STUDENT ORIENTATION GUIDE
Marine Environmental Biology Section
University of Southern California

Fall 2003
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Welcome

Welcome to graduate study in Marine Environmental Biology at USC! You are officially embarking upon your professional career in academics, and we hope your years here are exciting, challenging, and fruitful. The purpose of this brochure is to try and help smooth the way during your first few weeks, as well as to provide some basic information with regard to our program, being a graduate student at USC, and life in L.A. in general. In addition to this guide, a good source of information is provided by a free booklet entitled SCampus, which you can obtain at Topping Student Center. Of course, it is always a good idea to solicit information and advice from more senior graduate students and from faculty. Senior graduate students can be very helpful for adjusting to the “personal” side of life at USC, while Faculty and the Graduate Student Coordinator should be your source of information for “official” aspects of the program and academic life.

Our support staff is also available to help out with procedures for registration and other logistical details. Bill Trusten is the Graduate Student Coordinator for Biological Sciences; he is located in SHS 172, mc 1340, x07766. Bill is highly knowledgeable concerning all aspects of the graduate program.

Once again, welcome to the program!

Douglas Capone
Director, Marine Environmental Biology
**Registration Process**

**ACTION**

1) First year students: Set up advisement appointment with your advisor

   Continuing students: Check your mailbox for registration

2) Obtain the signed approval form from your advisor and return it to Bill Trusten for "D" clearance.

3) Register via TouchTone Registration (follow directions in the *Schedule of Classes*).

4) Get your fee bill and pay all necessary fees by deadline.

5) Pick up your ID card from USCard services (Commons Lobby).

6) Get validation sticker from your section Administrative Assistant.

If you have any problems with your fee bill, please see Bill Trusten.

**Registration Directory**

- Registration Packets
- Enrollment & Drop/Add
- American Language Institute
- Office of International Students
- USCard
- Health Insurance
- Housing/Dining Services
- Financial Aid
- Parking Permits/Ridesharing
- Payment of Fees/Cashier’s Office

Registration Building (REG)
1st Floor

Jefferson Building (JEF), Room 150
STU 300
Commons Lobby
Student Health Center (SHC)
Parking Structure C
Hazel and Stanley Hall (HSH)
Childs Way Building I
King Hall, 2nd Floor
Student Health and Insurance

All Teaching Assistants and Research Assistants will have the student health center fee and student health insurance fee paid by the University. You should enroll in the USC health plan for coverage. Enrollment deadline for health insurance is September 15. Go to the Student Health Center for information and enrollment forms.

Student Health Center

The Student Health Center provides the following services: primary care, basic emergency care, an urgent care clinic, Saturday clinics, specialist clinics, and a pharmacy. You are eligible to use the Health Center is you are enrolled in classes and a Health Center fee is listed on your fee bill. If you are not taking classes (as in summer) you must pay the appropriate fee for use of the Health Center.

If you are eligible, most care is free. There are nominal charges for some lab tests, prescriptions, orthopedic appliances, and copies of medical records. Hospitalization is NOT covered but must be purchased separately (see above). Should you have questions, call 740-5344.

Dental Care

Dental care is not covered by your Health Center fee or by health insurance. You should see a private dentist or consider the USC Dental School for inexpensive dental care. Call the Dental School at 740-2800 for details.
Program Life

Sectional Seminars

An important part of your training is the opportunity to attend and participate in research seminars. Seminars are given on most Tuesdays at 12:00 Noon in the Torrey Webb Room of AHF. A complete list of invited speakers will be given to you near the beginning of each semester. Speakers are selected by faculty and students. Seminars last for one hour and there is always time for questions and answers immediately following. You are expected to attend all marine biology seminars. Notices will be posted prominently in Allan Hancock as well as updated weekly on the Biological Sciences Homepage: http://www.usc.edu/dept/LAS/biosci/seminars/index.html.

Additionally, other groups and departments offer their own seminar series such as Neurobiology, Molecular Biology, Gerontology, Medical Sciences (Biochemistry, Microbiology, Pathology, Cell and Anatomy, Molecular Pharmacology and Toxicology), to name a few. Finally, schedules of seminars offered at other universities (CalTech, UCLA) will be posted as they are received on the seminar board located just outside of AHF 107. Be sure to check the bulletin boards weekly for announcements.

