

Department of Biology

Saint Louis University

Handbook

for

Graduate Studies

2023-2024

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A. GENERAL

The Biology graduate program exists within the framework of the College of Arts and Sciences and of the University. Questions pertaining to the Graduate Program at the department level should be addressed to the Graduate Program Coordinator or Chair; at the College level, to the Associate Dean for Graduate Affairs, and at the University level, to the Associate Vice-President for Graduate Education. Our program is governed by the rules and requirements contained in the current edition of the [Academic Catalog](#).

Within the Biology Department, the Graduate Program is overseen by the Graduate Affairs Committee (GAC), whose Chair is the Graduate Program Coordinator.

The generic email address for the Graduate Program Coordinator is gradbiol@slu.edu.

Supplementary information to that provided in the handbook is available [here](#).

Degree Programs Offered

The Biology Department offers advanced degrees at both the master's and doctoral level. A minor in biology is not available. The MA is a non-thesis degree, while the MS requires a research project and a thesis. The PhD requires a significant original research project that advances the field and is published in a publicly-defended dissertation.

The Biology Department also contributes to interdisciplinary MS programs in "Bioinformatics and Computational Biology," "Chemical Biology," and "Integrated and Applied Sciences (IAS)". Students interested in these programs should consult the [Academic Catalog](#) for more information.

Learning Outcomes (as established in 2017)

Graduate Program Learning Outcomes for Biology

M.A. degree

M.A. degree students will be able to:

- 1) *Critically analyze primary literature articles by evaluating the scientific contributions of peer-reviewed publications in biology*
- 2) *Effectively communicate scientific ideas*
- 3) *Demonstrate professional integrity*

M.S. degree

In addition to 1-3 above, M.S. degree students will be able to:

- 4) *Use appropriate instrumentation and analytical methods to collect data*
- 5) *Draw statistically valid conclusions from quantitative data*

Ph.D. degree

In addition to 1-5 above, Ph.D. students will be able to:

- 6) *Design novel research that advances knowledge of their field*
- 7) *Conduct self-directed research*

B. ADMISSION AND STUDENT EVALUATIONS

B.1) Procedure

Applicants for the Department of Biology graduate degree programs must submit a formal application to Saint Louis University through Graduate Admissions. Current requirements for applications to the Biology Graduate Programs are available online on the [department website](#). After an application is submitted to [Graduate Admissions](#), it is forwarded to the Biology Department for review.

B.2) Application Requirements

The Biology Department requires the following items to begin consideration of an applicant for a graduate program:

- 1) Completed application form
- 2) A Curriculum Vitae or resume
- 3) Complete official transcripts of all previous college work
- 4) Three letters of reference (preferably from faculty members and/or academic advisors)
- 5) A goals statement describing career objectives and, for students seeking the MS or PhD degrees, how those objectives relate to the research in the Department. Prospective biology graduate students should contact current faculty members in their research areas prior to applying for admission to learn whether they are accepting new students and if they are willing to serve as the student's thesis/dissertation mentor.
- 6) For international applicants, demonstration of English language proficiency (<https://www.slu.edu/admission/international/english-proficiency.php>).

B.3) Prerequisites for Admission

For admission to the MS and Ph.D programs in Biology, we are particularly interested in applicants who have demonstrated an interest in research. A significant research experience and strong undergraduate record is expected of applicants for the Ph.D program. For applicants with less extensive research experience, the MS offers an excellent opportunity to explore a research career. The MA program is ideal for applicants who desire post-baccalaureate training in Biology without a formal laboratory research project.

All applicants should have completed (or anticipate completing) baccalaureate training in the biological sciences or the substantial equivalent. In evaluating students' preparation, we prefer students whose training includes 4 (or more) semesters of chemistry, mathematics including calculus, and 1 to 2 semesters of physics, in addition to broad training in biology.

- Students interested in pursuing graduate work in cell biology, molecular biology, microbiology or biochemistry would be expected to have had some coursework in four of these six areas:
Genetics, Biological Chemistry, Cell Biology, Physiology, Microbiology and Developmental Biology
- Students interested in pursuing graduate work in ecology or evolutionary biology would be expected to have had some coursework in four of these six areas:
Genetics, General Ecology, Evolution, Introductory Statistics, General Botany, Taxonomy-oriented courses

The admissions committee will evaluate each applicant's academic background with respect to the proposed area of graduate work. While there are no specific prerequisites for admission, the committee may recommend additional training to be completed as a condition of admission.

B.4) Graduate Student Advising

MA students who do not have a mentor will be advised by members of the Graduate Affairs Committee. Students accepted into the MS and PhD programs will normally be advised by their faculty mentors and thesis or dissertation committees. Section B.7 (below) provides further information about selection of mentor and committees.

B.5) Definitions of Full Time Graduate Students

a) All enrolled students holding fellowships, teaching assistantships, or research assistantships are defined as full time students.

b) For other students, full-time enrollment is considered 6 hrs/semester (Fall and Spring). Students enrolled in Thesis or Dissertation Research (BIOL5990 or BIOL6990) are considered full-time, even if enrolled for 0 hrs.

B.6) Continuous Registration

All graduate students who are pursuing a degree are required to maintain continuous enrollment (*including the summer session*). In semesters when not taking structured courses, students may register for Research Topics (BIOL5970 or BIOL6970), Graduate Reading Courses (BIOL5980 or BIOL6980) or Thesis/Dissertation Research (BIOL 5990 or BIOL 6990); **please see Degree Requirements in Section E.**

B.7) Selection of Mentor and Thesis/Dissertation Committee.

Mentor selection: A faculty mentor must be identified no later than the end of the first semester in the program. Although they are not pursuing a research problem, MA students will benefit by having a mentor to help them choose an appropriate curriculum. Students accepted into the MS and PhD programs should have identified a faculty mentor prior to admission. While it is possible to change mentors early in the graduate program, change is not advised once the student's research project is underway.

Mentors for MS and PhD students shall be Tenure-Track Faculty in the Department of Biology at Saint Louis University. With appropriate appointments to the Graduate Faculty, Non-Tenure-Track Faculty, Visiting Faculty, Adjunct Faculty, and Emeritus Faculty may serve on MS and PhD committees. Non-Tenure Track Faculty and Adjunct Faculty may also serve as Co-Mentors for MS and PhD students with Mentors who are Tenure-Track Faculty in the Department of Biology.

Thesis/Dissertation Committee selection: Thesis or dissertation committee members must be chosen during the first semester in the MS and PhD programs. Students in the MA program do not need to select a committee.

Once the mentor and committee are identified, the student must file [the "Selection of Mentor & Committee" form](#). Please refer to Section D (Definitions of Graduate Committees) for further details on definitions and makeup of graduate committees.

B.8) Progress meetings for MS and PhD students

Purpose: The goals of the student progress meetings are 1) for the student to demonstrate to their mentoring committee that they are making good progress in their coursework and research, 2) for the student's committee to provide feedback and advice to for the student's coursework and research, 3) to encourage graduate students to pursue specific goals (publications, poster presentations, and grant submissions) in order to enhance career opportunities, 4) to help the Graduate Affairs Committee in assigning assistantships, and 5) for student evaluation in annual departmental reports to Graduate Education.

Procedure: Due to the short tenure of the research master's program, an MS student must meet each semester with their thesis committee. A PhD student will meet once each semester with their dissertation committee in the first year. In subsequent years, PhD students must meet with their dissertation committees prior to the end of the Fall Semester. However, if the committee is satisfied that the student is making diligent progress, they may recommend deferral of the spring semester meeting. In this case, the next regular meeting must be scheduled for the following fall semester.

Before each meeting, the student will send a brief progress report to each committee member; this should state what courses have been taken, what progress has been made in the student's research, any changes to the research plan or changes in the proposed graduation date, and any publications or presentations since the last meeting. The student should also fill out a [Progress Report form](#), found on the [department web site](#), and bring it to their committee meeting.

At the meeting, the student will make a brief presentation of progress made since the last meeting, including coursework completed and progress made on thesis/dissertation research. The presentation will be followed by a question/answer period. The student will then be asked to leave the room and the committee will evaluate the student's progress using the following rating system:

Coursework	inadequate adequate exceptional	GPA<3.0; has failed to take required courses GPA>=3.0; has taken required courses GPA well above 3.0; has excelled in coursework
Research quality	inadequate adequate exceptional	lack of significant research progress; student is sloppy with reagents or equipment or research design, or does not keep adequate records of experiments. Student is making good progress in their research. Student takes care with reagents, equipment; plans experiments in advance; performs controls as needed; keeps adequate records. Student may have applied for external funding or presented work in a departmental or on campus forum or regional/national/international meeting. Has made exceptional progress in their research; student may have given a research talk at a large meeting, or applied for and received external funding, or published a

		research paper in a peer-reviewed journal as a key author.
Research effort	inadequate	Is frequently absent from lab/field work, does not follow through on experiments, does not finish assigned tasks. Student has failed to form a dissertation/thesis committee, or to take preliminary doctoral candidacy exams according to schedule.
	adequate	Student is present for lab/field work regularly and for sufficient hours to finish experiments. Student has formed a committee and met with them as scheduled, and has taken preliminary doctoral candidacy exams according to schedule.
	exceptional	In addition to the above accomplishments, the student has shown remarkable effort in lab/field work, has worked extra hours to complete experiments, or has shown exceptional commitment to the lab and its research.

