School of Life Sciences

Graduate

student handbook 2021-22

ASU School of Life Sciences

Arizona State University

sols.asu.edu

School of Life Sciences

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Contents

Part 1: Introduction

Welcome to the ASU School of Life Sciences graduate programs! This handbook is designed to guide students through their degree programs, and includes information about SOLS policies. All graduate students in the School of Life Sciences are required to read this handbook and to familiarize themselves with the formal program requirements in the ASU Academic Catalog and ASU Graduate College policies. If you have any questions, please ask your major advisor, program director, or the SOLS Graduate Office. ASU and the School of Life Sciences are strongly committed to inclusion, ethnic, intellectual, socioeconomic and cultural, and advancing knowledge that reflects the deepest possible grasp of diverse perspectives.

Communications

By university policy, we will communicate with you primarily through your ASU email address. This email address will be added to a mailing list (DL.WG.LA.SOLS.GRAD@asu.edu). We will also communicate with you individually via our general account (sols.grad@asu.edu). Please add both of these addresses to your list of safe contacts, set an automatic forward on your ASU email if necessary, and get into the habit of checking your email at least once each day so that you do not miss important emails or notices about critical deadlines, opportunities, and events. Most important information is also available on the SOLS Grad Programs CANVAS page, including previous versions of this handbook.

Where to get help

In an emergency, dial 9-1-1

SOLS Grad Office

(sols.grad@asu.edu; LSA 181)

The SOLS Graduate Office is open from 8am to 5pm most weekdays for academic advising, employee resources, and logistical support to SOLS graduate students and their mentors. If you have questions or concerns about anything at all related to your work as a graduate student, the SOLS Grad Office is a good place to start.

Program directors and grad AD

Each graduate program (e.g., Biology PhD) is managed by a Program Director(s) who oversees admissions, curriculum, and your academic progress. When you have questions about course requirements or your academic progress, your Program Director is the person to ask.

The SOLS Associate Director for Graduate Programs (Grad AD) represents the SOLS Director (who leads all of SOLS) in matters related to graduate students, and has final authority on most graduate student issues. The Grad AD coordinates across programs, supervises the SOLS Graduate Office, and is guided by advice from the

Graduate Programs Committee (GPC, which includes one graduate student as a non-voting member).

Graduate student leaders

There are several organizations that represent SOLS graduate students and offer you an opportunity to take on a leadership role at ASU. The SOLS E-Board advocates on behalf of SOLS graduate students in discussions with SOLS leadership, and hosts several events including the brown-bag and mental health series, and an annual retreat. The Microbiology Graduate Student Association (MGSA), the Graduate Association of Interdisciplinary Neuroscience Students (GAINS), and Graduate Partners in Science Education (GPSE) all also offer important opportunities.

The ASU Graduate and Professional Student Association (GPSA) represents graduate students across campus, and provides funding and leadership opportunities. You may also want to explore opportunities through the Graduate Women's Association (GWA), the ASU SACNAS and AISES chapters, the Black Graduate Student Association, the Alliance of Indigenous Peoples, and the many other ASU student organizations.

Other ASU offices and resources

For incidents involving violence or crimes, contact the ASU Police Department (cfo.asu.edu/police, 480-965-3456) or report a concern by calling the ASU Hotline (877-786-3385).

Student Advocacy and Assistance: (Dean of Students) - they will connect you to the right university and community resources to address personal and family illness, accidents, and critical incidents such as harassment and discrimination complaints.

SOLS Crisis Fund: flexible financial relief for SOLS graduate students confronting difficult financial situations. You can also donate to this fund here.

Disability Resource Center: accommodations for students with disabilities.

Health Services: walk-in care at 451 E University. Students register for health Insurance each semester via My ASU.

Graduate Wellness Resources: a guide to Financial, Social, Emotional, and Physical Health and Wellness Resources for ASU Graduate Students, developed by the GPSA

Counseling Services: call 480-965-6146 during the week (480-921-1006 after hours) to speak immediately with a counselor.

10 Best Practices in Graduate Student Wellbeing: ways to help graduate students better care for themselves under the increasing demands of graduate school.

International students: current information and support relevant to students from other countries.

Sun Card: Arizona State University's official photo ID card. Students may upload a photo and either pick up the Sun Card in the Sun Devil Card Services Office or have the Sun Card delivered by mail. Students will be charged $25 for the card. A Sun Card is required to access some locations on campus.

Parking and Transit Services: Students can find information about parking permits and rules about parking at other campuses on the Parking and Transit Services web page.

Campus Amenities: the hub of student life at the Tempe campus is the Memorial Union (MU). Students can find restaurants, live music, a gaming lounge, bank automated teller machines (ATM), and much more.

ASU Libraries: ASU has several libraries and hosts impressive online and hardcopy collections. The Tempe campus is home to Hayden Library, the main library on campus, as well as the Design and the Arts Library, the Music Library, and the Noble Science Library. Students can research past theses and dissertations through the ProQuest database, request documents from other libraries around the world, or search online article databases. Hayden Library also provides free creative equipment and tools through mkrservices and mkrstudio through My ASU. The ASU Digital Repository is home to scholarly papers and theses in addition to cultural heritage materials, historical photographs, and music performances.

Part 2: University policies and resources

Student code of conduct

Academic integrity

All SOLS graduate students must adhere to the Arizona Board of Regents Student Code of Conduct and Arizona State University's Student Honor Code, and are expected to maintain high levels of academic integrity at all times. All ASU students are required to complete an online module on academic integrity (through My ASU), and will not be able to register for classes until it is complete.

SOLS does not tolerate academic dishonesty, and will take appropriate disciplinary actions if it is uncovered. We expect students to familiarize themselves with what constitutes violations to the ASU policies on academic integrity. Briefly, violations include but are not limited to: cheating on exams and assignments, plagiarizing, fabricating data, aiding academic integrity policy violations, and falsifying academic records (provost. asu.edu/academicintegrity). Please pay special attention to the definition of plagiarism to avoid unintentional mistakes, and discuss the topic further with advisors and instructors, as needed.

Allegations of academic dishonesty will be reviewed by Program Directors, the Grad AD and The College. Incidents that violate ASU's Misconduct in Research Policy or the Student Academic Integrity Policy may also be reviewed by the Office of Knowledge Enterprise Development (KED). Possible sanctions can be quite serious, and include grade changes, dismissal from the program, and expulsion from the university.

Discrimination complaints (Title IX)

ASU and SOLS prohibit all forms of discrimination, harassment and retaliation. Click HERE to view ASU's policy.

Any complaints of discrimination or harassment in employment, educational programs, or activities may be filed with the Office of Equity and Inclusion (OEI) for investigation and resolution. Most SOLS supervisors (including faculty, Program Directors, and Grad Office staff) are required to report any suspected violations, and are thus not free to discuss potential issues confidentially. However, any employee or student may visit with OEI's staff to discuss any concern confidentially without fear of jeopardizing job or academic standing.

Title IX protects individuals from discrimination based on sex in any educational program or activity operated by recipients of federal financial assistance. As required by Title IX, ASU does not discriminate on the basis of sex in the education programs or activities that we operate, including in admission and employment. Inquiries concerning the application of Title IX may be referred to the Title IX Coordinator or to the U.S. Department of Education, Assistant Secretary, or both. Contact titleixcoordinator@asu.edu or 480-965-0696 for more information. Office located at 1120 S. Cady Mall, INTDSB 284. For information on making a report please go to asu.edu/reportit.

Research involving human and animal subjects

All ASU theses and dissertations that involve research with human or vertebrate animal subjects must include a statement indicating that the research has been formally approved by the appropriate university body. Students must check with their major advisors well in advance to ensure compliance with university regulations as it pertains to the collection of research data involving human and animal subjects.

ASU's Office of Research Integrity and Assurance coordinates campus-wide efforts to maintain ethical principles and compliance with regulations. All ASU research involving human subjects must be reviewed and approved by an University Human Subjects Institutional Review Board (IRB) before data collection or recruitment of subjects is initiated. All ASU research involving live vertebrate animals must be reviewed and approved by the Institutional Animal Care and Use Committee (IACUC) before obtaining animals or collecting data.

Life science ethics program

Students, faculty and staff are frequently faced with challenging ethical issues involved with research and innovation. As a student in our school, you will find unique opportunities to explore the societal and ethical implications of life sciences research and education. Use the link above to find courses, workshops and more.

Registration and enrollment

Students register for classes through My ASU. If a student cannot register, they may have a registration hold on their account, which would be noted in My ASU. In My ASU, the student can click on the hold title and a box with additional information about the hold will appear, including information on resolving it.