There are many benefits to attending seminars. You will learn a great deal, especially in areas outside your expertise. You will have the chance to meet many distinguished scientists. These contacts will help you in your research and could lead to future letters of reference or postdoctoral opportunities.

The Marine Environmental Biology Office

There are at least two offices from which you can obtain administrative support. For matters relating to your research or the graduate program, see Don Bingham, the Administrative Assistant for the Marine Environmental Biology Program (AHF 107E, x05779, Bingham@usc.edu). See Bill Trusten if you any questions about registration, grades, Graduate School requirements, etc. For academic matters, see your faculty advisor. We cannot provide you with secretarial services per se, so you will have to do your own word processing, copying, library work. We do have a typewriter, computer, fax machine (740-8123 located in AHF 107), copying machines, and other equipment available for research-related purposes.

Offices, Mail, Keys

All students receive incoming mail in the mailroom in AHF 107. Mail should be addressed as follows: Marine Environmental Biology, Department of Biological Sciences, University of Southern California, AHF 107, Los Angeles, CA 90089-0371. This 9-digit Zip Code is extremely important. The digits 0371 identify Allen Hancock Foundation. These digits are all that is necessary for intercampus mail. Outgoing mail and stamped mail can be left in the mailroom for pickup by Mailing Services.

Keys can be obtained from the Administrative Assistant in the Marine Environmental Biology office. There is a charge for each key you need ($10 for AHF keys). Never leave your keys unattended. We take the matter of security very seriously. You must do your part to maintain the safety of the people and property that we depend on. Never prop open a locked door, especially after hours. Do not give your keys to others. If you see someone around the labs or halls that you do not recognize, call security (x06000 or x04321—emergency).
Libraries

The Seaver Science Library (SSL), located in the Seaver Science Center, is the principal science library on the main campus at USC. A good collection of current journals, arranged in alphabetical order, will be found on open shelves on the first floor. Older journals are bound and shelved together with books on the upper floors. Periodicals cannot be checked out, but photocopiers are available in the library. See the reference desk on the first floor for additional information and help (i.e., database searches, computer networks, etc.)

Other main campus libraries that might be of use are the Hancock Library, located on the second floor of AHF, Leavey Library (LVL), and the Doheny Memorial Library (DML). The Hancock Library is especially strong in the marine sciences and systematics, and the Doheny Library is the main undergraduate library with many general interest books, periodicals, and reference materials.

A USC library card must be obtained for library privileges. See the person at the main circulation desk in DML or SSC. You must have your I.D. card with a current registration sticker. Stickers are available from the section administrative assistants at the beginning of each semester. The card is valid for one semester only. You must renew at the beginning of each semester.

There are several excellent libraries off campus. Within the USC system, there is the Norris Medical Library on the Health Sciences Campus. Journal articles can be copied for you and sent via campus mail, but this takes two weeks or so. Inquire at the reference desk in SSL if you’re interested in this service. By far the best library in the area is UCLA’s Biomedical Library. Just about any journal, no matter how obscure or old, can be found there. There are numerous copying machines available that use debit cards that can be purchased from vending machines. USC students with valid identification can obtain a UCLA library card. Inquire at the circulation desk in the Biomed Library.

Information on Computing

USC maintains an extensive computer network that can be accessed from several public user rooms around campus, by modem from a home computer, and, most importantly, from any computer connected to local networks such as the Ethernet in the molecular biology laboratories. An extensive array of software is available on the campus network, and services such as electronic mail, database searching, and bulletin board access is provided free of charge to graduate students. The Computing Center offers advice and training sessions on using the system and its software. The key to this world of information is a computing account.

To encourage greater student use of university computing services and to ease the process of getting online, UCS has instituted a new procedure for issuing computer accounts to students.

Computer accounts will be created automatically for all students enrolled in degree programs. To activate your computer account, students will need to complete a simple Web based form and choose a password. To access this form, students can visit one of five public computing areas (Leavey Information Commons, KOH 200, SAL 125, or WPH B34 on the University Park campus, or Norris Medical Library on the Health Sciences Campus). In these facilities, students will find step-by-step instructions on how to activate new accounts.

