



**Genetics**  
**Graduate Interdisciplinary Program (GIDP)**  
**Student Handbook**  
**2015**

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## **1. General**

Welcome to the Graduate Interdisciplinary Program (GIDP) in Genetics at the University of Arizona. This handbook explains the organization of the program and provides a guide towards obtaining a Ph.D. degree in Genetics. The handbook outlines the rules and regulations of the graduate program.

Most of the basic rules are policies of the Graduate College of the University of Arizona and must be followed by all programs offering graduate degrees. More specialized requirements were established by the Program to ensure the quality of your training. As questions arise, good sources of information are the Graduate Program Coordinator and the Genetics Graduate Advisors.

The most important component of your Ph.D. training will be the experience of designing, performing and evaluating dissertation research. Courses will provide a valuable opportunity to discuss the fundamentals of genetics with established investigators, and to learn how to approach and evaluate the scientific literature. A critical goal of the faculty will be to teach you how to take responsibility for your own education. As a graduate student, you must determine what you need to know, figure out how to learn it, and pursue the information aggressively - be it in the classroom, library, or laboratory.

## **2. Overview of Ph.D. Program in Genetics**

The purpose of the University of Arizona's GIDP in Genetics is to train the next generation of life scientists with a productive integration of computational approaches (Computer Science, Mathematics, Physics and Engineering) and the basic life sciences (Molecular, Cellular, Genetics, Neuroscience, cancer, plant sciences, cellular and molecular medicine, pharmacology, ecology and evolutionary biology). In addition to the traditionally trained biology student, the Genetics program seeks to recruit students with undergraduate degrees in Computer Science, Mathematics, Physics and Engineering and train them in the life sciences.

In keeping with the diverse nature of current approaches included within the realm of genetics, the GIDP in genetics at the University of Arizona transcends traditional departmental boundaries. We seek to prepare students for research and teaching careers in academia, in medicine, industry, research centers as well as in law and public policy. The GIDP is designed to provide students with broad training in diverse areas of Genetics, and in-depth training in their chosen area of specialization. Students participate in designing an education program that is tailored to their long-term interests. To this end, there are minimal (two) predetermined course requirements (outlined below); instead, course work is determined based on student background, performance in the first year and discussions with their committee members and mentors at the end of their first year of study.

Students in the program complete a series courses, research rotations and other requirements, to ultimately pursue their Ph.D. dissertation research in the laboratory of one of over ~56 faculty members,

### **3. Administration of the Program**

The GIDP in Genetics at the University of Arizona is administered by an Executive Committee (EC, which is a University-wide faculty committee mandated to foster common interests, activities and communication among all researchers at the University of Arizona. The Genetics GIDP faculty represents the UA faculty who run the GIDP, mentor its students, and can serve as major advisor for a GIDP student.

The EC reports to the Dean of the Graduate College. It includes six members of the Genetics GIDP faculty, including the chairperson, and one GIDP student. The chairperson of the Genetics GIDP chairs the EC (see [bylaws](#) of the program for details in Appendix I). The EC is assisted by the Graduate Program Coordinator.

The EC includes one student member who is appointed by the EC for a one-year term. The student member must pursue a major in Genetics and is nominated by a simple majority vote of the Genetics GIDP students. The student member will be asked to leave the meeting when individual students are being discussed.

The EC coordinates two main standing subcommittees: the Graduate Student Admissions and Recruitment Committee (GSARC) and the Graduate Student Advisory and Progress Committee (GSAPC). The chairperson of each subcommittee is a member of the EC.

***The EC:***

- develops, implements and supervises the curriculum of the GIDP in Genetics as well as policies and procedures for the operation of the program;
- evaluates nominations and applications for membership to the GIDP in Genetics and reviews faculty appointments regularly;
- appoints Program faculty to serve on the standing committees of the GIDP in Genetics;
- acts on recommendations from the Graduate Student Recruitment and Admissions Committee regarding applications from prospective students;
- acts on recommendations of the Graduate Student Advisory & Progress Committee regarding academic counsel to new students and evaluations of students in the early phases of the Program until each has a Dissertation Advisor and an individual Advisory Committee;
- prepares and submits an annual report of Program activities and accomplishments for the Dean of the Graduate College;
- serves as advisory board for Training Grants
- ensures that regular reviews of the Program, consistent with requirements of the Board of Regents and the training grant, are carried out;
- and seeks funding in support of the Program.

***The Chairperson of the GIDP in Genetics:***

- administers the GIDP in Genetics with the assistance of the Graduate Program Coordinator;
- convenes and chairs meetings of the EC;

- acts on behalf of the EC to implement the Program (e.g. to sign requests to schedule examinations, to approve recommendations for appointments to examination committees, etc.);
- serves as representative of the GIDP in Genetics to the University Administration, granting agencies, prospective students, etc.

***Current Administration:***

*Chair:*

- Melanie Culver, Ph.D., Professor, School of Natural Resources and the Environment

*Executive Committee:*

- Carol L. Dieckmann Ph.D., Associate Professor, Department of Chemistry and Biochemistry
- Thomas Doetschman Ph.D., Associate Professor, Department of Cell Biology and Anatomy
- Felicia Goodrum Ph.D., Professor, Department of Immunology
- Marc J. Orbach Ph.D., Associate Professor, Department of Plant Sciences
- Student Representative, GIDP in Genetics

*Program Coordinator:*

- Cora Varas-Nelson, Ph.D.

***Faculty of the GIDP in Genetics***

The faculty of the Graduate Program are the Genetics GIDP Faculty, for a list of faculty <http://genetics.arizona.edu/faculty-members>

The *Graduate Program Coordinator* works closely with the students, faculty, EC and standing committees to ensure timely fulfillment of UA and Program policies and flow of information, as well as to assist faculty and students as needs arise.

#### **4. Coursework and Program Requirements**

The majority of students who enroll in the Genetics GIDP work towards a doctoral degree with a —major in Genetics and a —minor from another graduate program, depending upon the area of research focus. According to the rules of the UA Graduate College, all students must complete both a major and a minor. Work leading to the Ph.D. in Genetics requires approximately five years. Students must complete a total of 63 semester units of coursework in the major and minor subject areas in order to complete the degree:

Major: 36 units of coursework, combining units from the core curriculum and units from the student's specific area of interest (see below: typical curriculum).

Minor: At least 9 units are required by the minor department. Students may choose to minor in: Biochemistry, Molecular & Cellular Biology, Ecology and Evolutionary Biology, Psychology, Cell Biology & Anatomy, Genetics, Physiological Sciences, Natural Resources and the Environment, Plant Sciences, Insect Sciences, or another related area.

Dissertation Units: At least 18 units of dissertation credit are taken after successful completion of the comprehensive examinations. Other units come from independent study and research credit.

Teaching Requirement: Students are required to teach for one semester in a course that complements their interests. Additional opportunities for teaching may also be available.

*Transfer credit from other institutions can be applied to an advanced degree if "approved by the head of the Program, the grade earned is "B" or above, and it was awarded graduate credit at the institution where the work was completed." (For additional information see the UA Graduate Catalog, <http://catalog.arizona.edu/2006-07/policies/acceptcr.htm>.) If waivers are granted for coursework taken at other institutions, these courses are referred to as "Transfer Coursework" by the Graduate*



*College, and must be listed as such on the Doctoral Plan of Study form (in UAccess gradpath). This form must be filed during the third semester. The required courses are:*

### **Typical Curriculum**

Students are required to take two courses in their first year: GENE 670 Current Topics in Genetics and Ethics and GENE 695E Science Society and Ethics.

The weekly course GENE 670 Current Topics in Genetics fosters communication among faculty, postdoctoral fellows, and Ph.D. students. GIDP students are required to attend every semester, the discussion topic is widely advertised and all faculty, post-doc and students are invited to attend. In this seminar setting, we employ three different mechanisms every semester. First, junior students (mostly 1st & 2nd year) are assigned primary literature articles in which they prepare a 30 minute class presentation. They receive presentation mentoring prior to their presentation by at least one faculty member and peer evaluations following their presentations. Second, more senior students are required to present one primary literature paper and one dissertation research progress report presentation. When appropriate, students perform mock oral preliminary exams presentation in this setting, thus practicing for exams while serving as role models for junior students.