Drop/add deadline

The Academic Calendar lists specific dates and deadlines for each semester. SOLS will consider requests to drop courses past the drop/add deadline on a case-by-case basis. Otherwise, a student who no longer wishes to take a course will need to withdraw from it. A withdrawal will result in a "W" grade on the student's transcript, which may negatively impact students receiving student loans.

To add a class after the deadline, students can fill out an Enrollment Change Request form by contacting sols.grad@asu.edu to consult with the Graduate Coordinator.

Continuous enrollment

To remain in their programs, SOLS graduate students must be continuously registered for a minimum of 1 graduate credit hour in every fall and spring semester (usually xxx 592/792). Summer registration is required for students starting in the summer term, taking examinations, defending a prospectus, thesis or dissertation, or graduating. Students who fail to enroll in any semester (not including summer) will be dropped automatically by the Grad College, and have to re-apply and be re-admitted. Students can apply for a formal waiver of the continuous enrollment requirement or a leave of absence (up to 2 semesters). These must be formally approved by the major advisor, program director, SOLS Grad AD and the Graduate College before the semester for which the waiver or leave is requested.

Leave of absence

Graduate students planning to discontinue registration for a semester or more must submit a Leave of Absence request via their Interactive Plan of Student (iPOS). This request must be submitted and approved before the anticipated semester of non-registration. Students may request a maximum of two semesters of leave during their entire program. A student on leave is not required to pay fees, but in turn is not permitted to place any demands on university faculty or use any university resources, including libraries and computer facilities.

Students who do not enroll for a fall or spring semester without an approved leave of absence by the Graduate College have "broken enrollment" and are considered withdrawn from the university under the assumption that they have decided to discontinue their program. Students removed for this reason may reapply for admission to resume their degree in a later cohort; the application will be considered along with all other new applications to the degree program. A student who has broken enrollment cannot graduate without reapplying, being readmitted, and possibly repeating classes due to the ASU pre-admission credit policy, found in the Graduate College Policies and Procedures Handbook.

If a student has an approved iPOS, then they submit the leave request as an iPOS petition. If the student does not have an approved iPOS, then a paper form is required. Students should submit the form at least two weeks before the start of the term in which they plan to be on leave and notify the SOLS graduate office (sols.grad@asu.edu). Failure to meet this deadline may result in a denied request or one that is not processed in time. One alternative is to register for one credit hour of Continuing Registration, which is a placeholder class, and will keep the student actively enrolled for the semester. Tuition is required for Continuing Registration but there is no course work required.

Parental, medical and other leaves

Graduate students in TA or RA positions who have completed at least one year of academic service may be eligible for up to 12 weeks of paid parental leave for the birth or adoption of a child.

Those who experience serious illness or injury should consult with their faculty advisors and the SOLS Graduate Office to explore their options, which may include incomplete grades, a complete withdrawal from classes, a medical/compassionate withdrawal with tuition refund, or a waiver of the continuous enrollment requirement.

If students wish to withdraw completely from their degree programs, they must submit a complete session withdrawal form. Students will need to contact the University Registrar separately to withdraw from individual courses. International students should contact the International Students and Scholars Center (ISSC) before submitting a complete withdrawal form, since this will most likely have an impact on their visa status.

Part 3: Tuition and graduate positions

All PhD students admitted to a SOLS graduate program are promised five years of funding, including salary, health insurance and tuition remission sufficient to cover the required minimum of 84 credit hours. Students who need funding after those five years may also receive financial support, but often have lower priority (see below.) MS students are typically not offered financial support, although some individuals may receive 1- or 2-year funding or other awards on a case-by-case basis.

Tuition, fees, and residency

Students are responsible for paying several required student fees, and can estimate tuition and fee costs online. Some courses may have additional course fees and courses offered by other departments may charge a different tuition rate. Tuition and fees are set by the Arizona Board of Regents and are subject to change.

Additional expenses not covered by tuition and fees include the admissions application fee, immunizations, student ID card, textbooks, any equipment needed to access course materials, convocation regalia and the graduation application fee.

Students who wish to be considered Arizona residents for lower tuition rates will have to work with the University Registrar to see if they qualify and to learn what paperwork and procedures are necessary to change their status to resident. The Registrar has an entire site dedicated to Residency for Tuition Purposes.

Types of positions

Graduate positions are typically half-time jobs (0.5 FTE), requiring 20 h/week of work in either teaching or research. Pay is distributed biweekly (every other Friday). The Graduate College TA/RA handbook describes other relevant policies.

Both Teaching Assistant (TA) and Research Assistant (RA) positions are heavily subsidized and include salary, health insurance, and full tuition remission (up to 18 credit hours/semester). Graduate Service Assistant (GSA) positions provide only a stipend (no tuition waiver or health insurance), and may have a different pay rate.

Teaching Assistants (TAs) work with faculty and instructors in the classroom, while gaining valuable opportunities to learn and practice teaching skills. A typical TA teaches two or more laboratory sessions each semester or assists with grading and discussion sections in writing-intensive courses. TA assignments are based on the school's needs, faculty requests, student interests, and previous experience. First-time TAs must complete training, including extra requirements for online courses and international students (see TA Training below).

Research Assistants (RAs) are typically funded through research or training grants. Students in these positions usually work closely with their faculty mentors on scientific research.

Graduate Service Assistants (GSAs) share the same types of job responsibilities as TAs or RAs, differing only in the details of compensation (pay rate and tuition). Students in GSA positions are billed directly for tuition and health insurance, and do not receive a waiver of these costs.

TA eligibility and assignment priorities

Students who hold a TA position must:

- Register each semester for a minimum of 6 hours of approved graduate coursework. TAs who have not already taken the full complement of credit hours required for the degree (84 for PhD, 30 for MS) may enroll for up to 18 hours each semester (courses and research) to take advantage of the tuition benefit.
- Make satisfactory progress towards their degree. Students who are on academic probation or who do not receive a "satisfactory" score on their annual progress reports may receive lower priority or become ineligible for future TA assignments.
- In addition, international students must:
  - Pass the SPEAK test at ASU with a score of 55 or above, obtain a score of 26 or higher on the speaking section of the iBT (TOEFL), obtain a score of 8 or higher on the speaking portion of the IELTS test, or become certified through the ITA Teacher Training Course (a one-semester course).
  - Have an appropriate visa status

Students will be assigned to TA positions with the following priorities:

First priority:

PhD students within the 5-year funding guarantee, working with a major advisor whose primary faculty appointment is in SOLS.

Second priority:

SOLS PhD students with major advisors whose primary

faculty appointment is in SOLS, but who are beyond the 5-year funding guarantee. Students who have not received previous TA support may be given priority.

SOLS PhD students with major advisors whose primary faculty appointment is not in SOLS, but who have contributed substantively to SOLS undergraduate teaching, collaborative grants or research initiatives. Students who have not received previous TA support have priority.

SOLS MS students with major advisors whose primary faculty appointment is in SOLS.

Teaching and research assistant training

All SOLS students hired into job positions must complete:

- The Graduate Assistant Training Program. This includes pre-orientation modules for all students, and specialized training for teaching assistants.
- SOLS orientation and TA training, offered at the start of each fall semester.
- BIO 530, Scientific Teaching, or equivalent.

New international TAs must also attend international student orientation. This training is offered at the start of each fall semester.

TA responsibilities and performance review

TA work assignments begin one week before the first week of instruction each semester. Work terminates after the completion of grades, inventory, laboratory cleanup, and other final activities. The professor or laboratory coordinator in charge of the course will assign and supervise all TA activities, including course-specific meetings to coordinate those activities. Any necessary absences from teaching duties must be arranged individually and in advance with that supervising faculty member. TAs are generally expected to hold 2 office h/week and to respond within 24 h to email or phone communications.

Students who do not fulfill their job responsibilities adequately may receive lower priority for future job assignments. Faculty, lab coordinators and students evaluate teaching assistants at the end of every semester or summer session. These materials and additional information from TA supervisors may be reviewed as part of the annual progress report.

Part 4: Earning your degree

Below are general requirements for a graduate degree in the ASU School of Life Sciences. Each degree program also has specific requirements that are described in Part 7. In addition, SOLS graduate students must abide by policies and requirements set by the ASU Graduate College.

General admissions requirements

SOLS graduate students must have earned a bachelor's or master's degree in biology or a related discipline from a regionally accredited institution with a minimum 3.0 GPA. Applicants must also submit several documents including official transcripts, personal statement, curriculum vitae, letters of recommendation, and the results of language tests (for international students).

