no less than 5 members by March 1st, or before the submission of the first Annual Research Progress Report, whichever is earlier (end of the first spring semester after admission).

- At least 3 members should be active research-track (tenure-eligible) faculty members within ACBS (includes Joint faculty members). One member should be from the Minor department and no more than 2 members from outside the program.
- The Chair of the committee should NOT be the primary advisor in whose laboratory the student is working.
- The student should meet with the GAC at least once a year, starting in the second semester. A one-page committee report, signed by all three committee members, should be submitted to the Graduate Program Coordinator before the end of each semester. A minimum of 3 committee meetings (excluding the Preliminary Exams and final Defense) are anticipated before degree completion – one of the three meetings may occur as individual interactions with the various committee member (a signed committee meeting form should still be submitted).

## Plan of Study

The Plan of Study will be developed by the student and his or her Major Advisor and selected Graduate Advisory Committee and submitted electronically via GradPath by the end of the student's second semester. Committees for PhD students will comprise five members, including one from the minor department and no more than 2 from outside the program.

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.

Once the Plan of Study has been agreed upon by the student and their graduate committee, the student should submit the Plan of Study Form via GradPath. After submission, The Plan of Study must have the approval of the following people in this order: The Microbiology Graduate Program Coordinator, The Major Advisor, The Microbiology Graduate Committee Chair and lastly the Graduate College (Degree Counselor). All approvals are completed in GradPath. Once the Graduate Program Coordinator has approved the Plan of Study, he/she will notify the student and it is their responsibility to notify their Major Advisor to do the same.

All graded coursework should be completed by the end of the fourth semester. Courses numbered 900, and 910 are not included in computation of GPA. Courses in which the student earns a grade of D will not count toward graduate credit, but the grade will be included when computing the GPA.

Students will complete a dissertation which contributes knowledge in program disciplines, and which demonstrates a high degree of literary skill. It will be defended in a final oral examination. The dissertation research should generate sufficient data to write at least two first author, full-length manuscripts suitable for publication in a refereed journal in the field of specialization. The manuscripts should be submitted for consideration prior to the final examination unless this is waived by agreement of the student's mentor and GAC.

At least six semesters of full-time graduate study are required. Graduate credit earned at other institutions, if accepted by the major professor and Graduate Advisory Committee and approved by the MGPC and the Graduate College, may be counted toward degree requirements. More information on transfer credits accepted by the University of Arizona for PhD students can be found on the Graduate College website (<https://grad.arizona.edu/gsas/degree-requirements/doctor-philosophy>). The minimum residence requirement at The University of Arizona is  $\geq 2$  regular semesters of full-time academic work or 30 graduate credits in the major field. All degree requirements must be met within a period of 10 years.

Selection of at least one minor is required. It may be in another graduate program, or in the MGP. Minor coursework should present a unifying theme to the remainder of the student's program. Dissertation work *in absentia* must be recommended by the GAC and ACBS Director and approved by petition to the Graduate College.

## Converting from MS to PhD

If a student in the MGP wants to convert from an MS to a PhD candidate, he or she should seek approval from their GAC. The student and Major Advisor will need to contact the Program Coordinator to let them know of their intent. The student will need to go through the application process via the UA Graduate College.

## Converting from PhD to MS

If a student in the MGP wants to convert from a PhD to an MS candidate, he or she should seek approval from their GAC. The student and Major Advisor will need to contact the Program Coordinator, so the student can submit a Change of Program form (<https://arizona.app.box.com/v/grad-gsas-changeprogram>) which will be evaluated and approved (or not) by the admissions committee. Note: The student does not need to go through the admissions process.

## Transfer Credit

Graduate level courses completed at another university with a grade of “A” or “B” are transferable if approved by the GAC, but these grades will not be included in computation of the overall UA GPA. Transfer credit for those seeking the MS degree may not exceed 20% of the number of units required for the degree. No specific limitations on transfer units are placed upon those seeking the PhD degree; however, Graduate College policy requires that PhD students must complete  $\geq 30$  units in residence. A Transfer Credit form will need to be submitted prior to adding the courses to the student’s Plan of Study.

## Comprehensive Doctoral (Preliminary) Examination

The GAC will serve as the examining body for comprehensive doctoral (PhD) and final oral (MS, PhD) examinations. **Comprehensive doctoral examinations should be completed by the fifth semester and should be taken after the student has met with his/her GAC committee and has provided them with an overview of courses taken and an outline of thesis hypotheses and goals.** Completion of both written and oral examinations within the same semester is strongly recommended. MGP policy requires completion of the comprehensive doctoral examinations  $\geq 6$  months prior to the final oral examination. The Comprehensive Doctoral Examination is considered to be a single examination, although it consists of written and oral parts. The student must demonstrate a substantial grasp of his or her field in a broad sense, and a sophisticated depth of understanding in his or her area of specialization. The GAC (which acts as the Examining Committee) will assess whether the student has demonstrated knowledge of his or her field to the degree that he or she would be acceptable as a professional and academic colleague.

The Comprehensive Examination Committee Appointment form must be completed in GradPath and approved prior to submitting the Announcement of Doctoral Comprehensive Examination. The results of the Comprehensive Examination will be submitted by the Chair of the student’s committee on behalf of the GAC. Once exams have been passed and coursework has been completed, the student will be advanced to candidacy and the Bursar’s Office will charge a fee to the student’s account.

The **Comprehensive Doctoral Written Examination** is comprised of questions submitted by the members of the GAC and assembled by the major professor. Individual committee members will decide the format for written examination questions (open book, closed book, or both). The written examination is to be completed in no more than five consecutive days. Failure of the written examination does not necessarily constitute a failure of the comprehensive doctoral examination as a whole. The candidate may repeat any/all of the written portion(s) of the examination once. The second examination may, if recommended by the GAC, follow additional coursework to enhance the candidate's readiness. Students failing the second written examination will be dismissed from the Program.