If the student is making adequate progress in all categories, no further action is required. If a student is scored “inadequate” in any category, the student will receive a written evaluation that includes the reasons for the decision and the committee's recommendations for correction. An evaluation of “inadequate” at a second meeting will be considered grounds for dismissal. All written communications (C.V., progress report, follow-up letters) will be submitted to the Graduate Program Coordinator and placed in the student's file.

Graduate student evaluations for the Fall semester should be submitted to the Graduate Program Coordinator by January 31 (submitted either by email or in hard copy to the coordinator's departmental mail slot in room 301D). These evaluations, in conjunction with other relevant materials, will be used in the assigning of teaching and research assistantships for the following school year.

B.9) Evaluation of Assistantship performance:

Students who receive assistantships are required to spend up to 20 hours/week performing the duties associated with their assistantships. Renewal of assistantships requires students to remain in good standing in their programs, including good performance in their assigned duties; please see section F for a description of Assistantship types and associated duties. The work of students who have received University assistantships will be evaluated each year as described below (section F.3.a).

1. Teaching assistantships

Teaching assistantships may require up to 20 hours/week dedicated to the teaching of courses; this time may include pre-class or lab meetings, lecture preparation, teaching time and grading. Duties for teaching assistants will be outlined by the faculty or laboratory coordinators in charge of the assigned course(s). Performance of students

who have received teaching assistantships will be evaluated by 1) teaching evaluations from students in assigned laboratory sections or courses, and 2) by the laboratory coordinator or professor in charge of the assigned course(s).

2. Research assistantships

Research assistantships may require up to 20 hours/week dedicated to computer, laboratory or field work for a research project. Duties for Research Assistants are those proposed in the RA proposal by the student and agreed to by the research mentor (see section F.3.b below). Performance of students who have received Research Assistantships will be evaluated by the research mentor.

C. RESPONSIBILITIES OF GRADUATE STUDENTS, MENTORS, AND COMMITTEE MEMBERS:

The efforts of both graduate students and faculty are critical to the success of our graduate programs. While thesis or dissertation research is ultimately the responsibility of the graduate student, it benefits from the expertise and assistance of a committed mentor. Therefore, both mentors and students have responsibilities toward the graduate program and each other.

C.1) Responsibilities of Graduate Students:

- Be aware of student registration and graduation requirements. Students should be familiar with rules described in the [Academic Catalog](#) in addition to the requirements outlined here.
- Maintain a 3.0 GPA to remain in good standing in the graduate program and eligible for assistantships
- Conscientiously perform duties associated with assistantship (research or teaching)
- Assist with department responsibilities, e.g. proctoring undergraduate exams
- For students doing research projects, put consistent effort into doing good quality research and meet regularly with mentor to review research progress and data
- Organize meetings with committee members every semester unless otherwise indicated
- Fill out and bring progress report forms to committee meetings and turn them in after meetings
- For PhD students, complete Written and Oral exams on time.
- Be courteous and responsible in using Department equipment or reagents, or in borrowing reagents from other labs, and report problems when they are detected.
- Submit application to graduate and fulfill requirements set forth by Graduate Education for graduation.

C.2) Responsibilities of Mentors:

- Be aware of student registration and graduation requirements. Faculty should be familiar with rules described in the Graduate Education Catalog in addition to the requirements outlined here.
- Help guide the student to register for courses that will support and be relevant for their field of study.
- Meet with the student regularly to assess research progress and provide feedback

- Attend progress meetings with the student and their thesis or dissertation committee
- Encourage the student to find opportunities for funding and dissemination of their research
- Submit required forms for graduation, e.g. Notification of Readiness to Defend Dissertation form
- Make sure the appropriate department staff person is informed of student thesis/dissertation presentations at least a week in advance

C.3) Responsibilities of committee members:

- Attend progress meetings with student and thesis/dissertation committee
- help student plan course of study relevant for field
- assess student research progress

D. DEFINITIONS OF GRADUATE COMMITTEES

D.1) Master of Arts Program

MA students have no committee, only a faculty mentor.

D.2) Master of Science Program

Thesis Committee: This committee consists of three faculty members: the student's mentor and minimally two additional members. The mentor and at least one other member must be Biology Department faculty. This committee meets each semester (twice/year) with the graduate student to discuss progress in the program. Each member also serves as a "reader" that is responsible for final approval of the thesis. Responsibilities also include conducting the final degree examination.

D.3.) Doctor of Philosophy Program

D.3.a) Preliminary Examination Committees:

Written and Oral Preliminary Examinations must be passed in order to advance to candidacy.

D.3.a.i) Written Preliminary Examination Committee

This committee consists of three Graduate Faculty (membership described in the section in PhD Degree requirements relating to the Preliminary Examination), none of whom is the student's research mentor. Each member of the committee will prepare a reading list for the student in advance of the exam, prepare two questions for the exam, and participate in reading and evaluating the student's exam answers.

D.3.a.ii) Oral Examination Committee

This committee must consist of at least five members of the Graduate Faculty. The committee will read the student's research proposal and conduct the oral exam of the student. Often, though not necessarily, this committee will be identical to the student's Dissertation Committee.

D.3.b) Dissertation Committee:

This committee meets with the student (see B.8 above) to monitor the student's progress starting in the student's first semester in the program. Although in the first year the

committee may have as few as three members (the mentor and two others), by the end of the student's second year the committee should comprise at least five members, including at least three regular members of the Biology Department Graduate Faculty and at least one member from outside the Biology Department. Appointment of a member from outside Saint Louis University requires approval of the Associate Dean for Graduate Affairs for the College of Arts and Sciences. While Graduate Education requires that there be *minimally* three "readers" who are responsible for evaluating the student's written dissertation, in the Biology Department, all members (minimally five) of the Dissertation Committee will serve as "readers." These individuals will be listed as the "Committee in Charge of Candidacy" in the dissertation.

E. DEGREE REQUIREMENTS

E.1) General Guidelines:

- Students receiving assistantships must be registered for a class **every** semester, including summer. Students not on assistantships must be registered for a course every semester except summer. Please register on time to avoid paying late registration fees.
- Thesis Research, Dissertation Research, Research Topics, and Graduate Reading courses all require permission of the instructor before a student can register; faculty can give permission by doing a registration override in Banner. Each of these courses has a section number (e.g. BIOL5990-30) that corresponds to a particular faculty member.
- Masters students should begin registering for Thesis Research (BIOL5990) their first semester and should take at least one credit each semester until they reach the required six credits.
- PhD students may register for Dissertation Research each semester until they reach the required twelve credits. After reaching twelve credits, they should still register for Dissertation Research for zero credits each semester.
- If a course is cross-listed between 4000 and 5000 levels, graduate students should always take the 5000-level course.
 - If a course is offered at both the 5000 and 6000 levels (e.g. Department Seminar), Masters students should register for the 5000 level, PhD students should register for the 6000 level.
- Catalog of record: The academic catalog (including degree requirements) for the student's first academic year will apply with these exceptions:
 - A student may opt to make a subsequent academic catalog the catalog of record. This is an all-or-nothing opt-in (i.e. a student may not pick and choose policies from different academic catalogs. If a student opts for a newer catalog, they should send an email to the graduate program coordinator to indicate their choice.
 - The most recent academic catalog applies for students who have been in a grad program for more than 10 years

E.2) MA Degree

E.2.a) Requirements

The MA degree requires a minimum of 30 hours of post-baccalaureate coursework, but does not require a thesis. The expectation of the Biology Department is that students will complete the degree in two years, though up to five years are allowed by Graduate Education. The following requirements govern which courses may be counted toward a degree:

- At least **24** hours of structured courses (does not include reading courses or problems courses)
- No more than six credit hours taken at the 4000-level.
- At least **24** hours must be 5000- and 6000- level courses
- At least **12** hours of the total program must be from the Biology Department and **15** hours must be directly related to Biology
- At least **24** hours must be completed in residence (i.e. no more than 6 transfer hours (see below))
- No more than **6** hours of Research Topics (BIOL 5970) and/or Graduate Reading (BIOL 5980)
- Graduate Seminar course (BIOL 5820 or BIOL 5840) for two semesters
- Departmental Seminar (BIOL 5910, 0 credit hrs, must be taken each semester enrolled)
- Students must be enrolled in a course (even if it is for 0 hours) every fall and spring semester to maintain standing in the program; students on 11-month assistantships must also enroll in the summer.

E.2.b) Transfer of credit

If a student wishes to receive credit for graduate coursework at another institution, a “Petition for Transfer of Credit” form (available online at the Forms and Petitions page of Graduate Education) must be submitted, accompanied by a transcript showing the work, for approval by the mentor, Graduate Program Coordinator, and Associate Dean for Graduate Affairs for the College of Arts and Sciences. A maximum of 6 hours can be transferred from another program, but not if those hours were either part of another completed Master’s program or used to fulfill undergraduate degree requirements. The grades received must be “B” or better.

E.2.c) Coursework at other Universities

Students may enroll in courses at other area universities with the approval of their mentors and the completion of the [Inter-University](#) Exchange Program Enrollment Request form available from the Office of the Registrar.

E.2.d) Student responsibilities

The student should be familiar with University graduation requirements described in the Graduate Education Catalog in addition to the requirements outlined here.

E.2.e) Selection of Graduate Mentor

— The student’s mentor must be a member of the Graduate Faculty in the Department of Biology at Saint Louis University.

