



Master of Science in Biology
Graduate Student Guide
2015-2016

California State University, Bakersfield
Department of Biology

**CSUB Master of Science in Biology Program
Graduate Student Guide
2015-2016**

Table of Contents

	Page
1. INTRODUCTION.....	3
2. PROGRAM DESCRIPTION.....	4
3. GRADUATE PROGRAM PERSONNEL	5
4. APPLICATION PROCESS AND PROGRAM REQUIREMENTS	7
5. ADMISSION REQUIREMENTS.....	8
6. GRADUATE STUDENT CLASSIFICATIONS	8
Classified Graduate Status	
Conditionally Classified Graduate Status	
Advancement to Candidate Status	
7. COURSE REQUIREMENTS & COURSE DESCRIPTIONS.....	11
8. ADDITIONAL ACADEMICS INFORMATION	20
Mentoring	
Academic Course Load	
Continued Enrollment	
Concentration Outline	
Academic Continuation	
Non-thesis/Thesis Program Change	
Non-thesis Comprehensive Exam	
Thesis	
Commencement	
9. FINANCIAL ASSISTANCE.....	23
10. TIMELINE AND GRADUATE CHECKLIST.....	24
11. TWO-YEAR RECOMMENDED COURSE PLANS	27
12. APPENDICES	31
CSUB Biology Program Thesis Committee Membership Record	
Application for Advancement to Candidacy (Thesis)	
Application for Advancement to Candidacy (Non-thesis)	
Concentration Outline MS Degree (Non-thesis)	
Concentration Outline MS Degree (Thesis)	
Request for MS Program Non-thesis/Thesis Change	
Application for Admission to Classified Status	

1. INTRODUCTION

Greetings prospective and entering graduate students!

The Biology graduate faculty at California State University, Bakersfield (CSUB) developed this guide to introduce our Master of Science program in Biology. If you are considering CSUB as a possible choice for graduate school, this guide will give you some insight into our goals, curriculum, and strengths. If you are already admitted to our program, this guide will inform you of our policies, procedures, and requirements. We hope that this will be a useful tool toward determining and helping you to achieve your graduate school and professional objectives.

Todd McBride, Ph.D.
Professor and Chair

Anna L. Jacobsen, Ph.D.
Associate Professor and Biology Graduate Coordinator

2. PROGRAM DESCRIPTION

Department Chair: Dr. Todd McBride

Program Coordinator: Dr. Anna Jacobsen

Program Office: Science Building I, 114

Program Office Telephone: (661) 654-3089

Program Office email: vmayorga@csub.edu

Website: www.csub.edu/Biology

Graduate Faculty: I. Francis, D. Germano, J. Gillard, A. Jacobsen, C. Kloock, A. Lauer, T. McBride, R.B. Pratt, P. Smith, A. Stokes, K. Szick

The Department of Biology offers a graduate program leading to a Master of Science in Biology degree. The Master of Science with a thesis option is intended to prepare students for professional positions, such as in state and federal agencies and environmental consulting, and for further graduate studies. The Master of Science with a non-thesis option is intended for working professionals, especially public school teachers, and emphasizes course work. A broad range of faculty research interests, easy access to diverse biological environments, and a range of modern research facilities permit the student to select from a broad spectrum of research topics.

Faculty interests include field biology, conservation biology, physiology, comparative morphology, plant ecophysiology, plant anatomy, micro- and molecular biology, evolution, ecology, systematics, and behavior.

Some of the special features of our program include:

- Close, individual guidance by highly skilled faculty
- Incorporation of science pedagogy and teaching experience
- Late afternoon and evening course offerings, making the program accessible for persons who work during the day
- Close partnerships with the private and public sector. With appropriate approval, students will be able to conduct their thesis research off campus in a partnership with a company or governmental agency.
- Well-equipped, modern laboratory facilities and access to numerous field sites in the area

Laboratory and/or field research is an integral component of the program, which emphasizes a “hands-on” approach with close faculty mentoring. Research experience also enables students to hone investigative skills relating to experimental design, implementation, data analysis, and interpretation. On-campus research facilities include an ~20 acre Environmental Studies Area and two modern greenhouses. In addition, faculty research labs within the department contain state-of-the-art research facilities for physiology, molecular, genetics, biotechnology, histology/anatomy, and morphology research. This includes several growth chambers, an ultracentrifuge, digital gel documentation systems, three -70° C freezers, several thermal cyclers, a 2D protein analyzer, refrigerators, access to a shared scanning electron microscope (operated through the Department of Geology), and several research-grade light microscopes.

3. GRADUATE PROGRAM PERSONNEL

ASSOCIATE VICE PRESIDENT FOR ACADEMIC PROGRAMS — oversees all CSUB graduate programs; approves or disallows petitions to change or to grant waivers to the University and Department Graduate Degree Requirements as published in the CSUB Catalog.

DEAN OF NATURAL SCIENCES, MATHEMATICS AND ENGINEERING — provides input to faculty and students concerning the degree program.

DEPARTMENT OF BIOLOGY GRADUATE COORDINATOR — reviews admissions files and notifies Admissions and Records of departmental admissions decisions, advises incoming students, advises non-thesis students, administers non-thesis exams, coordinates graduate activities of the Department of Biology, and serves as the Biology Department liaison to other graduate programs and the Graduate Student Center.

DEPARTMENT OF BIOLOGY GRADUATE COMMITTEE — three-person committee (including Graduate Committee Chair) selected by the Department of Biology that oversees that program, reviews admissions files, and reviews petitions (e.g. admissions petitions or to extend the 5 yr program time to completion limit) submitted to the MS Biology program.

GRADUATE COMMITTEE CHAIR — a tenured or tenure-track faculty member from within the CSUB Department of Biology who oversees the acceptance, program establishment, progress, and completion processes as the advisor to a thesis student; resolves problems between thesis students and faculty and informs thesis students of departmental regulations; serves as final departmental quality control on thesis projects.

GRADUATE COMMITTEE — three-person committee (including Graduate Committee Chair) selected by the thesis graduate student that oversees progress and completion processes. This committee must contain at least two tenured or tenure-track faculty members from within the CSUB Department of Biology. One outside member of the committee is permitted as long as they are an expert within the student's field of research and have attained a minimum of a BS degree within their field of expertise.

GRADUATE FACULTY IN THE DEPARTMENT OF BIOLOGY*

NAME	INTERESTS
Dr. Isolde Francis	Phytobacteriology
Dr. David J. Germano	Vertebrate Biology, Ecology, Conservation Biology
Dr. Jeroen Gillard	Microbial Physiology and Genomics
Dr. Anna L. Jacobsen	Plant Structure Function, Plant Evolution and Ecology
Dr. Carl T. Kloock	Science Education, Behavioral Ecology
Dr. Antje Lauer	Microbiology, Marine Biology
Dr. Todd McBride	Human/Muscle Physiology
Dr. R. Brandon Pratt	Plant Physiological Ecology
Dr. Paul T. Smith	Entomology, Systematics & Evolution, Genetics
Dr. Amber Stokes	Chemical Ecology & Animal Physiology
Dr. Kathy Szick	Molecular and Cell Biology

*see the Department of Biology website for additional information about faculty and their research interests.

4. APPLICATION PROCESS AND PROGRAM REQUIREMENTS

Application for the Master of Science in Biology

To apply the Master of Science Degree in Biology, please visit www.csumentor.com to initiate the application process. In addition to the online application form, prospective students must provide the following:

1. Completed Departmental Application Form available from the Biology Department website: <http://www.csub.edu/biology/>
2. Official transcripts from all colleges and universities attended.
3. Score reports for the GRE General Test. International students must also submit TOEFL scores.
4. Three (3) letters of recommendation from persons familiar with your performance in the classroom and potential for independent research.