The **Comprehensive Doctoral Oral Examination** is taken after completion of the written examination. The student must initiate the Announcement of Doctoral Comprehensive Examination form to schedule the **oral comprehensive** exam. Approval of the Announcement will generate the Results of the Comprehensive Examination form for the Chair to submit. When the Graduate College approves or denies the form (i.e. does or does not accept the reported result), the student and all committee members will receive an e-mail notifying them and providing the link to view the form.

The oral exam consists, in part, of questions regarding the Dissertation Research Proposal (see below). The Comprehensive Oral Examination also includes clarification of answers to the written preliminary exam questions and general questions related to the area of study. The student should find a date agreeable to GAC members and send formal reminders of the date, time, and location **three weeks and one week** before it occurs. The student must also notify the Graduate College of the date of the Comprehensive Oral Examination (via Announcement of Doctoral Comprehensive Examination form) at least three weeks in advance. A GAC member (not the major professor) acts as examination reporter, ensuring that the exam is administered fairly and reporting to the Graduate College. All Examining Committee members must attend the entire exam, which should be  $\geq 1$  hour but  $\leq 3$  hours, in length. Greater than one negative or abstaining vote represents a failure. A second examination may be scheduled, within six months of the initial attempt. Students failing the second oral examination will be dismissed from the Program, per Graduate College policy. In case of illness or other scheduling problems a total of 4 members of the student's GAC may preside over the Comprehensive Doctoral Oral Examination.

The examining committee must consist of a minimum of four members – membership may overlap with the student's Graduate Advisory committee. The major advisor and two additional members must be current tenured, or tenure track faculty members. The fourth member may be tenured or tenure-track, or an approved special member. Special members must be pre-approved by the Dean of the Graduate College. Any members beyond the fourth can also be current tenured or tenure-track faculty members or approved special members.

All requirements for the PhD degree must be completed within five years of passing the Comprehensive Doctoral Examination. Upon immediate completion and passing of Comprehensive Exams the student will need to submit a Dissertation Committee Appointment form via GradPath.

## Dissertation Research Proposal

The Dissertation Research Proposal should be prepared after the student has completed their comprehensive exams and submitted to their GAC no later than the end of their 6<sup>th</sup> semester. A solid research proposal starts with a clearly stated hypothesis and carefully designed specific aims that will test the hypothesis. The Research Proposal is limited to 15 single-spaced pages and should be prepared as follows:

- **Hypothesis and Specific Aims:** Outline the general purpose or objectives of your research, usually in outline form, in approx. ½ a page.
- **Background and Significance:** Describe the background to your proposed research and convey its significance in broader terms (e.g. the impact on human or animal health) in approx. 2-3 pages.
- **Preliminary studies (if any):** Preliminary studies can include your unpublished data that provide supporting evidence for the work described in the Research Design and Methods. The data may be presented as figures or tables, if appropriate, and should cover approx. 1-2 pages.
- **Research Design and Methods:** this is the proposal's main focus and should describe the proposed work and how it relates to the specific aims. There should be experimental detail, predicted results, possible pitfalls and alternative strategies. Length should be 11-12 pages.
- The **Timeline** addresses the feasibility of conducting the proposed work in three-years, including the order of experiments and proposed amount of time required. This is often presented as a table, and should be approx. ½ page in length.
- **References** should be in a form appropriate to the discipline area, e.g. American Society of Microbiology journal format. References are not included in the page limit.

*A final copy of the approved dissertation proposal should be given to both the major advisor and the program Coordinator to log in your program profile. Your Prospectus/Proposal Confirmation will not be approved through GradPath unless the major advisor has given approval and a copy of the proposal has been turned in to the MGP Coordinator.*

## Final Oral Examinations for the PhD Degree

After a doctoral student has the Defense Committee Appointment form approved, he or she will be able to submit the Announcement of Final Oral Defense form. As for the oral comprehensive exam, the Results of Final Oral Defense form is automatically created, and the Chair receives an e-mail with a link to open, complete, and submit that form following the conclusion of the defense. Again, the e-mail will include a link to the final defense packet, which includes the policies, procedures, ballots, and the 900-level Change of K Grade form. No paper ballots should be returned to the Graduate College. Students should still have paper approval pages (see page 37 of MGP Handbook) signed by the committee at the defense and return those to the Graduate College.

All PhD candidates will be required to submit confirmation via GradPath that a prospectus (Dissertation Research Proposal) has been completed prior to submission of the Announcement of Final Oral Defense. The student will present a research seminar, consisting of a brief introduction and literature review, statement of the hypothesis tested and its significance, specific objectives, methods, results, and

conclusions. After questions from the audience, there will be further examination by the GAC in closed session. The seminar and questioning will not exceed three hours in length. The final examination is a defense of the dissertation. He or she will be questioned on methods, results, interpretation and significance of data, as well as the relevance of data to the acceptance or rejection of the hypothesis. The examination also may include general questioning related to the field(s) of study encompassed by the dissertation or and/or general knowledge of the discipline. The Committee on Graduate Study (convened by the Graduate College) will be involved only in the event of a second examination, following failure of a first attempt. The student will arrange an agreeable date with the GAC and submit an Announcement of Final Oral Defense form to the Graduate College via GradPath. The student should send subsequent reminders to the faculty in the weeks following up to the final defense. The Chair of the Committee will receive notification that the final oral defense packet is available online for print out. Once the defense is complete, the Chair of the Committee will submit the results to the Graduate College on behalf of the GAC by completing the Final Oral Defense form via GradPath.

