

MS IN BIOLOGICAL SCIENCE (MOLECULAR AND CELLULAR BIOLOGY)

In Workflow

1. BIO Committee Chair (kneitel@csus.edu)
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10. Graduate Studies (jdsmall@csus.edu)

Approval Path

1. Tue, 24 Sep 2019 22:07:01 GMT
Jamie Kneitel (kneitel): Approved for BIO Committee Chair
2. Wed, 02 Oct 2019 22:21:43 GMT
Jamie Kneitel (kneitel): Approved for BIO Chair
3. Wed, 02 Oct 2019 22:44:08 GMT
Thomas Krabacher (tsk): Approved for NSM College Committee Chair
4. Wed, 02 Oct 2019 22:58:20 GMT
Shannon Datwyler (datwyler): Approved for NSM Dean
5. Fri, 11 Oct 2019 20:08:27 GMT
Janett Torset (torsetj): Approved for Academic Services

History

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

Date Submitted: Wed, 18 Sep 2019 17:19:07 GMT

Viewing: MS in Biological Science (Molecular and Cellular Biology)

Last approved: Wed, 12 Jun 2019 15:23:43 GMT

Last edit: Wed, 02 Oct 2019 22:43:34 GMT

Changes proposed by: Jamie Kneitel (102041418)

Academic Group: (College)

Natural Sciences & Mathematics

Academic Organization: (Department)

Biological Sciences

Catalog Year Effective:

2020-2021 Catalog

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

Name (First Last)	Email	Phone 999-999-9999
Jamie Kneitel	kneitel@csus.edu	916-278-6535

Type of Program Proposal:

Major

Program Change Type:

Non-Substantive

Title of the Program:

MS in Biological Science (Molecular and Cellular Biology)

Designation: (degree terminology)

Master of Science

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

This program was out of compliance with Executive Order 1071. Including Bio 221A or Bio 221B in the Core resolves this.

Objectives of the degree program:

To provide students with research experiences and advanced study in Cell and Molecular Biology.

University Learning Goals

Graduate (Masters) Learning Goals:

Critical thinking/analysis
Communication
Information literacy
Disciplinary knowledge
Research (optional)

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

Catalog Description:

Total units required for MS: 30 includes units required in areas of concentration.

Program Description

The graduate programs in Biological Sciences lead to either a Master of Arts (MA) or a Master of Science (MS) degree and provides an opportunity for students to receive advanced training and to pursue independent investigations in particular fields of biology. It allows students to upgrade their qualifications for educational advancement to doctoral programs or for professional advancement in teaching, laboratory work, or fieldwork. The MA degree requires the completion of a project which is a Grant Proposal, unless the student is in the Stem Cell Concentration which requires an Internship Project Report. The MS degree requires completion of a thesis which has concentrations in Ecology, Evolution and Conservation and in Molecular and Cellular Biology so as to provide advanced training and research experience in these fields.

All students are required to complete a project or thesis involving field, laboratory, or literature research. The project or thesis research may be conducted on campus with a biology faculty member or at an off-campus location. In either case, the student's research must make a new contribution to the field of biology. If the research is conducted off campus, a biology faculty member must be identified as the student's graduate advisor. Following admission to the program, students are advised by a temporary graduate advisor or by the faculty member who has agreed to supervise the student in their project/thesis research. Students should plan their academic programs in consultation with a graduate advisor as early as possible, preferably prior to enrollment in the program.

For additional information regarding the Biological Sciences Graduate Program, students may contact the Biological Sciences Department Office, Biological Sciences website (<http://www.csus.edu/bios/>), or consult the Biological Sciences Graduate Program Handbook, available through the Department's Web site.

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 MA or MS program 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;
- a faculty member who has agreed to serve as their graduate advisor (Note: For your application to be considered for admission, you must correspond with a faculty member in the department with whom you would like to work prior to the application deadline. We suggest you do this well in advance of the application deadline. You will be asked to enter the name(s) of the faculty member(s) with whom you have been in correspondence on the Department Application. This requirement does not apply to applicants to the MA Stem Cell Concentration);
- two letters of recommendation from persons qualified to judge the applicant's potential for successful graduate study; and
- a statement of purpose.

It is important to note that meeting all admission requirements does not guarantee acceptance into the graduate program. Students who have deficiencies in admission requirements that can be removed by specified additional preparation, or who have not been accepted by a graduate advisor, 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 and a biology faculty member has agreed to serve as their thesis advisor. Any deficiencies in admissions requirements will be noted on a written response to the admission application.

Admission Procedures

Applicants must complete a university application by the posted application deadline date for the term applying. :

- an online application for admission; and
- two sets of **official** transcripts from **all** colleges and universities attended, *other than Sacramento State*.

For more admissions information and application deadlines, please visit <http://www.csus.edu/gradstudies/>.

In addition, all prospective graduate students must submit the following application materials directly to the Department of Biological Sciences:

- an online departmental application for admission;
- one set of **unofficial** transcripts from **all** colleges and universities attended, *other than Sacramento State*;
- two letters of recommendation; and
- a statement of purpose.

Departmental applications for admission are due February 1. There is currently **no general call for admission for students to begin in the spring semester**. However a student may **petition** the department to begin the **spring**. Please contact your potential graduate advisor (i.e., a faculty member in your area of interest) to discuss this option. Approximately eight to ten weeks after receipt of all items listed above, a decision regarding admission will be mailed to the applicant.

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 includes units required in areas of concentration

Minimum Cumulative GPA: 3.0

Advancement to Candidacy

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

- removed any deficiencies in admission requirements;
- completed at least 12 units in the graduate program with a minimum 3.0 GPA, including at least one course at the 200-level;
- begun a preliminary study for the thesis or project; 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.

An Application for Advancement to Candidacy forms are available on the Office of Graduate Studies website and the Department of Biological Sciences Web site. The student fills out the form after planning a degree program in consultation with his/her Biological Sciences graduate advisor. After approval by the Biological Sciences Graduate Committee and the student's thesis committee, the completed form is returned 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 degree, with graduate advisor and graduate committee approval obtained **before** taking the course(s).

No more than 10 units of BIO 299 and BIO 500 may be applied toward the 30 unit requirement.

Each student who receives a Master's of Science degree from the Department of 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 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 (12 Units)		
BIO 220	Introduction to Scientific Inquiry ¹	2
BIO 294A or BIO 294B	Seminar in Molecular and Cellular Biology ² Seminar in Ecology, Evolution and Conservation	1
BIO 299	Problems in Biological Sciences ³	1 - 4
BIO 221A or BIO 221B	Cell and Molecular Methods and Techniques Methods in Ecology, Evolution and Conservation	2
Culminating Requirement (4 Units)		
BIO 500	Master's Thesis	4
Additional Requirements for Concentrations (16 Units)		
Select a concentration from the following:		16
No Concentration		
Ecology, Evolution and Conservation		
Molecular and Cellular Biology		
Total Units		32

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.

³ Students must complete 6 units of BIO 299 to fulfill degree requirements.

Concentration in Molecular and Cellular Biology (16 units)

Code	Title	Units
BIO 221A	Cell and Molecular Methods and Techniques	2
BIO 222	Molecular Biology	3
BIO 224	Genomics, Proteomics, and Bioinformatics	3
Select 8 units of approved electives ¹		8
Total Units		16

¹ 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 two additional units of BIO 294A (up to 4 total) 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:

n/a

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:

None

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

None

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

Key: 303