Application target dates:

For quarters (for admissions through Spring 2016):

Fall Quarter: March 15

Winter Quarter: September 15

Spring Quarter: January 15

For semesters (for admissions for all terms including Fall 2016 and beyond):

Fall Semester: March 15

Spring Semester: September 15

***Note, these are TARGET dates for priority admissions consideration and not DEADLINES. The department of Biology will review all completed applications that are submitted after these dates, provided that all materials are submitted and available for review at least two weeks before the start of classes for the desired entrance quarter/semester.

Send all completed departmental application materials to:

**Graduate Admissions
c/o Renee Rugnao
Office of Graduate Studies
California State University, Bakersfield
9001 Stockdale Highway
Bakersfield, CA 93311-1022**

Recommendation letters may be emailed as a pdf by references directly to Dr. Jacobsen at: ajacobsen@csub.edu and/or to Renee Rugnao at rrugnao@csub.edu

If you have any questions, please contact Dr. Jacobsen, the Biology Graduate Coordinator (email: ajacobsen@csub.edu; phone: (661) 654-2572).

5. ADMISSIONS REQUIREMENTS FOR THE MASTER OF SCIENCE IN BIOLOGY

1. A bachelor's degree in biological or related sciences from an accredited 4-year college or university.
2. An undergraduate GPA of at least 3.0 in the last 90 quarter or 60 semester units of course work.
3. Graduate Records Examination (GRE) scores that are at the 50th percentile or greater for both the verbal and quantitative sections.
4. Student has taken and passed with scores of a C or greater the following courses or their equivalent:
 - BIOL 301/3120 Research Design and Analysis
 - BIOL 304/3010 General Genetics
 - BIOL 305/3020 General Physiology
 - BIOL 306/3110 General Ecology
 - BIOL 470/4100 Evolution
5. Formal acceptance into the program following review of completed application materials by the Graduate Program faculty within the Department of Biology.

Students interested in pursuing the thesis-option are encouraged to contact individual faculty members to learn more about their research programs and/or to find out if they are accepting graduate students. Students will not be accepted directly into the thesis-track without having first obtained permission to join a laboratory from the requested thesis-advisor.

6. GRADUATE STUDENT CLASSIFICATIONS

Classified Graduate Student - Acceptance as a Classified Graduate Student indicates that space has been made available for the student within the program and that the student has met the minimum preparation requirements to commence the program as listed below.

1. An acceptable baccalaureate degree from an accredited institution.
2. An undergraduate GPA of at least 3.0 in the last 90 quarter (60 semester) units of course work and Graduate Records Examination scores of 50th percentile or greater (verbal and quantitative), or an approved petition to the Departmental Graduate Committee waiving this requirement by proposing other evidence of adequate prior academic preparation.
3. Acceptance into an academic advising relationship with a departmental faculty member (thesis-option).
4. Acceptance will only be granted if space is available for the student in the program.

Conditionally Classified Graduate Status - Students who fail to meet entirely one or more of the criteria for admission as a Classified Graduate Student may, at the discretion of the Biology Graduate Admissions Committee, be admitted as a Conditionally Classified Graduate Student. These conditions may include, but are not limited to, specific prerequisite courses, GPA, GRE scores, etc. Once the

student has "remedied" all conditions specified by the Biology Graduate Admissions Committee, the student classification will be changed to Classified Graduate Student.

Students admitted as a Conditionally Classified Graduate Student are not allowed to enroll in any 600- (6000-) level courses. They are restricted to 500- (5000-) and 400- (4000-) level courses for which they have met prerequisites.

Admission to Classified Status must be accomplished within two calendar years after acceptance as a Conditionally Classified Graduate Student. No more than three courses (15 units) may be taken for graduate credit until all prerequisites have been satisfied.

Advancement to Candidate Status - Acceptance as a candidate indicates that the student has completed at least 30 quarter or 20 semester units within the approved Plan of Study and that there is a reasonable expectation that the student will complete all remaining requirements within one year. Classified Graduate Students will be advanced to Candidate Status when they have met the following criteria:

1. Completion of all requirements for Classified Status.
2. Completion of at least 30 quarter or 20 semester units of courses applicable to the Master of Science Degree in Biology with a grade of "B-" or better and graduate GPA of at least 3.0.
3. Submitted an application for advancement to candidacy that has been approved by the graduate coordinator.

Students in the thesis track must also:

4. Obtain approval of the student's Master's thesis research topic by the student's Departmental of Biology Graduate Thesis Chair and Thesis Committee.
5. Obtain certification by the student's thesis advisor that there is a reasonable expectation that the student will satisfactorily complete the Master's thesis within one year.

Admission to Candidate Status must be attained within two calendar years after acceptance as a Classified Graduate Student.

Progress through the program - All requirements and graduation are to be completed within five calendar years after initial acceptance as either a Classified or a Conditionally Classified Graduate Student. The five-year time limit can be extended by petition to and approval from the Departmental Graduate Committee.

Completion of all requirements for the Master of Science in Biology requires satisfactory completion of all courses in an approved Plan of Study and satisfactory completion of an exit examination (non-thesis) or thesis, including oral examination and any revisions required by the Thesis Committee or Departmental Graduate Committee (thesis), and maintaining a 3.0 GPA. Additionally, students must have received at least a C in a course in order for the course to count toward their required graduate courses and students must have taken at least 60% of their course units at the 500- (50001) or 600- (6000-) level.

7. COURSE REQUIREMENTS FOR THE MASTER OF SCIENCE IN BIOLOGY

CSUB is transitioning to a semester-based academic calendar in Fall 2016. Students entering the MS Biology program prior to Fall 2016 will be admitted under the quarter-based program requirements. They may choose to graduate under either the quarter-based or the semester-based requirements if they will be graduating in Fall 2016 or later. Students admitted in Fall 2016 or later will be required to meet the requirements listed for the semester-based program. Concentration outlines showing the quarter and semester-based program equivalences are included at the end of this document, with more detailed information on semester-based schedules to be released in the 2016-2018 catalog and graduate guide.

All graduate students must pass the Graduation Writing Assessment Requirement (GWAR) with a score of 8 or above. It is recommended that students take this writing proficiency examination in the first year of their graduate studies.

For students beginning the program during the 2015-2016 academic year or prior (quarters):

Thesis-Option (45 quarter units):

BIOL 505 Current Topics in Biology (9 units)

BIOL 510 Advanced Writing and Experimental Design (4 units)

BIOL 605 Seminar in Biology (3 units)

BIOL 690 Thesis (8 units)

BIOL 691 Thesis Defense & Submission (1 unit)

*ELECTIVES (400-, 500-, or 600-level courses) (20 units)

Non-thesis-Option (50 quarter units):

BIOL 505 Current Topics in Biology (9 units)

BIOL 510 Advanced Writing and Experimental Design (4 units)

BIOL 605 Seminar in Biology (3 units)

BIOL 680 Non-thesis Examination (1 unit)

*ELECTIVES (400-, 500-, or 600-level courses) (33 units; minimum of 8 units of these at the 500- or 600- level)

***ELECTIVE COURSES offered in Biology**

BIOL 404 Conservation Biology

BIOL 406 Advanced Ecology

BIOL 424 Evolutionary Genetics

BIOL 430 Advanced Molecular Genetics

BIOL 433 Developmental Biology

BIOL 451 Functional Analysis of Vertebrate Structure

BIOL 455 Physiological Measurements

BIOL 462 Physiological Plant Ecology

BIOL 470 Evolution

BIOL 477 Special Topics in Biology
BIOL 540 Graduate Practicum in Teaching of Biology
BIOL 577 Advanced Topics in Biology
BIOL 580 Research

*Selection of elective courses must be approved by Graduate Coordinator (non-thesis option) or Thesis Committee (thesis option). If approved prior to course registration, elective courses may include appropriate graduate-level courses offered by departments other than Biology.