### **Inclusion of Published Papers and Preprints in Theses or Dissertations**

MGP policy allows a thesis or dissertation to contain one or more manuscripts prepared for submission, submitted, accepted for publication, or previously published, under the following guidelines:

- If, the entire thesis or dissertation, excepting the Introduction, Discussion, and Conclusion sections, consists of materials previously published or currently in submission for publication, the student must be the first author on at least one of these papers. In the event that published or submitted works comprise only part of the thesis or dissertation, they may consist of works on which the student is not the first author *if the GAC believes that the student's contribution is significant, and if such inclusion adds substantively to the thesis or dissertation.*
- Additional material to be added to the thesis or dissertation (e.g., materials and methods or additional results) may be required at the discretion of the thesis/dissertation advisor.
- In general, papers published in a peer-reviewed journal or pre-prints submitted to peer-reviewed journals are acceptable. Papers that may be included in the thesis or dissertation must be full-length primary research papers; shorter communications in preeminent journals may be included at the discretion of the GAC.
- Papers on which the student is the first author and the student's faculty advisor is the remaining author are generally considered to be appropriate for inclusion in the thesis or dissertation. In cases where the student is the first author on a work that has two or more authors, or where the student is not the primary author, *the GAC will assess whether inclusion of a part, or all of the published work in the thesis or dissertation is appropriate.* In the case of multiple author papers, a statement in the thesis or dissertation will list the parts of the work that were done by the student.
- At the time of the oral defense of the thesis or dissertation, the student must be able to defend all the work included in the thesis or dissertation, even in the case of multiple authors. With this stipulation, the MGPC does not perceive a conflict of interest when other GAC members are co-authors.



- The penultimate copy of the thesis or dissertation must be submitted to each GAC member two weeks before the Final Oral Examination; under extenuating circumstances and/or by agreement of the Committee, the thesis or dissertation may be submitted less than four weeks prior to the final examination.
- The student needs to provide the home school/department and major professor with bound copies of the completed, final version of the thesis or dissertation. *The Department copy should be bound with a hard cover.* The University requires additional copies. Students should consult the graduate degree certification homepage at <http://grad.arizona.edu/> for submission deadlines.

A dissertation-formatting guide can be found on the Graduate College website:  
<https://grad.arizona.edu/gsas/dissertations-theses/dissertation-and-thesis-formatting-guides>

## Minor in Microbiology

A **Minor** in the MGP will consist of nine hours of graded coursework with one member of the graduate student's committee being part of the MGP. Students considering a Minor in MGP should first schedule a meeting with the MGP Coordinator.

## Thesis submission and defense – deadlines and recommendations

For the deadline for final thesis submission to the Graduate College for each semester, please refer to: <https://grad.arizona.edu/gsas/degree-requirements/important-degree-dates-and-deadlines>

Working back from the Graduate College deadline, students getting ready for their defense and graduation should follow the recommendations outlined below:

### Recommended timeframe and activities:

Time <b>PRIOR</b> to Grad. College Deadline	Event /Tasks	Description and related activities/ recommendations
At least 10 weeks	Pre-defense committee meeting	This meeting is to establish consensus among GAC members about what the student needs to do to tie up experiments and start writing the thesis/ dissertation. The GAC chair should prepare a brief report (<1 page) outlining the consensus opinion, including a clear timeframe for completing the subsequent steps. This should be shared with all committee members, the student, and the MGP coordinator.
10 weeks	Submit thesis draft to research mentor Finalize defense date in consultation with GAC. Submit Announcement of Final Oral Defense form	Subsequently, make edits recommended by research mentor, and generate final draft. (*See best practice recommendation below)
7 weeks	Submit edited thesis draft to GAC members. Work with MGP coordinator to announce Oral Defense date to ACBS members and others.	Use subsequent weeks to finalize manuscripts for publication, and prepare for the defense seminar.
<b>4 weeks</b>	<b>Oral Defense</b>	
	<b>Committee meeting</b>	Make edits recommended by GAC. Re-submit corrected thesis to GAC, and obtain final signatures.
	<b>Graduate College Deadline</b>	<b>Submit final thesis to the Graduate College</b>

\* *Best practice: It is **strongly** recommended that students write portions of their thesis from the very beginning of their graduate tenure, and refine the document as the progress through their projects. Soliciting periodic feedback on this document from their mentor throughout the graduate tenure will considerably ease the pre-defense writing task.*