Pre-admission and transfer credits

Credit hours completed at ASU or at another regionally accredited U.S. institution or international institution officially recognized by that country, before the semester and year of admission to an ASU graduate degree program, are considered pre-admission credits. With the approval of the academic unit and the Graduate College office, students may include a maximum of 12 graduate-level credit hours with grades of "B" or better that were not used towards a previous degree. Preadmission credits must have been taken within three years of admission to the ASU degree or certificate program to be accepted.

Accelerated Bachelor's/Master's programs may use a maximum of 12 pre-admission credits which may include up to a maximum of 12 hours shared between the Bachelor's and Master's program. Students in accelerated programs should contact their advisor to ensure proper sharing of credit hours. For more details, review the Graduate College's Policies and Procedures Manual.

Program duration

SOLS graduate students should aim to complete a MS degree within 2 years (maximum of 6 years allowed) and a PhD within 5 years (4 years, if the student enters with a previous MS, maximum of 10 years). Any exceptions to these limits must be formally approved by the program director, the SOLS Grad AD and the Graduate College.

Interactive plan of study (iPOS)

The interactive plan of study (iPOS) is the student's official contract with the department and the university. It lists the classes the student plans to take to complete the degree and indicates who is on the student's supervisory committee. SOLS requires the iPOS be submitted by the end of the student's first year in the program. Failure to meet this deadline could result in academic probation for the student for violation of department policies.

Upon approval, students are expected to keep the iPOS up-to-date by checking it at the start of each semester and making changes as needed. Students can update

iPOS courses (add and remove classes) and adjust their committees at any time unless on an approved leave of absence from the university. Contact sols.grad@asu.edu if you have questions.

A maximum of 6 credit hours of 400-level coursework can be included on an iPOS with program approval. 400-level courses taken prior to admission and 400-level courses graded as "Pass/Fail" are not acceptable. Courses with grades of "D", "E", or "W" and audited courses (graded as "X") cannot be included on an iPOS. Courses applied to a previously awarded degree cannot be included on an iPOS

Major advisors and supervisory committees

The major advisor and supervisory committee provide guidance in research, administer the PhD comprehensive examinations and defense of the research prospectus (PhD only), and direct and evaluate the final thesis or dissertation. **All SOLS graduate students must identify their major advisor and supervisory committee, complete a mentoring compact, and submit an Interactive Plan of Study (iPOS, available via My ASU) before the end of the first year in their program.**

Many students choose their major advisors as part of the admissions process, while others complete rotations or coursework first. The major advisor must be a member of the ASU Graduate Faculty, endorsed to chair or co-chair a committee in the student's degree program. All SOLS tenure-track faculty members can serve as major advisor. Others may need to be formally nominated by the Program Director and approved by the ASU Graduate College. Major advisors at partner institutions (e.g., Mayo, BNI) typically co-chair supervisory committees, working closely with an ASU co-chair. To add a committee member who has not already been approved, contact sols.grad@asu.edu to submit a special request.

Changing a major advisor is possible, but should be preceded by conversations with the new and previous advisors, program director and Grad AD. Please note that funding guarantees described in admission offer letters often depend on whether the major advisor has a primary appointment in SOLS. If the new advisor is not a SOLS faculty member, the five-year PhD-funding offer may be withdrawn. Students who lose a major advisor have one semester to identify a new advisor. If a new major advisor is not found after one semester, the student is placed on academic probation and is not eligible for most forms of funding (see below).

All SOLS graduate students and their advisors must complete a mentoring compact within the first year. A template for the mentoring compact is available on the Grad Programs Canvas site, which outlines roles and responsibilities in the mentor-mentee relationship. All SOLS graduate students must complete, sign and submit the mentoring compact to sols.grad@asu.edu within one month of identifying a major advisor. For most SOLS students, this will be before Fall Break, but all students must submit the signed mentoring compact before the end of the first year. Students and their major advisors are encouraged to revisit their mentoring compact each year as part of the annual progress report (see below).

Supervisory committees are chaired or co-chaired by the major advisor and include 2-4 other faculty members (see Part 6 for individual program requirements). As explained above, chairs and co-chairs of the supervisory committee must be members of the ASU Graduate faculty, endorsed to chair or co-chair committees in the student's graduate program. In addition, at least 3 members of a PhD supervisory committee must be members of the ASU Graduate Faculty, and at least 50% of the committee must be members of the program's graduate faculty.

Most programs have additional requirements. Adding a supervisory committee member who is not a member of the ASU or the program's graduate faculty may be possible, but requires additional approvals.

Annual committee meeting and progress report

Each year, SOLS graduate students complete an annual progress report, which is then comprehensively reviewed by the major advisor, Program Director, and Grad AD. Requests for waivers or extensions should be made directly to the Grad AD, and are granted rarely. The annual progress report is used to inform decisions such as nominations for fellowships, eligibility for funding, and determinations of academic status including probation and dismissal. Students receiving any rating other than "Student is making timely progress toward degree" will be provided with additional details on the issues that must be corrected, with specific milestones and timeline that must be met to avoid being placed on SOLS academic probation.

In addition, SOLS graduate students must meet with their supervisory committees at least once each year. This annual committee meeting requirement is waived only for students conducting rotations in their first year. The major advisor typically leads the meeting, which begins with the student presenting a brief (10-15 min) oral synopsis of their progress and a timeline of future plans, including research, coursework, and exams. The

committee asks questions and provides feedback. At the end of the meeting, the major advisor asks the student to leave briefly while the committee discusses and comes to a consensus assessment of the student's progress. When the student returns, the supervisory committee shares the outcome of their deliberations with the student, including the strengths and weaknesses of the research efforts and any recommendations for changes in the timeline or plan of study. The major advisor then submits a brief summary of the outcome to the SOLS Graduate Office as part of the annual progress report process.

Comprehensive exams and the prospectus defense (PhD degrees only)

All SOLS PhD students demonstrate their ability to integrate knowledge of their research area and their potential to conduct an original research project by completing oral and written comprehensive exams, plus a research prospectus. Usually these are done simultaneously, and **all SOLS programs require that the comprehensive exams and prospectus defense be successfully completed by the end of third year**.

Once the supervisory committee has agreed to a date for the comprehensive exams and prospectus presentation, the student must notify sols.grad@asu.edu of the proposed date. Students must be in good academic standing, with a full committee and an approved iPOS to be able to take the comprehensive exams and defend a prospectus. After the exams, the SOLS Graduate Office distributes an electronic form to all supervisory committee members to document the outcome of each of three parts: 1) oral comprehensive exam, 2) written comprehensive exam, and 3) prospectus defense. Details on each part are described in the description of each program (below.)

A Master's in Passing (MIP) may be awarded to PhD students in any SOLS program after they advance to candidacy. To be eligible, the student must not have applied credits from a previous Master's degree to their PhD iPOS. MIP degrees are awarded only at the end of the semester. To obtain an MIP, the student should contact sols.grad@asu.edu to confirm eligibility and to obtain detailed instructions.

Grievances and appeals

Graduate students wishing to appeal a grade or to report a grievance against another student, an instructor or supervisor should begin by conferring informally with that individual. The student may also want to seek guidance from their major advisor or Program Director. If informal discussions do not resolve the problem, the student may appeal to the Grad AD. The Grad AD is likely to confer with the instructor, supervisor, or Program Director, and may bring the grievance to the attention of the SOLS Director in an effort to resolve the situation. In nearly all cases, the grievance is successfully resolved by these discussions, and does not go beyond this level. In the rare instances when the matter is not yet resolved, the student may consult with a representative from The College Dean's office (CLASDean@asu.edu) to proceed with a formal grievance to The College.

Completing the degree

SOLS graduate students should aim to complete the PhD within 5-6 years, or a MS within 2 years. At the beginning of the semester of the MS thesis or PhD dissertation defense, the student should read through the ASU Graduate College guide to completing your degree. In brief, students must:

1. Register for at least one credit hour, even when defending during the summer.
2. Meet with the supervisory committee (4 months before for PhD, 2 months before for MS) to finalize plans.
3. Apply for graduation (through the My ASU graduation tab). There is a very strict deadline.
4. Schedule the public defense (through My ASU). The defense must be a public event.