Third, GIDP faculty and external guests are invited to give research presentations. The goals of these weekly meetings are to promote sharing of ideas and development of scientific presentation skills, and to foster a sense of community. Each student is required to give 3-4 presentations each year.

### **Required for Major (PhD in Genetics)**

GENE 670 (Recent Advances in Genetics): a 2-unit seminar course, required of all students every semester for a minimum of four years (i.e., 8 semesters = 16 credit units). This course will consist of research presentation and journal club literature presentations in the broad area of Systems Genetics. This is a letter graded course.

GENE 795A (Laboratory Research Rotations): Taken in the first semester of the first year. Three six-week lab rotations of 2 units each (6 credit units total). Students will produce a 2-page written report summarizing each rotation project, with the report to be presented to and signed by the supervising faculty before the letter grade is assigned.

MCB 695E Ethics (1 unit), PHCL 595B Scientific Writing Strategies, Skills and Ethics (2 units), or SP H 649 Survival Skills and Ethics (3 units)

GENE 920 (Dissertation): 18 units, as required by UA Graduate College

Units in the Minor: Minimum of 9, as required by the minor program

Approximate 14 units remaining (from 63 total), after above courses are taken: All students will be required to submit a Doctoral Plan of Study (PoS) by the end of their first academic year (e.g. June of their first year). The PoS will be developed by the student and his/her mentor in consultation with program curriculum committee members. The PoS will list (1) specific courses that satisfy the unit requirements of the graduate school, and (2) a specific timeline for the completion of the listed coursework. Because it will be impossible to predict the background education of each incoming student and their specific Ph.D. research project, this format will allow for maximum flexibility in constructing the specific curricula that will supplement deficiencies in each students' knowledge while also complementing their proposed area of research. The PoS progress will be evaluated a minimum of once per year by the student's dissertation committee and changes to the PoS shall be approved by the committee members and/or the chair of the program.

### **Minor in Genetics**

The genetics Program encourages students from other disciplines to minor in genetics. Nine credits in genetics are required. Students planning to minor in genetics must have at least one member of the genetics GIDP on their Comprehensive Exam Committee, and must submit the appropriate form to the EC (through the Graduate Program Coordinator) for approval and signature. Successful completion of 9 units of approved

coursework in genetics constitutes passage of the written comprehensive examination in the minor area.

### **Required Units for Doctoral Minor in Genetics**

GENE 670 (Recent Advances in Genetics): 2 semesters = 4 credit units.

Remaining 5 units: Graded courses as approved on student's PoS by the two Dissertation Committee members who are faculty members of the Genetics GIDP (see <<http://www.gidp.arizona.edu/node/48>> for official listing).

There must also be two Comprehensive Examination Committee members who are faculty members of the Genetics GIDP, and the Comprehensive Examination written and oral questions must include material from the student's genetics coursework.

### **5. Program Time Line:**

A Checklist is provided in Appendix II to help you keep track.

#### YEAR 1

Prepare and submit to Genetics Program Office a Proposed Program of Study. You and your mentor (or preceptor) should work on this together. This form should be revised as changes occur throughout your graduate studies.

Complete the Qualifying Exam by satisfactorily passing GENE 670 Current Topics in Genetics and GENE 695E Science Society and Ethics. (grade of "B" or better)

Complete three rotations in the laboratories of your choice. Submit completed lab rotation forms (Appendix III) at the beginning and end of each rotation.

#### YEAR 2

By the beginning of your third semester you are expected to have chosen a mentor from the Genetics regular faculty. You must select a mentor by the end of your third

semester. To formalize your selection, you must submit the “Mentor Selection Form” (Appendix IV) with the appropriate signatures. See additional information under “Mentor Selection”.

Begin the “gradpath” online form process. Complete the “Responsible Conduct of Research form” and your “Plan of Study” Detailed instructions are in appendix IV.

By the end of the third semester, you should form a Comprehensive Examination Committee (see below) and meet with them for the first time. You must submit the Comprehensive Examination Committee Form via gradpath prior to scheduling your written comprehensive exam.

The written and oral comprehensive exam should be completed by the end of the second year (see below). You should also, by the end of your second year, have completed the coursework required for a major in Genetics and working on your minor. You should be in the process of formulating a research project, conducting preliminary experiments, and considering members to serve on your dissertation committee.

Additional information on the comprehensive exam is available at:

<http://grad.arizona.edu/current-students/program-requirements/doctor-of-philosophy/comprehensive-examination>

The various required Graduate College forms are available at:

<http://grad.arizona.edu/current-students/forms>

Once you pass your written examination (described in detail below) you may schedule your Orals. Once you have taken your oral exam, the chair of your committee will report “Results of Oral Comprehensive Examination” via gradpath and you will be advanced to candidacy.

YEAR 3, 4 and 5

During the third year, you should form the Dissertation Committee (which need not be the same as your comprehensive exam committee) and submit the “Doctoral Dissertation Committee Appointment” form in gradpath. Complete the required dissertation proposal and submit to your dissertation committee for approval. Submit the “Dissertation Proposal Approval Form” to the Program Office and submit the “Prospectus/Proposal Confirmation” in gradpath.

Note that to remain eligible for Program funding, you must complete the Comprehensive Examination by the end of the fifth semester. In exceptional circumstances students may petition the Program Committee for an extension of the deadline.

Complete Minor Coursework, if necessary

## FINAL SEMESTER

Obtain the "Manual for Theses and Dissertations at:

<https://grad.arizona.edu/gcforms/sites/gcforms/files/page/thesisdissertationsubmissionmanual.pdf>

This manual contains the directions for formatting your dissertation; however, the overall organization of the dissertation should be determined by you and your mentor. It is the responsibility of your Mentor to proof your dissertation.

The “Announcement of Final Oral Defense” form must be submitted in gradpath at least 10 days prior to your exam. This form assumes that your dissertation manuscript has been accepted by all your committee members. Therefore, penultimate copies of your completed dissertation manuscript must be distributed to your committee members with enough time to review before you submit this form.

After passing your final exam, the final dissertation must be submitted via the electronic submission site at <http://www.etdadmin.com/arizona> and must meet all specifications of the dissertation manual.

Questions regarding submitting forms and/or deadlines should be directed to the Program Office.

**Teaching.** Because teaching is an important element in academic careers in genetics, supervised experience in university-level teaching is considered essential. Each student is therefore required to serve as a Teaching Assistant for at least one semester during the first 2 years.

**Research Rotations.** In preparation for the selection of rotation laboratories and a potential dissertation research advisor (Major Advisor), the student should become familiar with the research interests of the Genetics GIDP faculty. This is accomplished in two steps: (a) Soon after arrival, first-year students should explore the research of the Genetics GIDP faculty, available on each faculty member's website ([Faculty Directory](#)); and (b) Each student should meet individually with several members of the faculty of the Program during the first weeks in residence in order to discuss research activities and opportunities. Students may arrange to spend 1 or 2 days in the laboratory.

Each student must take at least two research rotations during the first year in the Program. The purpose of research rotations is

- to provide "hands-on" experience for at least two areas of interest
- to become familiar with specific research approaches and techniques
- to become acquainted with the laboratory work and research group of one or two prospective dissertation advisors.

Faculty members hosting a rotating student will expect a serious and conscientious effort by the student. Successful rotations may but are not required to lead to the completion of a specific project and/or publication.

Ordinarily, lab rotations last between 8 and 16 weeks, spending 10-20 hours/week in the lab. The duration of a rotation and the expectations of both the student and the faculty member must be discussed in advance.

**Rate and Quality of Work.** Students should make every effort to complete all requirements for the Ph.D. degree within 5 years. Students must take at least 12 units of graduate course work in each fall and spring semester in order to remain in good standing in the Program (in case of a long-term illness or pregnancy, a student is advised to take a leave of absence to remain in good standing).

A checklist of requirements is maintained by the Graduate Program Coordinator and reviewed annually for each student by the GSAPC and by the EC. If a student falls one full semester behind the timeline laid out in the checklist, he or she will meet with the GSAPC, which will make recommendations to help resolve any problems. If a student falls one year behind the recommended timeline, he or she may be referred to the Graduate College for conversion to non-degree status in the absence of extenuating circumstances. Students will be notified by June 1st of each year of their satisfactory or unsatisfactory progress.

