

MS IN BIOLOGICAL SCIENCES



SACRAMENTO STATE
Redefine the Possible

In Workflow

1. BIO Committee Chair (kneitel@csus.edu)
2. BIO Chair (kneitel@csus.edu)
3. NSM College Committee Chair (mikkel.jensen@csus.edu)
4. NSM Dean (datwyler@csus.edu)
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7. Faculty Senate Executive Committee Chair (kathy.garcia@csus.edu)
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9. Dean of Undergraduate (james.german@csus.edu; renee.leonard@csus.edu)
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11. President (sarah.billingsley@csus.edu)
12. Catalog Editor (catalog@csus.edu)
13. Graduate Studies (jdsmall@csus.edu; mxiong@csus.edu)
14. Registrar's Office (wlindsey@csus.edu)

Approval Path

1. Mon, 12 Sep 2022 15:12:13 GMT
Jamie Kneitel (kneitel): Approved for BIO Committee Chair
2. Mon, 12 Sep 2022 15:18:12 GMT
Jamie Kneitel (kneitel): Approved for BIO Chair
3. Wed, 21 Sep 2022 23:34:19 GMT
Mikkel Jensen (mikkel.jensen): Approved for NSM College Committee Chair
4. Wed, 21 Sep 2022 23:35:45 GMT
Shannon Datwyler (datwyler): Approved for NSM Dean

History

1. Apr 30, 2018 by clmig-jwehrheim
2. Jun 12, 2019 by Shannon Datwyler (datwyler)

Date Submitted: Tue, 06 Sep 2022 19:48:33 GMT

Viewing: MS in Biological Sciences

Last approved: Wed, 12 Jun 2019 15:48:43 GMT

Last edit: Tue, 06 Sep 2022 19:48:32 GMT

Changes proposed by: Jim Baxter (102010257)

Academic Group: (College)

Natural Sciences & Mathematics

Academic Organization: (Department)

Biological Sciences

Catalog Year Effective:

2022-2023 Catalog

Individual(s) primarily responsible for drafting the proposed degree major program:

Name (First Last)	Email	Phone 999-999-9999
Jim Baxter	jbaxter@csus.edu	916-278-4047

Type of Program Proposal:

Major

Program Change Type:

Substantive

Title of the Program:

MS in Biological Sciences

Designation: (degree terminology)

Master of Science

Briefly describe the program proposal (new or change) and provide a justification:

This program change eliminates concentrations from the MS in Biological Sciences and creates a single 30 unit MS in Biological Sciences degree. This change puts the MS degree into compliance with EO 1071. This proposal is being submitted together with a Form B for the MA in Biological Sciences.

The proposal: 1) eliminates concentrations in the MS degree and creates a single 30 unit MS in Biological Sciences; 2) changes the MS core to 14 units, the culminating experience to 6 units, and electives to 10 units; 3) creates a new introductory core course sequence (BIO 220A and BIO 220B, 3 units each); and 4) creates a new 1-unit seminar (BIO 294C).

In addition to achieving compliance, elimination of concentrations creates a more flexible, consistent, and sustainable curriculum for our graduate students and recognizes the interdisciplinary nature of biology and our students.

The proposed 6-unit core course sequence [BIO 220A Introduction to Scientific Inquiry (3 units) and BIO 220B Scientific Writing and Communication (3 units)] provides a stronger foundation and additional training for our graduate students in scientific inquiry and critical thinking, scientific communication (written and oral), development of their proposed thesis or project, and meeting graduate program requirements.

The proposed 1-unit seminar (BIO 294C Seminar in Biological Sciences) provides students with advanced training in the preparation and delivery of oral presentations of their thesis research or project.

The increased culminating experience units more accurately reflects the amount of time and effort required to complete the Thesis.

University Learning Goals**Graduate (Masters) Learning Goals:**

Critical thinking/analysis
 Communication
 Information literacy
 Disciplinary knowledge
 Intercultural/Global perspectives
 Professionalism
 Research (optional)

Program Learning Outcomes**Program Learning Outcomes****Learning Outcome**

- PLO 1. Communicate the findings of an original research investigation in the biological sciences and their broader significance.
 PLO 2. Critically analyze and synthesize findings in the biological literature and original research results and integrate those findings into an appropriate theoretical and discipline-specific context.
 PLO 3. Obtain, evaluate, and analyze findings in the biological literature as the basis for an original research proposal and investigation.
 PLO 4. Apply professional conventions, integrity, and ethics in the biological sciences, including professional interactions.
 PLO 5. Apply a global perspective to the interpretation of original research findings in the biological sciences.
 PLO 6. Design and conduct an original research investigation that makes a new contribution to the field of biological sciences.