For students beginning the program during the 2016-2017 academic year (semesters):

Thesis-Option (30 semester units)

BIOL 5100 Advanced Writing and Experimental Design (4)
BIOL 5010 Current Topics in Biology (6)
BIOL 6010 Seminar in Ecology and Evolutionary Biology (2)
BIOL 6911 Thesis (5)
BIOL 6921 Thesis Defense (1)
*ELECTIVES (4000-, 5000-, or 6000-level courses) (12 units)

Non-thesis-Option (33 semester units)

BIOL 5100 Advanced Writing and Experimental Design (4)
BIOL 5010 Current Topics in Biology (6)
BIOL 5710 Advanced Topics in Biology (4)
BIOL 6010 Seminar in Ecology and Evolutionary Biology (2)
BIOL 6901 Non-thesis examination (1)
*ELECTIVES (4000-, 5000-, or 6000-level courses) (16 units; no more than 12 units at the 4000-level)

***ELECTIVE COURSES**

BIOL 4100 Evolution
BIOL 4310 Conservation Biology
BIOL 4320 Advanced Ecology
BIOL 4330 Behavioral Ecology
BIOL 4340 Chemical Ecology
BIOL 4350 Environmental Microbiology
BIOL 4410 Insect Biology and Diversity
BIOL 4420 Plant Diversity
BIOL 4430 Vertebrate Diversity
BIOL 4440 Molecular Genetics
BIOL 4450 Bioinformatics
BIOL 4460 Evolutionary Genetics
BIOL 4510 Comparative Vertebrate Structure and Function
BIOL 4520 Plant Physiology
BIOL 4530 Terrestrial Ecosystems
BIOL 4540 Physiological Plant Ecology

BIOL 4550 Plant Structure and Function
BIOL 4700 Special Topics in Biology

* Selection of elective courses must be approved by Graduate Coordinator (non-thesis option) or Thesis Committee (thesis option). If approved prior to course registration, elective courses may include appropriate graduate-level courses offered by departments other than Biology. One elective course may be substituted for a 4000-, 5000-, or 6000-level CHEM, GEOL, MATH, PEAK, or PHYS course, with advisor approval.

COURSE DESCRIPTIONS (QUARTER-BASED COURSES)

BIOL 505 Current Topics in Biology (3) Current topics of special interest to graduate students in Biology. Topics and content will vary as announced but will include contemporary or interdisciplinary areas of interest. Two hours lecture and three hours laboratory. Repeatable. Prerequisites: Graduate standing or consent of instructor and an upper division course appropriate to the topic.

BIOL 510 Advanced Experimental Design and Analysis (4) Course covers how to effectively communicate biological science to the scientific community, effective methodology in experimental design, and proposal writing, including writing specific aims and creating a budget. Three hours lecture and three hours laboratory. Prerequisites: Graduate standing or consent of instructor.

BIOL 540 Graduate Practicum in the Teaching of Biology (3) Theory and practice in teaching biology at the undergraduate level. Regular meetings with the faculty sponsor and supervised experience in course design, lecturing, tutoring, laboratory preparation and delivery, administering and scoring examinations, and leading classroom discussions. One hour lecture and six hours laboratory. Prerequisites: Graduate standing.

BIOL 577 Advanced Topics in Biology (5) Laboratory or field-based graduate level biological topics in a specialized area of contemporary biology, such as genetics, ecology, microbiology, physiology, behavioral biology, systematics, or molecular biology. Topics will be announced. May be repeated for credit as topics change. Two hours lecture and nine hours laboratory. Prerequisites: Graduate standing or consent of instructor and an upper division course appropriate to the topic. Lab fee required.

BIOL 580 Research (1-5) Independent research: the student formulates a problem and research design in consultation with the faculty, conducts the investigation, compiles and analyzes the data, and presents the findings in written form. Repeatable. Although repeatable, a maximum of five units may be applied towards the Master's degree. Available by consent of the advisor.

BIOL 605 Seminar in Biology (3) Student presentation and discussion of reviews and reports focusing on current literature and scientific research in the areas of Biology. Two hours lecture and three hours laboratory. Prerequisites: Graduate standing.

BIOL 680 Non-Thesis Examination (1) Comprehensive examination of graduate-level breadth administered by the Departmental Graduate Committee. Can be repeated only once. Prerequisites: Approved petition for advancement to candidacy and consent of the graduate advisor.

BIOL 690 Thesis (1-8) Laboratory, field investigation, or a combination of both investigating a research problem. Repeatable. Although repeatable, a maximum of eight units may be applied towards the Master's degree. Prerequisites: Approved petition for advancement to candidacy.

BIOL 691 Thesis Defense (1) Preparation, completion (including final submission to the library), and oral defense of a written thesis approved by the Thesis Committee and the Departmental Graduate Committee. Prerequisites: Approved petition for advancement to candidacy and consent of the thesis advisor.

List of Acceptable Elective Courses from within the Department of Biology:

BIOL 404 Conservation Biology (5) Study of problems related to biological conservation, including endangered species issues, environmental laws, and mitigation solutions required by regulations. Includes site visits to conservation areas, collection of biological data, preparation of assessment reports, and study of elements of environmental impact reports. Two hours lecture and nine hours laboratory. Prerequisites: BIOL 301 and 306, or equivalent, or consent of instructor.

BIOL 406 Advanced Ecology (5) Advanced study of ecology. Emphasis includes evolutionary perspectives of physical and biological environments, population dynamics, and ecosystem stability. Laboratory emphasis will be placed on analytical methods used in the field. Laboratory includes weekend field trips. Two hours lecture and nine hours laboratory. Prerequisites: BIOL 301 and 306, or equivalent, or consent of instructor. Field trip fee required.

BIOL 424 Evolutionary Genetics (5) Contributions of molecular genetics to the understanding of evolution. Emphasis is placed on the processes of mutation, selection, and random genetic events as they affect the genetic architecture of natural populations and the process of speciation. Topics include quantitative inheritance, population genetics, phylogenetics, conservation genetics, and bioinformatics. Two hours lecture and nine hours laboratory. Prerequisites: BIOL 301 and 304, or equivalent, or consent of instructor.

BIOL 430 Advanced Molecular Biology (5) Advanced concepts of molecular genetics, including DNA damage and repair, homologous recombination, transposition, alternative splicing and posttranscriptional regulation of gene expression. Additional topics that contribute to an understanding of gene expression will include recent advances in genomics, proteomics and bioinformatics. Two hours lecture and nine hours laboratory. Prerequisite: BIOL 301 and 330, or equivalent, or consent of instructor.

BIOL 433 Developmental Biology (5) Development and growth of plants and animals at the cellular and organismic level. Embryogenesis of organisms from fertilization to the establishment of organ systems. Two hours lecture and nine hours laboratory. Prerequisites: BIOL 301 and 304, or equivalent, or consent of instructor. Lab fee required.

BIOL 451 Functional Analysis of Vertebrate Structure (5) Anatomy of vertebrates interpreted in terms of function including support, running, jumping, digging, climbing, swimming, flying and feeding. These functions are studied in their environmental context and as evolutionary adaptations. Independent student project will focus on one of these adaptations. Two hours lecture and nine hours laboratory. Prerequisites: BIOL 351, or equivalent, or consent of instructor. Lab fee required.

BIOL 455 Physiological Measurements (5) Physiological measurement techniques focusing on data collection and analysis of selected vertebrate organ systems. Discussion topics include electrical properties of nerve, cardiac and skeletal muscle tissues, pulmonary and metabolic function, and sensory physiology. Emphasis will be placed on understanding the mechanisms of how each system works and the benefits and limitations of the measurement techniques currently

available. Two hours lecture and nine hours laboratory. Prerequisites: BIOL 255 or 357, BIOL 301 and BIOL 305, or equivalent, or consent of instructor. Lab fee required.

