



CSUB Master of Science Program in Biology Graduate Student Guide 2007-2008

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Greetings prospective and entering graduate students!

The Biology faculty developed this handbook to introduce our Master of Science program in Biology. If you are considering CSUB as a possible choice for graduate school, our handbook will give you some insight into our goals, curriculum, and strengths. If you are already admitted to our program, the handbook will inform you of our policies, procedures, and requirements. In any event, our handbook will be a useful tool toward determining your graduate school and professional objectives.

Paul T. Smith, Ph.D.

Associate Professor and Graduate Coordinator for Biology

PROGRAM DESCRIPTION

The Department of Biology offers a comprehensive 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 in state and federal agencies, the environmental consulting industry, and for graduate studies at the doctoral level. The Master of Science with a non-thesis option is intended for working professionals, especially public school teachers, and emphasizes course work and the completion of a final project to be designed by the student and his/her advisor. 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.

Some of the special features of our program include:

- Close, individual guidance by highly skilled faculty
- Incorporation of science pedagogy and teaching experience
- Many 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. Research facilities include a 16.3 ha Environmental Studies Area (on campus), the Facility for Animal Care and Treatment where raptors are treated and rehabilitated (located within the ESA), and two greenhouses. In addition, the department has two growth chambers, an ultracentrifuge, gel-dryer, -70° C freezer, thermocyclers, 2D protein analyzer, refrigerators, and a scanning electron microscope. Faculty interests include field biology, physiology, comparative morphology, paleontology, microbiology, molecular evolution, ecology, systematics, and behavior.

MASTER OF SCIENCE DEGREE PROGRAM

The formal program of study for the Master's Degree in Biology includes 45 units of committee approved graduate work, at least 35 units of which must be at the 500/600-level. Biology 505, 577, and 605 may require an appropriate upper division pre-requisite. Other pre-requisites will vary according to course offering, the determined by the course instructor, and will be announced in the Course Schedule and on the Biology Department Web Page.

Course Requirements for the Master of Science in Biology

A minimum of 45 units of course work is required for the MS in Biology. The following courses are required of all students:

- 1. BIOL 505 Current Topics in Biology (9 units)**
- 2. BIOL 510 Advanced Writing and Experimental Design**
- 3. BIOL 605 Seminar in Biology**

For students choosing the MS Thesis option, the following courses are required:

- 1. MATH 521 Statistics and Data Analysis**
- 2. BIOL 690 Thesis**

For students choosing the MS Non-Thesis option, the following courses are required:

- 1. BIOL 540 Graduate Practicum in the Teaching of Biology**
- 2. BIOL 680 Non-Thesis Project**

	Thesis Option	Non-Thesis Option
BIOL 505 - Current Topics in Biology	9	9
BIOL 510 - Advanced Experimental Design and Analysis	4	4
BIOL 540 - Graduate Practicum in the Teaching of Biology	-	3
BIOL 605 - Seminar in Biology	3	3
BIOL 680 - Non-Thesis Project, including written report	-	6
BIOL 690 - Thesis, including oral defense	9	-
Additional 400-, 500-, or 600-level courses (could include non-biology courses as appropriate)	15	20
Math 521 – Statistics and Data Analysis	5	-
TOTAL UNITS	45	45

LIST OF GRADUATE 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.

This course is repeatable. Prerequisites: Graduate standing or consent of instructor.

BIOL 510 Advanced Experimental Design and Analysis (4)

Course covers how to effectively communicate biological science to the scientific community as well as effective methodology in experimental design.

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. 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. Prerequisites: Graduate standing or consent of instructor.

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. Although repeatable, a maximum of five units may be applied towards the Master's degree. Available by consent of the advisor. Note: Other 400 and 500 level courses outside of the Biology Department may be taken and applied towards the degree if deemed acceptable by the advisor and the Departmental Graduate

Committee.

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. Prerequisites: Approved petition for advancement to candidacy.

BIOL 680 Non-Thesis Project (6)

Students complete a project that requires the appropriateness of topic, theory, and methods applicable to the nature of the degree, conducted under the supervision of the Departmental Graduate Committee. Prerequisites: Approved petition for advancement to candidacy.

