

MA IN BIOLOGICAL SCIENCE (STEM CELL)

Units required for MA: 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

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;
- GRE General Test scores (*note: the GRE is not required for the Stem Cell Program*);
- a faculty member who has agreed to serve as their graduate advisor;
- 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*;
- GRE General Test scores (**NOTE: GRE General Test scores will be accepted after the application deadline but only if the test was taken prior to the deadline; GRE scores are not needed for the MA Stem Cell Program**);
- 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 Requirement for the Degree

Units required for MA: 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 Web site 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.

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

Program Requirements¹
Concentration in Stem Cell (30 units)

Code	Title	Units
Required Core Courses (25 Units)		
BIO 220	Introduction to Scientific Inquiry 	2
BIO 221A	Cell and Molecular Methods and Techniques	2
BIO 222	Molecular Biology	3
BIO 224	Genomics, Proteomics, and Bioinformatics	3
BIO 225	Stem Cell Biology and Manufacturing Practices	1
BIO 227	Development and Regenerative Medicine	3
BIO 293	Research Conference	2
BIO 294A	Seminar in Molecular and Cellular Biology	1
BIO 299	Problems in Biological Sciences (course taken twice for a total of 8 units)	1 - 4
Culminating Requirement (2 Units)		
BIO 502	Master’s Project ²	2
Additional Requirements (3 Units)		
Select one of the following:		3
BIO 223	Human Molecular Genetics	

BIO 245	Host/Pathogen Interactions
BIO 247	Contemporary Topics in Immunology
BIO 282	Evolution
CHEM 230	Separation Methods in Chemistry
CHEM 145/245	Applications of Computational Chemistry
CHEM 260	Protein Biochemistry
CHEM 261	Nucleic Acid Chemistry

Total Units 30

¹ The 30 units must include a minimum of 18 units of 200-level courses.
² No more than 2 units of BIO 502 may be applied toward the 30 unit requirement.

Each student who receives a Master of Arts degree from the Department of Biological Sciences must submit a written project based on a research problem in biology under the supervision of a graduate advisor. A project can be based on either of the following:

- Grant Proposal: a research proposal in the format required by a state or federal granting agency (e.g., National Science Foundation, National Institutes of Health) based on a novel hypothesis that addresses a biological problem; **OR**
- Internship Project Report: a project report on the student’s internship experience.