BIOL 462 Physiological Plant Ecology (5) The physiological basis of growth, reproduction, survival, abundance, and geographical distribution of plants. The ecological context of these processes will be examined by considering how plants are affected by interactions with the physical, chemical, and living components of their environment. Topics include the adaptive significance and evolutionary origins of plant functional traits. Two hours lecture and nine hours laboratory. Prerequisites: BIOL 301 and 305, or equivalent, or consent of instructor. Lab fee required.

BIOL 470 Evolution (4) Study of the processes of organic evolution. Three hours lecture and three hours laboratory. Prerequisites: Open only to graduate students and senior Biology majors who have completed 40 units of Biology courses.

BIOL 477 Special Topics in Biology (1-5) Contemporary or interdisciplinary problems of current interest. Typical topical areas might include pollution, population or integrative biological phenomena. Although repeatable for different topics, a maximum of 5 units may be applied to the major or minor, subject to advisor approval.

COURSE DESCRIPTIONS (SEMESTER-BASED COURSES)

BIOL 5010 Current Topics in Biology (2)

Current topics of special interest to graduate students in Biology. Topics and content will vary as announced but will include contemporary or interdisciplinary areas of interest. Two hours lecture. Repeatable. A maximum of 16 units allowed. Prerequisites: Graduate standing and an upper division course appropriate to the topic.

BIOL 5100 Advanced Experimental Design and Analysis (4)

Course covers how to effectively communicate biological science to the scientific community, effective methodology in experimental design, proposal writing, including writing specific aims and creating a budget. Two hours lecture, one hour discussion, and three hours laboratory. Prerequisites: Graduate standing.

BIOL 5710 Advanced Topics in Biology (4)

Laboratory or field based graduate level biological topics in a specialized area of contemporary biology, such as genetics, ecology, microbiology, physiology, behavioral biology, systematics, or molecular biology. Topics will be announced. May be repeated for credit as topics change. Three hours lecture and three hours laboratory. Prerequisites: Graduate standing or consent of instructor and an upper division course appropriate to the topic. Lab fee required.

BIOL 5901 Research (1-5)

Independent research: the student formulates a problem and research design in consultation with the faculty, conducts the investigation, compiles and analyzes the data, and presents the findings in written form. Repeatable. Although repeatable, a maximum of 5 units may be applied towards the Master's degree. Prerequisites: Graduate standing and consent of the advisor.

BIOL 5911 Graduate Practicum in the Teaching of Biology (2)

Theory and practice in teaching biology at the undergraduate level. Regular meetings with the faculty sponsor and supervised experience in course design, lecturing, tutoring, laboratory preparation and delivery, administering and scoring examinations, and leading classroom discussions. One hour lecture and three hours laboratory. Prerequisites: Graduate standing.

BIOL 6010 Seminar in Ecology and Evolutionary Biology (2)

Student presentation and discussion of reviews and reports focusing on current literature and scientific research in biology. Two hours discussion. Prerequisites: Approved petition for advancement to candidacy.

BIOL 6901 Non-Thesis Examination (1)

Comprehensive examination of graduate-level breadth administered by the Departmental Graduate Committee. Prerequisites: Approved petition for advancement to candidacy.

BIOL 6911 Thesis (1-5)

Laboratory, field investigation, or a combination of both investigating a research problem. Repeatable. Although repeatable, a maximum of 5 units may be applied towards the Master's degree. Prerequisites: Approved petition for advancement to candidacy.

BIOL 6921 Thesis Defense (1)

Preparation, completion (including final submission to the library), and oral defense of a written thesis approved by the Thesis Committee and the Departmental Graduate Committee.

Prerequisites: Approved petition for advancement to candidacy.

*List of Acceptable Elective Courses from within the Department of Biology:***BIOL 4100 Evolution (3) (BIOL 470)**

Study of the processes of organic evolution. Three hours lecture. Prerequisites: Open only to senior Biology majors who have completed BIOL 3120, 3010, 3020, and 3110.

BIOL 4310 Conservation Biology (4) (BIOL 404)

Study of problems related to biological conservation, including endangered species issues, environmental laws, and mitigation solutions required by regulations. Includes site visits to conservation areas, collection of biological data, preparation of assessment reports, and study environmental impact reports. Three hours lecture and three hours laboratory. Prerequisites: BIOL 3120 and 3110.

BIOL 4320 Advanced Ecology (4) (BIOL 406)

Advanced study of ecology. Emphasis includes evolutionary perspectives of physical and biological environments, population dynamics, and ecosystem stability. Laboratory emphasis will be placed on analytical methods used in the field. Laboratory includes weekend field trips. Three hours lecture and three hours laboratory. Prerequisites: BIOL 3120 and 3110. Field trip fee required.

BIOL 4330 Behavioral Ecology (4) (new course)

Animal behavior in an evolutionary and ecological context. Topics include: The comparative method, foraging and decision-making theory, anti-predator behavior, animal communication, social behaviors and systems, competition, cooperation, altruism, deceit, honesty, mating systems, parent-offspring conflict, kin selection. Three hours lecture and three hours laboratory. Prerequisites: BIOL 3120 and 3110.

BIOL 4340 Chemical Ecology (4) (new course)

This course focuses on the ecological interactions of organisms involving chemical communication. Specifically, students will learn about chemical involvement in inter/intraspecific communication in regards to feeding, pollination, host-plant selection, microbial interactions, defense, mate finding, and social communication. Three hours lecture and three hours laboratory. Prerequisite: BIOL 3120 and 3110.

BIOL 4350 Environmental Microbiology (4) (Previously BIOL 412 Microbial Physiology)

This course focuses on the study of microbial structure and function. In particular, students will learn about fermentation procedures, bioremediation with the help of microbes, composting, and detection of antibiotic producing microbes, use of microbes to supply fresh drinking water, safe disposal of sewage, and how microbes are used in food, beer and wine production. Three hours

lecture and three hours laboratory. Prerequisites: BIOL 3120, 3110, and 3410 or for the BA in Human Biological Sciences BIOL 2230, 3210, and 3220.

BIOL 4410 Insect Biology and Diversity (4) (BIOL 324)

Comparative study of aquatic and terrestrial insects with emphasis placed on terrestrial insect diversity. Laboratory focuses on comparative morphology, phylogeny, classification, and student projects. Three hours lecture and Three hours laboratory. Prerequisites: BIOL 3120. Lab fee required.

BIOL 4420 Plant Diversity (4) (BIOL 321)

Phylogeny and classification of vascular plants with emphasis on field recognition and identification of important plant families and genera characterizing the major floristic regions of California. Lectures review taxonomic diversity, evolutionary relationships, and eco-geographic patterns of western floras. Laboratory includes weekend field trips for which a fee is required. Three hours lecture and three hours laboratory. Prerequisites: BIOL 3120 and 3110.

BIOL 4430 Vertebrate Diversity (4) (BIOL 322)

Diversity, evolution, and biology of fish, amphibians, reptiles, and mammals, with special emphasis on the biology and identification of local species. Three hours lecture and three hours laboratory. Prerequisite: BIOL 3120 and 3110.

BIOL 4440 Molecular Genetics (4) (BIOL 430 Advanced Molecular Genetics)

Advanced concepts of molecular genetics, including DNA damage and repair, homologous recombination, transposition, alternative splicing and posttranscriptional regulation of gene expression. Additional topics that contribute to an understanding of gene expression will include recent advances in genomics, proteomics and bioinformatics. Three hours lecture and three hours laboratory. Prerequisites: BIOL 3120 and 3010 or BIOL 3010 and 3220.

