

GRADUATE PROGRAM GUIDELINES

BIOLOGICAL SCIENCES DEPARTMENT

CALIFORNIA POLYTECHNIC STATE UNIVERSITY

SAN LUIS OBISPO, CALIFORNIA

Revised August 2020

The graduate guidelines of the Biological Sciences Department in this document supplement those given in the University Catalog and the Graduate Education website. The information given here pertains to departmental requirements for admission to the degree program, and to procedures and requirements for the pursuit of a Master's of Science degree in Biological Sciences. Other information regarding the requirements and procedures for admission to the University as a graduate student is given in the University Catalog.

DIRECTORY OF RESOURCES

Cal Poly Graduate Education (important information on everything: applying to the program, required forms, financial support, thesis formatting requirements, etc.):

<http://grad.calpoly.edu>

Cal State Apply (application website): <https://www2.calstate.edu/apply>

Graduate Program Coordinator:

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ADMISSION REQUIREMENTS

Applications are due annually on 1 February. This deadline is a departmental policy and differs from the university deadline listed in the current catalog. Admission is for Fall quarter only.

Note that students interested in the CIRM program are strongly encouraged to apply by January 1, as application review will begin on this date.

Admission Requirements:

In addition to Cal Poly university-wide admission requirements, admission into the graduate program in the Biological Sciences Department requires the following:

- A **minimum undergraduate G.P.A. of 3.0** in the last 90 quarter units (60 semester units) taken as an undergraduate. Candidates with lower GPAs are considered only with extenuating circumstances.
- Satisfactory scores on the **General Graduate Record Examination (GRE) Aptitude Test**. Scores should be at least at the 50th percentiles in each of the verbal, quantitative, and writing sections of the GRE. (Note that the Biology GRE Subject Test is NOT required for admission.) Candidates with GRE scores that do not meet these minimum requirements are considered only with extenuating circumstances.
- **Prerequisite courses**: one year of majors' introductory course work in biology and one course in each of the following areas: general chemistry, organic chemistry, physics, calculus, genetics, evolution. NOTE: If you have not taken one or more prerequisite courses, you may still be admitted with conditional status, and will be required to take the course at Cal Poly.
- **Three letters of reference** from persons familiar with recent academic or work performance of the applicant.
- A typed **Statement of Purpose** describing your reasons for pursuing graduate study in the Biological Sciences at Cal Poly, your specific areas of interest (including the name(s) of your prospective faculty research advisor(s) if applicable), and any other information you consider pertinent.
- A copy of the applicant's **Curriculum Vita** with contact information
- **Applicants to the regular MS program are strongly encouraged to contact prospective faculty advisors** before applying to the MS program. Admission to the regular MS program requires that an advisor agree to supervise an applicant. Faculty research interests can be found by browsing faculty profiles on the Biological Sciences Department website.

Application Checklist:

Application to Cal Poly's graduate program in Biological Sciences requires completion of the application process at Cal State Apply. You will need:

- i. **Official GRE General Exam score report** must be sent to Cal Poly Admissions (code 4038)
- ii. **Official transcripts** must be sent to Cal Poly Admissions
- iii. Upload **Statement of Purpose** to Cal State Apply
- iv. Upload **Curriculum Vita** with your contact information to Cal State Apply

- v. Arrange for **three letters of reference** to be uploaded to Cal State Apply (hard copy letters are not accepted; letters MUST be submitted directly by the letter writer to Cal State Apply. A page for entering the e-mail contact info of letter writers (who will then be sent a letter upload link by e-mail) is provided during the application process on Cal State Apply. Reminder e-mails can also be sent to letter writers by the applicant via Cal State Apply.

Application Timeline:

- Application completed and all Supporting Materials (including official transcripts sent from ALL institutions attended by the applicant for their undergraduate degree or any additional / supplemental university-level coursework) uploaded via Cal State Apply **by 1 February**;
- Eligibility determined by Admissions Office by March;
- Recommendation of acceptance communicated/decline into the program communicated by the Cal Poly Admissions Office by April via e-mail;
- Departmental financial aid (if applicable) offered by MyCalPoly portal by June.