E.2.f) Graduation procedures

Students in their final semester should follow Graduate Education’s Calendar of deadlines available here: <https://www.slu.edu/academics/graduate/current-students/index.php> . The Application for Degree (available here: <https://www.slu.edu/academics/graduate/current-students/forms-petition.php>) is generally due within the first two weeks of the semester. No comprehensive exam is necessary for the MA degree.

E.3) MS Degree Requirements

E.3.a) Requirements

— The MS degree requires a minimum of **30** hours of post-baccalaureate coursework and a written thesis. The expectation of the Biology Department is that students will complete the degree in two years, though up to five years are allowed by Graduate Education.

Coursework

The following requirements govern which courses may be counted toward a degree:

- At least **18** hours of structured courses (does not include BIOL 5970 Research Topics or BIOL 5980 Graduate Reading courses)
- No more than six credit hours taken at the 4000-level.
- At least **18** hours (*exclusive of thesis*) must be 5000- and 6000- level courses
- At least **12** hours (*exclusive of thesis*) of the total program must be from the Biology Department
- No more than **6** hours of Research Topics (BIOL 5970) and/or Graduate Reading (BIOL 5980)
- At least **6** hours of thesis research (BIOL 5990)
- Students must be enrolled in a course (even if it is for 0 hours) every fall and spring semester to maintain standing in the program; students on 11-month assistantships must also enroll in the summer.

Required coursework

- | | |
|---|------------------|
| 1. Research Colloquium | BIOL 5800 2 hr |
| <i>taken twice for 1 credit hour each time. BIOL 5800 may be taken more than twice for credit.</i> | |
| 2. Scientific Communication Practicum | BIOL 5860 1 hr. |
| 3. CMR or EES seminar (<i>two semesters total; can be taken for 1-2 hrs</i>) | BIOL 5820 or |
| 5840 2-4 hrs | |
| 4. Departmental Seminar (<i>must be taken each semester enrolled</i>) | BIOL 5910 0 hrs. |
| 5. Thesis Research | BIOL 5990 6 hrs. |
| 6. Electives (<i>selected in consultation with the student's mentoring committee</i>) to 30 hrs total | |

E.3.b) Responsible Conduct in Research modules –

Students who are working in labs with external funding from the National Institutes of Health (NIH) or the National Science Foundation (NSF) are required to complete Responsible Conduct in Research training. Please see the RCR webpage for more information and workshop dates.

E.3.c) Electives

— Elective courses can be selected from courses offered in the Biology Department at Saint Louis University, from other academic departments at SLU, and from approved courses offered at other graduate degree granting institutions in the St. Louis area. Students may enroll in courses at other area universities with the approval of their mentors and the completion of the Inter-University Exchange Program Enrollment Request form available from the Office of the Registrar. Note that the student must be currently enrolled in 3 hours at SLU before coursework at another institution can be taken for credit (see section D.3.I for a partial list of electives offered). Coursework must be at 5000 or 6000 level. Elective courses should serve the student's need to become proficient in a specialized area.

E.3.d) Transfer of credit

If a student wishes to receive credit for graduate coursework at another institution, a "Petition for Transfer of Credit" form (available under the [transfer policy](#) in the Academic Catalog) must be submitted, accompanied by a transcript showing the work, for approval by the mentor, the Graduate Program Coordinator, and the Associate Dean for Graduate Affairs in the College of Arts and Sciences. A maximum of 6 hours can be transferred from another program, but not if those hours were either part of another completed Master's program or used to fulfill undergraduate degree requirements. The grades received must be "B" or better.

E.3.e) Sample student coursework schedules:**Sample schedule for an MS student whose focus is cell/molecular biology:****Fall semester, first year:**

<i>Molecular Techniques laboratory</i>	<i>BIOL 5050</i>	<i>2 hrs.</i>
<i>Advanced Molecular Biology</i>	<i>BIOL 5700</i>	<i>3 hrs.</i>
<i>Research Colloquium</i>	<i>BIOL 5800</i>	<i>1 hr.</i>
<i>Thesis Research</i>	<i>BIOL 5990</i>	<i>1 hr.</i>
<i>Department Seminar</i>	<i>BIOL 5810</i>	<i>0 hrs.</i>

Spring semester, first year:

<i>Biochemical Pharmacology</i>	<i>BIOL 5520</i>	<i>3 hrs.</i>
<i>Graduate Seminar in CMR</i>	<i>BIOL 5820</i>	<i>2 hrs.</i>
<i>Scientific Communication Practicum</i>	<i>BIOL 5860</i>	<i>1 hr.</i>
<i>Thesis Research</i>	<i>BIOL 5990</i>	<i>1 hr.</i>
<i>Department Seminar</i>	<i>BIOL 5810</i>	<i>0 hrs.</i>

Summer:

<i>Thesis Research</i>	<i>BIOL 5990</i>	<i>2 hrs.</i>
<i>Graduate Reading Course</i>	<i>BIOL 5980</i>	<i>1hr.</i>

Fall semester, second year:

<i>Genomics</i>	<i>BIOL 5030</i>	<i>3 hrs</i>
<i>Advanced Microbiology</i>	<i>BIOL 5640</i>	<i>3 hrs</i>
<i>Research Colloquium</i>	<i>BIOL 5800</i>	<i>1 hr.</i>
<i>Thesis Research</i>	<i>BIOL 5990</i>	<i>1 hr.</i>
<i>Department Seminar</i>	<i>BIOL 5810</i>	<i>0 hrs.</i>

Spring semester, second year:

<i>Concepts in Immunology</i>	<i>BIOL 5630</i>	<i>3 hrs</i>
<i>Graduate Seminar in CMR</i>	<i>BIOL 5820</i>	<i>2 hrs.</i>
<i>Thesis Research</i>	<i>BIOL 5990</i>	<i>1 hr.</i>
<i>Department Seminar</i>	<i>BIOL 5810</i>	<i>0 hrs.</i>

Sample schedule for an MS student whose focus is ecology/evolutionary biology:**Fall semester, first year:**

<i>Advanced Ecology</i>	<i>BIOL 5550</i>	<i>3 hrs.</i>
<i>Genomics</i>	<i>BIOL 5030</i>	<i>3 hrs</i>
<i>Research Colloquium</i>	<i>BIOL 5800</i>	<i>1 hrs.</i>
<i>Thesis Research</i>	<i>BIOL 5990</i>	<i>1 hr.</i>
<i>Department Seminar</i>	<i>BIOL 5810</i>	<i>0 hrs.</i>

Spring semester, first year:

<i>Conservation Biology</i>	<i>BIOL 5480</i>	<i>3 hrs.</i>
<i>Graduate Seminar in EES</i>	<i>BIOL 5840</i>	<i>2 hrs.</i>
<i>Scientific Communication Practicum</i>	<i>BIOL 5860</i>	<i>1 hr</i>
<i>Thesis Research</i>	<i>BIOL 5990</i>	<i>1 hr</i>
<i>Department Seminar</i>	<i>BIOL 5810</i>	<i>0 hrs.</i>

Summer:

<i>Thesis Research</i>	<i>BIOL 5990</i>	<i>2 hrs.</i>
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Fall semester, second year:

<i>Advanced Evolution</i>	<i>BIOL 5560</i>	<i>3 hrs.</i>
<i>GIS in Biology</i>	<i>BIOL 5640</i>	<i>3 hrs.</i>
<i>Research Colloquium</i>	<i>BIOL 5800</i>	<i>1 hrs.</i>
<i>Thesis Research</i>	<i>BIOL 5990</i>	<i>1 hr.</i>
<i>Department Seminar</i>	<i>BIOL 5810</i>	<i>0 hrs.</i>

Spring semester, second year:

<i>Graduate Seminar in EES</i>	<i>BIOL 5840</i>	<i>2 hrs.</i>
<i>Biogeography</i>	<i>BIOL 5450</i>	<i>3 hrs</i>
<i>Thesis Research</i>	<i>BIOL 5990</i>	<i>1 hr.</i>
<i>Department Seminar</i>	<i>BIOL 5810</i>	<i>0 hrs.</i>

E.3.e) Selection of Graduate Thesis Mentor

The student's mentor must be a member of the Graduate Faculty in the Department of Biology at Saint Louis University. Under rare circumstances, the student may be carrying out research under the supervision of a research supervisor outside of the Department of Biology. In such cases, the mentor must still be member of the Department of Biology Graduate Faculty, and the Graduate Affairs Committee must approve this arrangement.

E.3.f) Formation of the Thesis Committee

The student is responsible for forming and meeting with a thesis committee starting *no later than* the first semester (normally the Fall Semester) in the program. The student must meet with their thesis committee each semester in the Master's program. At least two of the committee members must be faculty members from the Biology Department at Saint Louis University.

E.3.g) Candidacy

Students in their final semester should complete the Application for Degree within the first two weeks of the semester (form available here: <https://www.slu.edu/academics/graduate/current-students/forms-petition.php> ; Calendar of Deadlines available here: <https://www.slu.edu/academics/graduate/current-students/index.php>). Procedures for graduation are available on the Graduate Education website. These will include arranging for the three thesis committee members to conduct the final degree examination. The content of the thesis must receive the approval of the committee before the candidate is permitted to take the final examination.