Students in the program are expected to maintain an overall grade-point average of at least 3.0 (B) and to have no more than a total of 2 grades of C; failure to achieve such a record can result in dismissal from the Program and conversion to non-degree status at any time. Students in non-degree status may be ineligible for continuing financial support, depending on the source of the funding.

In unusual circumstances, a student may apply for and be granted up to a one-year leave of absence. In the event of unexcused interruption of graduate work for one semester (not including summers), the student must apply to be readmitted to both the Graduate College and the Program.

**Doctoral Continuous Enrollment Policy.** Unless excused by an official “*Leave of Absence*” (which may not exceed one year throughout the student’s degree program), all graduate students are subject to the Continuous Enrollment Policy of the Graduate College in order to remain in the program. If the student fails to obtain a “*Leave of Absence*” or maintain continuous enrollment, he or she will be required to apply for re-admission. Tuition or registration waivers cannot be applied retroactively.

***Vacation Policy.*** Graduate students are research trainees but can also be University employees, so interpretation of holidays can be complicated. First year students should consult with the GSAPC for guidelines on how much vacation is considered appropriate. Once students are in the laboratory of a Major Advisor, they should negotiate when and how long they take vacations during semester breaks.

Students are required to notify the Graduate Program Coordinator or their Major Advisor when they make vacation plans. Attendance at scientific meetings or specialized courses is not considered vacation.

As trainees that anticipate a research career, graduate students should take advantage of semester breaks and the summer to work in the laboratory or literature research.

### ***Student Supervision & Evaluation***

It is important for GIDPs to foster student cohesiveness, since the range of courses and laboratories available may mean fewer chances than a traditional department for students to see and interact with each other. The Genetics program typically hosts a gatherings for all students, incoming and returning, as well as all faculty members, in addition to a Holiday Potluck. Additional social activities have included scheduled gatherings at local restaurants, as well as Genetics students participating in activities offered by the UA's very active Graduate & Professional Student's Council.

The GIDP evaluates student progress annually or more frequently if necessary. The chair of the GIDP and the student's primary mentor and mentoring committee advises first- and second-year students in the preparation of their curriculum, lab rotations. The EC also monitors student progress to ensure that remedial course work is completed, that the Comprehensive Examination is completed on time, and that the student advances steadily towards his/her dissertation. After a dissertation mentoring committee has been formed, advising and supervision are administered by the student's dissertation advisor and mentoring dissertation committee. Student progress is reported to and monitored by the EC. Students receive annual feedback.



Evaluation during year 1 & 2. Each student undergoes an evaluation after each rotation in year 1 and is assigned a letter grade for each rotation. These evaluations involve review of the student's research and course performance and input from the student's rotation advisor(s). GIDP students are expected to maintain an overall grade-point average of at least 3.00 (B) and to have no more than a total of two grades of C.

If the student fails to make satisfactory progress, the EC (in consultation with the mentoring committee and primary advisor) will recommend guidelines for improvement.

By the end of the first year, students are expected to select a Dissertation Advisor and to form a Mentoring Committee, which will conduct the comprehensive examination (see below). After the exam, the Committee may then be re-structured to serve as Dissertation Mentoring Committee.

Qualifying Examination. The Graduate College's requirement of a Ph.D. qualifying examination will be satisfied when the student has passed the first year evaluation, satisfactorily completed all course work, selected a dissertation advisor, finalized a comprehensive exam committee, and has been favorably reviewed by the advisor. Failure to complete the requirements for the qualifying exam by the end of the fourth semester is cause for dismissal from the Program.

Comprehensive Examination. The Comprehensive Examination is the major requirement that a student must pass before being admitted to formal candidacy for a Ph.D. degree. The Comprehensive Examination consists of written and oral parts that are both designed to meet two main objectives: To evaluate the proficiency of the student's general Genetics knowledge. To evaluate the ability of the student to independently evaluate and critique a body of specific literature, to integrate the acquired information into broad conceptual schemes, to develop testable hypotheses, to devise experimental approaches and thereby evaluate hypotheses, and to demonstrate the communication skills required to present and defend scientific ideas in oral and written formats.

The Comprehensive Examination must be taken in the student's fourth or fifth semester in the Program (with few exceptions). The EC may only grant an extension for compelling reasons upon written petition and review. Students will prepare (written exam) and defend (oral exam) a research proposal in the form of a mock grant application or answer up to three questions, as determined by the examination committee faculty. The exam evaluates the written proposal, its oral defense, and fundamental knowledge in all basic areas of Genetics. A detailed guide to the comprehensive exam is provided

The Major Advisor's responsibilities include:

- to advise and supervise a student's dissertation research
- to advise a Plan of Study
- to advise a student on the selection of a Comprehensive Exam Committee, and subsequently a Dissertation Committee

***Supervision and Evaluation during year 3 and above.*** The Major Advisor and the Dissertation Committee monitor student progress after a student has passed the Comprehensive Exam. A student must form a Dissertation Committee and arrange a first meeting within 6 months after the exam.

Initially, the Dissertation Committee will evaluate the merit of the student's dissertation-research proposal and provide advisory input. The chairperson of the Dissertation Committee will submit to the EC a written report of the Committee's evaluation of the proposal.

In subsequent meetings, the Dissertation Committee will monitor the progress of the student and provide critical advice during at least one annual meeting. The committee discusses the student's progress with the Dissertation Advisor (in the absence of the student) and with the student (in the absence of the Dissertation Advisor). A brief report of each meeting is submitted to the EC and Director of the GIDP by the chairperson of the Dissertation Committee. The student's comments concerning the Dissertation Advisor may be submitted to the Program Director in confidence.

**6. Qualifying Examination.** The Graduate College's requirement of a Ph.D. qualifying examination will be satisfied when the student has:

- passed the first year evaluation,
- selected a dissertation advisor and finalized the dissertation committee,
- satisfactorily completed the course work of the fourth semester, and
- been favorably reviewed by the Graduate Student Advisory & Progress Committee (GSAPC), which will then make a recommendation to the EC.

Every effort will be made by the **GSAPC** and the EC to help the student meet these requirements. Failure to complete the requirements for the qualifying exam at the end of the fourth semester, however, may be cause for dismissal from the Program.

### **7. Comprehensive Examination**

After the requirements of the Qualifying Examination have been fulfilled, the Comprehensive Examination is the major requirement that a student must pass before being admitted to formal candidacy for the Ph.D. degree.

The Comprehensive Examination is considered a single examination, although it consists of written and oral parts that are both designed to meet two main objectives:

- To evaluate the proficiency of the student's general genetics knowledge
- To evaluate the ability of the student to:
  - independently evaluate and critique a body of genetics literature,
  - integrate the acquired information into broad conceptual schemes,
  - develop testable hypotheses,
  - devise experimental approaches and thereby evaluate hypotheses,
  - demonstrate the communication skills required to present and defend scientific ideas in oral and written formats.

The Comprehensive Examination must be taken in the student's fourth or fifth semester in the Program. The EC may grant an extension only for compelling reasons upon

written petition by the student and recommendations from the student's Major Advisor (if selected) and GSAPC.

**Comprehensive Exam Committee.** By the end of the first year in the program, the student selects an Exam Committee, which will conduct the Comprehensive Examination. After the exam, the Committee may then be re-structured to serve as Dissertation Committee (for details, see section Dissertation Committee).

The Exam Committee should consist of at least 4 members, including at least 3 members of the GIDP Faculty (one of whom can be the Major Advisor) and one faculty member from the student's minor field. Note that since GIDP faculty may also be associated with the minor program, more than 3 members of the committee may belong to the GIDP.

One of the GIDP faculty members **other** than the Major Advisor will serve as chairperson, and will preside over all examinations and deliberations of the committee. The Exam Committee has the flexibility to make the best decision for a given student.

**Scheduling.** For scheduling requirements of the Graduate College, students are advised to consult the Graduate Program Coordinator and the Graduate College publication "Program Requirements".

See: [http://grad.arizona.edu/Current\\_Students/Program\\_Requirements/](http://grad.arizona.edu/Current_Students/Program_Requirements/).