About one month before the defense, the student should:

1. Submit their thesis or dissertation to their major advisors and supervisory committees for scientific review.
2. Submit their thesis or dissertation for format review through iPOS. The rules for formatting are specific and rigid. Use the Graduate College formatting tool. Note that although students may include up to three published papers in their final thesis/dissertation, these must be merged with the rest with consistent style and final, compiled reference section.
3. Complete the "Survey of Earned Doctorates" (PhD only).
4. Register for commencement (via My ASU) and rent or purchase academic regalia at ASU's Bookstore.
5. Announce the public defense by emailing a document to the SOLS Graduate Office including the following:
   - Date, time and place of the defense
   - Title of the dissertation/thesis
   - Names of all supervisory committee members, including chairs and co-chairs
   - Abstract
   - Photo or illustration related to the defense (optional)

At and after the defense

The first part of the defense is a public presentation of the thesis or dissertation research. After the public defense, the supervisory committee will examine the student and judge whether the student's dissertation and performance in the oral defense are sufficient to award the MS or PhD degree. Each committee member will receive an email with link to report their individual decision to the Graduate College.

After the defense, the student must:

1. Revise the thesis/dissertation and submit to the major advisor for final approval. Most students are asked to make revisions. Once revisions are complete and approved, the major advisor will issue a Final Pass on the electronic Pass/Fail form.
2. Upload the final document to ProQuest. Once revisions are complete, and the Pass/Fail form has been fully approved, you will receive approval from the Graduate College to submit the final document to ProQuest.
3. Attend commencement (optional).
4. Leave a forwarding address. Return any keys to the SOLS facilities office, clean out office and lab space, and give mail-forwarding information to the SOLS Graduate Office. Check with your major advisor regarding any requirements on the safekeeping of data, sample records and laboratory notebooks.

Applying for graduation

Every student is required to apply for graduation the semester in which they plan to complete their degree (including MIP) or certificate. The Graduate College lists graduation deadlines on their website. Students can apply after the deadline, but will have to pay a late fee. A separate application is required for each degree or certificate program. It is important that students update their mailing address in My ASU prior to applying for graduation so that the diploma gets mailed to the correct address. Students will not be able to apply to graduate if they are not in good standing or have issues on the interactive plan of study (iPOS).

Part 5: Satisfactory progress, probation and dismissal

SOLS satisfactory academic progress

To maintain satisfactory progress towards the degree, SOLS graduate students must:

1. Maintain a minimum of 3.00 GPA (cumulative, overall graduate, and iPOS). If any of the three GPAs fall below 3.00, the student will be immediately placed on academic probation by the Graduate College.
2. Enroll for at least one credit hour in every Fall and Spring semester ("continuous enrollment").
3. Satisfy all requirements for the degree program by the deadlines. This includes identifying a major advisor, forming an approved supervisory committee, passing comprehensive/prospectus exams, and defending the thesis or dissertation.
4. Each year, students who are working towards thesis or dissertation-based degrees must hold a committee meeting, complete the SOLS annual progress report and receive a final rating of "Student is making timely progress toward degree."
5. Work closely with a major advisor. Students who do not have a major advisor after the first year will be notified in writing that they have one semester to find a new one. Students who fail to reach an agreement with a new major advisor after this period will be placed on academic probation.

Students who are not making satisfactory progress will be asked to discuss their individual situations with their major advisors and Program Directors. Some students may also receive a written warning from the Grad AD with specific requirements to be met by stated deadlines. If those deadlines are not met, the student is likely to be placed on SOLS academic probation (see below) or be recommended to the Graduate College for dismissal from their program.

SOLS academic probation

SOLS academic probation is a strong warning that the student's status in the program is in jeopardy unless corrective action is taken. Students may be placed on SOLS academic probation for academic dishonesty or unsatisfactory progress. For example, a student who does not meet major program deadlines, such as the required date of the oral comprehensive exam, may be placed on academic probation. Students on SOLS academic probation are not eligible for many opportunities including scholarships, travel awards, TA and RA positions. After one semester of probation, students will return to a status of satisfactory progress (if they complete requirements in a timely way) or be recommended for dismissal. SOLS academic probation affects a student's status within SOLS but is not reported to the Graduate College and so does not appear on their ASU transcript or permanent academic record.

Students being placed on SOLS academic probation are notified in writing. The probation letter includes a list of requirements and explains the consequences of not meeting those requirements by the specified deadlines.

Students who are unable to fulfill a requirement by its

deadline may request an extension by submitting a petition in writing to the Grad AD. The petition must

- Explain extenuating circumstances as to why the requirement cannot be met.
- Describe what has been done and what will be done to get back on track.
- Give the date(s) as to when the requirement will be completed.
- Include a letter of support from the student's major advisor.

The Grad AD will consult with the Program Director and others, and will notify the students once a decision is made about the extension.

Dismissal

SOLS may recommend to the Graduate College that a student be dismissed from the program in several situations including:

Provisional admission:

At the end of each semester, the Graduate College reviews the progress of students who were admitted provisionally. If a student has met the conditions described in the admissions offer letter, the provisional admission hold will be removed from their records. If a student has not met those conditions, the Graduate College will dismiss the student from the program, with no possibility of appeal.

Admission with deficiencies:

At the end of each semester, SOLS reviews students who were admitted with academic deficiencies. If a student has completed the requirements described in the admissions offer letter, the Grad AD will send a letter to the student confirming that the student is now in good academic standing. If a student has not successfully met the requirements, the Grad AD will send a letter alerting the student that they will recommend to the Graduate College that the student be dismissed and offering the student an opportunity to appeal this decision (as described below).

Unsatisfactory progress:

If a student on academic probation does not meet the requirements specified in their probation letter by the stated deadlines, they may be subject to dismissal. The Grad AD will send a letter alerting the student that they will recommend to the Graduate College that the student be dismissed and offering the student an opportunity to appeal this decision (as described below).

Academic integrity policy or student code of conduct violations:

Students who are determined to have seriously violated the Academic Integrity Policy or Student Code of Conduct may be subject to dismissal. SOLS abides by the extensive College-wide policies and procedures for reporting and addressing such incidents.

Before recommending dismissal, the Grad AD will send the student a letter notifying them of their decision, and offering the student an opportunity to appeal the decision. The student will then have 10 business days to request an extension of the probationary period. To appeal the SOLS decision to recommend dismissal, the student must submit a written letter to the Grad AD 1) explaining the extenuating circumstances as to why the requirements were not met, 2) describing what has been done and what will be done to get back on track, 3) giving the date(s) as to when the requirement will be completed, and 4) including a letter of support from the student's major advisor. On receiving an appeal, the Grad AD will share the appeal with the student's program director and obtain their written recommendation. The Grad AD will then form a committee of SOLS program directors to review all of the associated materials, including previous student progress reports, major advisor and Program Director recommendations. That committee will make a final decision on the SOLS recommendation.

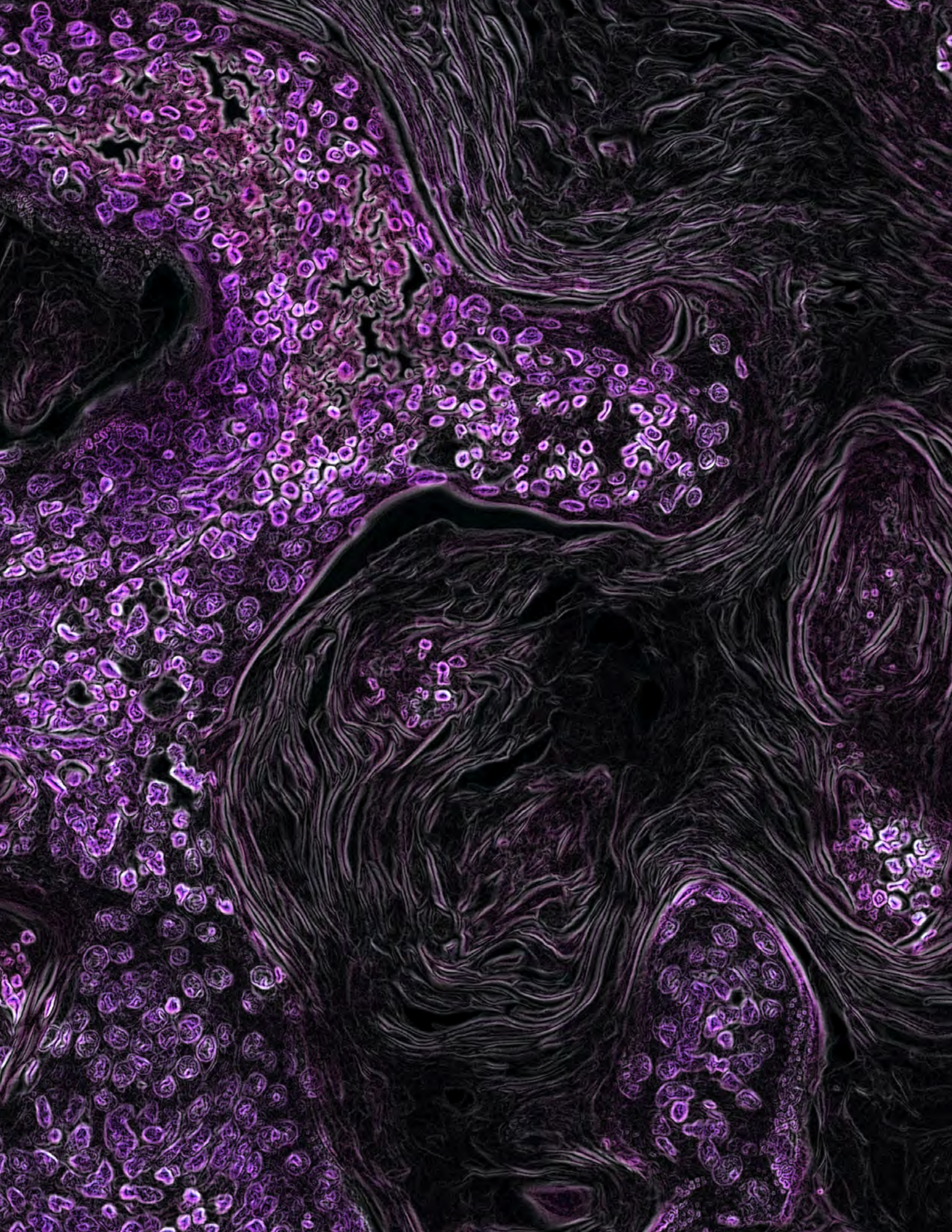
If the student does not submit a SOLS appeal, or if that appeal is not successful, the Grad AD will send a letter recommending dismissal to The College. The College will review the relevant documentation including any appeals, and decide whether to forward the recommendation for dismissal to the Graduate College or to return the materials to SOLS with a recommendation of new stipulations and deadlines. If The College forwards the recommendation for dismissal to the Graduate College, the materials will go to the Dean of the Graduate College, who makes the final decision about dismissal.