BIOL 690 Thesis (3)

Laboratory, field investigation, or a combination of both investigating a research problem. Preparation, completion, and oral defense of a written thesis approved by the Thesis Committee and the Departmental Graduate Committee. May be repeated for credit. Students may apply a total of 9 units towards degree. Prerequisites: Approved petition for advancement to candidacy.

MATH 521 Statistics and Data Analysis (5)

Basics of significance testing, basic exploratory data analysis, data summaries, multivariate data, time series, and multiway tables. Techniques may include graphical displays, transformations, outlier identification, smoothing, regression, and robustness.

List of Elective Courses

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 306 and 310, 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. Field trip fee required. Prerequisites: BIOL 306 and 310, or equivalent, or consent of instructor.

BIOL 414 Medical Microbiology (5) Isolation and identification procedures, and the clinical significance of medically important microorganisms (mainly bacteria). Key points of these organisms' epidemiology, and pathogenic mechanisms will be discussed. Skills concerning the isolation and identification of medically important bacteria is emphasized in laboratory. Two hours lecture and nine hours laboratory. Prerequisites: BIOL 311 or 312.

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 304 and 310, or equivalent, or consent of instructor.

BIOL 430 Molecular Biology (5) Evolution and molecular organization of the cell, macromolecules of organisms, and gene expression. Emphasis placed on recombinant DNA techniques, genetic engineering and biotechnology. Two hours lecture and nine hours laboratory. Prerequisite: BIOL 304 and 310, 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 304 and 310, or equivalent, or consent of instructor.

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.

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 305 and BIOL 310, or equivalent, or

consent of instructor.

BIOL 462 Plant Physiology (5) Structure, function, and physiological mechanisms of vascular plants. Topics include water and nutrient relations, photosynthesis and respiration. Two hours lecture and nine hours laboratory. Prerequisites: BIOL 305 and 310, or equivalent, or consent of instructor.

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.

ADMISSION REQUIREMENTS (UNIVERSITY)

Students applying for admission to CSUB should be prepared to provide official transcripts from last college/university attended. Students must formally apply for admission to a graduate program and must be formally admitted to the graduate program prior to beginning a plan of study to complete the requirements for the master's degree. Admission as a post-baccalaureate student to CSUB does not constitute admission to a graduate program.

Graduate applicants must first file an application for admission to the university as a post-baccalaureate/graduate student (available from the Office of Admissions).

All graduate applicants must meet the following minimum requirements for post-baccalaureate/graduate admission to the university:

- 1) Baccalaureate degree from an accredited four-year college or university
- 2) Overall 2.5 GPA in the last 90 quarter units or 60 semester units or last two years of college coursework.
- 3) Good standing at the last college or university attended.

ADMISSION REQUIREMENTS (DEPARTMENT)

1. An earned bachelor's degree in the biological sciences or a bachelor's degree in a related science with minimum course work equivalent to Biology 304, 305, 306, and 310.
2. An undergraduate GPA of at least 3.0 in the last 90 quarter (60 semester) units of course work, or Graduate Records Examination scores of 1000 or greater (verbal and quantitative), or an approved petition to the Graduate Committee of the Department waiving this requirement by proposing other evidence of adequate prior academic preparation.
3. Formal decision by the Departmental Graduate Committee to accept the student into the graduate program. The decision will be based on a formal application procedure, which includes evaluation of GPA, Graduate Record Examination scores, letters of recommendation, an interview, and other materials that may be required by the Committee and/or offered by the student.

Visit: http://www.csub.edu/Biology/Masters_info.htmlx **for application forms**

GRADUATE STUDENT CLASSIFICATIONS

Unclassified Post Baccalaureate Status – The Unclassified Post Baccalaureate status allows students to take graduate level courses on a course-by-course basis without being formally accepted into the MS program. Requirements for Post Baccalaureate status are listed below.

1. An acceptable baccalaureate degree from an accredited institution.
2. An undergraduate GPA of at least 2.5 in the last 90 quarter (60 semester) units of course work or an approved petition to the Graduate Committee of the Department waiving this requirement by proposing other evidence of adequate prior academic preparation.