CURRICULUM SUMMARY

The Biological Sciences Department offers programs leading to Master's of Science ("regular" M.S. or thesis-based program) and an interdisciplinary M.S. specialization in Regenerative Medicine ("CIRM" M.S. program) in collaboration with the Biomedical Engineering and Animal Science departments; this program consists of a year of coursework, a nine-month research internship at a partner institution, and a final capstone project for one quarter back at Cal Poly (see <https://regenmed.calpoly.edu> for more information). The M.A. program is no longer offered as of 2017.

Students interested in working toward a Teaching Credential in addition to a M.S. should contact the Teacher Preparation Coordinator (Dr. Ed Himelblau) in Biological Sciences immediately upon enrollment.

The program of study for all Master's Degrees must include 45 units of committee-approved graduate work. A grade point average of 3.0 or higher is required in all courses included in the Plan of Study (see *below*). The following courses cannot be taken by graduate students as part of the 45 units required in the study plan: Special Problems for Advanced Undergraduates (BIO 400) and Senior Project (BIO 461, BIO 462 or BIO 463). Descriptions of all courses are provided in the Cal Poly Catalog: <http://catalog.calpoly.edu/>

Note: The curricula below reflect the graduate curriculum of the 2019-21 Cal Poly Catalog.

Regular (Thesis-track) M.S.	Units	NOTES:
<i>Select two of the following:</i>	(8 units)	(1) At least 27 units of the study plan must be 500-level. The rest may be 500- or 400-level.
BIO 501 Molecular and Cellular Biology		(2) 32 units of course work must be taken in residence within Biological Sciences at Cal Poly.
BIO 502 Biology of Organisms		(3) No more than 9 units of BIO 599 can be used for credit toward the M.S. degree.
BIO 503 Population Biology		(4) Only 2 units of College Teaching Practicum (BIO 575) can apply toward the 45 unit degree requirement.
BIO 560 Graduate Professional Seminar	(2 units)	(5) Up to 3 units of BIO 500 (Individual Study) can be used toward the 45 unit degree requirement, as long as the project work for BIO 500 is a component of the student's MS thesis research project.
BIO 561 Proposal Writing for Biology Research	(3 units)	(6) Additional units of BIO 590 are strongly encouraged as electives (no limits).
BIO 590 Seminar in Biology	(3 units)	
BIO 591 Biology Colloquium	(2 units)	
<i>Select one of the following:</i>	(4 units)	
BIO 419 Analytical Methods in Ecology		
STAT 419 Applies Multivariate Statistics		
STAT 513 Applied Experimental Design and Regression Models		
STAT 523 Design and Analysis of Experiments I		
STAT 524 Applied Regression Analysis		
BIO 599 Thesis, with oral defense	(9 units)	
Elective courses at the 400- or 500-level *	(14 units)	
Total:	45	

* Electives can include any 400- or 500-level course at Cal Poly. The following courses are recommended as possible electives:

- BIO 562 (Data Management and Visualization, 3 units)
- Additional units of BIO 590 (no limits)
- Additional courses in Statistics (STAT)
- Up to 3 units of BIO 500 can be used for completing research toward projects outside your thesis research