Students who wish to connect to the university network by modem will need to install and configure PPP software on their personal computers. Free PPP software can be downloaded from public machines in UCS user rooms.

Automatic accounts will be available to enrolled students two weeks before classes begin. For more information on automatic accounts, please feel free to contact either UCS’s Customer Support Center or Computer Accounts Administration office at x05555, or send email to (consult@usc.edu).
**Personal Life**

**Housing**

On-Campus: The USC Student Housing Office (x02546) is in Parking Structure C.

Off-Campus:
Most graduate students choose to live off-campus. The major Los Angeles newspaper (*The LA Times*) as well as smaller community newspapers (*Hollywood Press, Santa Monica Evening Outlook, The Daily Breeze* - Redondo-Hermosa-Manhattan Beach areas, *Star News* - Pasadena area, *Northeast Newspaper* - Eagle Rock, El Sereno, East Los Angeles areas, have listings for apartments and houses for rent. You can also check listings in the student newspaper (*The Daily Trojan*). There is a classified advertising paper (*The Recycler*) which has many listings. Finally, just walk around a neighborhood you like and look for vacancy signs.

Before you start your off-campus housing search, there is one very important purchase you should consider: a *Thomas Brothers Street Atlas of Los Angeles and Orange Counties*. These are available at the USC Bookstore (next to the Commons) or at just about any bookstore in the LA area. With the "Thomas Guide" you can locate any street address in LA and Orange counties quickly and easily. Even long-time Los Angeles residents find a "Thomas Guide" to be extremely valuable.

Non-University housing near the USC campus is limited and therefore fills up early. In addition, some areas close to campus are pretty rough; you should definitely stay away from the south side of campus (near the stadium, Sports Arena, etc.). The area north of campus, known as "North University Park", is generally considered to be a safe area. Because the area is small, availability is limited and landlords are able to charge more, making it difficult to find a bargain. Nevertheless, there are a number of older places with "character" that are not too expensive and entirely livable. These must be sought out early, but try anyway - you might be lucky. One advantage of living in this area is that you can easily walk or bike to campus.

A word to the wise regarding safety: you should never walk around campus late at night alone. If you are working in the lab late at night, call the Escort Service (see below) for a pick-up at the building entrance.

**Transportation and Parking**

The Los Angeles transportation system is the Metropolitan Transit Authority (*MTA*). The MTA information number is 213/626-4455. There is excellent express bus service from several cities into the downtown area. Some routes include stops at or near USC. You can usually get between any two places in the L.A. area by bus, but one or two transfers may be required. The fare is $1.35, plus 25 cents for a transfer.

Los Angeles is installing a new subway and rail transit system. Currently, the "Blue Line" runs between Long Beach and L.A., and the "Red Line" runs from the Civic Center in downtown L.A. to what is known as the "Wilshire Corridor". Also, the new "Gold Line" runs from downtown through Pasadena to Sierra Madre. Purchase discount MTA bus passes from USC Transportation Services.

USC operates a Tram Service and an Escort Service. The tram provides transportation to the housing areas off campus, to the Health Sciences Campus, and to campus parking lots Monday through Friday. You can also call the Escort Service to transport you to locations within approximately one mile from the center of campus (including off campus housing area). If you work in the lab late at night, call the Escort Service (x04911) rather than walk to the parking structure alone. See *SCampus* for information and schedules.

If you live close to campus you may want to commute by bicycle. Keep in mind, however, that the traffic in
stolen bikes near USC is very high, so take precautions. Don’t park your bike outside unlocked; keep it in your apartment and, while you are at school, keep it in your office/lab. Bicycles must be licensed - see procedures in SCampus.

If you commute by car you would be wise to invest in a USC Parking Permit, which will entitle you to park in certain designated areas on campus. See the "Schedule of Classes" for details. You obtain a parking permit from the Transportation Office, located in Parking Structure A. There is some off-campus street parking but it is scarce and not very safe. There are also time restrictions for street parking - be sure to read the posted signs before you leave your car. Regardless of where you park, you should always lock your car and make certain that you leave nothing of value (tape deck, books, clothes, tennis rackets, etc.) in a place where it can be seen from the outside of the car.