Part 6: Individual program requirements

Animal behavior PhD

Supervisory committee

- Is selected by the end of the 2nd semester.
- Must have at least 5 members (the major advisor and at least 4 others).
- Composition needs to be approved by the Animal Behavior Program Executive Committee.
- One member may be from outside ASU but will need to be approved by the Animal Behavior Program Executive Committee.



Program of study

- 84 hours required.
- 8 credit hours of core courses: ANB 601 (4 credit hours) to be taken in the 1st or 2nd semester, and ANB 602 (1 credit hour) to be taken four times during the Program of Study.
- 64 credit hours of elective courses, omnibus courses and research, selected in consultation with the supervisory committee (e.g., ANB 784,Doctoral Internship; ANB 790, Doctoral Reading and Conference, ANB 792 Research).
- Exactly 12 credit hours of ANB 799 Dissertation.

Comprehensive exams and research prospectus

To be completed before the end of the 5th semester.

Research prospectus

The student will write a dissertation prospectus consisting of a synthetic, NSF-style research proposal that lays out the rationale and experimental plan of the dissertation. This should be submitted to the supervisory committee at least two months before the scheduled comprehensive exam date. The committee will judge how well the student's research proposal is designed and justified.

Within one month of receiving the research prospectus, committee members should send any suggestions for improvement of the prospectus to the student and advisor. Once these changes are incorporated into the prospectus and before the exam can be held, each committee member must, in writing, indicate to the student's advisor that the prospectus is ready to defend.

Comprehensive exams and prospectus defense

These exams (oral and written comprehensive exams & prospectus defense) consist of the defense of a research proposal and subsequent questions from the supervisory committee on the broader context of the proposed research.

At the beginning of the exams, the student may choose to give a 15-20 min presentation on their research plan. This part is open to a general audience of faculty, as well as to the supervisory committee. Questions from the committee in closed session should then focus on the prospectus and the student's general knowledge of their research and teaching discipline.

There are several allowable outcomes of the exam:

- Pass – Satisfactory performance on both the written and oral components and the prospectus defense.
- Postponed decision – Unsatisfactory performance on one or more components, but with an explicit plan and deadlines for dealing with the deficiencies by rewriting the prospectus, retaking the oral or written exams, or both.
- Failure – Unsatisfactory performance on both the written and oral components and the prospectus defense.

Dissertation defense

Typically completed within five to six years.

Biology PhD

Supervisory committee

- Is selected by the end of the 2nd semester.
- Must have at least 4 members (the major advisor and at least 3 others).

Program of study

- 84 hours required.
- 3 or 4 credit hours of core course: BIO 514 Statistical Models for Biology (4) or BIO 620 Research Prospectus Writing (3).
- 1 credit hour of other requirements: BIO 610 Introduction to Responsible Conduct of Research in Life Sciences (1).
- 67-68 credit hours of elective courses. Minimum of 5-6 credit hours of seminars or classes at the graduate level. The remaining credit hours are BIO 792 Research).
- Exactly 12 credit hours of BIO 799 Dissertation.

Comprehensive exams and research prospectus

To be completed before the end of the 6th semester (target = 4th or 5th semester).

Research prospectus and written comprehensive exam:

- Synthesizes current ideas in the student's area of research interest.
- Must follow the guidelines of an appropriate funding agency (e.g., NSF or NIH).
- Should show sufficient breadth and depth in the research area to be suitable for submission to a national funding agency, although actual submission and approval is not a criterion for successful completion of this requirement.
- Must be approved by supervisory committee before the oral comprehensive examination.

Oral comprehensive exam

- This is a defense of the written research prospectus.
- Tests the depth and breadth of knowledge in the major area, particularly in the student's research area.
- Failing the comprehensive examination is considered final.

Dissertation defense

Typically completed by end of the 10th semester.

Biology and society PhD (concentration in biology)

Supervisory committee

- Is typically selected by the end of the 4th semester; must be selected at least one semester before the prospectus defense.
- Must have at least 4 members (the major advisor and at least 3 others).

Program of study

- 84 hours required.
- 3 or 4 credit hours of core course: BIO 514 Statistical Models for Biology (4) or BIO 620 Research Prospectus Writing (3).
- 68-69 credit hours of electives.
  - 30 credit hours of restricted electives:
- 9 credit hours of seminars or classes fulfilling the requirements of the track of study selected. See SOLS web page for track course options.
- 9 credit hours of additional courses related to the life sciences. Any courses offered under one of the SOLS prefixes (BIO, ELS, EVO, HPS, MCB, MIC, and PLB) or any courses taught by faculty members in the Biology and Society faculty group fulfill the requirement. In general, the courses should be 'x of science or biology' rather than just 'x.' (e.g. 'history of biology' rather than 'modern American history').
- 12 credit hours of BIO 792 Research.
  - 38-39 credit hours of free electives:
- Additional research, seminars, and readings courses.
  - Exactly 12 credit hours of BIO 799 Dissertation.

Four different tracks of study are available, although with permission of the program students may also develop plans of study that incorporate elements of several tracks.

Sample restricted electives I: bioethics, policy, and law (BPL) track

- 3 hours – Ethics, as related to life sciences
- 3 hours – Science policy
- 3 hours – Law, as related to science or technology

Sample restricted electives II: biology education research (BER) track

- 3 hours - Quantitative methods or statistics
- 3 hours – Learning, educational, or psychological theory
- 3 hours – Discipline-based education research

Sample restricted electives III: ecology, economics, and ethics of the environment (4E) track

- 3 hours – Ecology
- 3 hours – Environmental or natural resource economics
- 3 hours – Environmental ethics or environmental policy

Sample restricted electives IV: history and philosophy of science (HPS) track

- 3-6 hours – History of science
- 3-6 hours – Philosophy of science

Comprehensive exams and research prospectus

To be completed before the end of the 6th semester (target = early in the 4th semester).

- Students must meet with their committees to discuss a draft research prospectus before formal defense of the research prospectus.
- The written research prospectus must contain, at a minimum, a description of the research question and its significance, a detailed work plan for data collection, analysis, and writing, and a complete bibliography.
- The goal of the written research prospectus and its oral defense is for the committee to ascertain whether the candidate has an adequate grasp on the scholarly literature relevant to the project and is ready to start researching and writing the dissertation.
- Failure is considered final except under extraordinary circumstances

Dissertation defense

Typically completed in the 8th - 10th semester; must be completed by the end of the 12th semester.

Environmental life sciences PhD

Supervisory committee

- Is selected by the end of the 2nd semester.
- Must have at least 4 members (the major advisor and at least 3 others).
- Must be interdisciplinary, with at least two ELS units represented.
- Composition must be approved by the ELS Executive Committee.