M.S. Specialization in Regenerative Medicine Research

	Units
BIO 501 Molecular and Cellular Biology	(4 units)
BIO 509 Communicating Biology to General Audiences	(1 units)
BIO 534 Principles of Stem Cell Biology	(2 units)
BIO/ASCI/BMED 583 Research Experience For Regenerative Medicine Students	(2 units)
BIO/ASCI/BMED 593 Regenerative Medicine Research Internship	(9 units)
BMED 510 Principles of Tissue Engineering	(4 units)
BMED 515 Into to Biomedical Imaging	(4 units)
BMED 560 Cell Transplantation and Biotherapeutics	(2 units)
BMED 561 Cell Transplantation and Biotherapeutics Laboratory	(2 units)
<i>Select one of the following:</i>	(4 units)
STAT 513 Applied Experimental Design and Regression Models	
STAT 523 Design and Analysis of Experiments I	
STAT 524 Applied Regression Analysis	
<i>Select from the following:</i>	(6 units)*
ASCI 581 Graduate Seminar in Animal Science	(1)
BIO 574 Teaching Strategies for College Biology Laboratories	(1)
BIO 590 Seminar in Biology	(1)
BIO 591 Biology Colloquium	(1)
BMED 563 Biomed. Engineering Graduate Seminar	(2)
Approved Electives of 400-500- level courses	(5 units)
Total	45

NOTE:

*(1) Students must take at least one offering of ASCI 581, BIO 590, and BMED 561. The remaining up to 6 units may be from any combination of seminar courses.

MILESTONES

Graduate students should consult the timeline below and work with their research advisors and committee to plan and execute a successful project. Forms can be found at the Graduate Education website: <https://grad.calpoly.edu/checklist-forms/forms.html>

The forms occasionally change, so students should always look for the current version of forms on the website for [Graduation Education](#) and the [Biological Sciences Department MS Program](#) webpages.

- **WORKING Formal Study Plan & Advancement to Candidacy** (Grad Ed form, *due at end of Fall quarter of 1st year*): This form must be completed during first quarter of study (Fall quarter of the 1st year). Fill it out, go over it with your advisor, get your advisor's signature, and submit it to the Graduate Coordinator.
 - **Graduation Writing Requirement:** When completing the WORKING Formal Study Plan & Advancement to Candidacy form, you must indicate that you completed the [Graduation Writing Requirement \(GWR\)](#). If your undergraduate degree is from a CSU or UC institution, you are automatically waived from this requirement. If you scored 5.0 or above on the GRE Writing section, you are waived from this requirement. If your degree is from another university, you may request a waiver (available at the Cal Poly Writing and Rhetoric Center). Otherwise, you must fulfill the GWR by taking the Writing Proficiency Exam, which is offered once per quarter and costs \$35. You must complete this requirement during your first quarter of enrollment.
- **Graduate M.S. Thesis Committee** form (BIO Dept. form, *due at end of Winter quarter of 1st year*): This form lists the faculty members for your M.S. thesis committee. It must be completed by you, signed by all committee members, and submitted to the Graduate Coordinator by the end of your 2nd quarter of enrollment (Winter quarter of 1st year).
- **1st Committee Meeting** form (BIO Dept. form, *due at end of Spring quarter of 1st year*): This form is to be signed by your committee after the 1st meeting of your M.S. thesis committee. This meeting should occur in Winter or Spring quarter of your 1st year in the program. This form must be completed by you, signed by all committee members, and submitted to the Graduate Coordinator by the end of Spring quarter of your 1st year.
- **Annual Evaluation of Research Progress:** (BIO Dept form): Form must be completed and submitted to the Graduate Coordinator by the end of the third quarter of enrollment (spring of the first year), spring of the second year, and quarterly thereafter. This form will be e-mailed to you by the Graduate Coordinator in the quarter in which it is due. Students whose advisors evaluate them as making unsatisfactory progress toward the degree will be required to meet with the advisor and the Graduate Coordinator and/or Department Chair to make a plan for improving their progress. Students who receive unsatisfactory evaluations twice in a row will be dropped from the program. Note that students who complete their research but do not finish their thesis, then leave campus, will be given unsatisfactory evaluations unless they are continuing to work on the thesis at pace deemed satisfactory by the advisor.