## Appendix A: Guidelines for Satisfactory Academic Progress

### Traditional Master's Degree

Semester	Milestone Checklist
1	<ul style="list-style-type: none"> <li><input type="checkbox"/> Attend orientations (UA Graduate College, International, and Microbiology Graduate Program) as available</li> <li><input type="checkbox"/> Complete Responsible Conduct of Research form via GradPath by September 1<sup>st</sup></li> <li><input type="checkbox"/> Identify research area</li> <li><input type="checkbox"/> Begin coursework and thesis research with approval of Major Advisor</li> <li><input type="checkbox"/> Optional- First lab rotation starts September 17<sup>th</sup> and second lab rotation starts on October 22<sup>nd</sup>. Finalize lab selections by November 26<sup>th</sup></li> </ul>
2	<ul style="list-style-type: none"> <li><input type="checkbox"/> Continue coursework with approval of Major Advisor</li> <li><input type="checkbox"/> Formulate and submit Plan of Study via GradPath by March 1<sup>st</sup></li> <li><input type="checkbox"/> Form Graduate Advisory Committee (GAC) and complete Master's/Specialist Committee Appointment Form by March 1<sup>st</sup></li> <li><input type="checkbox"/> Complete MGP Annual Progress Report with Major Advisor and submit to Graduate Program Coordinator by March 1<sup>st</sup></li> </ul>
3	<ul style="list-style-type: none"> <li><input type="checkbox"/> Continue coursework with approval of Major Advisor</li> <li><input type="checkbox"/> Meet with GAC to evaluate research/coursework</li> </ul>
4	<ul style="list-style-type: none"> <li><input type="checkbox"/> Continue coursework with approval of Major Advisor</li> <li><input type="checkbox"/> Complete MGP Annual Progress Report with Major Advisor and submit to Graduate Program Coordinator by March 1<sup>st</sup></li> </ul>
5/6	<ul style="list-style-type: none"> <li><input type="checkbox"/> Continue coursework with approval of Major Advisor</li> <li><input type="checkbox"/> Write thesis and submit to GAC for edits</li> <li><input type="checkbox"/> Present seminar and defend MS thesis</li> <li><input type="checkbox"/> Submit manuscript for publication via ProQuest, unless otherwise decided by GAC.</li> <li><input type="checkbox"/> The Major Advisor will notify the MGP Coordinator upon completion of research, thesis, and defense so the Master's/Specialist Completion Confirmation form can be submitted, and completion can be sent to the Graduate College for final approval</li> <li><input type="checkbox"/> After submitting your thesis, please complete the Graduate College Exit Survey: (<a href="https://uarizona.co1.qualtrics.com/jfe/form/SV_cxaoYeQAK42DR2t">https://uarizona.co1.qualtrics.com/jfe/form/SV_cxaoYeQAK42DR2t</a>)</li> </ul>

Note for students in last year of MS- Deadline for completion of ALL degree requirements including comprehensive exam, coursework, submission of the final approved thesis for archiving, and any other departmental requirements:

## Appendix A: Guidelines for Satisfactory Academic Progress

### Accelerated Master's Degree

Semester	Milestone Checklist
1	<ul style="list-style-type: none"> <li><input type="checkbox"/> Attend orientations (UA Graduate College, International, and Microbiology Graduate Program) as available</li> <li><input type="checkbox"/> Plan semester coursework with Major Advisor to complete and fill out/submit the Undergraduate Enrollment in Graduate Courses form. Note: Multiple signatures needed. (<a href="https://arizona.app.box.com/v/grad-gsas-ugradenroll">https://arizona.app.box.com/v/grad-gsas-ugradenroll</a>)</li> <li><input type="checkbox"/> Complete Responsible Conduct of Research form via GradPath by September 1<sup>st</sup></li> <li><input type="checkbox"/> Identify research area</li> <li><input type="checkbox"/> Begin coursework and thesis research with approval of Major Advisor</li> </ul>
2	<ul style="list-style-type: none"> <li><input type="checkbox"/> Continue coursework and thesis research with approval of Major Advisor</li> <li><input type="checkbox"/> Complete coursework for B.S. and meet with your undergraduate major advisor for degree check</li> <li><input type="checkbox"/> Complete MGP Annual Progress Report with Major Advisor and submit to Graduate Program Coordinator by March 1st</li> </ul>
3	<ul style="list-style-type: none"> <li><input type="checkbox"/> Continue graduate coursework/research</li> <li><input type="checkbox"/> Meet with GAC to evaluate progress with research/coursework</li> <li><input type="checkbox"/> Formulate and submit Plan of Study via GradPath by September 1<sup>st</sup></li> <li><input type="checkbox"/> Form Graduate Advisory Committee (GAC) and complete Master's/Specialist Committee Appointment Form by September 1<sup>st</sup></li> </ul>
4/5	<ul style="list-style-type: none"> <li><input type="checkbox"/> Continue coursework with approval of Major Advisor</li> <li><input type="checkbox"/> Write thesis and submit to GAC for edits</li> <li><input type="checkbox"/> Present seminar and defend MS thesis</li> <li><input type="checkbox"/> Submit manuscript for publication, unless otherwise decided by GAC.</li> <li><input type="checkbox"/> The Major Advisor will notify the MGP Coordinator upon completion of research, thesis, and defense so the Master's/Specialist Completion Confirmation form can be submitted, and completion can be sent to the Graduate College for final approval</li> <li><input type="checkbox"/> After submitting your thesis, please complete the Graduate College Exit Survey: (<a href="https://uarizona.co1.qualtrics.com/jfe/form/SV_cxaoYeQAK42DR2t">https://uarizona.co1.qualtrics.com/jfe/form/SV_cxaoYeQAK42DR2t</a>)</li> </ul>

Note for students in last year of MS- Deadline for completion of ALL degree requirements including comprehensive exam, coursework, submission of the final approved thesis for archiving, and any other departmental requirements

## Appendix A: Guidelines for Satisfactory Academic Progress

### Applied Master's Degree

Semester	Milestone Checklist
1	<ul style="list-style-type: none"><li><input type="checkbox"/> Attend orientations (UA Graduate College, International, and Microbiology Graduate Program) as available</li><li><input type="checkbox"/> Complete Responsible Conduct of Research form via GradPath by September 1<sup>st</sup></li><li><input type="checkbox"/> Identify research area</li><li><input type="checkbox"/> Begin coursework and thesis research with approval of Major Advisor</li></ul>
2	<ul style="list-style-type: none"><li><input type="checkbox"/> Continue coursework with approval of Major Advisor</li><li><input type="checkbox"/> Formulate and submit Plan of Study via GradPath by March 1<sup>st</sup></li><li><input type="checkbox"/> Form Graduate Advisory Committee (GAC) and complete Master's/Specialist Committee Appointment Form by March 1<sup>st</sup></li><li><input type="checkbox"/> Complete MGP Annual Progress Report with Major Advisor and submit to Graduate Program Coordinator by March 1<sup>st</sup></li></ul>
3	<ul style="list-style-type: none"><li><input type="checkbox"/> Continue coursework with approval of Major Advisor</li><li><input type="checkbox"/> Meet with GAC to evaluate research/coursework</li></ul>
4	<ul style="list-style-type: none"><li><input type="checkbox"/> Complete coursework with approval of Major Advisor</li><li><input type="checkbox"/> Write project report and submit to GAC</li><li><input type="checkbox"/> Present seminar and defend MS project</li><li><input type="checkbox"/> Your Major Advisor will notify the Graduate Program Coordinator upon completion of research, thesis and defense so that ACBS approval of degree completion can be sent to the graduate college for final approval</li></ul>