Los Angeles County sponsors a service called "Commuter Computer", which is designed to help commuters form car pools. If you would like to car pool, but have trouble finding partners, you can submit your name and commuting schedule to the "Commuter Computer", 213/380-RIDE. It will attempt to match you up with other people with similar commuting needs. USC also has an office on campus to help with car pooling needs called "Commuter Connections" (x07433), which is located on the first floor of Childs Way Building I.

Culture and Recreation

Los Angeles has no shortage of cultural and recreational activities. There is something for everyone, from amusement parks (Disneyland, Magic Mountain, Knott’s Berry Farm) to art museums (LA County, J. Paul Getty, Norton Simon, MOCA - Museum of Contemporary Art, Huntington Library and Art Gallery); from classical music (LA Philharmonic at both the Music Center and Hollywood Bowl) to contemporary (Greek Theater, Universal Amphitheater); from classic theater and musicals (Shubert, Ahmanson, Pantages) to first-run contemporary works (Mark Taper Forum, any of the many local smaller theaters); from zoos (LA, San Diego) to aquariums (Sea World); and horse racing (Hollywood Park, Santa Anita Park) to all pro sports (LA Dodgers, Kings, Lakers, Angels) and so on. The LA County Museum of Natural History, the LA County Museum of Science and Industry, and the California Afro-American Museum are just south of campus in Exposition Park.

For a unique experience, visit the Page Museum and La Brea Tar Pits next to the LA County Museum of Art on Wilshire (part of the Wilshire Corridor). Students are often entitled to discounts, and student rush tickets at concerts, etc. can be a really great deal. You must have a student ID with a current registration sticker. Here are a few ways to learn about what’s going on: the New Times and the LA Weekly are free and usually available each Thursday afternoon outside the Topping Student Center; also check the "Calendar" section of the Sunday Los Angeles Times and Los Angeles Magazine.

Recreational facilities in the Los Angeles area are superior. There are beaches, parks, golf courses and tennis courts. The mountains are an hour away where hiking is excellent and skiing sometimes good.

There’s also plenty going on at USC, including plays, musicals, concerts, first-run movies, film retrospectives, and art shows. Most popular, however are the athletic events, especially football games. It may seem intellectually inappropriate to go nuts over football, but USC football games (particularly the UCLA game) are exciting spectacles that you really should experience at least once. If you enjoy watching college athletics you ought to invest in a "Student Activity Card." These are available during registration week. The Student Activity Card is essentially a season ticket to all home USC athletic events (including all sports). It also guarantees you the opportunity to purchase a Rose Bowl Ticket if USC is selected to play.
Excellent athletic facilities available to students can be found at the Lyon Center (next to the McDonald's Olympic Swim Stadium). Entrance and basic facilities are free to students with current ID. There are several tennis courts, handball and racquetball courts, a weight room, and a track generally available for students use. Two new swimming pools, adjacent to the Lyon Center were built for diving and swimming events in the 1984 Olympic Games. Biology students can form teams to enter University intramural leagues in a number of sports (e.g., basketball, softball, coed water polo, coed volleyball). If you’re interest in participating, watch for notices throughout the section.

Finally, USC maintains a research lab on Santa Catalina Island in Big Fisherman Cove at Two Harbors. You can get there for free on the USC boat, which travels between Catalina and the USC Marine Support Facility in LA Harbor. Call 743-6792 for details.

Banking and Shopping

At the University Village, there is one bank, Bank of America, which offers bank cards as well as checking and savings accounts. Automatic teller machines are available there and on campus (near the University Bookstore). NEVER GO ALONE TO AN AUTOMATIC TELLER MACHINE AFTER DARK. If you open a savings account with them, they will cash your personal checks. A particularly good way to meet your banking needs is the USC Federal Credit Union (KOH 200), which is on campus and offers good deals on checking and savings accounts. The Credit Union currently has three automatic tellers on campus (near the University Bookstore, the Commons Lobby, and Kings Hall).

Books

The University has an excellent bookstore and graduate students with TAs or RAs are entitled to a 10% discount with their ID card. Another good store for books and supplies is "The Paper Clip", next to campus in University Village. The also give a 10% discount.