- **FINAL Formal Study Plan** (Grad Ed form): Form must be completed within the first 3 weeks of the quarter in which you plan to graduate. Sign and collect signature of Advisor, then submit to the Graduate Coordinator. If the plan changes after filing, a new plan must be filed.
- **Master's Thesis Approval Form** (Grad Ed form): These forms are to be completed and submitted to Graduate Education after the completion of the written thesis and oral defense (thesis-track students), or Master's exam (Regenerative Medicine specialization students).

Additional milestones for regular M.S. degree students:

- **Approval of Thesis Proposal:** Written proposal must be approved by advisor and committee as soon as possible but no later than end of second quarter of enrollment.
- **Approval of Thesis Draft** by student's advisor and thesis committee: All members of the committee must provide comments and indicate approval of the draft (pending final edits) to students' advisor. *Note that students should submit the first draft of the thesis to the committee at least 3 months prior to the desired defense date.*
- **Scheduling the Oral Defense:** Once you have revised your thesis draft using all of your committee's input *and* your advisor has given you the green light to schedule the defense, you should work with your committee to find a 3-hour block of time that works for everyone. It is wise to also have a backup time in case the office cannot schedule your first choice due to room conflicts, etc. After this, contact Kristin in the department office and ask her to schedule your defense at your chosen time. *Note: You must submit your request for the thesis defense date at least two weeks prior to the requested date, along with an electronic copy of the thesis (see below).*
- **Submission of Thesis to Biology Office:** A copy of the revised thesis (that has been approved by your advisor and committee members) must be submitted to Kristin in the office at least 2 weeks prior to your scheduled defense date. This thesis draft should be in the format indicated by the Graduate Education website (note: this should *not* be a rough draft. This draft should be very close to final.).
- **Oral Defense of Thesis:** Must take place no later than the ninth week of graduation quarter in order to allow time for revision before submission deadline (see below).
- **Approval of Final Thesis** by student's advisor and thesis committee: Form with signatures submitted to Graduate Education Office along with thesis and digital archiving fee by quarterly deadline (see deadlines and more specific information on thesis submission at <http://grad.calpoly.edu/forms>).
- **Approval of Thesis Format** by Graduate Education Office

CHOICE AND ROLE OF ADVISOR AND COMMITTEE

The Graduate Advisor for a M.S. (thesis) student is involved in helping the student with his/her Study Plan, selecting and planning the thesis research project, and selecting a Thesis Committee. The advisor has the responsibility of approving the Request for Advancement to Candidacy as well as the Study Plan.

M.S. students in the Regenerative Medicine Specialization will be assigned a faculty mentor from Biological Sciences, Biomedical Engineering or Animal Science. The mentor helps the student with his/her Formal Study Plan, assists in preparing students for the internship, provides guidance during the internship, and approves the capstone project. The mentor also assigns grades for the internship and

project, and has the responsibility of approving the WORKING Formal Study Plan & Advancement to Candidacy plan as well as the FINAL Formal Study Plan.

The Thesis Committee is composed of the Graduate Advisor and at least two other members selected by the advisor and the student. The Graduate Advisor must be a tenure-track faculty in Biological Sciences. Cal Poly faculty members from outside the department are permissible as committee members; however, a majority of the committee must be comprised of faculty members of the Biological Sciences Department. The Department Chair is an ex officio member of all thesis committees. Additional persons outside the Biological Sciences Department may serve in a consultative capacity as non-voting members, if approved by the official committee members. The functions of the student's Thesis Committee include helping the student develop a suitable plan of coursework and thesis project, evaluating the oral defense of the thesis, and approving the thesis.

Thesis students are urged to select members of the Thesis Committee carefully, so that the committee is composed of a well-balanced set of experts who can advise the student in the various fields encompassed by the research project. To ensure continuity of advice and feedback, the committee should remain intact throughout the graduate program of each student. Unavoidable changes in committee composition and/or thesis topic must be mutually acceptable to all persons involved. Students should schedule a formal committee meeting as soon as possible to discuss the study plan and approve the thesis proposal. Subsequent meetings should be held annually to check progress. If a student would like to change advisors or a faculty member wishes to dismiss a student, a formal written request for change must be submitted to the Graduate Coordinator by either the student or advisor. The Chairs of the departmental Graduate Coordination Committee (GCC) and Department will meet with both the advisor and student to determine whether the dispute can be resolved. If both the student and the faculty advisor agree, the GCC will evaluate the request.