Program of study

- 84 hours required.
- 3 credit hours of core coursework: ELS 501 Environmental Life Sciences: Grand Challenge: Global Climate Change (3) to be taken in the 1st semester.
- 69 credit hours of elective courses, including:

  - At least 6 credit hours selected from different broad categories. Successful completion of each course includes a synthetic paper in the subject area.
- Earth Sciences (e.g., geology, hydrology).
- Organismal Biology (e.g., physiology and behavior). Evolutionary Biology (e.g., population genetics).
- Ecology/ecosystems/ biogeochemistry
- Sustainability/Social/Policy
  - At least 3 credit hours in quantitative/modeling / statistics.
  - Additional ELS -approved courses or omnibus courses (ELS 784, Doctoral Internship; ELS 790, Doctoral Reading and Conference, ELS 792 Research).
- Exactly 12 credit hours of ELS 799 Dissertation.

Comprehensive exams and research prospectus

To be completed before the end of the 4th or 5th semester.

Research Prospectus and written comprehensive exam:

A detailed description of the rationale and experimental plan of the dissertation, in NSF-grant style, should be submitted to the graduate committee at least two months before the scheduled oral exam date. Students will be engaged in dissertation projects that explicitly involve interdisciplinary research and will be evaluated on it. The Supervisory Committee will judge how well the student's research proposal is designed and justified. Within one month of receiving the Research Prospectus, committee members should approve the Prospectus as "ready to defend" and send any suggestions to the student. All committee members must indicate that the prospectus is "ready to defend" before the oral comprehensive exam is held.

Oral comprehensive exam:

The oral comprehensive exam consists of the defense of the research proposal and subsequent questions from the supervisory committee on the broader context of the proposed research. At the beginning of the exam, the student should give a 15-30 min presentation on his or her research plan. Questions from the committee should then focus on the prospectus and the student's general knowledge of their research and teaching discipline. Failure is considered final except under extraordinary circumstances.

Dissertation defense

To be completed by end of 8th or 10th semester.

Evolutionary biology PhD

Supervisory committee

- Is selected by the end of the 2nd semester.
- Must have at least 4 members (the major advisor and at least 3 others).
- Composition must be approved by the EVO Executive Committee.

Program of study

- 84 hours required.
- 9 credit hours of core courses including:
  - EVO 601 Principles of Evolution (3): to be taken by the end of the 2nd semester.
  - EVO 610 Research Areas of Evolution (1 credit hour taken 2 times): to be completed by the end of the 2nd semester.
  - BIO 514 Statistical Models for Biology (4): to be taken by the end of the 4th semester.
- 54 credit hours of other requirements including:
  - Credit hours should be filled either from the list of EVO electives or EVO omnibus courses (EVO 784, Doctoral Internship; EVO 790, Doctoral Reading and Conference, EVO 792, Research), and completed by the end of the 6th semester.
- 9 credit hours of approved EVO elective courses.
- Exactly 12 credit hours of EVO 799 Dissertation.

Comprehensive exams and research prospectus

To be completed before the end of the 6th semester.

Research prospectus and written comprehensive exam:

A detailed description of the rationale and experimental plan of the dissertation, in NSF-grant style, should be submitted to the graduate committee at least two months before the scheduled comprehensive exam date. Students will be engaged in dissertation projects that explicitly involve interdisciplinary research and will be evaluated on it. The Supervisory Committee will judge how well the research proposal is designed and justified. Within one month of receiving the Research Prospectus, committee members should approve the Prospectus as "ready to defend" and send any suggestions to the student. All members must indicate that the prospectus is "ready to defend" before the oral comprehensive exam is held.

Oral comprehensive exam:

The oral comprehensive exam consists of the defense of the research proposal and subsequent questions from the supervisory committee on the broader context of the proposed research. This exam is open to the supervisory committee only. At the beginning of the exam, the student

should give a 20-25-minute presentation on his or her research plan. Questions from the committee should then focus on the prospectus and the student's general knowledge of their research and teaching discipline. Failure is considered final except under extraordinary circumstances.

Dissertation defense

To be completed by end of the 10th semester.

History and philosophy of science PhD

Supervisory committee

- Is typically selected by the end of the 4th semester; must be selected at least one semester before the Prospectus defense.
- Must have at least 5 members (the major advisor and at least 4 others).

Program of study

- 84 hours required.
- 6 credit hours of core courses including:
  - HPS 620 Research Prospectus Writing (3).
  - HPS 615 Biology and Society Lab (3).
- 30 credit hours of restricted program electives in the following content areas:
  - History of science (6).
  - Philosophy of science (6).
  - History of philosophy (3).
  - Value theory (3).
  - Advanced logic or other advanced methods (3).
  - Other approved courses in philosophy, history, or the life sciences (9).
- 24 credit hours of open electives:
  - Additional research, seminars, and readings courses.
- 12+ credit hours of HPS 792 Research.
- Exactly 12 credit hours of HPS 799 Dissertation.

Comprehensive exams and research prospectus

To be completed before the end of the 6th semester.

- Students must meet with their committees to discuss a draft research prospectus before formal defense of the research prospectus.
- The written dissertation prospectus must contain, at a minimum, a description of the research question and its significance, a detailed work plan for data collection, analysis, and writing, and a complete bibliography.
- The goal of the written research prospectus and its oral defense is for the committee to ascertain whether the candidate has an adequate grasp on the scholarly literature relevant to the project and is ready to start researching and writing the dissertation.
- Failure is considered final except under extraordinary circumstances.

Dissertation defense

Typically completed in the 8th - 10th semester; must be completed by the end of the 12th semester.

Microbiology PhD

Supervisory committee

- Is selected by the end of the 3rd semester.
- Must have at least 4 members (the major advisor and at least 3 others).
- Chair or co-chair must be a member of the School of Life Sciences (SOLS) Microbiology faculty.

Program of study

- 84 hours required.
- 4 credit hours of core courses including:
  - MIC 501 Foundations in Microbiology (3).
  - BIO 610 Introduction to Responsible Conduct of Research in Life Sciences (1).
- 68 credit hours of electives comprised of MIC 792 Research, seminars and journal clubs.
- Exactly 12 credit hours of MIC 799 Dissertation.

Comprehensive exams and research prospectus

Comprehensive exam

To be taken at the end of the 4th semester but before the start of the 5th semester.

The comprehensive exam is evaluated by a committee composed of at least four faculty members. The chair of this committee must not be the student's major advisor, but can be any other member of the SOLS Microbiology faculty. Usually at least one member of the committee should be from outside SOLS.

Each student can choose between two options for the comprehensive exam. In Option A (research proposal-based exam), the student proposes three research topics not directly related to the dissertation, and the exam committee chooses one of these. The student then has 4 weeks to write a research proposal based on these ideas, without the help of their major advisors or peers. The committee provides written comments on the proposal, and the student then has 1-4 more weeks to prepare for the oral examination. In Option B (Knowledge-based exam), the exam committee chooses the research topics and prepares a written exam that can be completed within a 2-day period. If the student passes the written component of the exam, the oral component is scheduled (within 4 weeks). With approval of the comprehensive exam committee, the

exam can be retaken once.

Research prospectus

Competed prior to the beginning of the 7th semester.

The Supervisory Committee will determine the specific format of the Research Prospectus, which typically includes (a) an introduction broadly describing the research problem, (b) specific aims, and (c) text pertinent to each aim describing approaches that will be taken to achieve the aims. Figures should be included where relevant, and the Prospectus should include a bibliography.

Dissertation defense

Completed in the 8th semester for students with MS or 10th semester for students with BS.

Molecular and cellular biology PhD

Supervisory committee

- Is selected by the end of the 2nd semester.
- Must have at least 4 members (the major advisor and at least 3 others).
- At least 2 members must be MCB chair-eligible faculty.

Program of study

- 84 hours required.
- 6 credit hours of core courses including:
  - MCB 555 Advanced Molecular and Cellular Sciences (3): membrane biology, neurobiology, signal transduction, bioimaging and molecular-based disease.
- Please note that the MCB 555 requirement was changed from 6 credit hours to 3 credit hours. The degree requirement change is not official yet, but the SOLS Grad Office will assist you with ensuring your iPOS meets requirements.
  - MCB 556 Advanced Molecular and Cellular Biology II (3): gene regulation, developmental biology, microbiology and immunology; reading the scientific literature and scientific writing and oral presentation.
- 54 credit hours of electives, including MCB 792 Research taken in all years. Elective courses may be taken from various subjects both inside and outside of SOLS with permission from the student's committee.
- 12 credit hours of additional requirements:
  - MCB 701 Seminar taken every semester (at least 8 credit hours).
  - BIO 543 Molecular Genetics and Genomics, or equivalent genetics course if an equivalent course was not previously taken (3).
  - BIO 610 Introduction to Responsible Conduct of Research in Life Sciences (1), offered in the spring. Take in year 1 or 2.
- Exactly 12 credit hours of MCB 799 Dissertation.