BIOL 4450 Bioinformatics (4) (BIOL 360)

Introduction to basic concepts, methods and tools used in bioinformatics and their application to biological sequence and structure data analysis. Topics include (but not limited to) bioinformatics databases, sequence and structure alignment, motif and domain finding, gene, RNA and protein structure prediction, protein-protein interaction, microarray technology and data analysis, genome annotation and comparative genomics. Three hours lecture three hours laboratory. Prerequisites: BIOL 3120 and 3010.

BIOL 4460 Evolutionary Genetics (4) (BIOL 424)

Contributions of molecular genetics to the understanding of evolution. Emphasis is placed on the processes of mutation, selection, and random genetic events as they affect the genetic architecture of natural populations and the process of speciation. Topics include quantitative inheritance, population genetics, phylogenetics, conservation genetics, and bioinformatics. Threehours lecture and three hours laboratory. Prerequisites: BIOL 3120 and 3010.

BIOL 4510 Comparative Vertebrate Structure and Function (4) (BIOL 451)

Comparative study of both structure and function in vertebrate systems. This course will cover skeletal, muscular, circulatory, respiratory, digestive, excretory, nervous, and sensory systems in

an evolutionary and adaptive context. Three hours lecture and three hours laboratory.
Prerequisite: BIOL 3120 and BIOL 3020. Lab fee required.

BIOL 4520 Physiological Measurements (4) (BIOL 455)

Physiological measurement techniques focusing on data collection and analysis of selected vertebrate organ systems. Discussion topics include electrical properties of nerve, cardiac and skeletal muscle tissues, pulmonary and metabolic function, and sensory physiology. Emphasis will be placed on understanding the mechanisms of how each system works and the benefits and limitations of the measurement techniques currently available. Three hours lecture and three hours laboratory. Prerequisites: BIOL 2220 or 3550, BIOL 3120 and 3020. Lab fee required.

BIOL 4530 Terrestrial Ecosystem Ecology (4) (new course)

This course presents organisms and the physical characteristics of the environment as an interacting and integrated system. Topics covered are the climate and geologic factors that affect ecosystems. The central processes that govern ecosystem function are covered including water, carbon, and nutrient cycles. An emphasis will be placed on how ecosystems are perturbed by environmental changes. Three hours lecture and three hours laboratory. Prerequisites: BIOL 3120 and 3110.

BIOL 4540 Physiological Plant Ecology (4) (BIOL 462)

The physiological basis of growth, reproduction, survival, abundance, and geographical distribution of plants. The ecological context of these processes will be examined by considering how plants are affected by interactions with the physical, chemical, and living components of their environment. Topics include the adaptive significance and evolutionary origins of plant functional traits. Three hours lecture and three hours laboratory. Prerequisites: BIOL 3120, 3020, and 3110. Lab fee required.

BIOL 4550 Plant Structure-Function (4) (new course)

Anatomy of plants as related to plant function. Topics include development and reproduction, the capture of light and nutrients, transport of water and solutes, storage of water and carbohydrates, and biomechanics. The evolutionary history and ecological context of these traits will also be examined as well as the use of plant structure in predicting plant function. Three hours lecture and three hours laboratory. Prerequisites: BIOL 3120 and 3020.

BIOL 4700 Special Topics in Biology (1-5) (BIOL 477)

Contemporary or interdisciplinary problems of current interest. Typical topical areas might include pollution, population or integrative biological phenomena. Although repeatable for different topics, a maximum of five units may be applied toward the major or minor, subject to advisor approval. Not necessarily restricted to Biology majors.

8. ADDITIONAL ACADEMIC INFORMATION

MENTORING

It is our belief that the quality of a student's graduate experience is, in large measure, a reflection of mentoring. Too often, especially in graduate programs that have large faculty-student ratios, students do not receive adequate faculty supervision. In our program, each student is carefully mentored throughout his/her tenure at CSUB. No student will be without an adviser at any time in his/her course of study. Our aim is to include our graduate students in the “every-day life” of the department: offering teaching opportunities, inviting participation in faculty research programs, and welcoming involvement in departmental social events.

Upon acceptance into our program, a student will be advised by a faculty advisor/committee chair (thesis option) or the Graduate Coordinator will serve as advisor for students in the non-thesis option. The thesis student should consult with the Committee Chair to select two other committee members and complete a COMMITTEE MEMBERSHIP & CONCENTRATION OUTLINE form.

ACADEMIC COURSE LOAD

Eight units (per quarter or per semester) of graduate course work per academic term are considered the minimum full-time graduate unit load. Typical enrollment is 8-12 units per term.

CONTINUED ENROLLMENT

Graduate students must maintain continuous enrollment in the graduate program. An unauthorized leave of absence of more than 2 consecutive quarters (i.e. the student is not enrolled in any courses or continuing enrollment units) requires that a student reapply to the biology graduate program and reapply to the university (including payment of the non-refundable application fee). Graduate courses that a student completed prior to their leave of absence from the program will be reassessed and will not be automatically accepted for credit in the graduate program upon reapplication. Applicants will be required to meet all program and university admissions requirements at the time of reapplication and, if accepted, will be accepted under the catalog and graduate handbook of their renewed admissions year.

CONCENTRATION OUTLINE

Each thesis graduate student must file a signed COMMITTEE MEMBERSHIP & CONCENTRATION OUTLINE form that will detail the approved courses for the Master of Science degree. The COMMITTEE MEMBERSHIP & CONCENTRATION OUTLINE form must be completed before the student advances to candidacy. In addition, advancement to candidacy requires the preparation of a thesis research proposal. This proposal must be defended to the thesis committee and receive committee approval prior to the initiation of thesis research.

The requirements for the Master's Degree in Biology (thesis) includes 45 quarter units or 30 semester units of committee approved graduate work, **at least 60% of which must be at the 500(0)/600(0)-level**. Additional courses (prerequisites and/or deficiencies) of study may be required, but are not counted as part of the coursework that applies towards this requirement. The program of study should be developed in consultation with the chair of the student's graduate committee with a focus on gaining depth of knowledge in a particular sub-discipline of

biological science. The formal program of study must be submitted for approval to the student's graduate committee before the end of the second quarter after admission to the program.

The requirements for the Master's Degree in Biology (non-thesis) includes 50 quarter or 33 semester units of graduate coordinator (or other Biology faculty advisor) approved graduate work, at least 60% of which must be at the 500(0)/600(0)-level. Additional courses (prerequisites and/or deficiencies) of study may be required, but are not counted as part of these units of approved course work. The formal program of study must be submitted for approval to the Graduate Coordinator before the end of the second quarter after admission to the program.

ACADEMIC CONTINUATION

Graduate students must maintain an overall GPA of 3.0 and earn at least a C (2.0) in all courses, except those graded credit/no credit. Students who are conditionally classified because of GPA deficiencies may not earn less than a B (3.0) in the courses on their approved CONCENTRATION OUTLINE. Any student whose overall GPA falls below 3.0 for two consecutive quarters, or who receives more than three grades of C (2.0) or lower in any graduate course, will be placed on academic probation and/or dismissed from the program.

NON-THESIS/THESIS PROGRAM CHANGE

Students may wish to change their track within the MS Biology program during their tenure as a student. A student must obtain the written consent of their current or future thesis advisor as well as the Biology Graduate Coordinator to switch their status within the program between non-thesis and thesis tracks (see appendix for the Thesis/Non-thesis Change Form).

NON-THESIS COMPREHENSIVE EXAM

A comprehensive written examination will be the culminating experience for each student in the Master's program (non-thesis option). The exam will be offered once each quarter: at 9 AM on the first Friday of November, the first Friday of March, and the first Friday of May (the exam date may change depending on annual variations in holiday schedules, but any deviations from the above posted schedule would be announced within the first three weeks of each quarter). In the semester system, this exam will be offered once each semester: at 9 AM on the first Friday of November and at 9 AM on the first Friday of March. It is the responsibility of the student to make sure that they are available to take the exam during the term they intend to graduate. It is the student's responsibility to sign-up with the graduate coordinator to take the exam on the scheduled exam date by enrolling in BIOL 680/6901 in the term they intend to take the exam.