WORKING FORMAL STUDY PLAN & ADVANCEMENT TO CANDIDACY FORM

At the time of initial enrollment in the Biological Sciences Department graduate program, each student will prepare, with the help of their Faculty Advisor and Graduate Coordinator, the [Working Formal Study Plan & Advancement to Candidacy Form](#). The Working Study Plan outlines the courses the student plans to take to complete the required 45 units of coursework for their M.S. degree. All coursework must be completed with a GPA of 3.0 or higher. Successful completion of coursework with a GPA of 3.0 or higher is used as an indication of whether or not the student will be allowed to continue graduate studies in the Biological Sciences Department.

The Advancement to Candidacy is a step that clears the student to complete his/her degree. It certifies that 1) the Graduate Writing Requirement (GWR) has been completed, 2) the Working Formal Plan of Study correctly outlined and filed, 3) any conditions of admissions have been (or will be) completed. Students must complete the online E-form [Working Formal Study Plan & Advancement to Candidacy Form](#) during the 1st quarter (fall) of coursework in the graduate program.

FINAL FORMAL STUDY PLAN

The [Final Formal Study Plan](#) must be submitted within the first 3 weeks of the beginning of the quarter in which you plan to graduate. All background course work deficiencies should be completed by this time. Students should have satisfied the Graduate Writing Requirement by this time.

The Final Formal Study Plan must comply with minimal requirements and regulations of the California Education Code and Cal Poly regulations (see the University Catalog) as well as requirements of the Biological Sciences Department. These include:

1. Completion of a minimum of 45 units within 7 years after admission to the graduate program.
2. Completion of no less than 32 units in residence.
3. Completion of no less than 27 units in courses at the graduate 500-level.

ADDITIONAL REQUIREMENTS FOR THE M.S. PLAN

Students must complete a research thesis and complete 9 units of Thesis coursework (BIO 599). The thesis is based on a student's own research. Thesis (BIO 599) is open only to a graduate student having the approval of the student's Graduate Advisor.

Each M.S. student is expected to present a thesis proposal in both written and oral forms at a meeting with his/her Thesis Committee by their second quarter of enrollment. The student should provide the committee members with a copy of the research proposal at least two weeks before the meeting. The proposal should outline the overall research plan in sufficient detail so that the committee may evaluate its feasibility and acceptability as an appropriate research project. The Thesis Committee may require modification of a thesis proposal until all persons involved mutually agree upon the objectives, methodology, and other aspects of the proposal. Since the thesis proposal constitutes a formal statement of research to be completed for the degree, the student should have a reasonable expectation that the thesis will be acceptable if all elements of the proposal are completed in a satisfactory and timely manner.

Since the Thesis Committee assumes the responsibility of advising the student to assure the success of the student's research, the department expects that the student will seek regular reviews of the research by the Thesis Advisor as well as periodic reviews by the committee. The committee will provide constructive feedback such that potential excesses or deficiencies in the research become apparent to the student at a time when corrective measures can be taken to rectify any problems.

