

Proposal to Change the Academic Master Plan
Academic Planning Committee
(Short Form)

Name of Proposed Program:

Master of Science in Biology

Person Proposing the New Program:

Amy Denton, Asst. Professor of Biology
Nancy Mozingo, Assoc. Professor of Biology
Nitika Parmar, Asst. Professor of Biology
Ching-Hua Wang, Professor of Biology

Date of Proposal:

15 December 2006

Approvals:

Academic Planning Committee Approval:

Chair(s): _____

Date: _____

Academic Senate Approval:

Chair: _____

Date: _____

Administration Approval:

President or Designee: _____

Date: _____

Proposal to Change the Academic Master Plan (Short Form)

1. Program Name:

Master of Science in Biology

Academic Year of Implementation:

2009

Name of the program area or unit that would offer the proposed degree or program:

Biology

Name, title, and rank, of individual(s) primarily responsible for drafting the proposed degree program:

Amy Denton, Asst. Professor of Biology
Nancy Mozingo, Assoc. Professor of Biology
Nitika Parmar, Asst. Professor of Biology
Ching-Hua Wang, Professor of Biology

2. Description

Description of the degree program. Major subject matter elements of the program, core content areas, and representative courses taught. (250 words)

The mission of the Master of Science in Biology program is to provide students with the skills, knowledge and experience that will allow them to gain entry into a doctoral program or acquire employment in the public or private sector.

The Master of Science in Biology Program will require a minimum of 30 units of advisor-approved graduate work and will include graduate seminars, a professional development course and coursework related to specific sub-fields in Biology.

Similar to other Master of Science programs in Biology in the CSU, most of the curriculum will be tailored to meet individual student needs. The curriculum will be chosen in consultation with the student and a graduate advisor and will insure that students gain breadth in Biology and depth in a sub-field in biology.

Student Learning Objectives: Principal content and skills that students will learn in the program. (150 words)

1. Graduates from this program will develop comprehensive knowledge of the field of Biology.
2. Graduates from this program will develop in-depth knowledge in one or more of the sub-fields in Biology (e.g. Botany, Cell Biology, Developmental Biology, Immunology, Molecular Biology, etc).
3. Graduates from this program will develop expertise in contemporary lab and/or field techniques.
4. Graduates from this program will be able to communicate scientific content, ideas and original research (orally and in writing) in a clear, concise and effective fashion.

3. Justification

Other Universities and CSU campuses and that currently offer the proposed degree:

18 of the 23 CSU campuses offer a Master of Science in Biology degree (Bakersfield, Chico, Dominguez Hills, East Bay, Fresno, Fullerton, Long Beach, Los Angeles, Northridge, Pomona, Sacramento, San Bernardino, San Diego, San Francisco, San Jose, San Luis Obispo, San Marcos, Sonoma) and one of the campuses offers a Masters of Arts in Biology degree (Humboldt).

California Lutheran University and Pepperdine University do not offer Master's degrees in Biology.

UCSB offers Master of Arts degrees in either Molecular, Cellular and Developmental Biology (MCDB) or Ecology, Evolution and Marine Biology (EEMB).

Professional uses of the proposed degree program:

The Master of Science in Biology program will prepare students to enter doctoral programs in the biological sciences, to gain employment or advance in the Biotechnology industry, to gain employment in state/federal agencies (e.g. US Fish and Wildlife, California Department of Fish and Game) to teach at community colleges and will provide professional development opportunities for secondary teachers.

Community/Regional/Statewide need for the proposed program:

Projections from the US Department of Labor (USDOL) indicate that the market for post-secondary teachers will be strong in the coming years and that biological science is one of the areas in which job growth will be especially strong. Students completing the Master of Science in Biology degree will be prepared for teaching opportunities at

community colleges and/or will be prepared to enter doctoral programs from which they can gain employment at colleges and universities. According to the USDL, “Overall, employment of postsecondary teachers is expected to grow much faster than the average (increase over 27% between 2004 and 2014) for all occupations through 2014.” “...the best job prospects for postsecondary teachers are likely to be in fields where job growth is expected to be strong over the next decade. These will include fields such as business, health specialties, nursing, and biological sciences. Community colleges and other institutions offering career and technical education have been among the most rapidly growing, and these institutions are expected to offer some of the best opportunities for postsecondary teachers.”

According to Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2006-07 Edition*, Teachers—Postsecondary, on the Internet at <http://www.bls.gov/oco/ocos066.htm> (visited December 04, 2006).

Recently, the Employment Development Department of the State of California published a document detailing the job growth rates and training requirements for 36 types of biotechnology jobs in California. The majority of the jobs in the biotech industry require at least a bachelor’s degree level education in biological science/science. Many jobs also require graduates with master’s education. The projected growth rates for these jobs range from 8-99%, averaging 26.4% (2000 to 2010).

4. Enrollment:

The expected number of majors in the year of initiation and three and five years thereafter. Please identify the data source(s) for these projections.

	<u>Number of Students</u>	<u>Number of Graduates</u>
Initiation Year (2009):	10-12	0
Third Year (2011):	20	12
Fifth Year (2013):	40	20

Projections were based on an analysis graduate enrollment in other CSU Biology MS programs which is available from the Chancellor’s office.

5. Resources and Budget

- a. **Budget.** Costs estimated to be associated with the degree in the pre-implementation year, first, third and fifth year of operations. Provide narrative and justification.

	Pre-Implementation Year	First Year	Third Year	Fifth Year
Faculty: (By Rank)		9	11-12	14

Justification: The numbers above represent total numbers of Biology faculty for each year. Currently, Biology has sufficient numbers of qualified tenured/tenure-track faculty to plan the program. We anticipate that the Biology program will have ~9 tenured/tenure-track faculty members by 2009 and then will gain approx. 1 new position per year after that. These numbers do not represent needs based solely on implementation of the MS program, but instead represent needs based primarily on growth of the undergraduate program in Biology.

Staff: (By Job Class)	1 ASC	-	-
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Justification: Currently, Biology shares 1 Academic support coordinator (ASC) with several other disciplines. We anticipate that by 2009 we will need an ASC dedicated solely to the Biology program.

Equipment: see below

Instructional: see below
Justification:

Justification: Currently, we have budgeted approx. \$100,000 for undergraduate equipment and laboratory supplies (Equipment and Instruction). We anticipate that we will need an additional \$20,000 per year to support graduate instruction (Equipment and Instruction).

Program
Development: 6 WTU
2007/8
(Consultants, etc) academic year

Justification: To plan the curriculum and prepare the long form, the Biology Program will need 6 WTU in the 2007/08 academic year to allow faculty sufficient time to develop the program.

b. Facilities. Identify new facilities, building modifications and other physical and space needs associated with the new degree. Provide narrative and justification.

Pre-Implementation Year	First Year	Third Year	Fifth Year
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+ 4000 sq. ft. lab space /faculty

Justification: The Biology program is in need of space for faculty-supervised, graduate research and instructional space. To support 9 tenured/tenure-track faculty who will supervise graduate research, we anticipate that we will need approx. 700 square feet of graduate research/instructional space per faculty to initiate the program (The Biology Council of the CSU system recommends to have every new tenure-track faculty hire in Biology to be provided with 700 sf of lab space and the current CSU average for the biology programs is 300 sf per faculty). The space allocation for graduate students also calls for 240 sf of lab space per graduate student FTE with each FTE having 12 units of course load. Typically, Biology programs also have facilities for animal care, greenhouses, equipment rooms, prep rooms, and chemical stock rooms. In the following years, we will need additional space as the number of faculty and students increases.