THESIS

Research leading to the thesis will be the culminating experience for each student in the Master's program (thesis option). The thesis will be a substantial product of original empirical research carried out under the close supervision of the student's Committee Chair and two additional committee members.

It is expected that the student and his/her committee chair will work closely together to identify elective courses and possible research topics for a thesis. Together the chair and student will select and ask two additional members to serve on the graduate committee. A minimum of two Committee members must be tenured/tenure-track faculty members in the Department of Biology. Upon approval of the Committee Chair, a faculty member from another department or a professional member from the community or a faculty member from another university with

pertinent background to the research topic and the appropriate terminal degree (Ph.D.) may sit on the committee as the third member.

A student must obtain the written consent of each member who will serve on the thesis committee (see Appendix for COMMITTEE MEMBERSHIP & CONCENTRATION OUTLINE form).

In some cases a student will rely primarily on the Committee Chair for thesis development; in other cases the committee members will be consulted more substantively. It is the student's responsibility to keep all committee members informed of his/her progress and to ask their Committee Chair for guidance in determining the appropriate level of involvement for the committee members. Students are encouraged to meet with their committee at least twice per year to discuss progress.

Students should be enrolled in BIOL 690/6911 (Thesis) while work toward the thesis is being conducted, analyzed, and written. Thesis students must be enrolled in BIOL 691/6921 during the quarter in which their thesis is defended (including a publically announced and presented thesis talk as well as an oral defense of the thesis with their graduate committee) and approved. If the student does not complete their thesis during this quarter or semester, they will be assigned a grade of NC (no credit) and must re-enroll in BIOL 691/6921 in the quarter in which they defend their thesis. Credit for BIOL 691/6921 will only be received once the approved thesis has been submitted to the library.

Information regarding thesis guidelines and submission procedure are maintained by CSUB's Walter Stiern Library and may be accessed at:
www.csub.edu/library/MasterThesisApp.pdf

COMMENCEMENT

Students will be allowed to participate in the graduation ceremony if, and only if, the student's thesis has been defended and approved by their graduate committee or they have successfully passed the non-thesis comprehensive exam. **Students should therefore not make plans for participating in the graduation ceremony until it becomes evident that the thesis/comprehensive examination will indeed be completed and passed on time!**

In addition, students are reminded that they need to apply to the University for Graduation. More information on university graduation application deadlines can be found at: <http://www.csub.edu/admissions/graduation/>. Note: the application for graduation is due to the university well before the expected quarter of graduation. Students should make sure that they are checking these deadlines and that they submit their application into the university on time.

9. FINANCIAL ASSISTANCE

Graduate Equity Fellowship: Graduate Equity Fellowships are renewable for a maximum of six academic terms, pending available monies and satisfactory performance in one's graduate program. The fellowships are based upon financial aid eligibility. Fellows are expected to be full-time graduate students and to complete their degree requirements within the one- or two-year time frame of their respective Master's program. Applicants are also encouraged to pursue advanced degrees (PhD, etc.) upon completion of study at CSUB, an issue worth consideration in the development of the Personal Statement. Fellows may be expected to participate in some special activities during the academic year. Although renewable, students must reapply for the fellowship in spring term for the next academic year.

Graduate Student Tuition Fee Waiver (GSTFW) Program: A minimal number of graduate student tuition fee waivers are available each year. The goals of the GSTFW program include 1) increasing the number of CSUB graduate students who would otherwise not attend without financial assistance; 2) to provide student assistant support to graduate programs that have demonstrated notable enrollment growth; and, 3) to assist graduate programs to recruit students from underrepresented groups. Nominations by faculty are requested toward the end of spring quarter.

Graduate Assumption Program of Loans for Education (Graduate APLE): Once a Graduate APLE participant has obtained a graduate degree, the California Student Aid Commission (Commission) may assume a total of \$6000 in outstanding educational loans in return for a cumulative total of three consecutive full-time years of eligible teaching service at one or more colleges or universities in California. Check the Financial Aid Home Page for additional information and programs.

Graduate Teaching Assistantships: A limited number of paid teaching assistantships are available. See the biology website for application forms.

Graduate Research Assistantships: Inquire with thesis advisor regarding availability.

Students are encouraged to check with the office of Financial Aid & Scholarships for additional information on programs, scholarships, and fellowships.

10. TIMELINE AND GRADUATE CHECKLIST

Listed below are some of the steps that need to be completed during each year of your tenure in the MS Biology program. Additional information about some of these steps is included below the checklist for each year.

Year 1

_____ 1) If required, pass the writing proficiency examination (**GWAR**). All graduate students who apply for a master's degree must demonstrate upper-division writing competency. If the student has completed this requirement during his/her baccalaureate program with a score/grade that meets the minimal requirements specified by the graduate program, then certification of the upper-division writing competency will be accepted. Students who have not yet completed this requirement must register for and pass the Graduation Writing Assessment Requirement (GWAR) with a score of 8 or above. The exam is administered three times each academic year.

_____ 2) Complete any course deficiencies if admission was granted as a conditionally classified graduate student (or complete any other requirements needed to in order to be admitted as a fully classified student). Deficiency courses do not count toward completion of units for the MS Biology program. Admission to Classified Status must be accomplished within two calendar years after acceptance as a Conditionally Classified Graduate Student. No more than 15 quarter units or 10 semester units may be taken for graduate credit until all deficiencies have been satisfied. Once deficiencies have been remedied, students should submit an APPLICATION FOR ADMISSION TO CLASSIFIED STATUS to the Biology Graduate Coordinator.

_____ 3) Establish your formal Program of Study by completing a CONCENTRATION OUTLINE form in consultation with the Chair of your Graduate Committee (thesis) or with the Graduate Coordinator (non-thesis). Most courses that you take before you establish a formal Program of Study (in your Concentration Outline) may be put on this program and count toward your degree completion credits, up to a total of 15 quarter units and 10 semester units.

Non-thesis students: meet with the Graduate Coordinator to determine a CONCENTRATION OUTLINE.

Thesis students: Establish a graduate committee and complete and file a COMMITTEE MEMBERSHIP and CONCENTRATION OUTLINE form.

_____ 4) Thesis students should meet with their Graduate Committee and present a thesis research proposal (orally and in writing) by the end of their first year. Students should work with their Graduate Committee Chair to develop an approved draft of the thesis project which will then be circulated among the other members of the Committee for comments. Students must complete any and all revisions suggested by the Committee before being accepted as a candidate. A copy of the committee-approved thesis proposal must be filed with the graduate coordinator.

Years 2-4

_____ 1) For students admitted as Conditionally Classified, deficiency courses or requirements must be completed by the end of Year 2. Once deficiencies have been remedied, students should submit an APPLICATION FOR ADMISSION TO CLASSIFIED STATUS to the Biology Graduate Coordinator (if this was not completed in Year 1).

_____ 2) Complete graduate course work as outlined in the student's approved Concentration Outline. At least 60% of all graduate coursework must be at the 500(0)- or 600(0)- level.

_____ 3) File for advancement to Candidacy by completing the APPLICATION FOR ADVANCEMENT TO CANDIDACY. Admission to candidate status must be attained within two calendar years after acceptance as a Classified Graduate Student and when there is a reasonable expectation that a student will satisfactorily complete the MS Biology program within one year.

Non-thesis: Non-thesis students may file for advancement to candidacy after they have completed 30 units of graduate course work as outlined in their approved Program of Study. They must have Classified status in the program, have completed 30 quarter course units or 20 semester units with a B or greater in all courses, and have a GPA of at least 3.0. Applications for Advancement to Candidacy for Non-thesis students are submitted to the Biology Graduate Coordinator for evaluation.