Comprehensive exams and research prospectus

Comprehensive Exam

To be completed before the end of the 6th semester.

- Student prepares two abstracts of two potential proposals.
- The abstracts should be submitted to the Chair of the Comprehensive Exam Committee, who is a Supervisory Committee member, but not the student's major advisor.
  - The exam committee will select one of the abstracts for the student to prepare for written comprehensive exam suggested time frame is within four weeks. The oral exam should take place after that (suggested time frame within two weeks).
  - Written research proposal should be in NIH NRSA 7-10-page format based on a hypothesis driven problem that is not the focus of the student's research project.
- To Advance to Candidacy or to receive a Master's in Passing, the student must also complete the Research Prospectus on their own research.

Research prospectus

Completed by end of 3rd year

A brief written description of the dissertation research plan should be distributed to the committee and orally presented at the committee meeting.

Dissertation defense

Completed in the 8th semester for students with MS or 10th semester for students with BS.

Neuroscience PhD

Supervisory committee

- Is selected by the end of the 2nd semester, unless a special extension is granted if the student does not choose either of their two rotation supervisors as major advisor. In this case, the student is expected to complete a third rotation and to form the committee as soon as possible after completing that rotation.
- Must have at least 4 members (the major advisor and at least 3 others).
- Annual meeting must be documented on a form (available on Canvas site) by the major advisor, who records the date of the meeting and a brief statement summarizing the student's progress and committee feedback on that progress.

Program of study

- 84 hours required.
- 8 credit hours of core courses, with grade of "B" or better. These must be completed before taking the comprehensive exams.
  - NEU 555 Advanced Molecular and Cellular Sciences (3)
- Please note that the NEU 555 requirement was changed from 6 credit hours to 3 credit hours. The degree requirement change is not official yet, but the SOLS Grad Office will assist you with ensuring your iPOS meets requirements.
  - NEU 556 Human Systems Neuroscience (4).
  - BIO 610 Introduction to Responsible Conduct of Research in Life Sciences (1).
- Minimum 6 credit hours of other requirements, with grade of "C" or better:
  - NEU 558 Neuroscience Journal Club (at least 3 credit hours).
  - NEU 591 Neuroscience Research Seminar (at least 3 credit hours).
  - Students must enroll in either NEU 558 or 591 each spring and fall semester that they are in the program.
- 58 credit hours of electives or research:
  - At least 4 credit hours of Professional Development courses.
  - NEU 792 Research hours (taken each semester).
  - Additional credits will be comprised of specialized disciplinary courses chosen in consultation with the mentor and advisory committee, and taken with "C" grade or better.
- Exactly 12 credit hours of NEU 799 Dissertation.

Sample courses for a first-year student:

Fall semester

- NEU 555 Advanced Molecular and Cellular Sciences - Topic: All Semester Modules (3 credit hours).
- NEU 558 Neuroscience Journal Club (1 credit hour).
- NEU 792 Research (5 credit hours).

Spring semester

- NEU 556 Human Systems Neuroscience (4 credit hours).
- NEU 591 Neuroscience Research Seminar (1 credit hour).
- NEU 792 Research (1 credit hour).
- BIO 598 Bioethics (4 credit hour).

Laboratory rotations (first year):

- Rotations to be planned by the student and their major advisor (or Program Director, if the major advisor has not yet been identified).
- Minimum of 2 rotations for a minimum of 7 weeks each within the 1st year.
- Students are strongly encouraged to perform their rotations at more than one of the units that participate in this interdisciplinary program (SOLS, Math, Psychology, Biomedical Engineering, Speech and Hearing Sciences, Barrow Neurological Institute, T-GEN, or the University of Arizona College of Medicine – Phoenix).
- At the end of each rotation, the student will write a short report describing the rotation. The report is to be signed by the student and the laboratory leader in whose laboratory the rotation was performed. The form for the rotation report is available on the Canvas site and must be submitted to the Graduate Office.

Comprehensive exams and research prospectus

To be completed during the 2nd year; must be completed before the end of the 6th semester.

- Includes a written proposal of the dissertation research (Research Prospectus), take-home exam questions formulated by the supervisory committee, and an oral examination. Students are expected to have a broad understanding of areas that pertain to their research, in-depth knowledge of the literature that directly relates to their research, and the ability to communicate and formulate ideas about research.
- The exam begins with the student submitting his/her Research Prospectus in the form of a pre-doctoral NIH (NRSA) or NSF (DDIG) proposal to the supervisory committee. The Prospectus should be based on the student's remaining two to three years of research and training. Proposed hypotheses should be supported by preliminary results. Individual supervisory committees have the option to require a more expanded background section than that allowed in the pre-doctoral NIH and NSF proposals.
- Within 1 week of receiving the Prospectus, each committee member will submit 1-2 exam questions to the major advisor, who will then compile the questions to comprise the take home exam. Students chooses 2 of the questions to be answered in writing within a day or two (e.g., 24-48 hours after receiving the questions). The answers to both questions should be a total of 6-10 pages (11pt Arial font, double-spaced, and including figures, as needed).
- The oral portion of the exam takes place 1-2 weeks later. During this exam, the student presents their Research Prospectus to their supervisory committee, which then uses the Prospectus and the written

answers to the exam questions as a springboard for questioning students about their research plans and the implications of the work to the broader scientific field.

- The evaluation of the student will follow immediately after the oral portion of the exam and will be based on overall performance on the three exam components (Prospectus, written exam questions, and oral exam). At the discretion of the committee, students may be required to address minor deficiencies in order to receive a pass. Failure is considered final.

Dissertation defense

Typically completed within 5-6 years, but must be completed by the summer after the 7th year.

Biology MS (Research & Thesis)

Supervisory committee

- Is selected by the end of the 1st semester.
- Must have at least 3 members (the major advisor and at least 2 others).

Program of study

- 30 hours required.
- 3 credit hours of required core coursework:
  - BIO 541 or 591 SOLS Seminar (1)
  - BIO 542 or 591 SOLS Current Topics in the Life Sciences (1)
  - BIO 610 Introduction to Responsible Conduct of Research in the Life Sciences (1) OR BIO 611 Current Topics in Responsible Conduct of Research in the Life Sciences (1)
- 21 credit hours of electives in Biology, such as additional seminars or Reading and Conference (BIO 590).
  - At least 6 of the 21 credit hours should be BIO 592 Research.
- Exactly 6 credit hours of BIO 599 Thesis.

Research prospectus

- Completed by middle of 2nd semester.
- Submitted to, discussed with and approved by Supervisory Committee.

Thesis defense

Completed by end of 4th semester.

Biology MS (Coursework & Capstone)

Supervisory committee

- For students beginning in Fall 2021, the Grad AD will serve as committee chair. Additional members will be identified along the way or as part of the capstone course.

Program of study

- 30 hours required.
- 3 credit hours of required core coursework:
  - BIO 541 or 591 SOLS Seminar (1)
  - BIO 542 or 591 SOLS Current Topics in the Life Sciences (1)
  - BIO 610 Introduction to Responsible Conduct of Research in the Life Sciences (1) OR BIO 611 Current Topics in Responsible Conduct of Research in the Life Sciences (1)
- 24 credit hours of graduate courses in Biology and related fields.
- 3 credit hours of BIO 597 Capstone.

Biology and society MS (concentration in biology)

Supervisory committee

- Is selected by the end of the 2nd semester.
- Must have at least 3 members (the major advisor and at least 2 others).
- Half or more of the committee members must be members of the Biology & Society graduate faculty.

Program of study

- 30 hours required.
- At least 9 credit hours of core courses fulfilling the requirements of the track of study selected (see below for examples). These seminars combine to provide broad, basic competency in biology and society.
- At least 9 credit hours of additional courses related to the life sciences. This supporting coursework provides expertise in the particular research area. Any courses offered under one of the SOLS prefixes (BIO, ELS, EVO, HPS, MCB, MIC, and PLB) or any courses taught by faculty members in the Biology and Society group fulfill the requirement. In general, the courses should be 'x of science or biology' rather than just 'x.' (e.g. 'history of biology' rather than 'modern American history').
- At least 6 credit hours of BIO 592 Research.
- Exactly 6 credit hours of BIO 599 Thesis

Four different tracks of study are available, although with permission of the program students may also develop plans of study that incorporate elements of several tracks.