**\*Students and major professors must also complete the MGP Annual Progress Report, due by March 1st of each spring semester.**

## Appendix A: Guidelines for Satisfactory Academic Progress

### Doctor of Philosophy Degree

Semester	Milestone Checklist
1	<ul style="list-style-type: none"> <li><input type="checkbox"/> Attend orientations (UA Graduate College, International, and Microbiology Graduate Program) as available</li> <li><input type="checkbox"/> Complete Responsible Conduct of Research form via GradPath by September 1<sup>st</sup></li> <li><input type="checkbox"/> Identify research area</li> <li><input type="checkbox"/> Begin coursework and thesis research with approval of Major Advisor</li> <li><input type="checkbox"/> Three 6-week lab rotations (optional) - First lab rotation starts September 3<sup>rd</sup>, second lab rotation starts on October 15<sup>th</sup> and third lab rotation starts on November 26<sup>th</sup>. (There will be a Winter break starting December 17<sup>th</sup> and lab research will start again in January 2019)</li> </ul>
2	<ul style="list-style-type: none"> <li><input type="checkbox"/> Final lab rotation must be complete by January 30<sup>th</sup>. Finalize lab selections by February 10<sup>th</sup></li> <li><input type="checkbox"/> Continue coursework/research</li> <li><input type="checkbox"/> Formulate and submit Plan of Study via GradPath by March 1<sup>st</sup> with approval of Major Advisor</li> <li><input type="checkbox"/> Form Graduate Advisory Committee (GAC) and complete Comprehensive Exam Committee Appointment Form via GradPath by March 1<sup>st</sup>. It should be submitted as soon as you have determined who will serve on your committee, and before you begin the written comprehensive exams.</li> <li><input type="checkbox"/> Complete MGP Annual Progress Report with Major Advisor and submit to Graduate Program Coordinator by March 1<sup>st</sup></li> </ul>
3	<ul style="list-style-type: none"> <li><input type="checkbox"/> Continue coursework/research</li> </ul>
4	<ul style="list-style-type: none"> <li><input type="checkbox"/> Continue coursework/research</li> <li><input type="checkbox"/> Meet with GAC to evaluate progress</li> <li><input type="checkbox"/> Complete Announcement of Doctoral Comprehensive Exam form via GradPath. It should be submitted before your oral exam once you set the date, time and room with your committee. (Written and oral comprehensive exam results are reported together by the committee chair following the oral exam.)</li> <li><input type="checkbox"/> Complete MGP Annual Progress Report with Major Advisor and submit to Graduate Program Coordinator by March 1<sup>st</sup></li> </ul>
5	<ul style="list-style-type: none"> <li><input type="checkbox"/> Continue/complete coursework (if necessary) and research</li> <li><input type="checkbox"/> Begin preparing Dissertation Research Proposal</li> <li><input type="checkbox"/> Pass Doctoral Comprehensive Exam</li> <li><input type="checkbox"/> Complete Doctoral Dissertation Committee Appointment form via GradPath as soon as comprehensive exams have been passed</li> </ul>
6	<ul style="list-style-type: none"> <li><input type="checkbox"/> Complete coursework (if necessary) and research</li> <li><input type="checkbox"/> Complete Dissertation Research Proposal and submit to GAC</li> </ul>

	<ul style="list-style-type: none"> <li><input type="checkbox"/> Once the DRP is approved, contact the Graduate Program Coordinator so they can submit Verification of Prospectus/Proposal Confirmation form via GradPath</li> <li><input type="checkbox"/> Complete MGP Annual Progress Report with Major Advisor and submit to Graduate Program Coordinator by March 1st</li> </ul>
7/8+	<ul style="list-style-type: none"> <li><input type="checkbox"/> Continue/complete research</li> <li><input type="checkbox"/> Write dissertation and submit to GAC for edits</li> <li><input type="checkbox"/> Submit Announcement of Final Oral Defense via GradPath as soon as you set the date, time and room for your defense with the committee. This needs to be completed by at least ten (10) business days prior to the date of the Final Oral Examination. In addition, notify the Graduate Program Coordinator of your planned defense date.</li> <li><input type="checkbox"/> Present at seminar (ACBS 696A) and complete the Final Oral Exam/Defense. See more information below. Results of Final Defense will be submitted by committee chair to the Graduate Program Coordinator.</li> <li><input type="checkbox"/> Once successfully defended and gained final approval from GAC, your dissertation needs to be submitted via ProQuest.</li> <li><input type="checkbox"/> After submitting your dissertation, please complete the Graduate College Exit Survey: (<a href="https://uarizona.co1.qualtrics.com/jfe/form/SV_cxaoYeQAK42DR2t">https://uarizona.co1.qualtrics.com/jfe/form/SV_cxaoYeQAK42DR2t</a>)</li> </ul>

More Information on PhD deadlines

Complete the Final Oral Examination/Defense. This is the latest date recommended in order to meet the Dissertation Submission deadline below. Defending after this date leaves less time for final revisions before the submission can be made.