Students must complete, print, and have signed the "*Results of the Oral Comprehensive Exam*" form PRIOR to the oral exam, and take the form to the exam ("login to My GradColl": <https://grad.arizona.edu/gc/>). Once the exam is complete, this form must be signed by all members of the committee and the student, and then delivered to the Graduate Degree Certification Office (3rd floor of Administration Building) by a member of the Oral Exam Committee (not by the student).

## 8. 1. Guidelines for the Genetics Graduate Interdisciplinary Program

Doctoral Comprehensive Examination Policy.

University of Arizona Graduate College rules must be followed, and supersede any of our policies which might conflict:

<http://grad.arizona.edu/academics/program-requirements/doctor-of-philosophy/comprehensive-examination>

With regard to your written and oral exams:

Your advisor will organize the exams. The written exam can be in two formats:

- 1) Write a grant proposal (NIH or NSF format) on something unrelated to your dissertation. Your committee will read this and evaluate it.
- 2) Answer three written questions correctly out of five (one each) from your committee members. Your advisor will request questions from your five committee members. The questions should relate to genetics, course work listed on your Plan of Study, and subjects that you should know based on your research. These questions will be given to you at the same time and you will have exactly three weeks to prepare detailed answers (about 5-10 pages per answer). You can answer all five or you can choose three to answer (as most students do). You must satisfy the committee member who sent you the question. They will tell your advisor if you pass that question. If you pass three, then you pass the written portion of your comps and are eligible to take your oral exam.

Typically, in the oral exam, the unanswered written questions are the first asked and the subject matter should relate to genetics, major and minor course work (listings of which will be distributed to the committee) and subjects that you should know based on your research. Your advisor will not be allowed to chair the oral exam or even ask questions - s/he may attend the exam. Typically, in the oral exam, the unanswered written questions are the first asked and the subject matter should relate to genetics, major and minor course work (listings of which will be distributed to the committee) and subjects that you should know based on your research. Your advisor will not be allowed to chair the oral exam or even ask questions - s/he may attend the exam.

**Initial Preparation.** The student must convene an initial meeting with the committee to select:

- a specific topic for the research proposal
- a date for submission of the research proposal (written examination): 8 weeks after initial meeting
- a potential date for the oral examination: no later than 12 weeks after the initial meeting

Prior to the first meeting, the student submits a pre-proposal to the committee (one page). The pre-proposal should outline a rationale for the topic/problem to be studied and 2-3 questions (or Aims) that will be addressed later in the proposal.

It is recommended that the proposed topic be part of, or covers the student's planned dissertation research. It is expected that students will later use the successful "exam proposal" as a template for an NIH pre-doctoral fellowship application.

The questions raised in the pre-proposal must allow the student to develop and address a working hypothesis regarding an unresolved issue in Genetics. The pre-proposal should reflect an informed analysis of the problem and the relevant literature, and should be supported by key citations.

At the first committee meeting, the committee must evaluate whether the topic and the outlined questions of the proposal are appropriate to design a hypothesis-driven research proposal. The committee chair is charged with ensuring that such an evaluation has been carried out and that appropriate dates for the written and oral exam (see time line) have been selected.

It is recognized that sometimes it may be unavoidable that parts of a specific aim of a student's proposal are similar to that of an active or submitted grant application by the advisor. The committee is asked to discuss to what degree such a "thematic" overlap is tolerable. If in question, the advisor may provide copies of the respective grant application to the committee.

The written proposal must be entirely the work of the student. It is not permitted to cut & paste or “slightly” modify any part of an existing research proposal (being current or in draft form). If a partial thematic overlap exists, it is expected that there is also exhibit significant divergence.

Before and during the preparation of the proposal, the student may have general discussions on background information, or the strengths and weaknesses of experimental approaches and techniques with members of the Exam Committee or the Dissertation Advisor, but NOT with other colleagues. It is not appropriate to ask anybody for review of any parts of the written proposal, even in draft form.

***Timeline.***

- Initial committee meeting and identification of a specific topic for the research proposal (ideally during the fourth, the latest by the end of the fifth semester)
- Deadline for submission of research proposal (time of written exam): 8 weeks after initial committee meeting
- Announcement of written exam evaluation: no later than 1 week after submission of the proposal.
- Oral examination: 10-14 weeks after the initial committee meeting (2-6 weeks after submission of the proposal)

***Written Exam (research proposal).*** After selection of the specific research topic, the student will answer questions provided by the advisor, the time and length of the answers will be provided to the students. The student will have the choice to answer questions or to work on a grant application based on the selected problem. The student will need to evaluate the literature in the selected area, formulate significant and relevant hypotheses, and devise experimental strategies to test hypotheses.

The emphasis of the research proposal should not be on a review of the literature but on dealing creatively with the problem selected. The proposal should aim to explicitly address a working hypothesis regarding an unresolved issue in genetics. There is an

expectation of substantial depth of knowledge in the research area *per se*. It will not be sufficient to defend only the particulars of the proposed experiments. A key element of the proposal defense will be to explain and defend the importance of the questions to be addressed, and to place these questions in the broader context of the field. Thus, in both the significance section of the written proposal and in the subsequent oral defense, the student should be able to marshal knowledge from the relevant literature and from broader areas of genetics.

The research proposal should follow the basic form of an NIH Predoctoral grant application.

The guidelines for the written proposal are those used for the standard NRSA grant application format <http://grants.nih.gov/grants/funding/416/phs416.htm>. NOTE that the bibliography does not count as part of the page limit. The limits on font size, margins and document length must be followed.

The research proposal includes multiple subsections, some of which have page limits. Sections B through D must not exceed 10 pages, including all tables graphs, figures, diagrams, and charts. Follow the format provided below:

**Section A. Specific Aims (1 page max.):** This section should include a concise statement of what the proposed research is intended to accomplish and/or what hypothesis is to be tested. It also lists the aims (2-3) of the proposal and brief statements of how each aim will be addressed.

**Section B. Background and Significance:** The section should include a concise presentation of pertinent literature to explain the significance of the chosen topic. It is expected that the relevant literature is critically and scholarly evaluated in substantial depth such that specific gaps are identified that the proposal intends to fill.

**Section C. Preliminary Results:** A description of preliminary results is not required but may be added at the discretion of the student and the Exam Committee. This description is restricted to a maximum of 2 pages.

**Section D. Research Plan:** Description of experiments that are proposed to achieve the research goals of the proposal. This section should place less emphasis on



methodological details and more emphasis on anticipated and unexpected outcomes, potential experimental pitfall and potential alternative strategies.

This discussion should include:

- Discussion of experimental or other procedures and their advantage over alternative methodologies, including a brief description of any new and non-standard methodology.
- Description of means by which the data will be analyzed and interpreted.
- Discussion of possible results, both positive and negative, and an interpretation of different outcomes.
- Discussion of potential difficulties and limitations of the proposed experiments and identification of alternative approaches that might be taken to achieve the aim.

**Section E. References:** (Not part of the page limit). Full citations of all referenced literature must be included. Any format of in-text citations can be used. In the bibliography each literature citation must include the names of all authors, the year of publication, the title of the publication, the name of the book or journal, volume number, and page numbers.

Students are encouraged to look at actual grant applications submitted by their advisor, other committee members or students to get a sense of what is included in an application. However, students are not allowed to receive assistance with written drafts of their exam or guidance in the construction of the proposal.

The degree of any third person's involvement in developing the hypothesis, any of the proposed experiments, or possible conclusions must be stated at the end of the research proposal. Additionally, the student must certify that nobody other than the student has reviewed any parts of the written proposal, and that the written proposal is entirely the work of the student.

As mentioned above, **general** discussions on background information, or the strengths and weaknesses of experimental approaches and techniques are permitted with

members of the Exam Committee or the Dissertation Advisor but NOT with other colleagues. However, such discussions must be briefly described in the above statement.

The research proposal must be electronically submitted to the chair of the committee (preferably as a pdf file).

**Evaluation of written exam.** The student's answers to the committee questions, or the research proposal will be immediately distributed to all committee members for their evaluation, using the following criteria:

- Expectation that pertinent literature in the chosen area of interest is presented in substantial depth and that the addressed problem is presented in relation to a wider context (“big picture”).
- Expectation that the existing knowledge is critically and scholarly evaluated such that specific gaps in our knowledge are identified.
- Expectation that ***hypothesis-driven approaches*** are proposed and that the logic connecting the hypothesis, experiment approaches, experimental outcomes, and possible conclusions is clearly developed and presented.