Will this program be required as part of a teaching credential program, a single subject, or multiple subject waiver program (e.g., Liberal Studies, Biology) or other school personnel preparation program (e.g., School of Nursing)?

No

Please attach a Comprehensive Program Assessment Plan (required)

MS Assessment Plan - Biol Sciences V4.docx

Please attach a Curriculum Map Matrix (required)

MS Curricular Map - Biol Sciences V2.docx

Catalog Description:**Total units required for MS: 30****Program Description**

The Master of Science (MS) in Biological Sciences offers advanced training in the biological sciences through coursework and completion of an original research-based thesis. The MS degree prepares students for careers in education, government, and industry, as well as for doctoral programs or advancement in teaching, laboratory work, or fieldwork.

Faculty have specializations and expertise in a diverse range of areas within the biological sciences. Students work with a graduate faculty advisor to develop a coursework plan that meets their professional goals, design an original research investigation, and complete their thesis. A student's thesis research may be conducted on campus or at an off-campus location under the supervision of their faculty advisor.

The MS degree requires 30 credit hours of coursework, original research, and completion of a thesis that involves biological field and/or laboratory research.

For additional information regarding the MS in Biological Sciences, visit the Biological Sciences website (<http://www.csus.edu/bios/>).

Admission Requirements: Course prerequisites and other criteria for admission of students to the degree major program, and for their continuation in it.

Admission Requirements

Admission as a classified graduate student to the MS in Biological Sciences requires:

- a baccalaureate degree;
- completion of a major in biological sciences or closely related field; or completion of 24 units of upper division biological sciences courses or courses in closely related fields, each of which must be passed with a "C-" or better;
- a minimum GPA of 2.75 in all biology courses and a minimum GPA of 3.0 in upper division biology courses; and
- a faculty member who has agreed to serve as the applicant's graduate advisor.*

It is important to note that meeting all admission requirements does not guarantee acceptance into the graduate program. Applicants who have deficiencies in admission requirements (e.g., GPA, coursework) that can be removed by specified additional preparation may be admitted with conditionally classified graduate status. Admission as a conditionally classified graduate student does not guarantee fully classified status. Fully classified graduate status is conferred when all deficiencies identified at the time of admission are removed. Any deficiencies in admissions requirements will be noted in a written communication to the applicant.

**For your application to be considered for admission, a faculty member in the Department must agree to serve as your graduate advisor. This requires that you correspond directly with a faculty member with whom you would like to study. We recommend that you do this well ahead of the application deadline to allow sufficient time for correspondence. In your application, you will be asked to enter the name(s) of the faculty member(s) with whom you would like to study and have been in correspondence.*

Admission Procedures

To be considered for admission to the MS in Biological Sciences, all applicants must complete a Cal State Apply application by the posted application deadline date for the term applying and submit all requested application materials below.

A complete application for admission includes all of the following:

- an online application for admission;
- two sets of **official** transcripts from **all** colleges and universities attended, *other than Sacramento State*;
- a Department supplemental application (https://www.csus.edu/college/natural-sciences-mathematics/biology/_internal/_docs/biol-suppl-appl-2022.pdf);
- two letters of recommendation from persons qualified to judge the applicant's potential for successful graduate study; and
- a statement of purpose.

Applications are due by February 15. For additional university admissions information and application deadlines, visit the Office of Graduate Studies (<https://www.csus.edu/graduate-studies/>). Approximately eight to ten weeks after receipt of all items listed above, a decision regarding admission will be mailed to the applicant.

Note: The Department of Biological Sciences currently does not have a call for admission in the spring semester. However, under exceptional circumstances an applicant may petition the department to begin graduate study in the spring. A petition for spring admission requires a compelling reason and support by a faculty member in the department. Please contact your potential graduate advisor (i.e., a faculty member in your area of interest) to discuss this option.