Thesis: Thesis students may file for advancement to candidacy after they have completed 30 units of graduate course work as outlined in their approved Program of Study. They must have Classified status in the program, have completed 30 quarter course units or 20 semester units with a B or greater in all courses, and have a GPA of at least 3.0. Additionally, thesis students must have successfully defended their thesis proposal prior to advancement to candidacy. Applications for Advancement to Candidacy for Thesis students are submitted to their Committee Chair.

Year 5

_____ 1) All requirements and graduation are expected to be completed within five calendar years (most students will graduate within 2 to 3 years of being admitted as a Classified Graduate Student). The five-year time limit can be extended by petition to and approval from the Biology Department Graduate Committee.

Year of Graduation

_____ 1) Apply to the University for Graduation (<http://www.csub.edu/admissions/graduation/>). Note, the application for graduation is due to the university well before the expected quarter of

graduation. Students should make sure that they are checking these deadlines and that they submit their application into the university on time.

_____ 2) Non-thesis students must pass the comprehensive written examination for non-thesis students. The exam will be offered once each quarter, most quarters the exam will be offered at the following dates and times: at 9 AM on the first Friday of November, the first Friday of March, and the first Friday of May. In the semester system, this exam will be offered once each semester: at 9 AM on the first Friday of November and at 9 AM on the first Friday of March. Check with the Graduate Coordinator to confirm the test date! It is the responsibility of the student to make sure that they are available to take the exam during the term they intend to graduate. It is the student's responsibility to sign-up with the graduate coordinator to take the exam on the scheduled exam date by enrolling in BIOL 680/6901 in the term they intend to take the exam. It is the responsibility of the student to make sure that they are available to take the exam on the date and time that it is offered during the term they intend to graduate. It is the student's responsibility to sign-up to take the exam with the graduate coordinator.

_____ 3) Thesis students should enroll in BIOL 691/6921 in their final quarter after they have finished their thesis research and writing. A Thesis Defense should be scheduled. The Thesis Defense will consist of a research presentation and must be announced publicly at least 2 weeks prior to the presentation. This formal presentation should be a detailed review of the Thesis research and should involve slides and/or video displays. The presentation should be 40-50 minutes in duration with an additional 10-15 minutes for questions from the general audience.

Following the presentation, the Candidate will field additional, specific, and in-depth questions from their Graduate Committee. After this question and answer session is completed, the Committee will excuse the Candidate and, in private, decide to accept or reject the thesis. Credit for BIOL 691/6921 will only be granted if the thesis is successfully completed and accepted by a student's Graduate Committee. And following submission of the completed thesis to the library by the required date for completion within that quarter.

_____ 4) Thesis students must submit their thesis to the Walter Stiern Library before they will be approved for graduation and allowed to walk. Information regarding thesis guidelines and the submission procedure are maintained by CSUB's Walter Stiern Library and may be accessed at: www.csub.edu/library/MasterThesisApp.pdf

11. TWO-YEAR RECOMMENDED COURSE PLANS

Following the two provided course plans below (these are meant as rough-guidelines and include flexible recommendations) may assist students in completing their MS degree within the recommended two-year completion time. The first two pages include outlines for the quarter-based academic calendar and also contain additional useful information about goals for each year of the program. The third page includes preliminary outlines for the semester-based academic calendar. More information on semester-based course plans will be included in the 2016-2018 graduate guide.

MS BIOLOGY **T**

Thesis Track Full-time* Sample Schedule (8 quarter units required to be full-time):

	Fall		Winter**		Spring	
Year 1	Course	Units	Course	Units	Course	Units
	BIOL 505	3	BIOL 510	4	BIOL 505	3
	BIOL 577 or 4xx***	5	BIOL 577 or 4xx***	5	BIOL 580	5
	Total units:	8	Total units:	9	Total units:	8
			<i>If applicable, student should apply for admission as a fully classified student at the end of this quarter.</i>		<i>BIOL 580 units are typically used for thesis proposal preparation and defense.</i>	
Summer	<i>Many thesis students choose to conduct thesis research over the summer following their thesis proposal defense.</i>					
	Fall		Winter		Spring	
Year 2	Course	Units	Course	Units	Course	Units
	BIOL 505	3	BIOL 577 or 4xx***	5	BIOL 605	3
	BIOL 577 or 4xx***	5	BIOL 690	4	BIOL 690	4
					BIOL 691****	1
	Total units:	8	Total units:	9	Total units:	8
	<i>Student can apply for Advancement to Candidacy after successful completion of 30 units, formation of committee, and successful proposal defense and completion of a Plan of Study.</i>		<i>Applications for graduation are due early in this quarter--students should check on-line for application due dates. Students should make sure that they have met university graduation requirements (for example, the</i>		<i>Graduation!</i>	

Total Units:** 50**

*Depending on financial aid requirements, students may not need to be on a full-time schedule. The schedule included above is designed to assist students that require full-time enrollment and who are trying to graduate within two years.

**Students who are conditionally classified should apply for admission as a classified graduate student at the end of the second quarter of their first year. Only 15 units of course work can be applied toward degree as a conditionally classified student. Requirements for admission as a classified student should be addressed in the first two quarters of enrollment.

***More than 50% of units must be taken at the 500- or 600-level. Thesis students should not take more than 4 courses at the 400-level.

****Only 45 units are required for graduation--students not requiring full-time enrollment may wish to not enroll in one of the BIOL 577/4xx courses listed above).

*****This course can be repeated if students do not successfully complete their thesis defense and thesis submission to the library on the first course attempt.

MS BIOLOGY **NT**

Non-thesis Track Full-time* Sample Schedule (8 quarter units required to be full-time):

	Fall		Winter**		Spring	
Year 1	Course	Units	Course	Units	Course	Units
	BIOL 505	3	BIOL 510	4	BIOL 505 or 540****	3
	BIOL 577 or 4xx***	5	BIOL 577 or 4xx***	5	BIOL 577 or 4xx***	5
	Total units:	8	Total units:	9	Total units:	8
			<i>If applicable, student should apply for admission as a fully classified student at the end of this quarter.</i>		<i>Student should meet with the Graduate Coordinator to confirm their Plan of Study.</i>	
	Fall		Winter		Spring	
Year 2	Course	Units	Course	Units	Course	Units
	BIOL 505 or 540****	3	BIOL 505 or 540****	3	BIOL 577 or 4xx***	5
	BIOL 577 or 4xx***	5	BIOL 577 or 4xx***	5	BIOL 605	3
			BIOL 680****		BIOL 680	1
	Total units:	8	Total units:	8	Total units:	9
	<i>Student can apply for Advancement to Candidacy after successful completion of 30 units and development of a Plan of Study in consultation with the Graduate Coordinator for biology.</i>		<i>Applications for graduation are due early in this quarter--students should check on-line for application due dates. Students should make sure that they have met university graduation requirements (for example, the</i>		<i>Graduation!</i>	
					Total Units:	50

*Depending on financial aid requirements, students may not need to be on a full-time schedule. The schedule included above is designed to assist students that require full-time enrollment and who are trying to graduate within two years.

**Students who are conditionally classified should apply for admission as a classified graduate student at the end of the second quarter of their first year. Only 15 units of course work can be applied toward degree as a conditionally classified student. Requirements for admission as a classified student should be addressed in the first two quarters of enrollment.

***More than 50% of units must be taken at the 500- or 600-level. Students should not take more than 4 courses at the 400-level.

****Students are not eligible for BIOL 540 until after they have successfully completed at least one quarter of graduate course work and until after they are a classified graduate student. BIOL 540 may only count toward the degree once.

*****Students may consider taking the comprehensive exit exam (BIOL 680) during the winter quarter so that they have an additional quarter to re-take the exit exam if needed. This course can be retaken if students do not pass exam on their first attempt.