E.3.h) Comprehensive Degree Examination format

The student will write a formal thesis and provide ample time for their committee to read it before the final degree examination. The Office of Graduate Education has a thesis formatting guide at this site: [Information for Current Students : SLU](#) through a link on formatting policies and procedures.

Recent examples of theses may be found as electronic resources in the SLU Library system as described [here](#).

In-text citations and the literature list may be formatted in a style that is accepted in the student's field of science. The student should consult with the mentor regarding a suitable citation/reference style for their thesis.

The student will present a formal seminar on their thesis research that is advertised within the Biology Department and through the departmental mailing list. The faculty mentor will introduce the student to the audience and clarify the format of the presentation. At the end of the seminar, there will be a brief question-answer period, after which time the audience will be excused. The committee will then begin the exam period. The final exam normally will last 1-2 hours. Next, the student will be briefly excused and the committee will evaluate the performance of the candidate, and will fill out two results forms, one for the oral presentation and one for the written thesis. Results Forms are sent directly to Graduate Education. Graduate Education will provide official notification of the committee's decision. The format of the thesis will be reviewed by the Master's Candidacy Advisor.

E.3.i) Change to PhD program

— Students who wish to transfer into the PhD program during their Master's studies must petition to do so. Petitions to amend a student's program from a Master's to the PhD must be made before the end of the third semester in residence (i.e. December 15th) to allow for scheduling of written qualifying exams no later than the end of the subsequent spring semester. The request must include the following items:

1. Amendment petition (available on the [Graduate Education website](#))
2. Student letter of request
3. Copy of the most recent progress report
4. Current CV
5. Copy of transcripts
6. Letter of support from mentor
7. Separate letters of support from remaining members of student's thesis committee, or a committee letter

Items 1-5 are submitted by the student; items 6 and 7 should be submitted separately. The request will not be considered until all items are received. The student must complete the 'Petition to Amend the Graduate Program' and attach a letter that describes how their proposed doctoral research would build upon or differ significantly from the research the student has done during the tenure of their master's program. The letter must include a detailed timeline for completing the additional coursework required for the PhD and scheduling written and oral exams. The timeline should demonstrate that the student will be able to carry out the dissertation research within the support limits for a PhD. The petition, letter, progress report, CV and transcripts must be submitted to the Chair of the Graduate Affairs Committee who will present it to the committee for evaluation.

Support letters must be submitted separately by the mentor and thesis committee members. Committee members may submit a joint letter, but it must be signed by all members. Letters should address the student's progress to date and the likelihood that the student will be able to complete all remaining requirements for the PhD (coursework, research and dissertation) within the time span normally allotted for a PhD (10 semesters total, including the time elapsed in the MS program).

If the petition is approved, the student must select an examining committee who will administer the written qualifying exam in May of the fourth semester in residence. The student's thesis committee must be converted to a dissertation committee by adding faculty members to meet normal requirements (five members total, one of whom must be outside the department). Petitions to amend an MA to the PhD program will be permitted only under exceptional circumstances.

E.3.j) Progression through the MS Program (Normally a two-year program)

First year

Fall Semester-Coursework, thesis research as described above

- 1) Select a faculty mentor and two thesis committee members. Complete the "*Selection of a Graduate Mentor and Committee*" form. The faculty member must agree to accept the applicant into their laboratory.
- 2) Thesis committee meeting. The committee will complete a *Progress Report* form (available in departmental office), discuss it with the student and submit a copy to the departmental office.

Spring Semester- Coursework, thesis research as described above

Thesis committee meeting. The committee will complete a *Progress Report* form, discuss it with the student and submit a copy to the departmental office

Second year

Summer session- Thesis Research; other coursework is optional.

Fall Semester – Coursework, thesis research as described above

Thesis committee meeting. The committee will complete a *Progress Report* form, discuss it with the student and submit a copy to the departmental office.

Spring Semester- Final coursework, thesis research as described above.

- 1) Review graduation requirements and dates on Graduate Education website <https://www.slu.edu/academics/graduate/current-students/index.php>
- 2) Fill out Application for Degree on Banner (due within the first two weeks of the semester). The application form is available here: <https://www.slu.edu/academics/graduate/current-students/forms-petition.php>
- 3) Turn in *Thesis Proposal* form to Masters Candidacy Advisor (due early March).
- 4) Make an appointment to meet with Master's Candidacy Advisor to review thesis and formatting (early April). The thesis should be nearly complete and ready to be checked for formatting and style (including bibliography and text referencing) by the time it is presented.
- 5) Final Comprehensive Examination must be held by early May.
- 6) Turn in final electronic draft of thesis to ProQuest (mid-May).

Note: Students should obtain the “*Calendar of Deadlines*” from the Graduate Education website to determine exact due dates.

E.4) PhD Degree Requirements

E.4.a) Requirements

The PhD degree requires a minimum of **36** hours of postbaccalaureate credit. At least three years must be completed in residence. Graduate Education requires that students complete the PhD program within 8 years if entering from a baccalaureate and within 7 years if entering from a completed Master's degree program; a student who has already completed a Master's degree in Biology at Saint Louis University has a total of 8 years to complete both degrees. The expectation of the Department of Biology is that all PhD students will complete their degrees within five years.

The requirements for the PhD degree include

- A minimum of **24** hours of post-baccalaureate coursework (exclusive of dissertation)
- **12** hours of Dissertation Research (BIOL 6990)
- Passing Preliminary Written and Oral Examinations
- A dissertation
- A public, oral presentation and dissertation defense

Coursework

The following requirements govern which courses may be counted toward a degree:

- At least **18** hours of structured courses (these do not include Research Topics (BIOL 6970) and/or Graduate Reading courses (BIOL 6980))
- No more than six credit hours taken at the 4000-level.
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- At least **18** hours (*exclusive of dissertation*) must be 5000- and 6000- level courses
- At least **12** hours (*exclusive of dissertation*) of the total program must be from the Biology Department
- No more than **6** hours of Research Topics (BIOL 6970) and/or Graduate Reading courses (BIOL 6980)
- At least **12** hours of dissertation research (BIOL 6990).
- Students must be enrolled in a course (even if it is for 0 hours) every fall and spring semester to maintain standing in the program; students on 11-month assistantships must also enroll during the summer.

Required coursework

- | | |
|---|--------------------------|
| 1. Research Colloquium | BIOL 5800 2 hr |
| <i>generally taken for 1 credit hour in each of the first two years (may be taken for credit more than twice)</i> | |
| 2. Scientific Communication Practicum | BIOL 5860 1 hr |
| 3. CMR or EES seminar (<i>two semesters total; can be taken for 1-2 hrs</i>) | BIOL 5820 or
2-4 hrs. |
| 5840 | |
| 4. Departmental Seminar (<i>must be taken each semester enrolled</i>) | BIOL 6910 0 hrs. |
| 5. Dissertation Research | BIOL 6990 12 hrs. |
| 6. Electives (<i>selected in consultation with the student's dissertation committee</i>) to 36 hrs total | |

E.4.b) Responsible Conduct in Research modules

– Student who are working in labs with external funding from the National Institutes of Health (NIH) or the National Science Foundation (NSF) are required to complete Responsible Conduct in Research training. Please see the [RCR web page](#) for more information and workshop dates.

E.4.c) Electives

Elective courses can be selected from courses offered in the Biology Department at Saint Louis University, at the Saint Louis University Medical School or from approved courses offered at other graduate degree granting institutions in the St. Louis area. Students may enroll in courses at other area universities with the approval of their mentors and the completion of *the Inter-University Exchange Program Enrollment Request form* available from the Office of the Registrar. Note that the student must be currently enrolled in 3 hours at SLU before coursework at another institution can be taken for credit (see section D.3.I for a partial list of electives offered). Coursework must be at 500 or 600 level. Elective courses should serve the student's need to become proficient in a specialized area.

E.4.d) Transfer of credit:

Graduate level course work completed elsewhere but not used toward another degree may be considered for transfer into the doctoral program. If a student wishes to receive credit for graduate coursework at another institution, a "Petition for Transfer of Credit" form (available online at the Forms and Petitions page of Graduate Education) must be submitted, accompanied by a transcript showing the work, for approval by the mentor, the Graduate Program Coordinator, and the Associate Dean for Graduate Affairs in the College of Arts and Sciences. A maximum of 6 hours can be transferred from another program. The grades received must be "B" or better.

E.4.e) Sample student schedules:

Sample schedule for a PhD student whose focus is cell/molecular biology:

Fall semester, first year:

<i>Molecular Techniques laboratory</i>	<i>BIOL5050</i>	<i>2 hrs.</i>
<i>Advanced Molecular Biology</i>	<i>BIOL5700</i>	<i>3 hrs.</i>
<i>Research Colloquium</i>	<i>BIOL5800</i>	<i>1 hr.</i>
<i>Department Seminar</i>	<i>BIOL6810</i>	<i>0 hrs.</i>

Spring semester, first year:

<i>Biochemical Pharmacology</i>	<i>BIOL5520</i>	<i>3 hrs.</i>
<i>Graduate Seminar in CMR</i>	<i>BIOL5820</i>	<i>2 hrs.</i>
<i>Scientific Communication Practicum</i>	<i>BIOL5860</i>	<i>1 hr</i>
<i>Department Seminar</i>	<i>BIOL6810</i>	<i>0 hrs.</i>

Summer:

<i>Dissertation Research</i>	<i>BIOL6990</i>	<i>1 hr.</i>
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Fall semester, second year:

<i>Genomics</i>	<i>BIOL5030</i>	<i>3 hrs</i>
<i>Advanced Microbiology</i>	<i>BIOL5640</i>	<i>3 hrs</i>
<i>Research Colloquium</i>	<i>BIOL5800</i>	<i>1 hr.</i>
<i>Department Seminar</i>	<i>BIOL6810</i>	<i>0 hrs.</i>

Spring semester, second year:

<i>Concepts in Immunology</i>	BIOL5630	3 hrs
<i>Graduate Seminar in CMR</i>	BIOL5820	2 hrs.
<i>Dissertation Research</i>	BIOL6990	1 hr.
<i>Department Seminar</i>	BIOL6810	0 hrs.