Supermarkets

The 32nd Street Market, located in University Village, is the only supermarket near USC. The food, meat, and produce are usually acceptable. The market will cash personal checks if you have a California Driver's License. You can also send telegrams and mail packages as well as purchase money orders.

A Ralph's Supermarket has opened on Vermont Avenue, at the corner of Adams Boulevard. A Smart and Final store has opened on Vermont Avenue directly across from campus--janitorial supplies, food in large quantities at discount rates can be found here.

Other Important Locations

A United States Post Office is at 3585 S. Vermont Avenue (directly West of the University). There is also a mail stop in the Commons Lobby that provides a limited number of postal services (at an additional charge).

The California Department of Motor Vehicles (DMV) is at 3615 S. Hope Street, 2 blocks East of campus.
General Information about Financial Aid

It is the intention of the Marine Environmental Biology Section to provide or arrange for the provision of financial support (stipend + tuition) for all of our Ph.D. students. Students should feel assured that the faculty will do everything possible to meet this goal. Please note that Graduate School rules prohibit full time students from accepting any employment above and beyond their graduate assistantships (see Graduate Assistantship Handbook). There are 4 main sources of support for graduate students: Teaching Assistantships, Research Assistantships, Training Grants, and Individual Fellowships and Grants.

1) Teaching Assistantships
We are fortunate to be part of a large undergraduate department, because this gives us access to many TAships. The exact number varies with enrollments, but is divided equally between the 3 research sections. TAships, which are generally awarded for an academic year, carry a stipend and full tuition remission. You must maintain at least a 3.0 GPA to receive the tuition remission. Nine monthly payments are made beginning September 26 and ending May 26. It is possible to arrange for payments to begin August 26 (for a total of ten payments). See Bill Trusten for more information. The authority to offer TAships rests exclusively with the Biological Sciences Department Chair, Dr. Sarah Bottjer. She consults extensively with the Graduate Admissions Committees of each of the sections, and with faculty instructors.

The workload associated with TAships is quite variable, depending on the course in question and the familiarity of the TA with the subject matter. Consult a few of the more advanced graduate students for tips on course selection. Keep in mind that the best way to learn a subject in detail is to attempt to teach it to someone else. Whatever course you are assigned, please take your responsibilities very seriously. You are under a moral and legal obligation to do your best for your students. Undergraduates pay a hefty tuition bill, so they are entitled to your best efforts. Learn the subject matter diligently and find creative ways to explain it. Practice your verbal communication skills. Make yourself available and approachable. Conform to high ethical standards and respect confidantials of your position. All of these skills will be directly useful to you in your future careers as researchers and educators. We faculty view the TAships as an important part of your training. Please be aware that as with any other job, you TA position can be terminated for poor performance.

2) Research Assistantships
Research Assistants are paid on the same scale and receive identical benefits as TAs. Whereas TAships are funded by the department, RAships are funded by the research grants of individual faculty. As the name implies, RAs do research, usually directed the Specific Aims of the grant that funds the position. The time required is often more than that for a TAship, but this is usually not considered a burden because the work should be directly relevant to your research training. At a minimum, an RAship should be considered a 15-20 hour per week job. Students might opt to put in more time, however, depending on the relationship between RA duties and the dissertation project, or the likelihood of co-authoring resulting publications. The relation between the RA project and the dissertation project varies depending on the faculty member involved and other circumstances. In some cases, the two projects are the same and you will in effect be paid for doing your dissertation research. In others, efforts are made to keep the projects distinctly different. Good arguments can be made for either approach.

Research assistantships need to be cultivated. Try to identify your research interests as early as possible, certainly by the end of your second semester. Determine which professor best matches those interests. If necessary, do some reading to educate yourself about that professor’s work and the field in general. Tell the professor you would like to work with him or her and inquire about the availability of RAships. Before you start an RAship, be sure you understand what is expected of you, what you can expect from the professor, and what relations might exist between your work and dissertation research.
TAships vs. RAships: Your teaching assistant experience can be very rewarding. You will learn a great deal and have the satisfaction of seeing that knowledge take root in others. You may establish lasting friendships or mentor relationships with some of your students. On the other hand, you are here primarily to do research, not teach. If you are not very efficient in organizing your time, progress on your dissertation research may be slowed by extended service as a TA. Most agree that RAships are preferable. Try to be flexible, though. As grant budgets wax and wane, it may be necessary to RAs to take TAships to cover lean periods.