Sample restricted electives I: bioethics, policy and law (BPL) track

- 3 hours – Ethics, as related to the life sciences
- 3 hours – Science policy
- 3 hours – Law, as related to science or technology

Sample restricted electives II: biology education research (BER) track

- 3 hours – Quantitative methods or statistics
- 3 hours – Learning, educational, or psychological theory
- 3 hours – Discipline-based education research

Sample restricted electives III: ecology, economics and ethics of the environment (4E) track

- 3 hours – Ecology
- 3 hours – Environmental or natural resource economics
- 3 hours – Environmental ethics or environmental policy

Sample restricted electives IV: history and philosophy of science (HPS) track

- 3-6 hours – History of science
- 3-6 hours – Philosophy of science

Research prospectus

- Completed by middle of 2nd semester.
- Discussed with and approved by Supervisory Committee.

Thesis defense

Completed by end of 4th semester

Microbiology MS

Supervisory committee

- Is selected by the end of the 1st semester.
- Must have at least 3 members (the major advisor and at least 2 others).
- Chair or co-chair must be a member of the School of Life Sciences (SOLS) Microbiology faculty.
- All supervisory committee members must be approved members of the ASU Graduate Faculty.
- If a student is doing research with a non-SOLS mentor, they must have a SOLS microbiology faculty member serve as co-chair of the supervisory committee.

Program of study

- 30 hours required.
- 3 credit hours of core coursework:
  - MIC 501 Foundations of Microbiology (3), taken during 1st semester.
- 21 credit hours of electives and research, including graduate courses appropriate to the research area and approved by the supervisory committee.
- 6+ credit hours must be MIC 592 Research.
  - Exactly 6 credit hours of MIC 599 Thesis, taken during last semester of 2nd year.

Sample schedule:

Fall semester – 1st year

- MIC 501 (3 credits).
- Elective course appropriate to the research area and approved by the supervisory committee (3 credits).
- Research seminars and/or journal club (1 credit).
- MIC 592 Research (3 credits).

Spring semester – 1st year

- Elective course (3 credits).
- Research seminars and/or journal club (1 credit).
- MIC 592 Research (3 credits).

Fall semester – 2nd year

- Elective course (3 credits).
- Research seminars and/or journal club (1 credit).
- MIC 592 Research (3 credits).

Spring semester – 2nd year

- MIC 599 Thesis (exactly 6 credits).

Research prospectus

Completed by middle of 2nd semester.

Thesis defense

Typically completed by end of 4th semester; required by end of 5th semester.

Molecular and cellular biology MS

Supervisory committee

- Is selected by the end of the 1st semester.
- Must have at least 3 members (the major advisor and at least 2 others).

Program of study

- 30 hours required.
- 6 credit hours of core courses including:
  - MCB 555 Advanced Molecular and Cellular Sciences (3): membrane biology, neurobiology, signal transduction, bioimaging and molecular-based disease.
- Please note that the MCB 555 requirement was changed from 6 credit hours to 3 credit hours. The degree requirement change is not official yet, but the

SOLS Grad Office will assist you with ensuring your iPOS meets requirements.
  - MCB 556 Advanced Molecular and Cellular Biology II (3): gene regulation, developmental biology, microbiology and immunology; reading the scientific literature and scientific writing and oral presentation.
- 8 credit hours of additional requirements:
  - MCB 501 Seminar must be taken every semester (4).
  - BIO 543 Molecular Genetics or equivalent genetics course if approved by committee (3).
  - BIO 610 Introduction to Responsible Conduct of Research in Life Sciences (1), offered in the spring.
- 4 credit hours of open electives or additional research.
- 6+ credit hours of MCB 592 Research.
- Exactly 6 credit hours of MCB 599 Thesis.

Research Prospectus

Completed by end of 2nd semester.

Thesis defense

Completed by end of 5th semester.

Plant biology and conservation MS

Supervisory committee

- Is selected by the end of the 1st semester.
- Must have at least 3 members (the major advisor and at least 2 others).
- Students are encouraged to seek out members of the Desert Botanical Garden research and conservation staff as potential committee members.

Program of study

- 30 hours required.
- 3 credit hours core coursework:
  - PLB 502 Perspectives in Plant Biology (3), only taught every other fall.
- At least 3 credit hours of PLB 592 Research.
- 1 credit hour of additional requirements:
  - BIO or PLB 591 Seminar: Botany.
- Up to 17 credit hours of electives including Fieldwork (PLB 583), Special Topics (PLB 598, BIO 598), Readings and Conference (PLB 590), and additional Research (PLB 592).
- Exactly 6 credit hours of PLB 599 Thesis.

Research Prospectus

- Completed by middle of 2nd semester.
- Submitted as a part of the Program of Study
- Discussed with and approved by Supervisory Committee

Thesis defense

Completed by end of 4th semester.

Accelerated bachelor of science/master of science

Accelerated degree programs (4+1) are available in: Biology, Biology and Society, Microbiology and Molecular and Cellular Biology. The requirements are the same as for the associated MS degrees, except that up to 12 credit hours may be shared between the BS and MS degrees.

Sample program of study (BS in Biological Sciences/MS in Biology Research and Thesis)

Undergraduate (BS)

Semesters 1-6 (90 bachelor's hours)

- Courses towards Bachelor of Science in biological sciences (e.g., Neurobiology, Physiology and Behavior). Semester 7 (15 bachelor's hours including 8 toward master's)
- Undergraduate courses (4).
- BIO 455 Introduction to Comparative Genomics (3).
- BIO 435 Research Techniques in Animal Behavior (3).
- BIO 522 Populations: Evolutionary Ecology (3).
- BIO 541 SOLS Seminar Series (1).
- BIO 542 Current Topics in the Life Sciences (1).

Semester 8 (13 bachelor's hours including 4 toward master's)

- Required undergraduate courses (9).
- BIO 465 Neurophysiology (3).
- BIO 610 Intro to Responsible Conduct of Research in the Life Sciences (1).

Semester 9 (Biology MS)

- 3 credit hours of open elective coursework or additional research chosen in consultation with supervisory committee.
- BIO 592 Research (6).

Semester 10 (Biology MS)

- BIO 599 Thesis (6).
- 3 credit hours of open elective coursework or additional research chosen in consultation with supervisory committee.

Computational life sciences (graduate certificate)

This certificate is offered both in person on the Tempe campus and online.

Program of study

- 16 credit hours required.
- 1 credit hour of core coursework:
  - BIO 611 Current Topics in Responsible Conduct of Research (RCR) in Life Sciences (1) or BIO 610 Introduction to Responsible Conduct of Research (RCR) in Life Sciences (1).
- 15 credit hours of elective courses chosen from this list of elective options.

Environmental communication and leadership (graduate certificate)

Program of study

- 15 credit hours required.
- BIO 578 Environmental Leadership and Communication (3 credit hours).
- 12 credit hours of elective courses.
  - At least 3 credit hours in Policy & Management
  - At least 3 credit hours in Communication
  - At least 3 credit hours in Leadership
  - 3 credit hours open elective

Evolutionary medicine (graduate certificate)

Program of study

- 15 credit hours required.
- 3 credit hours of core courses chosen from this list:
  - ASB 507/BIO 507 Advanced Evolutionary Medicine (3).
  - ASM 503/BIO 510 Evolutionary Medicine and Global Health (3).
- 3 credit hours of anthropology electives chosen from this list:
  - ASB 510 Health: Social & Biocultural Theories (3)
  - ASB 503 Medical Anthropology (3)
- 3 credit hours of biology restricted electives chosen from this list:
  - BIO 545 Populations: Evolutionary Genetics (3).
  - BIO 546/ASM 546 Principles of Human Genetics (3).
  - EVO 601 Principles of Evolution (3).
- 3 credit hours of approved elective courses not already taken for required core coursework.
- BIO 571 Evolutionary Medicine Capstone (3).

Scientific teaching in higher education certificate (graduate certificate)

Program of study

- 15 credit hours required.
- 2 credit hours of core courses including:
  - BIO 530 Scientific Teaching (2 credit hours).
- 10 credit hours of approved elective courses, including:
  - BIO 598 Topic: Biology Education Research (3).
  - COE 502 Introduction to Data Analysis (3).
  - COE 503 Introduction to Qualitative Research (3).
  - DCI 691 Advanced Pedagogy in STEM (3).
  - EDP 523 Educational Assessment (3).
  - EDP 540 Theoretical Views of Learning (3).
  - EDP 541 Motivating Students to Learn (3).
- 3 credit hours of BIO 593 Applied project. This is the culminating capstone experience which can be a significant teaching experience, curriculum development, or discipline-based education research.

School of Life Sciences

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