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, or Graduate Records Examination scores of 1000 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. Formal decision by the Departmental Graduate Committee to accept the student into the graduate program. The decision will be based on a formal application procedure, which includes evaluation of GPA, Graduate Records Examination scores, letters of recommendation, an interview, and other materials that may be required by the Committee and/or offered by the student.
4. Acceptance into an academic advising relationship with a departmental faculty member.
5. Acceptance will only be granted if space is available for the student in the program.

Conditionally Classified Graduate Student - 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-level courses. They are restricted to 500- and 400-level courses for which they have met any prerequisites.

Advancement to Candidate Status - Acceptance as a candidate indicates that the student has completed 20-25 quarter 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:

Completion of all requirements for Classified Status.

1. Completion of at least 30 quarter 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.
2. Certification by the student’s academic advisor that there is a reasonable expectation that the student will satisfactorily complete the approved Plan of Study within one year.
3. Approval of the student’s Master’s thesis research topic by the Departmental Graduate Program Coordinator, Thesis Committee and Departmental Graduate Committee.
4. 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.

Time Limits

Time limits have been set for completion of requirements at each level of status. 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. Admission to Candidate Status must be attained within two calendar years after acceptance as a Classified Graduate Student. All requirements and graduation are to be completed within five calendar years after acceptance as 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 require satisfactory completion of all courses in an approved Plan of Study and satisfactory completion of a project or thesis, including oral examination and any revisions required by the Thesis Committee or Departmental Graduate Committee, and maintaining a 3.0 GPA.

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 AND MATHEMATICS - provides input to faculty and students concerning the degree program.

DEPARTMENT OF BIOLOGY GRADUATE COORDINATOR - maintains the files of all graduate students; tracks the adherence of programs and student progress to the published requirements; delivers the various forms to students; serves as a resource person for questions about the program.

DEPARTMENT OF BIOLOGY GRADUATE COMMITTEE CHAIR - oversees the acceptance, program establishment, progress, and completion processes; resolves problems between students and faculty and students and departmental regulations; serves as final departmental quality control on thesis/non-thesis project.

DEPARTMENT OF BIOLOGY GRADUATE COMMITTEE - three-person committee (including Graduate Committee Chair) selected by the graduate student that oversee progress and completion processes.

FACULTY IN THE DEPARTMENT OF BIOLOGY*

NAME	INTERESTS
Dr. David Germano	Animal Biology, Ecology, Conservation Biology
Dr. Kenneth Gobalet	Vertebrate Biology, Anatomy, Evolution
Dr. Carl T. Kloock	Science Education, Behavioral Ecology
Dr. Antje Lauer	Microbiology, Marine Biology
Dr. Todd McBride	Human/Muscle Physiology
Dr. L. Maynard Moe	Botany, Ecology, Taxonomy, Evolution
Dr. R. Brandon Pratt	Plant Physiological Ecology
Dr. Paul T. Smith	Entomology, Systematics & Evolution, Genetics
Dr. Kathleen Szick-Miranda	Molecular and Cell Biology
Dr. Ted Weinheimer	General, Cell, and Developmental Biology

*see http://www.csub.edu/Biology/Bio_faculty.htmlx for additional information about faculty and their research

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 training 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 tentatively assigned a Graduate Committee Chair whose interests appear to match those of the student. Students are free to seek a Committee Chair other than the one originally assigned, should interests change in the early part of the student's program. If a student seeks to change faculty advisers, he/she must fill out and have signed a new thesis committee membership form. **Students should not feel that a decision to change advisers will reflect badly on them!** The faculty understand that the professional and personal compatibility of students and faculty may change.

PROGRAM OF STUDY

Each graduate student must establish a specific plan (program) of study that will lead to fulfillment of requirements for the Master of Science degree. It must be approved before the student advances to candidacy. **The formal program of study for the Master's Degree in Biology includes 45 units of committee approved graduate work, at least 35 units of which must be at the 500/600-level.** Additional courses (prerequisites and/or deficiencies) of study may be required, but are not counted as part of the 45 units of committee approved course work. 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.