MS Biology Semester-based sample schedules

(Note, refer to the notes included with the quarter-based schedules on the previous two pages for important information about these courses and typical year 1 and year 2 activities for thesis and non-thesis students. More information on semester-based schedules will be included in the 2016-2018 graduate guide).

Sample FULL-TIME SEMESTER 2 yr Schedules				
Yr 1	THESIS			
	Fall		Spring	
	BIOL 5010	2	BIOL 5100	4
	BIOL 4xxx/5710	4	BIOL 5010	2
	5901	2	BIOL 5901	2
	TOTAL	8	TOTAL	8
Yr 2	BIOL 5010	2	<i>BIOL 5911 (op.)</i>	2
	BIOL 4xxx/5710	4	BIOL 6010	2
	BIOL 6911	2	BIOL 6911	3
			BIOL 6921	1
		TOTAL	8	TOTAL
Yr 1	Non-THESIS			
	Fall		Spring	
	BIOL 5010	2	BIOL 5100	4
	BIOL 4xxx/5710	4	BIOL 5010	2
	BIOL 4xxx/5710	4	BIOL 4xxx	4
	TOTAL	10	TOTAL	10
Yr 2	BIOL 5010	2	BIOL 6010	2
	BIOL 4xxx/5710	4	BIOL 4xxx	4
	BIOL 6911	2	BIOL 6901	1
		TOTAL	8	TOTAL

APPENDICES

Additional forms and concentration outlines

APPLICATION FOR ADVANCEMENT TO CANDIDACY (THESIS)

PART I

1. STUDENT NAME: _____

2. ID #: _____

PART II

As Committee Chair for the above named student, I recommend his/her advancement to candidacy. The student has demonstrated a satisfactory level of scholastic competence by meeting the criteria established for this program of study.

The student has completed _____ units with a _____ grade point average.

A concentration outline has been completed and approved. A copy is attached.

The following members comprise the student’s thesis graduate committee:

Name _____	Position _____
Name _____	Position _____
Name _____	Position _____

The program requires that the student complete a thesis project proposal and successfully defend it with their committee before advancement to candidacy can occur. The student completed this requirement on _____(date).

A copy of the approved thesis proposal is attached. The thesis/project is tentatively entitled:

SIGNATURES

STUDENT _____ Date _____

COMMITTEE CHAIR _____ Date _____

GRADUATE COORDINATOR _____ Date _____

PROCEDURES

A graduate student who has been granted classified standing is normally advanced to candidacy by his/her Committee Chair. Essentially, the chair is providing an affirmative recommendation of eligibility to continue with the program, attesting to the student’s demonstration of a satisfactory level of scholastic competence.

Along with the Committee Chair recommendation, students must prepare and submit an approved Committee Membership & Concentration Outline form. The Committee Chair must complete and submit this form along with an approved study plan to the Office of Admissions & Records to record the information requested for advancement to candidacy.

APPLICATION FOR ADVANCEMENT TO CANDIDACY (NON-THESIS)

PART I

3. STUDENT NAME: _____

4. ID #: _____

PART II

As the Graduate Coordinator and on behalf of the Graduate Committee, I recommend his/her advancement to candidacy. The student has demonstrated a satisfactory level of scholastic competence by meeting the criteria established for this program of study.

The student has completed _____ units with a _____ grade point average.

A concentration outline has been completed and approved. A copy is attached.

SIGNATURES

STUDENT _____ Date _____

GRADUATE COORDINATOR _____ Date _____

**CONCENTRATION OUTLINE
DEPARTMENT OF BIOLOGY
MS Degree (Non-thesis Option)
Catalog (2015–2016)**

Name: _____
Address: _____
ID#: _____

<u>Coursework</u>	<u>Quarters</u>		<u>Semesters</u>	
	<u>Date</u>	<u>Units</u>	<u>Date</u>	<u>Units</u>

Students must take 3 course offerings of BIOL 505 and/or BIOL 5010 (additional course offerings may count as elective courses):

BIOL 505: (3 quarter units each)	= BIOL 5010 (2 semester units each)
a) _____	_____
b) _____	_____
c) _____	_____

The following courses are required:

BIOL 510 (4 quarter units)	= BIOL 5100 (4 semester units)
_____	_____
BIOL 577 (5 quarter units)	= BIOL 5710 (4 semester units)
_____	_____
BIOL 605 (3 quarter units)	= BIOL 6010 (2 semester units)
_____	_____
BIOL 680 (1 quarter units)	= BIOL 6901 (1 semester units)
_____	_____

ELECTIVES (28 quarter units or 16 semester units required; Conversion is 3 semester units to 5 quarter units; No more than three courses may be at the 400-(quarters) or 4000-(semesters) level):

Course:

_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

UNIT TOTALS: (must be ≥50) _____ (must be ≥33) _____

Additional requirements:

GWAR satisfied _____
Overall GPA >3.0 with a C or higher in ALL graded courses that apply toward degree _____

APPROVAL

_____	_____	_____	_____
Date	Advisor	Date	Department Chair

**CONCENTRATION OUTLINE
DEPARTMENT OF BIOLOGY
MS Degree (Thesis Option)
Catalog (2015–2016)**

Name: _____
Address: _____
ID#: _____

<u>Coursework</u>	<u>Quarters</u>		<u>Semesters</u>	
	<u>Date</u>	<u>Units</u>	<u>Date</u>	<u>Units</u>

Students must take 3 course offerings of BIOL 505 and/or BIOL 5010 (additional course offerings may count as elective courses):

BIOL 505: (3 quarter units each)	= BIOL 5010 (2 semester units each)
a) _____	_____
b) _____	_____
c) _____	_____

The following courses are required:

BIOL 510 (4 quarter units)	= BIOL 5100 (4 semester units)
_____	_____
BIOL 605 (3 quarter units)	= BIOL 6010 (2 semester units)
_____	_____
BIOL 690 (8 quarter units)	= BIOL 6911 (5 semester units)
_____	_____
BIOL 691 (1 quarter unit)	= BIOL 6921 (1 semester unit)
_____	_____

ELECTIVES (20 quarter units or 12 semester units required; Conversion is 3 semester units to 5 quarter units; No more than three courses may be at the 400-(quarters) or 4000-(semesters) level):

Course:

_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

UNIT TOTALS: (must be ≥45) _____ (must be ≥30) _____

Additional requirements:

GWAR satisfied _____
Overall GPA >3.0 with a C or higher in ALL graded courses that apply toward degree _____

APPROVAL

_____	_____	_____	_____
Date	Advisor	Date	Department Chair

Request for MS Program Non-thesis/Thesis Change

Student Information:

Name: _____		Campus ID # _____	
Last	First	M.I.	
Address: _____			
Street	Apt. #	City	State Zip Code
Student Signature _____		Date _____	

Change Request:

Present:		Request is submitted to Change to:	
Degree Objective: MS Biology		Degree Objective: MS Biology	
Track (Circle One):		Track (Circle One):	
Thesis Non-Thesis		Thesis Non-Thesis	

Approval (Both signatures are required):

Approved: _____	_____	Date: _____
Print Name	Signature	
Thesis Advisor		
(If changing from Thesis to Non-thesis this should be the signature of the current thesis advisor)		
(If changing from Non-thesis to Thesis this should be the signature of the faculty member who will become the thesis advisor)		
Approved: _____	_____	Date: _____
Print Name	Signature	
Biology Graduate Coordinator		

NOTE: Students must ALSO submit a REQUEST TO CHANGE PROGRAM/PLAN (POST-BACCALAUREATE) to the office of Admissions and Records to change between the thesis/non-thesis tracks!

<http://www.csub.edu/admissions/OfficialForms/ProgramPlanChange.pdf>