No units from the following are acceptable toward the Master's degree:

Code	Title	Units
BIO 106	Genetics: From Mendel to Molecules	3
BIO 194	Biology-Related Work Experience	6 - 12
BIO 195	Biological Internship	1 - 2
BIO 197A	Laboratory Teaching Assistant	1 - 2
BIO 197B	Laboratory Techniques	1 - 2
BIO 197C	Co-curricular Activities in Biology	1 - 2
BIO 198A	Honors Proseminar and Research	2
BIO 198B	Honors Research and Seminar	2
BIO 199A	Introductory Undergraduate Research	1 - 2
BIO 199B	Directed Readings	1 - 2

Minimum Units and Grade Requirements for the Degree

Units required for the MS: 30

Minimum Cumulative GPA: 3.0

Advancement to Candidacy

The Advancement to Candidacy process serves to ensure that the student is qualified for and making good progress toward successfully completing their master's degree. Each classified graduate student must file an application for Advancement to Candidacy, indicating a proposed program of study, and receive approval for their proposed thesis research. This procedure can begin as soon as the student has:

- removed any deficiencies in admission requirements (i.e., attained fully classified status);
- completed at least 12 units in the graduate program with a minimum 3.0 GPA, including at least one course at the 200-level;
- completed an acceptable draft of the proposed thesis; and
- taken the Writing Placement for Graduate Students (WPG) or taken a Graduate Writing Intensive (GWI) course in their discipline within the first two semesters of coursework at California State University, Sacramento or secured approval for a WPG waiver.

Advancement to Candidacy forms are available on the Office of Graduate Studies website. The student must fill out and submit the form after planning a degree program in consultation with his/her graduate advisor and supervisory committee. After approval by the Department's Graduate Coordinator, the completed form is sent to the Office of Graduate Studies for approval.

Note:

Supporting Fields: A maximum of 10 units from an approved supporting field (e.g., Chemistry, Physics, Environmental Studies, Geology, Physics) may be counted toward the MS in Biological Sciences; graduate advisor and Graduate Committee approval must be obtained **before** taking any of these course(s).

No more than 12 units of BIO 299 and BIO 500 may be applied toward the 30 unit requirement.

Each student who receives an MS in Biological Sciences must submit a Thesis based on original research in biology. A thesis can be based on either of the following sources of data:

- data generated by the student's original research, in which the student performs the fieldwork or laboratory experiments; and/or
- data obtained from sources other than the student's own fieldwork or laboratory experiments, provided that the data are analyzed in an original way.

The use of data must result in an original contribution to the problem being investigated.

All requirements for the Master's degree must be completed within seven (7) years starting from the time the first course is used to meet the Master's degree requirements.

As defined by policy <http://www.csus.edu/umannual/acadaff/fsm00010.htm>, a change in units constitutes a substantive change to the program. If your changes constitute a substantive change, please refer back to the "Program Change Type" field above to ensure that "Substantive" is selected.

Program Requirements: (If new courses are being created as part of a new program, it will be useful to propose courses first.)

Program Requirements ¹

Code	Title	Units
Required Core Courses (14 Units)		
BIO 220A FOUNDATIONS IN SCIE	Course BIO 220A FOUNDATIONS IN SCIENTIFIC INQUIRY Not Found	3
BIO 220B SCIENTIFIC WRITING AND COMMUNICATION	Course BIO 220B SCIENTIFIC WRITING AND COMMUNICATION Not Found	3
BIO 294A	Seminar in Molecular and Cellular Biology ²	1
or BIO 294B OR BIO 294C	Course BIO 294B OR BIO 294C Not Found	
BIO 299	Problems in Biological Sciences ³	1 - 4
Culminating Experience (6 Units)		
BIO 500	Master's Thesis	6
ELECTIVE COURSES (10 Units)		10

Select electives in consultation with graduate advisor ⁴

Total Units

30

- 1 The 30 units must include a minimum of 18 units of 200-level seminar courses.
- 2 Students must take BIO 294 two times to fulfill degree requirements. Two additional units of BIO 294 may count toward the elective requirement.
- 3 Students must complete 6 units of BIO 299 to fulfill degree requirements.
- 4 Approved electives in Biological Sciences or supporting fields. Electives must be selected in consultation with the graduate advisor and approved at the Advancement to Candidacy meeting. Up to six units of upper division (100-level) coursework taken as a graduate student in the program may be applied to the MS degree.

For graduate programs, the number of declared undergraduate major and the degree production over the preceding years of the corresponding baccalaureate program:

NA

Fiscal Impact to Change an Existing Program

Indicate programmatic or fiscal impact which this change will have on other academic units' programs, and describe the consultation that has occurred with affected units:

None

Provide a fiscal analysis of the proposed changes:

NA

How will the above changes be accommodated within the department/College existing fiscal resources?

NA

Will the proposed changes require additional resources?

No

What additional space, equipment, operating expenses, library, computer, or media resources, clerical/technical support, or other resources will be needed?

None

Estimate the cost and indicate how these resource needs will be accommodated:

NA

Key: 302