Each committee member will submit a letter grade of A (4), B (3), C (2), D (1), or F (0) to the committee chair to calculate an average score. An average score of 3.0 or higher will be necessary and sufficient for the student to pass the written section of the examination.

Additionally, committee members are asked to provide constructive and useful written feedback to the student regarding major weaknesses of the proposal (either in the submitted file or as a formal review). The chair of the committee will compile these comments and transmit them to the student together with the average grade.

The chair of the committee will notify the student, the other members of the committee, and the chair of the GIDP of the outcome within 1 week of submission of the proposal.

The student must have passed the written examination in order to proceed to the oral examination.

At the discretion of the committee, a student who fails the written examination may be permitted to repeat the examination once. It is also at the discretion of the student's committee to decide whether the student will be permitted to revise and resubmit the failed proposal, or whether the student must submit a new proposal on a different research topic. A repeated written examination must be completed within 5 months after the first examination.

A student with an average of 1.0 or lower shall not be allowed to repeat the examination. In this case, the student will be dismissed from the program.

**Oral Exam.** The oral part of the comprehensive examination should be taken as soon as possible, and no longer than 4 weeks after successful completion of the written examination.

Students must complete, print, and have signed the "*Results of the Oral Comprehensive Exam*" form PRIOR to the oral exam, and take the form to the exam ("login to My GradColl": <https://grad.arizona.edu/gc/>). Once the exam is complete, this form must be signed by all members of the committee and the student, and then delivered to the Graduate Degree Certification Office (3rd floor of Administration Building) by a member of the Oral Exam Committee (not by the student).

The exam must be conducted according to the Graduate College's "Policies and Procedures for Comprehensive Oral Examinations", with particular attention to the following passage: "*The examining committee must attest that the student has demonstrated the professional level of knowledge expected of a junior academic colleague.*"

The oral examination involves:

- **in-depth questions** within the area of specialization (topic of research proposal but also dissertation research, if different)
  - **broad questions** across the general field of genetics (including molecular/cellular, developmental, systems, behavioral, computational and/or medical genetics).

The oral exam should be organized in 3 sections:

- The student may initially give a 5-10 minute overview of the research proposal using audio-visual materials. A LCD projector and, if needed, a laptop computer will be made available for the exam.
- The first hour of the oral exam may be devoted to the defense of the research proposal and in-depth questions related to the students' area of specialization.
  - The remaining time consists of a broad examination covering any aspect of genetics and/or the chosen minor field of study. The exam must last a minimum of 2 hours but cannot exceed 3 hours.

Students are advised to have at least one practice oral exam with other graduate students and postdocs about two weeks before the scheduled exam. This can be helpful in identifying strengths and weaknesses since students often need practice to effectively illustrate answers to posed questions on a black board.

***Evaluation of oral exam.*** The student is expected to master both parts of the oral exam and show:

***a) solid in-depth knowledge within the area of specialization.*** There is an expectation of substantial depth of knowledge on the topic of the written proposal (and topic of dissertation, if different). It will not be sufficient to defend only particulars of the proposed experiments. A key element of the defense will be to explain and defend the importance of the addressed questions, and to place these questions in the broader context of the field. It is also expected that the student will, in a scholarly manner, address questions concerning background information relevant to the topic, significance, and design of the proposed experiments.

**b) general knowledge of the major and minor subjects of study.** The student is expected to demonstrate a solid, general knowledge of fundamental principles in all areas of genetics, including molecular, cellular, developmental, systems, behavioral, computational and disease-orientated genetics. A similar solid general knowledge of fundamental principles is expected for the respective minor field of study.

- Failure to meet one of the expectations (a or b) results in failure of the entire oral exam.
- Failure to meet one part cannot be substituted by an excellent performance in the other part.

After no more than 2 hours into the exam, the student will be briefly excused from the room and the committee will discuss the student's performance. At this time, the committee may decide that the student has either passed or failed the exam, or it may decide that the examination should continue with additional questions. If continued, the chair is charged to ensure that the exam time is limited to three hours, by which time the committee must decide on a pass or fail grade. Committee deliberation time is not included in the exam time.

If a student fails the oral examination, the committee may recommend that the student be dismissed from the Program or be re-examined no later than six months from the date of the failed oral examination (provided that the student is not already on probation and has not taken the written exam twice). Failure to pass the oral comprehensive exam within six months of the original date will be grounds for dismissal from the program.

After successful completion of the comprehensive exam, the student will be promoted from Graduate Assistant to Graduate Associate (effective the next January 1 or July 1). The student must then apply for Advancement to Candidacy. This application must be submitted before the student may enroll in GENE 920, Dissertation Research. At least 18 units are required, with no more than 9 being taken in any one semester.

### ***Advancement to Candidacy***

After successful completion of the comprehensive written and oral examinations, you are automatically advanced to candidacy.

### ***The Dissertation Committee***

Students should select a Dissertation Committee by the end of the 5th semester. The Dissertation Committee must meet with the student at least once each year. There is no obligation for the student to convene the same faculty members on their Comprehensive Examination and Dissertation Committees.

## **9. Dissertation and Defense**

**Overview.** After passing the Comprehensive Exam (CE), the following sequence of events applies:

- Selection of a Dissertation Committee
- Submission of a Dissertation-Research Proposal to the Dissertation Committee
- First meeting with the Dissertation Committee to approve proposed dissertation research (within 6 months after CE)
- Annual meetings with the Dissertation Committee to discuss progress on dissertation research
- Dissertation
- Dissertation defense

***Dissertation Committee.*** The Dissertation Committee should ideally consist of five members. At minimum, the Dissertation Committee must consist of three members, all of whom must be members of the genetics GIDP Faculty (one of whom being the major advisor). There is no maximum of committee members. Any committee member beyond the third may be associated with the major or minor area of study, or another appropriate field, and may be tenured, tenure-track, or a special approved member. Special members (someone who is not a UA tenured or tenure-track faculty) must be pre-approved by the Dean of the Graduate College. If a committee has only three members, all must approve the dissertation. If a committee has more than three

members, there may be one dissenting vote. All dissertation committee members are expected to attend the final defense.

One of the genetics GIDP faculty members on the Dissertation Committee other than the Major Advisor will serve as the chair and will preside over all examinations and other deliberations of the committee. The chair will also provide a summary report of all meetings to the Graduate Program Coordinator.

The student must declare the composition of the Dissertation Committee (see below, ***Committee Appointment Form***) to the GIDP program office no later than three months after passing the Comprehensive Examination.

The responsibilities of the Dissertation Committee include:

- to evaluate the merit of the Dissertation-Research Proposal
- to critically advise the student's dissertation research during annual advisory meetings to ensure steady progress
- to ensure an appropriate relationship between the student and the major advisor
- to accept the Dissertation and conduct the Final Examination (Dissertation Defense).

Before the first meeting, a student is required to submit a brief dissertation-research proposal (see below). The Dissertation Committee will evaluate the proposal's overall merit, and provide advisory input by discussing the strength and weaknesses of the plan. The chairperson of the Dissertation Committee will submit to the EC a written report of the Committee's evaluation of the proposal.

In subsequent meetings, students present their research progress and potential changes of the research plan for discussion and advice during at least one annual meeting with the Dissertation Committee. The committee discusses the student's progress with the Dissertation Advisor (in the absence of the student) and with the student (in the absence of the Dissertation Advisor). A brief report of each meeting is submitted to the EC and Director of the GIDP by the chairperson of the Dissertation

Committee. The student's comments concerning the Dissertation Advisor may be submitted to the Program Director in confidence.

***Committee Appointment Form.*** In addition to declaring the composition of the Dissertation Committee to the GIDP program office no later than three months after successful completion of the Comprehensive Examination, the student must file the form entitled "Committee Appointment Form" to Graduate College Degree Certification. This application must be submitted to the Graduate Degree Certification Office as soon as requirements are met (approved doctoral Plan of Study on file, satisfied course work, language, and residence requirements, and passed the Comprehensive Examination) but no later than six months before the Final Oral Defense Examination is scheduled.