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 list. Any student whose overall GPA falls below 3.0 for two quarters, or who receives more than three grades of C (2.0) or lower, will be dropped from the program. A

full time graduate student should be enrolled in at least 9 units per semester. Each student must present a formal thesis/non-thesis proposal no later than the end of the third quarter after admission to the program

NON-THESIS

The Non-Thesis project will be the culminating experience for each student enrolled in the Master's program (non-thesis option)

The form of non-thesis project will be determined by the students' committee, but will consist of a written project and an exam (both written and oral). A suitable written project may be the development of a laboratory experiment/exercise that is suitable for publication in *American Biology Teacher*. The ultimate goal of the non-thesis project is one of content breadth in biology. Students will be expected to demonstrate mastery of content in ecology, genetics, physiology, and evolution for the written and oral exam portion of the non-thesis project. Other subject areas in biology may be substituted, but must be approved by the students' committee.

THESIS

Students must orally present a formal written thesis proposal to his/her Graduate Committee and should normally do so by the end of the third quarter of study.

The proposal should include the following sections: an **Introduction** (about four pages), **Methods** detailed enough so that someone familiar with your specialty can discern the appropriateness of the techniques, a **Bibliography**, and a **Budget** page where the costs of the project are presented along with the sources (if any) of the necessary funds. Please, double space the proposal. Also include a Thesis Proposal cover page. The purpose of the proposal presentation is two-fold: (1) allow the committee to assess and offer suggestions for improvement of the thesis project; and (2) provide graduate student valuable experience in presenting and defending planned research to other biologists. The proposal presentation is open to all faculty and fellow graduate students.

Research leading to the thesis will be the culminating experience for each student enrolled 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 a faculty adviser and two additional thesis committee members.

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

university with pertinent background to the research topic may sit on the thesis committee as a fourth member.

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

In some cases a student will rely primarily on the adviser 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 the adviser for guidance in determining the appropriate level of involvement for the committee members.

Students must be enrolled in BIOL 680 (Non-Thesis Project) or 690 (Thesis) while work toward the same is being conducted, analyzed, and written, and when the thesis manuscript is defended and approved.

All students must complete an application for submission of Master's Thesis / Project. Forms are available from the Office of Graduate Studies (also available online).

Master's Thesis: General Information/Guidelines

1. Basic Requirements*

- **Paper** - The thesis containing original signatures and all additional copies to be bound (at least 2 additional copies) must be printed on 100% rag cotton -- available at the campus bookstore.

- **Margins** - Margins must be 1-1/4" on the left side and 1" on the other three sides.

Copies - Students must submit a **minimum of 3 copies** to the Library

- 1) The unbound original will be forwarded for the Library archives;
- 2) One copy is bound and made available to the public through Library circulation;
- 3) The third copy is sent back to the department. If desired, the department may elect to pay for binding of its copy. Alternatively, the student may pay an additional \$28.75 for binding the department copy. *If the student wishes to have a copy bound for personal use, additional binding fees of must be paid.*

The original and one copy of all accompanying materials (e.g., video/audio cassettes, etc.) must be submitted. The original will be housed with the original written copy in the archives and the copy will be placed on reserve for student checkout in the Library.

- **Format** - Contact your graduate coordinator for instructions on format (MLA, APA, etc.) Use laser quality printer for final printing.

- **Deadline** - The thesis and all required copies must be submitted to the Library for binding **no later than the last day of regularly scheduled classes** during the quarter in which you plan to graduate.

**Procedures for non-thesis projects may differ. Please contact your department for*

specific information.

2. Payment for Binding. Students must go to Accounting to pay for binding of the thesis (projects are not required to be bound). The student must pay an initial \$28.75 for binding of the copy to be housed in the Library. If the student wishes to have more copies bound, an additional charge of \$28.75 per copy must be paid at that time.

3. Application/Submission of Thesis to the Library. Once you have paid for the binding, contact Monica Ibarra at 654-3249 to make an appointment to turn in your thesis. Take the accounting receipt, along with the completed Application for Submission of Thesis and at least three copies of your thesis.