Students may register for Dissertation Research (BIOL6990), 1-3 credits/semester, until 12 credits are reached. After 12 credits have been reached, students should register for 0 hrs of BIOL6990 each semester until they graduate.

Sample schedule for a PhD student whose focus is ecology/evolutionary biology:**Fall semester, first year:**

<i>Advanced Ecology</i>	BIOL5550	3 hrs.
<i>Genomics</i>	BIOL5030	3 hrs
<i>Research Colloquium</i>	BIOL5800	1 hrs.
<i>Department Seminar</i>	BIOL6810	0 hrs.

Spring semester, first year:

<i>Conservation Biology</i>	BIOL5480	3 hrs.
<i>Graduate Seminar in EES</i>	BIOL5840	2 hrs.
<i>Scientific Communication Practicum</i>	BIOL5860	1 hr
<i>Department Seminar</i>	BIOL6810	0 hrs.

Summer:

<i>Dissertation Research</i>	BIOL6990	1 hr.
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Fall semester, second year:

<i>Advanced Evolution</i>	BIOL5560	3 hrs.
<i>GIS in Biology</i>	BIOL5640	3 hrs.
<i>Research Colloquium</i>	BIOL5800	1 hrs.
<i>Department Seminar</i>	BIOL6810	0 hrs.

Spring semester, second year:

<i>Graduate Seminar in EES</i>	BIOL5840	2 hrs.
<i>Biogeography</i>	BIOL5450	3 hrs
<i>Dissertation Research</i>	BIOL6990	1 hr.
<i>Department Seminar</i>	BIOL5810	0 hrs.

Students may register for Dissertation Research (BIOL6990), 1-3 credits/semester, until 12 credits are reached. After 12 credits have been reached, students should register for 0 hrs of BIOL6990 each semester until they graduate

E.4.f) Teaching

— All doctoral students must complete one year of teaching. This can be accomplished by serving as a Graduate Teaching Assistant, by completing two semesters of a Practicum in Teaching course, or by other teaching experience approved by the student's Committee and the Department Chair.

E.4.g) Selection of Research Mentor

PhD students will usually have chosen a research mentor before beginning the program, but must choose a research mentor by the end of the first semester. After a student has reached a

verbal agreement with their proposed research mentor, they should file the "Selection of Mentor & Committee" form, available on the Biology Graduate Program website. Generally, the mentor had been selected before admission to the graduate program or early in the program; this form is a means of formalizing the arrangement. The formal appointment of a research mentor becomes effective when approved by the proposed research mentor and the Graduate Program Coordinator.

The student's mentor must be a member of the Graduate Faculty in the Department of Biology at Saint Louis University. Under rare circumstances, the student may be conducting thesis/dissertation research under the supervision of a research supervisor outside of the Department of Biology. In such cases, the student's mentor must still be a member of the Graduate Faculty of the Department of Biology, and the term "lab supervisor" will be used to identify the student's laboratory advisor, who is outside the Department. The Graduate Affairs Committee must approve this arrangement.

E.4.h) Preliminary Examinations

For the PhD degree, Graduate Education requires successful completion of a written preliminary examination and an oral examination before a student is eligible to advance to candidacy and enroll in Dissertation Research. A student entering the PhD program with only an undergraduate degree may take their exams at the end of the first or second year of the program; a student entering the program with a Master's must take exams at the end of their first year unless petitioning to do otherwise.

Academic Accommodations: The current SLU policy is that students who have documented academic accommodations have the "responsibility to approach instructors to discuss how accommodations may be implemented." The Center for Accessibility and Disability Resources (CADR) provides further guidance: "Students are not required to tell faculty the nature of their disability. Faculty are not obligated to arrange accommodations until a student specifically requests it. It is necessary that eligible students speak with each instructor individually." (see [Faculty, Staff and TA Resources : SLU](#)). Thus, students who would like to use academic accommodations should arrange with their written and/or oral exam committee members how accommodations will be implemented. While faculty have a right to be "informed of accommodations in a timely manner," faculty also have the responsibility to "provide accommodations to students who have approved need".

The written and the oral preliminary exams in Biology are described below:

1) Written Preliminary Examination

The goal of the written exam is to test the student's knowledge and synthesis of the seminal and influential literature related to their broad program of study and tailored to the student's research interests. Mastery will be assessed via written responses to three questions developed by members of the student's examining committee. The timetable of the Written Exam is given below:

a. by January 15: the student should form an examining committee in consultation with their mentor and fill out the [Selection of Examining Committee Members form](#). The examining committee will be composed of three faculty members not including the student's primary mentor. These may or may not be the same faculty selected to serve on the student's dissertation committee. One written preliminary examination committee member may be from outside the Department of Biology. A student may petition to the

GAC to have an additional external faculty member on the committee. This petition should be submitted two weeks before the exam committee selection form is due.

NOTE: if a student – in consultation with their mentor – feels unprepared to sit for the written exam according to this timetable, they may submit a petition to the Graduate Affairs Committee requesting a one-year extension. The petition must justify the reason for the request and must be signed by the student and their mentor.

b. by February 1: The members of the examining committee will each prepare a reading list appropriate to the broad topic areas of the student's research area. Reading lists may be focused on coursework, seminal texts or primary literature, but should provide the necessary level of breadth and depth to prepare the student for the written exam. Reading lists will be sent to the student by the individual faculty members by February 1.

c. mid-May: Written exams will be scheduled for the last week of the semester, after finals and before graduation. The exam will take place over the course of three consecutive days, with the order of topics determined by the committee. For each topic, the student will receive two questions from a member of the examining committee each day, and may choose which question to answer. For each question the student answers, s/he may use notes to prepare a written response which must be completed within a maximum six-hour period. The student will use a computer to prepare their responses, but **internet access will not be permitted** during the exam.

During the written exam

- Students may use paper copies of items on the reading lists and associated notes
- Students may also use electronic copies of items on the reading lists and electronic versions of notes
- Students may not access items in the library or the internet that are not included on the reading lists

d. by June 1: The response to each question will be assessed by two committee members, one of whom assigned the original topic. The examiners will evaluate the student's work and assign a pass or fail grade. If there is no consensus between the two evaluators, the third member of the committee will review the student's response. After all examiners have evaluated their parts of the exam, the committee will meet to discuss the outcome. A student who successfully passes all three portions of the written exam may begin working on their dissertation proposal in preparation for the oral exam.

A student who fails any portion of the exam will be allowed to retake that portion once. All retakes must be completed within a one-month time period. However, the specific question, while in the same general area, may not be the same as the original question. In the case of a second failure, the student may not continue in the PhD program, but may petition to amend the program to a Master's. The Graduate Affairs Committee will solicit the examining committee's recommendation to approve or reject such petition.

2. Oral Examination and Advancement to Candidacy

In accordance with Graduate Education guidelines, after passing the Written Examination, a student must also pass an Oral Examination before advancing to candidacy. The Department of Biology requires that a dissertation research proposal be prepared and distributed to the student's committee prior to the Oral Examination; the

Oral Examination will consist of a presentation of this proposal and questions from the student's committee.

The format of the dissertation research proposal may vary depending on the general expectations in a specific research field. Thus, the student should consult with the primary dissertation mentor and the oral exam committee on what will be expected in the proposal. An example might include:

- Summary of background literature including what gaps in knowledge should be addressed
- Specific aims and/or hypotheses (sufficient to meet dissertation requirements, such as a three-manuscript format) to address the gap in knowledge
- Description of why the knowledge to be gained would be a significant advance to the research area
- Preliminary data in support of the proposed aims
- For each aim:
 - Description of research approach to address the aim, including for each approach
 - Rationale
 - General design (e.g. experimental or observational approach)
 - Discussion of expected results, interpretations, and potential pitfalls or alternative approaches if results are unexpected or not supportive of hypotheses
 - Description of materials and methods
- General summary and re-emphasis of importance of the project

Generally, at this stage of career development, the dissertation research proposal could be reasonably conveyed in about 6-8 single-spaced pages (no more than 12 pages) with additional pages for references cited.

The primary mentor should play a role in guiding the student toward appropriate literature, crafting the aims, and creating a research approach. Primary mentors are encouraged to review drafts of the research proposal and provide feedback as the student develops the proposal.

1. Summer after passing the written exam: Student should begin to prepare a research proposal for their committee. This commonly assumes the form of a grant proposal; a sample format might contain Specific Aims, Background and Significance, Preliminary Data, Research Methods and Design, and a timetable for completion, but the specific format of the proposal should be consistent with that used in the student's field of study. The student will distribute the proposal to their committee members at least one week in advance of the student's Oral Examination.