## Appendix B: GradPath: Forms and Procedures

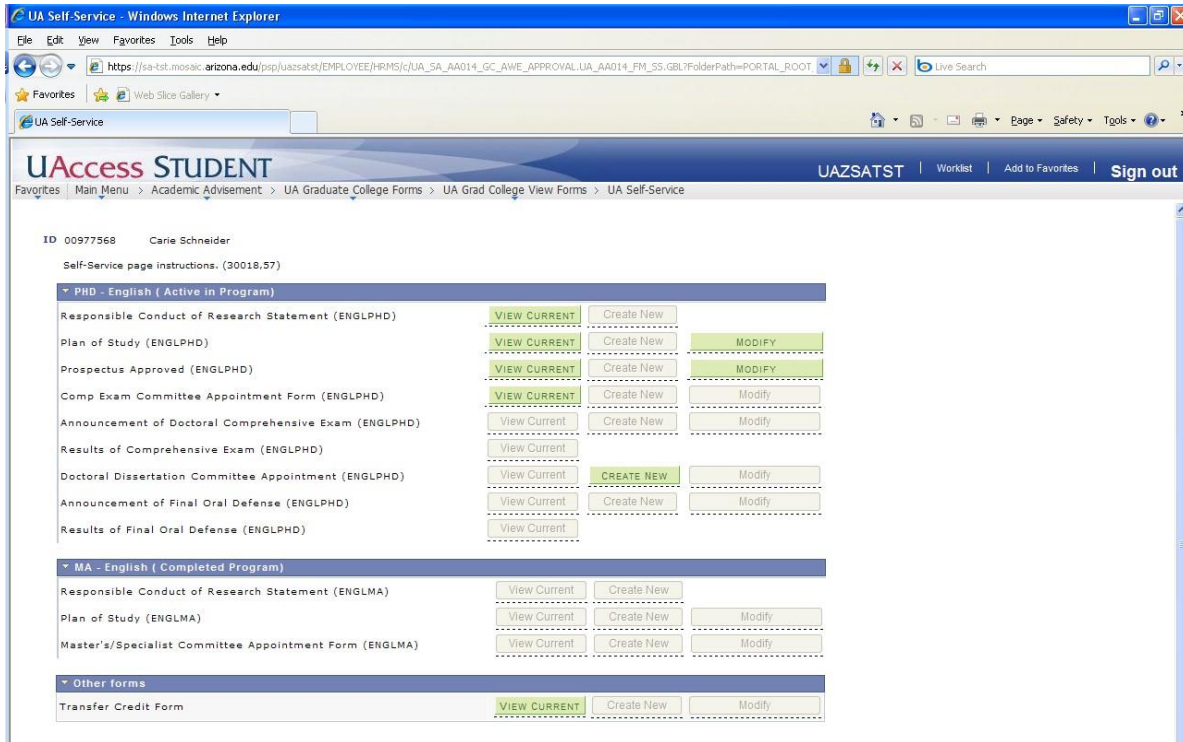
GradPath is the Graduate College's nearly paperless degree audit process that makes tracking and monitoring student progress much easier. Students can fill in and submit forms online through UAccess Student. Forms have some automatic checking built in that prevent common errors (e.g., typos in course numbers, illegible faculty names, etc.). There is also built-in logic to notify students when there is a problem with their forms, such as courses outside our time limit. Such messages include links to policy.

The automated workflow engine routes the electronic forms to everyone who needs to see or approve them - each approver is notified by email when a form is awaiting review and approval, with a link in the email to go straight to the form.

GradPath can be accessed through the UAccess online system on your homepage:

The screenshot displays the 'Student Center' interface. At the top, there is a header with 'Student Center' and a user ID. Below the header, the 'Academics' section is expanded, showing a list of links: Search, Plan, Enroll, My Academics, and Booklist. A dropdown menu is open under 'other academic...', listing various options: Academic Agreement, Academic Planner, Advisement Report, Apply for Graduation, Class Schedule, Course History, Enrollment Verification, Enrollment: Add, Enrollment: Drop, Enrollment: Edit, **GradPath Forms** (circled in red), Request Official Transcript, Transcript: View Unofficial, Transfer Credit: Report, and What-if Report. Other options include 'other financial...'. The main content area contains two informational messages: 'You are not enrolled in classes.' with an 'enrollment shopping cart' link, and 'You have no outstanding charges at this time.' with a 'make a payment' link. On the right side, there are several panels: 'SEARCH FOR CLASSES', 'Notices & Holds' (with 'UAlerts Opt Out' and 'details' link), 'Milestones' (with 'No Milestones'), 'Enrollment Dates' (with 'Open Enrollment Dates' link), 'Advisor(s)' (with 'None Assigned'), and 'Helpful Links' (with 'Help', 'Getting Started Guide', and 'View & Search Textbooks' links).

## Student's view in GradPath:



Each form has a description and general instructions. Prerequisite forms must be completed before a student can access additional forms. All forms can be saved so that a student can return to them for edits or corrections before submitting the final version.

Students must first confirm the Responsible Conduct of Research form. If the student has any transfer credit they would like applied to their UA graduate degree, then they will need to submit a Transfer Credit form before those courses can be used on their Plan of Study. Both the Plan of Study form and the Comprehensive Exam Committee Appointment form must be approved before a doctoral student announces their oral comprehensive exam. The Prospectus Proposal form (generated automatically by GradPath and completed by your program Coordinator) and the Doctoral Final Defense Committee Appointment form must be approved before a student may announce their final oral defense.