***Dissertation Proposal.*** Having passed the Comprehensive Examination, the student is required to submit a dissertation-research proposal (not to exceed 10 pages) that has been developed in cooperation with the Major Advisor. The proposal should include the following sections: Specific Aims, Background and Significance, Preliminary Studies, and Research Design and Methods. The proposal should present a carefully prepared, thoughtful, critical, and realistic plan of research actually intended to lead to the completion of the dissertation. It should be based on preliminary work carried out by the student or others under the advice of her/his Advisor.

The research proposal should be submitted to the student's Dissertation Committee 1-3 weeks before the Committee's first meeting (with a copy to the GIDP program Office). For the first meeting, the student should prepare for an oral presentation of the proposal. The Committee will discuss the merit of the proposal with the student and the Major Advisor, and provide critical advisory input on the research plan. The chairperson of the Dissertation Committee will submit to the EC a written report of the Committee's evaluation of the proposal and its defense.

***Dissertation.*** Preparation of the written dissertation shall follow the regulations of the Graduate College (as set forth in the Student's Manual for the Preparation and Presentation of Theses for Advanced Degrees). After writing and correcting a draft of



the complete dissertation, the candidate must submit the draft to each member of the Dissertation Committee. The exact timing of the submission is at the discretion of the Dissertation Committee, but candidates must file the "Announcement of Oral Defense Examination" form with the Graduate College no later than 7 working days before the date of the Oral Defense Examination. This form requires the signatures of all members of the dissertation committee, signifying their assessment that the dissertation is ready to defend - although revisions may still be required. Thus, it is suggested that the final draft of the dissertation be submitted to committee members at least 6 weeks before the exam date. This allows 3 weeks for them to make a general assessment. Committee members will then provide the candidate with detailed suggestions or requirements for revision before, or on the day of, the final exam.

**10. Final Examination.** Formal defense of the dissertation constitutes the final examination. The defense comprises two parts:

- a one-hour public colloquium in which the candidate presents her/his research and explains how it contributes to the advancement of understanding of the nervous system, and
- an oral examination by the candidate's Dissertation Committee and other qualified persons acceptable to the committee. There is no minimum time limit for the final examination, but the examination may not exceed three hours.

The Final Examination will be chaired by a member of the Dissertation Committee other than the Major Advisor and must be conducted according to the Graduate College's "Policies and Procedures for Final Oral Examinations for Doctoral Candidates". After successful completion of the final examination, the candidate must submit a final copy of the dissertation to the Graduate Program Coordinator for a format review. The candidate makes any corrections required and provides two signed copies of the final dissertation to the Graduate Degree Certification office. Approval pages, which must accompany these copies, are available on the Graduate College website ([www.grad.arizona.edu](http://www.grad.arizona.edu)) and it is recommended that the student take these approval pages to the final examination for signatures. The candidate also provides a final copy

of the dissertation to the Graduate Program Coordinator to be bound for the Program's library.

### ***Announcement of Final Examination***

The final examination is your dissertation defense. The Announcement of final examination form must be submitted through gradpath at least 10 days prior to the date of your examination.

### ***Penultimate Draft of Dissertation***

Submit copies of the draft of your dissertation document to your committee. Make sure you allow adequate time for your committee to review and for you to prepare the final version. For information regarding the preparation of the dissertation, see the "Manual for Theses and Dissertations," which is available at:

<https://grad.arizona.edu/gcforms/sites/gcforms/files/page/thesisdissertationsubmissionmanual.pdf>

### ***Final Copies of Dissertation Document***

The final dissertation must be submitted via the electronic submission site at

<http://www.etsadmin.com/arizona>

and must meet all specifications of the manual. You can order your bound copies from this site. The dissertation is submitted by about April 20 for May graduation, November 26 for December graduation and August 11 for August graduation. Check with the PS Program Office for exact dates. The last requirement is to clear all fees with the Bursar's office, failure to clear your account will postpone the posting of your degree.

**YOU MUST BE REGISTERED TO DEFEND DURING THE FALL AND SPRING SEMESTERS! YOU MUST ALSO BE REGISTERED DURING THE SEMESTER YOU**

## **SUBMIT YOUR DISSERTATION. SUMMER REGISTRATION IS NO LONGER REQUIRED**

To defend and/or submit the final copies of the dissertation in the Fall or Spring semester you must register for a minimum of three graduate units; during the summer, you must register for one unit either summer session.

### **11. Terminal Master's Degree Option for Ph.D. Students**

Students enrolled in the doctoral program who wish to obtain the Terminal MS degree in Genetics are expected to complete the following five requirements:

- 1) Contact Program Committee (copy Program Chair and Program Coordinator) in writing of intention/circumstances to obtain a MS
- 2) Pass Ph.D. coursework with B grade or above
- 3) Form a MS committee comprised of three members, two faculty of which are from Genetics Sciences; and alert the Program Committee of your intentions, and the makeup of your committee by submitting the "Master's Committee Form" Appendix VI
- 4) Pass qualifying comprehensive exams (written and oral)
- 5) Demonstrate scientific insight/integrative thinking (three options)
  - a. Write a critical literature review
  - b. Write a dissertation proposal
  - c. Write a first author manuscript

If qualifying comprehensive exams are not yet passed, student must orally defend one of options in # 5.

Specific content of written portion of MS requirement for students enrolled in PhD program are established on a case-by-case basis by the student's MS committee.

## **12. Financial Structure of the Doctoral Program**

The funds utilized by the Program to support the doctoral student stipends are derived from NIH Training Grants, Graduate College Fellowships, Teaching Assistantships, and faculty contributions. In general, these funds dictate the number of students supported by the Program. It is the intention of the Genetics program to provide at least partial support for full-time predoctoral students who are in good standing in the program for five consecutive years. However, because of uncertainties in funding sources, this support cannot be construed as a guarantee of continuous support to any student. The five year period begins with the year of admission into the program, and barring exceptional circumstances is limited to five years regardless of the actual source of support for the student during that period. Support ends at the time of graduation (with congratulations!) if the student finishes in less than five years.

Support from the Program includes stipend, health insurance, registration fees and out of state tuition if applicable. Once a mentor is selected in the second year, the student's major adviser covers the student's salary, in other cases, the Program covers part of the student's salary with the other part provided by the student's major adviser, in some cases the Program covers provides with most of support for a period of time. Students will not be allowed to join a laboratory that does not have ongoing support.

### ***Competitive Predoctoral Fellowships***

The Program encourages individual students to seek supplementary funding. The advantages of seeking predoctoral fellowships are that it provides you with an opportunity to develop grant-writing skills, it brings prestige to you and the Program, it enables us to recruit more students into the Program, and it enables you to supplement (increase) your stipend. The Resources Committee can provide guidance in this endeavor by identifying potential funding agencies. The proposal, however, should be written in consultation with your mentor or with the advice of the Resources Committee.

The regular stipend for a maximum possible stipend of \$26,532. This does not include stipends from training grants or predoctoral fellowships awarded on the basis of an application made by the Program on your behalf, and therefore not from your own initiative.

### ***Scientific Conferences***

Depending upon the availability of funds, the Program attempts to defray the costs for students who are attending and presenting a “first author” poster or talk at one national meeting per year. Specifically, the Program may pay for costs associated with travel, lodging, meals and registration fees. Students must be a first-author presenter. Travel Request Forms are available in the Program Office.

### ***Teaching Activities***

The Genetics Graduate Program participates in teaching activities. The faculty members believe that teaching, and the communication skills it develops, is a central part of graduate training. Indeed, all students in the Ph.D. program are required to participate in teaching activities as an integral element of the training program.

## **APPENDIX I**

### **Bylaws**

#### **THE UNIVERSITY OF ARIZONA**

#### **Graduate Interdisciplinary Program in**

#### **Genetics**

The Genetics Graduate Interdisciplinary Program is composed of research and graduate educational activities in the broad-ranging area of the study of genetics. The Program awards a Master of Science and a Ph.D. in Genetics. The organization and structure of the Genetics GIDP shall conform to the Guidelines for Graduate Interdisciplinary Programs as established at <[gidp.arizona.edu](http://gidp.arizona.edu)>

The Genetics GIDP provides a graduate educational program of the highest quality in the various areas of genetics, including vigorous productive research activities, and promotes campus-wide interdisciplinary activities in the broad area of genetics. It is also the responsibility of the Program to identify promising areas of genetics research and the faculty expertise and facilities needed to explore these areas.