2) Fall after passing the written exam: The student forms their Examination Committee. The Examination Committee for the Oral Exam consists of at least five members of the Graduate Faculty, at least four of whom are regular faculty members of the Department. Students should submit the Doctoral Oral Exam Form (on the [Graduate Education website](#)) to the Associate Dean of Graduate Affairs in the College of Arts and Sciences

at least three weeks before the date of the Oral Exam so that the Graduate Faculty status of all the committee members can be verified.

NOTE: if a student – in consultation with their mentor – feels unprepared to present a research proposal for the oral exam according to the timetable described above, they may submit a petition to the Graduate Affairs Committee requesting a one semester extension. The petition must justify the reason for the request and must be signed by the student and their mentor. An additional semester delay is possible under exceptional circumstances.

At the time the student submits the Doctoral Exam Form, if the student wishes to count coursework from a graduate degree completed at another institution toward their degree requirements, they should also fill out the “Request for Advanced Standing” form from the Graduate Education website. The student should consult with the grad program coordinator as to what courses to include and whether they would count toward required courses or elective hours.

The Doctoral Candidacy Advisor will send an Oral Exam Result Form to the student and mentor before the oral exam date; these should be brought to the Oral Exam. At the completion of the Oral Exam, the members of the Examination Committee vote on whether the student has passed their exam, and this result is delivered to Graduate Education. If a student receives a "fail" on the Oral Examination, the exam may be repeated once, according to the policies and regulations of Graduate Education (see the Graduate Education Catalog for details). If a student fails their Oral Exam twice, the student may not continue in the PhD program, but may petition to amend the program to a Master's. The Graduate Affairs Committee will solicit the examining committee's recommendation to approve or reject such petition.

After passing the Written and Oral Examinations, a student is automatically advanced to Candidacy for the Doctorate.

E.4.i) PhD Research and Development of the Dissertation

With advancement to candidacy, the PhD student officially undertakes their PhD research. Typically, a doctoral candidate in Biology will have already initiated their research prior to this point. At this stage, students should enroll in Dissertation Research for at least one credit hour each semester until 12 hours have been accumulated. Students should continue to meet with their Dissertation Committees regularly until their research is completed.

Dissertation Committee: Graduate Education requires that the Associate Dean for Graduate Affairs for the College of Arts and Sciences officially approve the Dissertation Committee at the same time the student applies for advancement to candidacy. However, prior to candidacy, the student's Dissertation Committee will be given "provisional" status. The membership of the Dissertation Committee will typically be the same as that of the Oral Preliminary Examination Committee, although this is not essential. While Graduate Education requires that there be *minimally* three "readers" who will vote whether to approve the student's dissertation and oral defense at the end of the student's PhD program, in the Biology Department, all members of the Dissertation Committee will serve in this capacity. These individuals will be listed as the "Committee in Charge of Candidacy" in the dissertation.

After the student's research is completed, the student prepares a dissertation that must be approved by the dissertation mentor and eventually by the entire dissertation committee. The student should consult the [Graduate Education](#) document entitled "*Formatting Guide for Saint Louis University Graduate Education*" for details concerning the preparation and format of the Dissertation.

The traditional **thesis** format typically includes an introduction, a review of the literature, methodology, results, and discussion as described in the Formatting Guide referenced above.

A dissertation may be formatted in the same style as a thesis (see the Formatting Guide) In addition, the Department of Biology offers a "manuscript-style" format. This is similar to the non-traditional format described in the Office of Graduate Education's dissertation formatting guide with a major difference being that it is not required that any of the manuscript-style chapters be published or accepted for publication. According to office of Graduate Education's dissertation formatting guide The student's dissertation committee must approve the use of this format. If this option is used, the student will normally use the following format:

Chapter 1- Introduction
Chapter 2- Manuscript # 1
Chapter 3- Manuscript # 2
Chapter 4- Manuscript # 3
Chapter 5- Discussion and Conclusions

With either format, the dissertation must be formatted in accordance with the regulations of Graduate Education. Once completed, the dissertation will be approved by the research mentor and a copy given to each member of the student's dissertation committee; the dissertation should be distributed two weeks before the public presentation (see below). The committee will evaluate the dissertation, make comments and suggest any necessary corrections or changes. Once approved, the dissertation may be submitted to Doctoral Candidacy Advisor.

Graduate Education allows a third format when the student has had three manuscripts published or accepted for publication. Refer to Graduate Education's formatting guide for details.

Recent examples of dissertations may be found as electronic resources in the SLU Library system as described [here](#).

In-text citations and the literature list may be formatted in a style that is accepted in the student's field of science. The student should consult with the mentor regarding a suitable citation/reference style for their dissertation.

E.4.j) Public Presentation and Defense of the Dissertation

Graduate Education requires a public, oral presentation and defense of the dissertation. The presentation may be scheduled after all committee members have approved the dissertation. The research mentor must submit the "Notification of Readiness for the Public Oral Presentation of the dissertation Defense" from (on the [Graduate Education website](#)) to the Associate Dean of Graduate Affairs in the College of Arts and Sciences *at least two weeks* prior to the defense. The appropriate department staff person should be informed of student thesis/dissertation presentations at least a week in advance to send out formal announcements. Following the presentation, the candidate must be prepared to respond to questions from the committee and

the assembled audience. One of the committee members (not the mentor) serves as the moderator for the presentation and defense.

The final defense normally will last 1-2 hours. The student will then be briefly excused, and the members of the committee will fill out separate results forms for 1) the written dissertation and 2) the oral defense.

E.4.k) Schedule for students in the PhD Program:

First year:

Fall semester- Coursework, preliminary research

- 1) Identify a faculty mentor. The faculty member must agree to accept the applicant into their laboratory; this is usually agreed upon prior to matriculation.
- 2) Select Dissertation Committee.
- 3) Meet with Dissertation Committee. All PhD students are required to meet with their committees to discuss their progress. At this time the committee will sign the Progress Report form, discuss it with the student, and submit a copy to the Graduate Program Coordinator.

Spring semester- Coursework, preliminary research

- 1) If taking Written Exams at the end of the first year, submit Examining Committee Member form to the Graduate Program Coordinator (early January)
- 2) Receive reading lists for Written Exams (early February)
- 3) Meet with the Dissertation Committee
- 4) Take Written Exams (mid-May)

Second year

Summer-

- 1) Student registers for BIOL 6990 Dissertation Research
- 2) If a student has taken the written exam, they begin to prepare for Oral Exams

Fall Semester –Coursework, preliminary research

- 1) If taking the Oral Exam, prepare a research proposal for your committee; this usually takes the form of a grant proposal.
- 2) If taking the Oral Preliminary Examination (see procedures below). The request for Oral Preliminary Exam result forms must be submitted to the Graduate Program Coordinator (by email or hard copy to the coordinator's departmental mail slot), who will in turn submit it to the Associate Dean for Graduate Affairs in the College of Arts and Sciences no later than *three weeks* prior to the scheduled exam date. The Associate Dean must approve all the members of the committee; outside members must be approved in advance (see information on committees, section D.3) Successful completion of the oral exam automatically advances a student to candidacy for the PhD degree.
- 3) The progress meeting with the Dissertation Committee is usually combined with the oral exam; a progress report should be filled out and signed at the meeting.

Spring Semester- Core courses, dissertation research

Meet with Dissertation Committee (spring meeting can be deferred by committee)

Third - Fifth years

Core courses, electives, and BIOL 6990 "Dissertation Research" (if necessary to complete the required 12 hours).

- 1) Meet with Dissertation Committee. All PhD students are required to meet each semester* with their committees to discuss their progress (*spring meetings can be deferred, with committee approval). At this time the committee will sign the Progress Report form, discuss it with the student, and submit a copy to the Graduate Program Coordinator.

Last semester of program

Final coursework, dissertation research as described above

- 1) Review graduation requirements and dates on Graduate Education website <https://www.slu.edu/academics/graduate/current-students/index.php>
- 2) Fill out Application for Degree (due within the first two weeks of the semester, form available here: <https://www.slu.edu/academics/graduate/current-students/forms-petition.php>)
- 3) Mentors should fill out Notification of Readiness to Defend Dissertation form and send it to Associate Dean for Graduate Education, College of Arts and Sciences, *three weeks* before defense; last day to defend for spring graduation is in early May.
- 4) Oral Presentation of Dissertation and Defense
- 5) Final formatting meeting with Doctoral Candidacy Advisor
- 6) Turn in final draft of dissertation.

F. ASSISTANTSHIPS AND FELLOWSHIPS

See the "Graduate Assistant Handbook" and other [information for Graduate Assistants](#) available online from Graduate Education.

F.1) General information:

The Department of Biology strives to support as many MS and PhD students as possible with assistantships. Assistantships funded by the University are typically 11-month awards that include a stipend, health insurance for the student (plus the option to purchase family coverage), and a tuition scholarship. Nine hours of tuition are provided during the fall and spring semesters and three hours during the summer. For PhD students in later years of the program, the tuition scholarship may be reduced to six hours/semester during the regular academic year with the student's permission. Summer registration and attendance is mandatory for all students after the first year. In the first year, awards may begin on July 1 or August 1; the student is **required** to be in residence by the start of their award. After the first year, awards start on July 1. Under special circumstances, the student may petition the Graduate Affairs Committee to delay the start date of their assistantship.