Once a student submits a form, it is routed for electronic approver. The approver then receives an e-mail notification that the form is waiting for them to view. The e-mail will include a link directly to the form and the approver must be logged in through **WebAuth** to open the form. This can be done by using a VPN connection if the approver is off campus.

Students can identify where their forms are in the routing process by looking at the Workflow Approval Path at the bottom of the form. The Workflow Approval Path shows you where the form has been, the action taken, and where it's going. If any approver denies your form, you will receive an e-mail notifying you, and you can open the form to see the message about why it was denied. When someone approves your form, it will route automatically to the next approver. A single approval step may require more than one person to approve (e.g. co-chairs of a committee), or a step may require one of several people to

approve (e.g. at the Graduate College). Click on the blue link in any approval group to see more details regarding the person/people in the group.

### Pre-check Stage



### Approval for Major



If you have any questions about the process of using GradPath or which forms you should be completing contact your Program Coordinator, Dari Trujillo at 621-3058 or kdtrujil@email.arizona.edu. You may also contact your Degree Certification Officer within the Graduate College for any additional questions involving preparing for the completion of your degree: Mary Carroll at mcarroll@grad.arizona.edu or 621-3484.

**Forms not yet available on GradPath:**

- Change of Program
- Distribution Rights
- Undergraduate Enrollment in Graduate Courses
- Graduate Academic Renewal Request Form
- Comprehensive Exam Instructions
- Final Defense Instructions
- Dissertation Formatting Guide
- Thesis Formatting Guide
- Application for Advanced Status
- Special Member Request (for Graduate Coordinator use only)

The above forms can all be located on the Graduate College website at the following address:

<https://grad.arizona.edu/gcforms/academic-services-forms>

The list of forms below can also be found on the Graduate College website:

<https://grad.arizona.edu/gcforms/financial-resources-forms>

- English Speaking Proficiency Evaluation
- GA Parental Leave Request Form

## **Appendix C: The Faculty-Graduate Student Relationship**

Mentoring is an essential part of graduate education. In fact, in many ways, mentoring is the “heart” of graduate education. The major advisor is a mentor that is responsible for ensuring the student becomes sophisticated in a discipline or field of study, is challenged intellectually, learns how to think critically and aspires to create new knowledge. In addition, the mentor is responsible for assisting the student in developing the interpersonal skills needed to succeed in the discipline. Mentoring is distinct from general advising because it involves a personal relationship. This relationship includes faculty acting as close, trusted, experienced guides and advocates. The nature of the mentorship relationship is different for each student and depends on experience, personal needs and background (e.g. age, gender, ethnicity, and culture). It recognizes that graduate school includes socialization to the values, norms, practices and attitudes of a discipline. Mentoring gradually transforms the student into a colleague. It produces opportunity and growth for both the mentor and the student.

The task of mentoring is multifaceted. “Mentors are advisors, people with career experience willing to share their knowledge; supporters, people who give emotional and moral encouragement; tutors, people who give specific feedback on one’s performance; information about and aid in obtaining opportunities; models, of identity, of the kind of person one should be to be an academic.” (Zelditch, M., 1990, “Mentor Roles” Proceedings of the 32nd Annual Meeting of the Western Association of Graduate Schools). These characteristics of mentors combine to provide a broad-based nurturing of the professional and personal development of the graduate student.

Early stages of a program of study require many decisions on the part of the student, so it is important that the counsel of a mentor be available from the very beginning. The mentor is expected to interact with the student on a regular basis, providing guidance, advice and intellectual challenge necessary for the student to complete his or her program. Mentoring is essential to student retention and the quality of the student’s program of study. Activities that are important components of the faculty-student mentoring relationships are discussed below. The activities described here are intended to be suggestions. They represent dimensions of a good mentoring program. However, in the final analysis, the role of the mentor as advisor, supporter, tutor, master, sponsor and model will be more than the sum of these activities and will be highly individualized.

### **Responsibilities of the Graduate Student**

#### **Take Charge of the Program of Study**

The graduate student is an active part in the mentoring relationship. The student should keep in mind the responsibilities of the mentor and the Microbiology Graduate Program discussed above and at the same time takes final responsibility for tailoring his or her program of study. Thus, while seeking guidance from a mentor, the student should make sure the program of study meets his or her needs. The student should keep track of requirements and deadlines. The student should be well informed about the policies and procedures, which can be located using the Graduate College website. He or she should be self-motivated and take initiative to capitalize on education opportunities. It is important that the student

strive to be as independent as possible, though recognizing that independence will increase over the course of the program of study. The student should consult often with student peers who have gone through the various stages of a program of study and seek options about the pros and cons of the various options available.

#### Appraise Mentor of Progress and Problems

Communication with the mentor is essential. The student should keep the mentor fully informed of his or her program status. It is important that the student tell the mentor as soon as problems arise. The student should be honest and open in sharing information. The mentor may have solutions for many of the student problems or know what resources are available to assist with problems.

#### Contribute Knowledge

Students tend to see themselves as on the receiving end in the mentoring relationship. It should be remembered, however, that the student has a great deal to offer to the mentor. The student should contribute to the knowledge base of the mentor, peers and program. The act of contributing will boost self-esteem, gain additional respect and stimulate the surrounding intellectual environment. Good mentors envision that their students will ultimately surpass them. Thus, good mentors welcome contributions from students and value them as indication of their success as teachers.

#### Seek Multiple Mentors

It is unlikely that one mentor can fulfill all of the student's needs. Therefore, the student shall seek out multiple mentors during his or her program of study. These may be chosen to fulfill different intellectual needs, provide specific training opportunities in various skills (e.g. certain laboratory techniques), and obtain emotional support. The search for appropriate mentors need not be restricted to faculty members. Other graduate students can provide significant mentoring experiences. Postdoctoral students are often a rich resource for mentoring activities. Those outside of academia can also provide mentoring in areas ranging from career guidance to personal/family matters.