Creative planning and leadership are essential to maintain and foster excellence in scholarly activities in the wide-ranging areas of genetics. These related functions are provided by the Executive Committee of the Genetics Graduate Interdisciplinary Program, with the input of all of the members of the Program. Accordingly, it is essential that the Program carry out timely planning and review of the faculty, the research and training programs. The Bylaws that govern the operating procedures and policies of the Genetics GIDP are outlined in the following sections.

#### **Article I. Executive Committee and Chair of the Genetics Graduate**

## **Interdisciplinary Program**

The activities of the Genetics Graduate Interdisciplinary Program are administered by the Executive Committee. The Chair of this Executive Committee will also be Chair of the entire Genetics GIDP. The Executive Committee reports to the Dean of the Graduate College through the Faculty Director of Graduate Interdisciplinary Programs. The Executive Committee serves as the executive, administrative and policy making board for the Program.

### **A. Chair of the Genetics GIDP**

1. The Chair of the Genetics GIDP will be appointed by the Dean of the Graduate College based on a nominee selected by the Executive Committee. The Chair will normally serve a five-year term and may not serve more than ten years consecutively or two terms as the Chair. A second term must be approved by a two-thirds positive vote by the Executive Committee.
2. The duties of the Chair of the Genetics GIDP are: a) call and preside at meetings of the Executive Committee to be held not less than twice a semester; b) call and preside at meetings of the entire Genetics GIDP at least once per year and as needed; c) with the advice of the Executive Committee appoint and supervise the Standing Subcommittees as needed; d) act as Director of Graduate Studies.
3. Administer the Genetics GIDP budget; manage administrative matters (qualifying and thesis committees, etc.), including the submission, when appropriate, of competitive and non-competitive grants, direct course change and approval forms and monitor catalogue copy, supervise the Program Coordinator, and advise the Faculty Director of Graduate Interdisciplinary Programs and Dean of the Graduate College on issues pertinent to the Genetics GIDP.

## **B. Executive Committee**

The Executive Committee consists of five to eight faculty members representing the various disciplines within the Genetics GIDP and one student member. Faculty members of the Executive Committee serve a three-year term and the terms are staggered so that two members of the Executive Committee will be replaced every

### **Required for Major (PhD in Genetics)**

**GENE 670** (Recent Advances in Genetics): a 2-unit seminar course, required of all students every semester for a minimum of four years (i.e., 8 semesters = 16 credit units). This course will consist of research presentation and journal club literature presentations in the broad area of Systems Genetics. This is a letter graded course.

**GENE 795A** (Laboratory Research Rotations): Taken in the first semester of the first year. Three six-week lab rotations of 2 units each (6 credit units total). Students will produce a 2-page written report summarizing each rotation project, with the report to be presented to and signed by the supervising faculty before the letter grade is assigned.

**MCB 695E** Ethics (1 unit), PHCL 595B Scientific Writing Strategies, Skills and Ethics (2 units), **or** SP H 649 Survival Skills and Ethics (3 units)

**GENE 920** (Dissertation): 18 units, as required by UA Graduate College

**Units in the Minor:** Minimum of 9, as required by the minor program

**Approximate 14 units remaining** (from 63 total), after above courses are taken: All students will be required to submit a Doctoral Plan of Study (PoS) by the end of their first academic year (e.g. June of their first year). The PoS will be developed by the student and his/her mentor in consultation with program curriculum committee members. The PoS will list (1) specific courses that satisfy the unit requirements of the graduate school, and (2) a specific timeline for the completion of the listed coursework. Because it will be impossible to predict the background education of each incoming student and their specific Ph.D. research project, this format will allow for maximum flexibility in constructing the specific curricula that will supplement deficiencies in each



students' knowledge while also complementing their proposed area of research. The PoS progress will be evaluated a minimum of once per year by the student's dissertation committee and changes to the PoS shall be approved by the committee members and/or the chair of the program.

### **Required for Doctoral Minor in Genetics**

**GENE 670** (Recent Advances in Genetics): 2 semesters = 4 credit units.

**Remaining 5 units:** Graded courses as approved on student's PoS by the two Dissertation Committee members who are faculty members of the Genetics GIDP (see <<http://www.gidp.arizona.edu/node/48>> for official listing). There must also be two Comprehensive Examination Committee members who are faculty members of the Genetics GIDP, and the Comprehensive Examination written and oral questions must include material from the student's genetics coursework.

### **Required for MS Degree in Genetics**

The University of Arizona requires a minimum of 30 units of graduate credit, of which at least 24 credits must be in non-thesis credits. A thesis, substantial research project, final creative project, or additional coursework in lieu of a thesis is required. The Genetics GIDP offers the choice of doing a thesis/substantial research project with 30 units of graduate credit courses, or a non-thesis option with 36 units of graduate credit required.

Except for a limited number of units that can be transferred from other approved institutions, the remaining unit requirements must be met by University of Arizona credits requirements.

## APPENDIX II

### Program Forms

#### GENETICS DOCTORAL STUDENT CHECKLIST

Name: \_\_\_\_\_ First Enrollment: \_\_\_\_\_ Mentor:

\_\_\_\_\_

Faculty Preceptor: \_\_\_\_\_

#### Program Forms

Lab Rotation Forms (Faculty/Term) \_\_\_\_\_

\_\_\_\_\_

Mentor Selection Form \_\_\_/\_\_\_/\_\_\_ Minor Approval Form: \_\_\_/\_\_\_/\_\_\_

Comprehensive Exam Committee Form: \_\_\_/\_\_\_/\_\_\_ Dissertation Proposal Form:

\_\_\_/\_\_\_/\_\_\_

Teaching Fulfilled \_\_\_\_\_ Transfer Units Approved (if applicable)? \_\_\_\_\_

Student Forum (Term): Full Length Seminar: \_\_\_\_\_ 20 Minute Presentations:

\_\_\_\_\_

#### Required Coursework (Term/Grade)

GENE670 \_\_\_\_\_ GENE795A \_\_\_\_\_ MCB695E \_\_\_\_\_ Stats (course

#) \_\_\_\_\_

#### Graduate College GRADPATH forms:

Responsible Conduct of Research \_\_\_/\_\_\_/\_\_\_ Doctoral Plan of Study:

\_\_\_/\_\_\_/\_\_\_

Comp Exam Committee Appointment \_\_\_/\_\_\_/\_\_\_ Announcement of Comprehensive

Exam \_\_\_/\_\_\_/\_\_\_

Dissertation Committee Appointment \_\_\_\_/\_\_\_\_/\_\_\_\_ Prospectus/Proposal  
Confirmation \_\_\_\_/\_\_\_\_/\_\_\_\_

Announcement of Final Oral Defense: \_\_\_\_/\_\_\_\_/\_\_\_\_

Comprehensive or Dissertation Committee Meetings: \_\_\_\_/\_\_\_\_/\_\_\_\_,  
\_\_\_\_/\_\_\_\_/\_\_\_\_, \_\_\_\_/\_\_\_\_/\_\_\_\_, \_\_\_\_/\_\_\_\_/\_\_\_\_, \_\_\_\_/\_\_\_\_/\_\_\_\_,  
\_\_\_\_/\_\_\_\_/\_\_\_\_

Comprehensive Exam Committee:

Faculty Representing Major (Name & Dept) Faculty Representing Minor (Name & Dept)

Written Completion Date: \_\_\_\_/\_\_\_\_/\_\_\_\_ Oral Completion Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

Dissertation Committee:

Faculty Representing Major (Name & Dept) Faculty Representing Minor (Name & Dept)

Dissertation Title:

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Honors/Awards: \_\_\_\_\_  
\_\_\_\_\_

GENETICS MASTERS STUDENT CHECKLIST

Name: \_\_\_\_\_ First Enrollment: \_\_\_\_\_ Mentor: \_\_\_\_\_

Faculty Preceptor: \_\_\_\_\_ Student Preceptor: \_\_\_\_\_

Program Forms

Lab Rotation Forms (Faculty/Term) \_\_\_\_\_

\_\_\_\_\_

Master's Committee Form \_\_\_\_/\_\_\_\_/\_\_\_\_

Student Forum (Term): 20 Minute Presentation: \_\_\_\_\_

Required Coursework (Term/Grade)