F.1.a) External Employment:

Students on assistantship can petition the department for permission for external employment. If the department approves, the request goes to the Associate Dean for Graduate Affairs for approval. The external responsibility should not be more than 10 (12 at the most) additional hours and should not interfere with the student's academic progress and their GA responsibilities. Requests are viewed more favorably if the external employment is relevant to

the student's professional development. Requests should be made in writing to the biology Graduate Program Coordinator.

F.2) Years of support possible:

Policy in the Biology Department is that students may hold a Teaching or Research Assistantship for a maximum of two years while pursuing a Master's degree and five years in a doctoral program. A student entering the doctoral program with a Master's degree from Saint Louis University is eligible for assistantship funding for not more than five years **total** (e.g. a student with two years of assistantship support during their Master's at Saint Louis University is eligible for a maximum of three additional years of assistantship support in their doctoral program). With approval from the student's mentor and committee, the student may apply for a sixth year of support from a source other than the department's assistantship lines, e.g. a University Dissertation Fellowship. In unusual circumstances, the student may request an additional semester or year of departmental assistantship support from the Chairperson; long-term illness or family emergency might be considered reasonable grounds for an additional year. Note that grant-based assistantships contribute to the total number of years of assistantship support allowed.

F.3) Types of Assistantships

F.3.a) Teaching Assistantships

These assistantships are funded by the University and require the student to act as a teaching assistant for a lecture or laboratory course for up to 20 hours/week.

F.3.a.1) Process for Awarding TAs

Normally, students applying for admission to MS and PhD programs in Biology are considered for Teaching Assistantships at the same time. Current students who hold Teaching Assistantships will automatically be assigned one for the next year of their program if they meet the criteria below (see Part b); no formal application is necessary. The final decision for awarding an Assistantship rests with Graduate Education. The appointment to a Teaching Assistantship will be by contract offered by Graduate Education to the nominated individual.

F.3.a.2) Criteria for Assignment of Teaching Assistantships

The Graduate Affairs Committee uses the following criteria in nominating individuals for Teaching Assistantships:

For students currently holding an Assistantship: *Graduate students currently with an Assistantship (Teaching or Research) are normally awarded an assistantship the following year, provided the student has not exceeded the years of Teaching/Research Assistantship support described above in Part F2, and that the student has remained in good standing. **To remain in good standing, a student must***

- Have a GPA of 3.0 or greater. *Graduate students with GPAs below 3.0 are considered to be on probation, and students on probation cannot be awarded assistantships.*
- Have good teaching evaluations from their current assistantship. Continuation is dependent upon satisfactory performance of the assigned teaching responsibilities. Teaching evaluations will be made by the classroom mentor and undergraduate students. Based upon evaluations, the GAC may recommend that the student not receive a Teaching Assistantship the following year. Alternatively, the GAC may

recommend a course of action that may improve the performance of the student as a TA (e.g., enrollment in the Reinert Center for Transformative Teaching and Learning, or acquisition of a faculty teaching mentor).

- Have adequate ratings on the student's Progress Report - Student progress will be rated each semester by their committees. An "inadequate" rating may preclude a student from receiving an assistantship renewal (see section B.8. of this manual for an explanation of the rating system).

For incoming students and/or students without a prior Assistantship, assignment of a Teaching Assistantship will take into consideration:

- English-speaking ability (as determined by the ESL Program). This aspect is required for effective teaching of undergraduate students as part of the Teaching Assistant's duties.
- Academic standing. Includes undergraduate grade point average (GPA)
- Letters of reference and any additional materials (publications, presentations, etc.).
- Degree program. For students that are of nearly equal standing, PhD students are given priority over MS students. MS students are given priority over MA students.
- Identification by the student of a faculty member in whose lab the student will carry out research.
- For current students, progress in the graduate program. Students currently enrolled, but not supported by an assistantship, are in competition with the current applicant pool for Teaching Assistantship awards. In other words, a student does not receive priority simply due to being enrolled in the graduate program. However, the committee will solicit a letter from the student's mentor and examine current academic standing and progress in the program.

F.3.a.3) Teaching Assistant Duties

Teaching Assistants will be assigned by the Departmental Chairperson to instructional duties in the courses, lectures, and laboratories offered by the Biology Department. The appointment is half-time, and teaching duties will normally not require more than 20 hours per week (thus allowing the student to spend substantial time in laboratory research). The duties will include instructional time in the classroom or laboratory, necessary preparation for class or lab, marking papers, and other instructional activities as required. Teaching Assistants must also arrange for reasonable "office hours" for meeting with undergraduate students and inform their students of the time and place of office hours. The Department will provide a suitable office or other place for Teaching Assistants to meet with their students.

Students who begin their assistantships/fellowships during the summer are required to begin their residence at this time. Students may be assigned teaching responsibilities or begin laboratory work.

F.3.a.4) Teaching Assistantship evaluations

Semester evaluations are to be completed by both faculty instructors overseeing the Teaching Assistant duties as well as by students being taught by the Teaching Assistant. All evaluations will be turned in to the department office to be included in the graduate student's file. Copies of evaluations will be forwarded to the student's graduate mentor to be discussed with the student. Evaluations must be signed by both the faculty mentor and the student verifying that they have

been discussed. Forms must be turned in to the departmental office by finals week each semester.

F.3.a.5) Teaching Assistant/Graduate Student Orientations

All new teaching assistants are required to attend orientations for Graduate Assistants, both at the department level and university level, at the beginning of the fall semester. Announcements of the time and place will be sent to each new assistant in the summer preceding their first semester at Saint Louis University. Orientation schedules for the University can be found on the Graduate Education webpage.

F.3.b) Research Assistantships

Like Teaching Assistantships, Research Assistantships funded by the University are 11-month awards that include a stipend, a health insurance, and tuition. There are normally no instructional duties associated with appointment to a Research Assistantship. Instead, the Research Assistant's faculty sponsor is responsible for directing the research duties of the student. The student's time may be spent performing routine lab tasks, helping oversee undergraduate research, etc., as well as working on original research. Students who apply for RAs should already possess the laboratory or other skills needed to successfully carry out their assigned duties and be capable of working independently. Because the Department has access to a limited number of RA positions, students must submit an application to be considered for them (see below). Deadline for application: March 1st.

F.3.b.1) Who can apply?

All MS and PhD students are eligible to apply for RAs, but ***priority is generally given to PhD students who have advanced to candidacy.*** Additional consideration may be given to students who have not previously been awarded an RA.

F.3.b.2). Process for applying for Research Assistantships

Eligible students should submit an **electronic** application via email to the Biology Department Graduate Program Coordinator by March 1st. The application should include:

- a one- to two-page description of the mentor's research project on which they will work during the tenure of the RA. This must be developed in consultation with the mentor and should include a description of the specific work to be performed and the expected outcomes of the RA award.
- a copy of the student's most recent progress report
- transcripts (unofficial Banner transcript is sufficient)
- current CV

A separate letter from the student's mentor supporting the application and verifying that they are in agreement with the proposed work plan should also be submitted electronically to the Graduate Program Coordinator.

F.3.b.3) Review of applications

RA applications will be reviewed by the Graduate Affairs Committee, who will subsequently submit a ranked list of recommended awards to the department Chair. Final determination of awards will be made by the Chair. Every effort will be made to ensure that distribution of awards is as equitable as possible across the department. Applications must be received by **March 1st** to allow sufficient time for review and selection.

Criteria for Assignment of Research Assistantships- The Graduate Affairs Committee uses the following criteria in nominating individuals for Research Assistantships:

1. Academic standing, including current GPA.
2. Description of goals to be accomplished during the period of the RA
3. Progress Report evaluation- The student's progress will be rated each semester. An "inadequate" rating may preclude a student from receiving an assistantship renewal.
4. Type of degree program. For students that are of nearly equal standing, PhD students who have advanced to candidacy are given priority over PhD students who have not yet advanced and over MS students. MS students are given priority over MA students.
5. Letters of support from research mentor and any additional materials (publications, presentations, etc.).
6. Term of the student's graduate program. Students nearing the end of their graduate program that could greatly benefit from a Research Assistantship may be given a modest priority.

F.3.b.4) Reporting requirements

A student who had an RA appointment in the prior year must submit to the Graduate Program Coordinator a summary (maximum 2 pages) of the work that was completed, including any grant applications or manuscripts resulting from the work. Since RAs are usually effective until May 31, students should also include a plan for the work to be completed in the remaining months. The summary should correspond to the description and outcomes provided in the original application. If the work accomplished differed from that described in the original proposal, an explanation of why the changes were made must be provided. If the student is applying for a new RA, this summary should be attached to the application.

In addition to the student's report, the Research Mentor should also write a brief letter evaluating the student's performance as an RA. These evaluations will be added to the student's permanent file and will be considered in decisions about future assistantship awards.

F.3.c) Dissertation Fellowships

Dissertation fellowships are for PhD students in the last year(s) of their programs. During the writing phase of the dissertation, PhD students are encouraged to apply for University Dissertation Fellowships; these fellowships do not require students to carry out any instructional or research duties, other than those associated with their thesis or dissertation research. Dissertation Fellowships are available for one or two years. Students must have advanced to candidacy (have completed their oral exams) before applying. The Department of Biology allows students to apply for a Dissertation Fellowship for a sixth year of support, so students may apply in their third, fourth, or fifth years of the program. To apply, the student must be nominated by the Department of Biology; the Department can only nominate two students each year, so an internal competition will be used to decide who can apply. Students interested in applying should send a letter describing how the Dissertation Fellowship would be used along with their CV to the Graduate Program Coordinator; internal applications will be evaluated by the GAC. Deadline for internal application: January 1st. Deadline for University application: usually late January. Please see the Dissertation Fellowship webpage (Graduate Education > Graduate Scholarships, Fellowships and Assistantships) for current packet requirements and deadlines.