A complete and essentially final copy of the thesis must be provided to all committee members well in advance of (at least 6 weeks prior to) the time that the student would like to defend. The style of the thesis should follow that specified by the Graduate Education Office. The student, advisor and committee may reserve the right to reschedule the oral defense if the guidelines have not been met. The oral defense of the thesis should be scheduled no later than the ninth week of the quarter in which a student plans to graduate. Failure to meet this deadline may mean that the student will not graduate that quarter. The time and place of the thesis defense must be announced to all faculty and the graduate student body of the department no less than two weeks prior to the date of the defense. This announcement will be accompanied by an electronic version and hard copy of the thesis draft (placed in the mail room). The thesis defense will be open to all interested individuals. The student should be prepared to give a seminar discussing the immediate and related subject areas as well as the results of the thesis. After that seminar, the student will meet with his/her committee for a more in-depth discussion of the thesis (defense). The committee may require modifications to the thesis following the

defense. The student is expected to have any such modifications reviewed by his/her committee before submitting a final draft of the thesis to the Graduate Education Office. Once the Graduate Education Office approves the thesis, it must be submitted to the library (Digital Commons) electronically. See the Graduate Education website for specific instructions.

Students in the MS. Specialization in Regenerative Medicine are not required to complete a thesis or present a defense on campus. Instead, they write an Internship Report and deliver oral presentations on their internship research both at their host institution and at Cal Poly. In addition, they deliver an oral presentation on their capstone project at Cal Poly, and present a poster on their research at a statewide CIRM (California Institute for Regenerative Medicine) symposium.

OTHER REQUIREMENTS FOR GRADUATION

1. All graduate students are required to **maintain a GPA of 3.0 or higher in all courses** included on the Final Formal Study Plan. A GPA below 3.0 for two sequential quarters of enrollment will result in the GCC reviewing the student's record(s) and the possibility of recommending to the office of the Dean of the College of Science and Mathematics the dismissal of the student.
2. All graduate students must fulfill the [Graduation Writing Requirement \(GWR\)](#) as specified by the Trustees of the CSU system.
3. Graduate students are required to maintain [continuous enrollment](#) from the time of first enrollment in a graduate program until completion of the degree. Continuous enrollment is defined as being enrolled during Fall, Winter, and Spring quarters each year. Students can maintain continuous enrollment by being enrolled as a regular student, by obtaining approval for an education or medical leave prior to the quarter when such a leave would begin, or by registering in a special course through Extended Education. [GS 597](#) is a one-unit course, offered credit/no credit; credits in GS 597 do not count toward meeting degree requirements. GS 597 is only to be taken by students who have completed the coursework on the formal study plan and who are no longer conducting research on campus. Students who have completed the formal study plan but who are still conducting research on campus should register for BIO 599 units through regular registration (not Extended Education). Students who do not register in at least one unit for two consecutive quarters may be discontinued; formal reapplication and readmission will have to occur in order to reactivate student status. Students who fail to fulfill this continuous enrollment requirement will be not be permitted to graduate—even if all other degree requirements have been completed—until payment has been made for all quarters of non-enrollment (in the event of discontinuation, students must also reapply and be readmitted). This requirement is retroactive to Fall 2009. In addition, all graduate students must be enrolled the quarter they graduate. If a student plans to graduate in summer, Cal Poly requires enrollment in GS 597 during that same summer session.

ADDITIONAL EXPECTATIONS OF GRADUATE STUDENTS

Graduate programs include a variety of academic experiences beyond formal course work. Ideally these experiences should occur in an environment with scholarly exchange of ideas and information between faculty and students as well as among peers. Several activities are organized by the Biological Sciences Department to foster scholarly exchange, and graduate students are expected to participate.

The Biological Science Department conducts a weekly seminar series (Fridays 11am-12noon) in which notable off-campus experts from various fields are brought to campus to give seminars and interact with students. The visiting scientists often consult with graduate students concerning their thesis projects. Graduate students are expected to attend Friday weekly seminars in the Biological Sciences Department.

As part of the culminating experience of a M.S. student's thesis program he/she must present a formal seminar on his/her research project at a "thesis defense." This seminar is open to the public and is a venue to showcase the student's work as well as serve as a guide for the student's thesis committee members whether the student has satisfactorily completed his/her thesis requirements. Attendance at thesis defense seminars is an important part of the scholarly exchange process and provides a positive showing of support for one's colleagues. Graduate students are expected to attend thesis defense seminars of other students, when allowable by their own coursework and/or TAing schedule availability.