GENE 670 \_\_\_\_\_ MCB 695E \_\_\_\_\_

Graduate College GRADPATH forms:

Responsible Conduct of Research \_\_\_\_/\_\_\_\_/\_\_\_\_ Master's Plan of Study: \_\_\_\_/\_\_\_\_/\_\_\_\_

Master's Committee Appointment Form: \_\_\_\_/\_\_\_\_/\_\_\_\_

Committee Meetings: \_\_\_\_/\_\_\_\_/\_\_\_\_, \_\_\_\_/\_\_\_\_/\_\_\_\_, \_\_\_\_/\_\_\_\_/\_\_\_\_,

Graduation Option (check one):

1 Masters Thesis, and oral presentation

1 Research Project Summary (written document) and oral presentation

1 Written scientific document (review) and oral examination

Committee:

Project or Thesis Title

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Honors/Awards: \_\_\_\_\_

\_\_\_\_\_



**APPENDIX IV**

**Mentor Selection Form**

I, \_\_\_\_\_ hereby agree to accept \_\_\_\_\_ into my laboratory and serve as mentor effective \_\_\_/\_\_\_/\_\_\_\_. By accepting this student I understand that each year I am financially responsible for 50% (or the current amount set by the PS GIDP) of the current stipend amount to the program on behalf of this student. I further understand that this student may be supported via a training grant, thus my portion will be paid to the program not necessarily directly to the student. I will make my contribution in one of the following ways:

\_\_\_ Pay 50% directly towards a graduate assistantship (Student is NOT appointed to a training grant);

\_\_\_ Transfer state salary dollars to Genetics State line by transferring my salary to grant dollars;

\_\_\_ Provide indirect cost dollars for program use;

\_\_\_ Another method to be agreed upon by me and the Program, outlined below

(i.e. Training support 100% this year, I will pay 100% next year)

\_\_\_ Should my funding become unavailable, my department head agrees to cover my portion of the above named student salary at the Geneticsstipend rate for the duration of training, or until extramural funding is obtained

\_\_\_\_\_  
(Mentor Signature) (Date)

\_\_\_\_\_  
(Student Signature) (Date)

\_\_\_\_\_  
(Home Department Head Signature) (Date)

\_\_\_\_\_  
(Home Department Business Manager) (Date)

## **APPENDIX V**

### **The Genetics Comprehensive Examination**

#### Committee Chair Checklist

The following is a checklist for the Chair of the Comprehensive Examination Committee (NOT the mentor). For further details, refer to the Genetics Program Handbook. Questions may be directed to the Program Coordinator or the Program Chair.

Doctoral students must select a Comprehensive Examination Committee during their 3rd semester in the Program (ordinarily Fall of year 2). The student will select one member (not the advisor) to chair the committee. The chair is responsible for chairing meetings of the Exam Committee and for managing the development and execution of the exam.

At the initial meeting of the Exam Committee:

\_\_\_ Determine the date for the written exam, and if possible, potential dates for the oral exam (if the written is successfully passed).

\_\_\_ Determine the areas on which the student will be examined, and which committee member is responsible for composing each question (3 systems, 3 cell/molecular).

\_\_\_ Set a date by which the questions will be submitted to the chair (see below).

The questions must be submitted to the Program office at least 1 week prior to the exam, so that the PS Program Committee can evaluate it for consistency with program goals, and suggest changes when warranted.

\_\_\_ Once the questions are approved, the exam should be submitted to the Program Coordinator (Cora Varas-Nelson), at least 1 week prior to the exam date.

The Program Coordinator will administer the exam (unless instructed otherwise). The Program Coordinator will then distribute the questions to the appropriate committee members for grading, and the graded questions are returned to the Committee Chair.

The Chair of the Committee must insure that exams are graded in a timely manner (5 days).

\_\_\_ Once the exams are graded the Chair of the Committee collects the original exams, notifies the committee, the Program Coordinator, and the student of the results.

\_\_\_ The Chair of the Committee provides a copy of the graded exams to the Program Office to be

filed and returns the original, graded exam to the student.

If the result is “pass”, the student proceeds with the Oral Exam.

If the result is “fail”, the Chair of the Committee follows the guidelines for repeating the written exam – by calling another Committee Meeting to determine procedure.

After the Oral Examination the Chair reports the results in gradpath.



## APPENDIX VI

### Gradpath Directions

#### PhD Students

Doctoral gradpath forms instructions. These forms are initiated during the 3rd semester.

- Log in to UAccess Student
- On the main page is a menu box “other academic”
- Click on the drop down menu and select “gradpath forms” near the bottom of the list.
- You must then click the “>>” to “go”
- This will take you to the gradpath forms page
- You must first fill out the “Responsible Conduct of Research Statement” by checking “I accept” and clicking “submit”
- Once this form is complete the “Plan of Study” form becomes available. Fill in this form by selecting your courses to fill the form. You need 36 units total in the major and 9 units in the minor. You may need to select “future” courses. Dissertation units can NOT be included on this form. Once filled in click “submit”. It will be forwarded first to the Program Coordinator, then to your Mentor, then to the Minor, then to our Program Chair, then to the Graduate College. If there are mistakes it will be “denied” by the coordinator for you to correct and resubmit.
- After the Plan of Study is approved (typically by the summer of year 2) you must submit the “Comp Exam Committee Appointment” form which lists your comprehensive exam committee, by selecting the faculty from the UAccess database. You must also assign each committee member a “role”. Remember the Chair of your comp committee can NOT be your mentor. All other faculty should be given the role of “member”. Remember to click “submit” If a member of your committee does not show up on the list contact the program coordinator right away so that member can be added by the Graduate College.
- Once this form is available and prior to your oral exam you must complete the “Announcement of Doctoral Comprehensive Exam” form, including the date of your oral exam. After your exam an email will be sent to your committee chair to record the results of the exam in gradpath which will complete the “Results of Oral Exam” form.
- During year 3 you should establish your dissertation committee and complete the “Doctoral Dissertation Committee Appointment” form; Same as above, you must assign each committee member a “role”; Your mentor is now the chair of your committee and the other faculty “members”. If a member of your committee does not show up on the list contact the program coordinator right away so that member can be added by the graduate college.
- The next step is to have your dissertation proposal approved by your committee. Once this is done, submit the “Dissertation Proposal Form” to the program office and in gradpath submit the “Prospectus/Proposal Confirmation”
- You are all done with forms until it’s time for your defense. 2 weeks prior to your defense you must submit your “Announcement of Final Oral Defense” This form schedules your exam with the graduate college. After your defense your Mentor is sent an email to record the results from your exam. This will complete the final form “Results of Final Oral Defense.”

## Gradpath Directions

### MS Students

Master's gradpath forms instructions. These forms are initiated during the 3rd semester.

- Log in to UAccess Student
- On the main page is a menu box "other academic"
- Click on the drop down menu and select "gradpath forms" near the bottom of the list.
- You must then click the ">>" to "go"
- This will take you to the gradpath forms page
- You must first fill out the "Responsible Conduct of Research Statement" by checking "I accept" and clicking "submit"
- Once this form is complete the "Plan of Study" form becomes available. Fill in this form by selecting your courses to fill the form. You need a minimum of 30 units total. If you click on the "Yes" I am doing a thesis button then you MUST register for at least 1 unit of 910 thesis units and these MUST be included on the Plan of Study. If you are doing the research summary option in the form of a manuscript you should click "No". You will need to select "future" courses to fulfill the 30 unit requirement. Once filled in, click "submit". It will be forwarded first to the Program Coordinator, then to your Mentor, then to our Program Chair, then to the Graduate College. If there are mistakes it will be "denied" by the coordinator for you to correct and resubmit.
- Once you have established your committee you will complete the "Master's/Specialist Committee Appointment" form which lists your committee, by selecting the faculty from the UAccess database. You must also assign each committee member a "role". Your mentor is the "chair" all other faculty should be given the role of "member". Remember to click "submit" If a member of your committee does not show up on the list contact the program coordinator right away so that member can be added by the Graduate College
- These are the only gradpath forms for you to complete. After your MS Defense, your mentor must contact the program office with the results and we will submit the "completion of requirements request" which will generate the "Master's/Specialist Completion Confirmation" form in gradpath.