At least three (3) copies of the thesis (one with original signatures of Thesis Committee members and two with copies of signatures) must be submitted. Each copy of the thesis must be in a separate manila envelope with a label affixed to the front of the envelope which states the last name, first name, and truncated title (see application). Please identify the original on the envelope label.

4. Certification. At the time the thesis is submitted to the Library, the student must certify that he/she has carefully checked each copy and that the copies are complete and all pages are in order. This certification is at the bottom of the Application for Submission of Thesis. **If the pages are out of order, they will be bound that way!**

5. Receipt for Master's Thesis. The Library will issue a receipt for the master's thesis. Payment of fees will be verified by the student's receipt from Accounting. One copy of the receipt will go to Evaluations and one copy will be given to the student.

6. Distribution of Thesis Copies. Upon receipt of the thesis copies, the Library will send the appropriate number of copies to the bindery. When the bound copies are returned, the unbound copy and one bound copy will remain in the Library, another to the department (if applicable). If the student has paid for an additional copy to be bound for their personal use, it will be returned to the appropriate department to be picked up by the student. Turn-around time for binding is 2-3 months.

Each student must submit and orally defend a final thesis manuscript. The manuscript must adhere to CBE style or a style pertinent to the student's area of research (with the consent of the committee). The student must submit the manuscript to the thesis committee two weeks prior to the oral defense and s/he must arrange a time and place for the defense. Oral defense of the final thesis is open to all students and faculty, but attendance is required only of the student and her/his committee. The final thesis will be approved when, by general consensus of the student's thesis committee, the thesis is deemed to have met or exceeded a satisfactory level of achievement. This may require one or more revisions of the thesis manuscript before a final version is approved.

If a student publishes (in a peer-reviewed journal) the results of faculty-supervised research that s/he conducted while enrolled in the graduate program, that publication may, if approved by the thesis committee, be submitted and orally defended in lieu of the final thesis.

Students will be allowed to participate in the graduation ceremony if and only if the student's thesis/non-thesis project has been completed and approved by the graduate committee. **Students should therefore not make plans for participating in the graduation ceremony until it becomes evident that the thesis/non-thesis will indeed be completed on time!**

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) to increase the number of CSUB graduate students who would otherwise 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.

TIMELINE

THE FIRST YEAR

Listed below are some of the steps that need to be completed during the first year of your tenure here.

(1) **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 which 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 may 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, or students may enroll in and satisfactorily complete one of the following approved courses: Communications 304, 306, or 311; English 305, 310 or 311; History 300; or Admin 510. All graduate students should check with the appropriate graduate program coordinator to discuss the specific requirements, including acceptable scores or grades, of their respective program.

Student requesting a waiver for the GWAR must contact the Composition Office in Faculty Towers 102-D.

(2) **COMPLETE COURSE DEFICIENCIES**

(3) **PASS THE GRE GENERAL TEST** if acceptance into the program was granted without test scores (The 50th percentile or 1000 combined score on verbal and quantitative sections is required for passing) Check CSUB Testing office for dates.

(4) **ESTABLISH A GRADUATE COMMITTEE AND OFFICIAL GRADUATE PROGRAM** (Obtain forms from the Department Graduate Coordinator.)

First-Year Coursework

In consultation with the Chair of your Graduate Committee, enroll in courses that match your general research area at the upper division level (courses with 400, 500, or 600 numbers). Of course, if you have any course deficiencies these should be completed during the first-year. Most courses that you take before you establish a formal Program of Study may be put on this program, up to a total of 15 units (deficiency courses cannot be on the Program).

Finding A Graduate committee Chair/thesis Advisor

Non-thesis students. Non-thesis students will be assigned a Graduate Committee Chair by the Graduate Coordinator. The responsibility of the Chair is to monitor progress and assist with course selection. The graduate student will work with the Chair to identify two other faculty members in the Department to serve on the graduate committee. The Graduate Committee will be responsible for administering and evaluating the non-thesis culminating project.