Informal interactions are also important to the learning process. We strongly encourage students to discuss ideas, concepts, and even key publications with their fellow students and with faculty. These interactions often lead to unanticipated insights and can even change research directions.

TIMELINE FOR FINISHING IN TWO YEARS

Timely progress toward degree completion is an expectation of students in the MS program. Presented on the next pages are sample timelines for completing the coursework and research required to finish the MS program in two years. Every student's progress will differ based on individualized plans of study (i.e., coursework) and research thesis project goals. Please consult with your advisor and the Graduate Coordinator to plan your progress and consult with these sample timelines regularly to assist with course planning and conduct quarterly checks of your degree progress.

M.S. Biological Sciences Program - *Sample Course Sequence for Graduation in 4 Quarters:*

	Summer Before Year 1	Year 1			Summer Before Year 2	Year 2		
		Fall	Winter	Spring		Fall	Winter	Spring
Suggested Coursework	None	<i>Required:</i> BIO 560 (2) BIO 591 (1) ¹ <i>Suggested additional courses:</i> BIO 500 (1 or 2 units) BIO 590 (1 or 2 units) BIO 599 (1-3 units) Elective(s) at 500 or 400-level (2-6 units) Total units: 10-12	<i>Required:</i> BIO 501 (4) or BIO 502 (4) ² BIO 561 (3) BIO 591 (1) ¹ <i>Suggested additional courses:</i> BIO 590 (1 or 2 units) BIO 599 (3) Elective at 500 or 400-level (3-4 units) Total units: 14	<i>Required:</i> BIO 503 (4) ² BIO 591 (1) ¹ <i>Suggested additional courses:</i> STAT course (4) BIO 590 (1) BIO 500 (1 or 2 units) BIO 599 (3) 400- or 500-level elective (3 or 4) Total units: 12+	None (<i>Note: MSCI 410. Scientific Diving (3 units) is offered in summer, for interested students</i>)	<i>Required:</i> BIO 599 (3) <i>Suggested courses:</i> BIO 590 (1) BIO 591 (1) ¹ STAT course (4) 400- or 500-level electives Total units: 10-12+	GS 597 (1) ⁵	GS 597 (1) ⁵
Research Plan	Begin planning research w/ faculty advisor	<ul style="list-style-type: none"> • Complete and submit <i>Working Study Plan & Advancement to Candidacy</i> form • Complete <i>Graduate Writing Requirement</i> • Establish Thesis Committee • Develop research plan 	<ul style="list-style-type: none"> • Complete and submit <i>Thesis Committee</i> form • Write Thesis Research Proposal • Hold 1st Thesis Committee meeting • Begin research data collection ³ 	<ul style="list-style-type: none"> • Hold 1st committee meeting and complete and submit <i>1st Committee Meeting</i> form • Continue data collection 	<ul style="list-style-type: none"> • Continue research data collection & analysis 	<ul style="list-style-type: none"> • Collect & analyze data • Hold 2nd Thesis Committee meeting • Thesis writing 	<ul style="list-style-type: none"> • Thesis writing • Submit draft thesis to committee • Submit <i>Final Study Plan</i> form • Submit <i>Application for Graduation</i> 	<ul style="list-style-type: none"> • Submit final thesis to BIO dept and schedule oral defense ⁶ • Oral Defense of thesis research • Submit <i>Master's Thesis Approval Form</i> to Graduate Education

The coursework above is provided as a suggestion and will differ from student to student. For example, a course in statistics (STAT) may be taken at any time; spring is simply one option. All students should consult with their advisors and the Graduate Coordinator to plan their coursework.

¹ Only two (2) units of BIO 591 are required for graduation. However, we encourage students to take BIO 591 each quarter during year 1.