#### Change the Relationship if Necessary

For one reason or another, not every faculty-student mentoring relationship will be the best match. If the student believes the mentoring relationship is not satisfactory, then it may be appropriate to terminate the relationship and find another primary mentor. Before terminating a relationship, the student should try to have a close communication with the mentor and try to resolve differences. Failing this, the student should refer to the Grievance committee procedures outlined above. If the student continues to believe that the mentoring relationship is not satisfactory it may be beneficial, or even necessary, to seek another primary mentor. There are perfectly good reasons for the entire program of study to be under a single mentor. However, when a change in mentors may seem appropriate, the student should discuss it with the primary mentor and those who might assume the role as the new mentor.

## Appendix D: Teaching Component

Teaching experience could be part of graduate training in the Microbiology Graduate Program, especially for the Ph.D. degree. Those students who will be teaching must go through the University's TATO and FERPA Training.

### FERPA Training

All students are protected by a federal privacy law called FERPA (The Federal Education Right Protection Act). Since TAs are dealing with student records in an official capacity they are bound by this law. The University of Arizona requires that all employees with access to student records complete an online training course. Failure to complete this course within two weeks of starting your position as a TA, will render you ineligible to serve as a TA and your position may be terminated. The course can be accessed at this link: <http://registrar.arizona.edu/personal-information/ferpa-tutorial> or through the link in TATO.

### TATO (TA Training online)

Teaching Assistant/Associate Training Online (TATO) is a collection of self-paced modules about teaching and learning made available via D2L. All students who wish to be appointed as Teaching Assistants/Associates (TAs) must complete the module "TATO 2016" and pass the test with a score of 95% or higher no later than two weeks after the start of classes.

It is recommended that TAs review the information from all modules in TATO before the beginning of each semester. Individual departments may also assign additional modules from TATO.

Please note that the mandatory training Graduate Assistant/Associate Teaching Orientation (GATO) is no longer offered or required by the Graduate College. However, individual departments or colleges may be requiring in-person training. Please contact the appointing department for more information.

### Instructions

1. Go to <http://d2l.arizona.edu>.
2. Click on the button labeled "UA NetID Login" in the upper left side of the screen.
3. Enter NetID and password.
4. Click on "Self Registration" in the bar under the D2L logo
5. Click on the hyperlinked course offering name "TATO 2016" (don't worry about the "2016" this is the correct training to take!)
6. Click on the button labeled "Register"; Click on "Submit"; Click on "Finish".
7. When finished, click on "My Home". In the center of the page, find the Student tab and follow the links to complete the TATO module(s).

Any questions or concerns should be directed to [D2L@email.arizona.edu](mailto:D2L@email.arizona.edu).

TATO and FERPA Deadlines: The deadlines for completion of the required trainings are September 6, 2020. Completion of these required modules monitored by Graduate College staff to ensure completion of this important training. TAs who fail to complete either of these trainings will be ineligible for further employment and will be terminated.

## Appendix E: Checklist for Finishing Doctoral Requirements

### FROM SUBMISSION TO APPROVAL Checklist for Finishing Your Doctoral Requirements

#### 1. Approval Page (before defense)

Use the sample at <https://grad.arizona.edu/gsas/dissertations-theses/sample-pages> to prepare your approval page. Type the names of the members of your final committee – i.e. those who are actually participating in your defense. Use your defense date as the date for the signature lines.

1. Copy and insert this page into your dissertation file as pages 2-3. (Include typed names and dates only - no signatures.)
2. Print out one hard copy to take to the defense and get the signatures of all committee members. Deliver the signed page to Administration 316.

#### 2. Submit Your Dissertation

1. Please refer to the Doctoral Dissertation Formatting Guide at <https://arizona.app.box.com/v/grad-gsas-dissformat> for help on formatting your dissertation.
2. Submit your dissertation via <https://www.etdadmin.com/cgi-bin/school?siteId=63>. Your Graduate College degree counselor will do a format check and will e-mail you to let you know whether changes are needed. This e-mail will be sent to the account you use in the submission profile you establish – be sure to check the spam folder in case the message goes there.
3. Note: If you elect to copyright your work, the \$65 fee for filing the copyright will be charged to your Bursar's account.

#### 3. Distribution Rights form

You can access this form on the Graduate College web site at) <https://arizona.app.box.com/v/grad-gsas-distrightsthesisdiss>. This form should be signed and dated and submitted to the Graduate Student Academic Services office. Use the current date unless you are delaying release of your archived work to the public. You can bring the signed form to Administration 316 or fax it to (520) 621-4101.

#### 4. Survey of Earned Doctorates (only for Ph.D and Ed.D candidates)

The 'Survey of Earned Doctorates' online survey should be completed when you submit your dissertation to the Graduate College.

How to submit your Survey of Earned Doctorates:

1. Please go to <https://sed.norc.org/survey> and take the survey.
2. You will receive a PIN and password via email should you need to leave and return to the survey.

#### 5. Graduate College Exit survey



Complete the Graduate College survey (see Milestone Checklist for link). Once you have completed both surveys, please be sure to notify your degree counselor.

#### Requests for Technical Help while Submitting Your Dissertation

The Graduate College can only help with formatting questions. Technical questions such as how to upload files, combine files, change page numbers, etc., should be addressed to OSCR – Office of Student Computing Resources at <http://www.oscr.arizona.edu/>. Should you have trouble converting WORD to PDF, please contact ProQuest (who maintain the submission site) at [etdsupport@proquest.com](mailto:etdsupport@proquest.com).