Thesis students. As indicated in your acceptance letter, you should talk with the professors whose research interests best match your own about the possibility of working with them on a thesis project. While you may not get a direct commitment at first, often you can sign up for Directed Studies/Research (BIOL 580) with a professor. This course allows you to learn what types of research they do and how you might fit into that program. It is also useful to talk to other graduate students about what the various faculty are doing and who might have an opening for a new student. Once you have found a faculty member who has agreed to be your Thesis Chair, two additional members need to be selected. These members should have some interest and expertise in your research field so that they may constructively add to your research efforts. At least two members (including the Thesis Chair) must be tenured/tenure-track faculty from the Department of Biology; one or more additional members may be from outside of the department. It is the responsibility of the student to ensure that the committee members remain updated on your progress. A Committee meeting must be held toward the end of each academic year. Meeting forms are available from the Graduate Coordinator.

Establishing a Program of Study

You and your Graduate Advisor fill in the "Graduate Program for the Master of Science" form obtained from the Departmental Secretary with a tentative list of courses; these will be discussed for approval at the first committee meeting. Refer to the CSUB Catalog for other university and departmental restrictions.

Thesis Proposal

Students must orally present a formal written thesis proposal to his/her Graduate Committee and should normally do so by the end of the third quarter of study

FAILURE TO COMPLETE THESE FIRST-YEAR REQUIREMENTS BY THE END OF THE THIRD QUARTER IN RESIDENCE WILL RESULT IN TERMINATION OF YOUR ACCEPTANCE INTO THE MS DEGREE PROGRAM.

SECOND AND THIRD YEAR

- (1) FINISH COURSES ON THE OFFICIAL GRADUATE PROGRAM
- (2) SUBMIT "REQUEST TO GRADUATE" FORM
- (3) FINISH THE RESEARCH AND COMPLETE THE WRITING
- (4) DEFEND THESIS/COMPLETE NON-THESIS PROJECT OR EXAM

THESIS DEFENSE

The MS Candidate will work with the Graduate Committee Chair/Thesis Advisor to develop an approved draft of the thesis, which will then be circulated among the other members of the Committee for comments. When there is general agreement among the Committee and the Graduate Advisor that the thesis is basically sound, the Chair will arrange a time for a thesis defense.

The Thesis Defense will consist of a research presentation and will be announced publicly. 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 the 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. The signed Thesis Defense Form will be submitted to the Graduate Coordinator.

REVIEW OF STUDENT PROGRESS

In addition to the required Committee meetings to formulate program of study and defend thesis proposal, the student should schedule brief meetings with the committee to provide an update on research progress.

CSUB Biology Program Thesis Committee Membership Record

(Graduate Student Name)

(Date)

(Proposed Thesis Topic or Non-Thesis Project)

I agree to serve as a member of the thesis committee for the above mentioned graduate student.

(Committee member signature)

(Date)

(Committee member signature)

(Date)

I agree to serve as chair of the thesis committee for the above mentioned graduate student, and approve the two faculty members who have signed above as committee members.

(Advisor/Chair's signature)

(Date)

(Former advisor's signature, if applicable)

(Date)

The Graduate Committee approves the thesis committee for the above mentioned graduate student.

(Graduate Coordinator)

(Date)

When completed, this form should be returned to Terry Hansen, Biology secretary, and placed in the Biology Program files, in the student's folder. Copies should be sent to the student, other committee members and the former advisor if applicable. If there are changes in committee composition, the advisor should complete a new form.

APPLICATION FOR ADVANCEMENT TO CANDIDACY

PART I

1. STUDENT NAME: _____
2. ID #: _____
3. DEGREE PROGRAM: _____

PART II

As faculty advisor 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 study plan has been completed and approved. A copy is attached.
- The following members comprise the student's thesis, project or comprehensive written examination committee:
Name _____ Position _____
Name _____ Position _____
Name _____ Position _____
- The program requires that the student complete a thesis/project proposal before advancement to candidacy can occur. The student successfully completed this requirement on _____ (date).
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 faculty advisor. Essentially, the advisor 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. Some programs require students to satisfy a thesis or project proposal requirement before an advancement to candidacy can be made.

Along with the faculty advisor recommendation, students must prepare and submit an approved study plan. The plan details a student's course of study, listing the courses to be taken and indicating when they are to be taken. The study plan also identifies the members of the student's thesis, project or comprehensive examination committee.

The student's assigned faculty advisor 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.