² At least two (2) of the following courses must be taken: BIO 501, BIO 502, BIO 503

³ The timing for beginning of data collection varies. To complete the MS program in 2 years, data collection should begin in the first year.

⁴ The course **GS 597** is a 'continuous enrollment' course. Once the 45 units of coursework are completed, graduate students may enroll in one (1) unit of **GS 597** each quarter unit graduation. For Fall 2020, the **GS 597** enrollment fee is \$349 per unit.

⁵ The thesis submitted to the BIO department office must be approved by the committee and submitted at least two weeks prior to the oral thesis defense

M.S. Biological Sciences Program - *Sample Course Sequence for Graduation in 3 Quarters*

	Summer Before Year 1	Year 1			Summer Before Year 2	Year 2		
		Fall	Winter	Spring		Fall	Winter	Spring
Suggested Coursework	None	<i>Required:</i> BIO 560 (2) BIO 591 (1) ¹ BIO 599 (1-3 units) Elective(s) at 500 or 400-level (2-6 units) <i>Suggested additional courses:</i> BIO 500 (1 or 2 units) BIO 574 (1) STAT course (4) Total units: 14-16	<i>Required:</i> BIO 501 (4) or BIO 502 (4) ² BIO 561 (3) BIO 591 (1) ¹ BIO 599 (1-3 units) <i>Suggested additional courses:</i> BIO 590 (1 or 2 units) Electives at 500 or 400-level (3-4 units) Total units: 14-17	<i>Required:</i> BIO 503 (4) ² BIO 591 (1) ¹ BIO 599 (3) BIO 590 (1 or 2 units) Elective course at 500 or 400-level (3-4 units) <i>Suggested additional courses:</i> STAT course (4) BIO 590 (additional; 1 or 2 units) BIO 500 (1 or 2 units) Total units: 14-17	None (Note: MSCI 410. Scientific Diving (3 units) is offered in summer, for interested students)	GS 597 (1) ⁵	GS 597 (1) ⁵	GS 597 (1) ⁵
Research Plan	Begin planning research w/ faculty advisor <ul style="list-style-type: none"> • Develop research plan 	<ul style="list-style-type: none"> • Complete and submit <i>Working Study Plan & Advancement to Candidacy</i> form • Complete <i>Graduate Writing Requirement</i> • Establish Thesis Committee • Develop research plan 	<ul style="list-style-type: none"> • Complete and submit <i>Thesis Committee</i> form • Write Thesis Research Proposal • Hold 1st Thesis Committee meeting • Begin research data collection ³ 	<ul style="list-style-type: none"> • Hold 1st committee meeting and complete and submit <i>1st Committee Meeting</i> form • Continue data collection 	<ul style="list-style-type: none"> • Continue research data collection & analysis 	<ul style="list-style-type: none"> • Collect & analyze data • Hold 2nd Thesis Committee meeting • Thesis writing 	<ul style="list-style-type: none"> • Thesis writing • Submit draft thesis to committee • Submit <i>Final Study Plan</i> form • Submit <i>Application for Graduation</i> 	<ul style="list-style-type: none"> • Submit final thesis to BIO dept and schedule oral defense ⁶ • Oral Defense of thesis research • Submit <i>Master's Thesis Approval Form</i> to Graduate Education

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¹ Only two (2) units of BIO 591 are required for graduation. However, we encourage students to take BIO 591 each quarter during year 1.

² At least two (2) of the following courses must be taken: BIO 501, BIO 502, BIO 503

³ The timing for beginning of data collection varies. To complete the MS program in 2 years, data collection should begin in the first year.

⁴ The course **GS 597** is a 'continuous enrollment' course. Once the 45 units of coursework are completed, graduate students may enroll in one (1) unit of **GS 597** each quarter unit graduation. For Fall 2020, the **GS 597** enrollment fee is \$349 per unit.

⁵ The thesis submitted to the BIO department office must be approved by the committee and submitted at least two weeks prior to the oral thesis defense