F.3.d) Diversity Fellowships

These fellowships are awarded by the University to newly accepted MS and PhD students whose presence will improve diversity at the University or in their particular discipline. The award includes an 11-month stipend, a tuition scholarship of 18 hours during the regular academic year and three hours during the summer session, and health-insurance; summer

attendance is mandatory. The student must be nominated by the Department of Biology; only a single student may be nominated per year. The award is for a maximum of two years for a Master's degree recipient and four years for a Doctoral degree recipient. Further information on Diversity Fellowships is available from the Graduate Education website ([Graduate Education > Graduate Scholarships, Fellowships and Assistantships](#)).

F.3.e) Presidential Fellowships

These University awards are given to outstanding newly-accepted MS and PhD students who hold exceptional promise for success in their graduate studies. Awards include an 11-month stipend, a tuition scholarship of 18 hours during the regular academic year and three hours during the summer session, and health-insurance; summer attendance is mandatory. The student must be nominated by the Department of Biology; only a single student may be nominated per year. The award is for a maximum of two years for a Master's degree recipient and four years for a Doctoral degree recipient. Further information on Presidential Fellowships is available from the Graduate Education website ([Graduate Education > Graduate Scholarships, Fellowships and Assistantships](#)).

F.3.f) Other Fellowships/Scholarships

Students may receive financial support from outside sources. The terms of such fellowships/scholarships will be specified by the award sponsor. In general, students with fellowship support will pursue their degree requirements, but will not be obliged to carry out any instructional or research duties, other than those associated with their thesis or dissertation research. The terms of appointment, continuation, and maximum support will be governed by the terms for teaching assistantships, unless there are overriding conditions specified by the fellowship sponsor.

F.3.g) Grant-supported Research Assistantships

Faculty members will sometimes agree to pay a graduate student's stipend and health insurance from grant funds. In such cases, the faculty member can petition the College of Arts and Sciences Dean for tuition remission for that student. Tuition remission may or may not be provided, depending upon funds available from the Dean for this purpose. Duties of students on Grant-supported Research Assistantships will be outlined by the faculty mentor in accordance with the goals of the funded project.

G. CENTER FOR TEACHING EXCELLENCE

Graduate students are encouraged to take advantage of the [Reinert Center for Transformative Teaching and Learning](#). The Reinert Center is both a place and a concept. It is designed to improve teaching skills through consultation, collaboration and presentation. Teaching Assistants who participate in the seminars and other services can earn a Certificate in University Teaching Skills.

H. FORMS AVAILABLE ON THE DEPARTMENT OF BIOLOGY WEB SITE

<https://www.slu.edu/arts-and-sciences/biology/student-resources/graduate-student-resources.php>

- 1) Biology Graduate Coursework Requirements and Worksheet – this lists required courses for students in MA, MS and PhD programs and provides a framework for students to assess their progress in completing them. For further details on requirements of each program, please consult the Graduate Handbook.
- 2) Selection of Graduate Mentor and Thesis/Dissertation Committee. This form is to be filled out by the student and applies only to MS and PhD students. MS and PhD students are expected to have a committee formed during their first semester in their program (normally Fall semester). Signatures are required from each committee member. The completed form should be forwarded to the Graduate Program Coordinator.
- 3) Progress Report_(for Thesis/Dissertation Committee meetings). This form is designed to monitor the student's progress in the graduate program. It is to be filled out by the student's mentor. The student is required to meet with their thesis/dissertation committee each semester (twice each year) unless otherwise indicated. This form requires signatures from each committee member. The completed form should be forwarded to the Graduate Program Coordinator for the student's permanent file.
- 4) Change of Mentor or Committee Members – use this form if you are changing your mentor or members of your Thesis or Dissertation committee.
- 5) Amending Program from MS to PhD. This form is to be used by a student wishing to switch from the MS to the PhD program. Please note requirements for this petition listed on the form.
- 6) Teaching Assistant Evaluation forms. This form is to be filled out by each faculty instructor or laboratory coordinator that has observed a graduate student in a teaching role, either in a classroom or a laboratory course. The completed form should be forwarded to the departmental office; a copy will be sent to both the student and the Graduate Program Coordinator, who after review will place the form in the student's permanent file.

I. ACADEMIC HONESTY:

The importance of academic honesty at the university level cannot be overemphasized, but in particular, the behavior of graduate students, who are obtaining advanced academic degrees, must be above reproach. The policy on academic honesty in the Graduate Education Catalog states:

“The University is a community of learning, and its effectiveness requires an environment of mutual trust and integrity. As members of this community, students share with faculty and administrators the responsibility to maintain this environment. Academic integrity is violated by any dishonesty in submitting an assignment, test, research report, or any other documentation required to validate student learning. In a case of clear indication of such dishonesty, the faculty member or administrator has the responsibility to apply sanctions to protect the environment of integrity.

Although not all forms of academic dishonesty are given here, the instances listed

below should be seen as actions that violate academic integrity:

- Soliciting, receiving, or providing any unauthorized assistance in the completion of any work submitted;
- Copying from another student;
- Using electronic devices to share information during an exam;
- Copying from a book or class notes during a closed-book exam;
- Submitting materials authored by or editorially revised by another person but represented as their own work;
- Copying a passage or text directly from a published source without appropriately citing/recognizing that source;
- Taking a test or doing an assignment or other academic work for another student;
- Securing or supplying in advance a copy of an examination without the knowledge or consent of the instructor;
- Falsifying or fabricating research data

Any clear violation of academic integrity will be met with sanctions. In a case of dishonesty within a course, the instructor may assign an appropriate grade and/or recommend further sanctions to the Dean, Associate Dean, or Center Director of the particular college, school, or center, who is then responsible for the final decision and notification of all associated parties. The final decision of the Dean, Associate Dean or Center Director may be appealed as described in “Procedures for Academic Appeals.”

Ethical behavior is also expected of students and faculty in the academic setting and extending into professional life. Sexual harassment will not be tolerated and will be sanctioned. Most disciplines require their students to complete an ethics requirement within the curriculum. Coursework or other training in ethical research is required of academic personnel involved in traineeship and investigative programs funded by a number of federal and other agencies.”

Within our department, honesty in research and its dissemination is particularly critical. Research misconduct, the fabrication or dishonest selection of data, plagiarism of text or figures, false entries into lab notebooks, etc... are all also considered forms of academic dishonesty.

Whether in the classroom, in research, or in preparation of theses and dissertations, academic dishonesty will not be tolerated. Any instance of academic dishonesty in our department may be considered grounds for dismissal from the graduate program.

Disability statement

Disability Accommodations apply to all academic aspects and assistantship-related duties of the graduate program. The university Disability Accommodations are described [here](#).

Connection between graduate assistantships and learning outcomes

The issues in the disability accommodations statement apply to all effort toward meeting responsibilities of graduate assistantships. Assistantships are a part of the graduate educational experience. In addition to potential for an assistantship to meet the doctoral program requirement for teaching, aspects of assistantships can lead toward several learning outcomes of the graduate program, such as being able to:

- Critically analyze primary literature articles by evaluating the scientific contributions of peer-reviewed publications in biology
- Effectively communicate scientific ideas
- Demonstrate professional integrity
- Use appropriate instrumentation and analytical methods to collect data
- Draw statistically valid conclusions from quantitative data
- Design novel research that advances knowledge of their field
- Conduct self-directed research

Because graduate assistantships support the learning experience and are an integral part of the academic program, students on assistantship are eligible for the same types of accommodations customarily associated with coursework, qualifying exams, etc.

Satisfactory and unsatisfactory ratings

All biology graduate students are rated at least once a year as making satisfactory or unsatisfactory progress. For MA students, ratings should be satisfactory if a GPA of 3.0 or higher is maintained and the student is making progress toward their degree. MS and PhD students are rated by their Thesis or Dissertation committees as described above for Progress Meetings. The progress report form allows ratings of “inadequate,” “adequate,” and “Exceptional.” An “inadequate” rating is considered to be the same as “unsatisfactory.” Students receiving ratings of “adequate” or “exceptional” are considered to have made satisfactory progress.

Students are rated as making satisfactory or unsatisfactory progress for Thesis Research and Dissertation Research courses in that formal grades of satisfactory or unsatisfactory will go on the transcript. Grades of “In progress” for Thesis Research and Dissertation Research are discouraged as of the 2022-23 academic year. Before submitting an unsatisfactory grade for a semester of Thesis Research or Dissertation Research, there should be a progress report meeting (as described above) for the semester in question so that the thesis or dissertation committee makes a collective decision on the progress. An unsatisfactory grade should not be assigned for Thesis Research or Dissertation Research unless that is consistent with the committee’s ratings on the progress report.

Students whose assistantship duties are separate from issues rated on Progress Reports may be rated separately for their supervisor for their assistantship. For example, the faculty of record for a course a student is a TA for should provide a rating (satisfactory or unsatisfactory) of whether the graduate assistant met their TA responsibilities.