3) Individual Fellowships and Grants
There are an enormous number of grants and financial aid available to students. Detailed information can be obtained from two sources. First, the Graduate School (UGR 105, x35179) has a partial listing of available grants. Second, there is a computerized database in Doheny Library (DHL reference section). This database contains literally hundreds of grants to choose from.

4) Summer Support
Your decision to be a Ph.D. student is a year-round commitment. You should view the summer as an opportunity to engage intensively in research, free from the distractions of coursework, TA assignments, and the like. We expect you to be in the laboratories, engaged in full time research, every summer. We will do everything we can to provide the financial support to make this possible. Please be aware, however, that it is your responsibility to take the initiative in securing summer positions. Early in the spring semester, if not earlier, every new student should make at least a tentative decision about which laboratory to work in. Talk to that professor and see if support is available. The best plan would be to secure a RAship, although there are a small number of summer TAships available. These provide only partial support and you must put your bid in early to Carolyn Facer. If these possibilities don’t work out, see one of the Graduate Advisors or the Section Director. They may be aware of other possibilities for summer funding.
DEPARTMENT OF BIOLOGICAL SCIENCES

GRADUATE PROGRAM IN MARINE ENVIRONMENTAL BIOLOGY

REQUIREMENTS AND POLICIES

Revised August, 2003
REQUIREMENTS AND POLICIES GOVERNING
THE GRADUATE PROGRAM IN MARINE ENVIRONMENTAL BIOLOGY

The Graduate Program in Marine Environmental Biology & its Administration

Introduction

Graduate students in the Graduate Program in Marine Environmental (referred to subsequently as "GPMEB" or the "Program") may pursue a Ph.D. degree.

At the University of Southern California, graduate education is the responsibility of the Department, but the University's Graduate School establishes minimum requirements concerning grade point average, number and distribution of units, residency, time limits, etc. that are common to all advanced degrees offered within the College of Letters, Arts and Sciences at the University. Specific courses, examinations, skills, and research requirements are established by the student's program of study, in this case the Graduate Program in Marine Environmental Biology. Collectively, both sets of regulations constitute the student's "degree requirements," all of which must be met by the student.

Graduate School regulations are listed in the current University of Southern California Catalogue somewhat confusingly, one part of these are scattered in the section on "Academic Policies and Information" near the beginning of the USC Catalogue and the rest are found near the middle of the USC Catalogue under "The Graduate School." Those regulations, which most commonly affect GPMEB students, are included in this document, but this listing should not be considered definitive. GPMEB regulations are listed in this document; the major requirements of degrees in the GPMEB are also listed in the USC Catalogue under "Department of Biological Sciences."

Program Administration--The Graduate School

The Graduate School maintains the University's official Permanent Graduate Student File and is ultimately responsible for admission of our graduate students and the awarding of their degrees. As noted above the Graduate School establishes requirements concerning grade point average, number and distribution of units, residency, and time limits that are common to advanced degree programs in all units under their jurisdiction, including the Department of Biological Sciences.

Official forms are used to track a student's progress by The Graduate School and completion and submittal of these usually is to be at a specified point in the student's tenure. Timetables for the completion of degree requirements are available at The Graduate School. The schedule for the Ph.D. student's final and penultimate semesters are especially detailed and need to be adhered to closely.

All Graduate School forms prepared by or on behalf of the student must be approved by the Director of the Program and by the Chair of the Department before their submittal to the Graduate School. All Graduate School forms are available from the Graduate Student Coordinator, Bill Trusten.

Graduate Student Representatives

In late spring, GPMEB students select two graduate students to serve as Graduate Student Representative and Alternate Graduate Student Representative for the coming academic year. Both students must have passed their Qualifying Examination in order to be eligible for the post. The Alternate will represent the graduate students in the Graduate Student Representative's absence or by the latter's appointment. The Graduate Student Representative has one vote in meetings of the GPMEB Faculty representing the opinions of the graduate students.

The Graduate Student Representative has no voting power either in the matter of continuation of fellow graduate students or in matters concerning the Qualifying Examination. At the option of the student examined, the Graduate Student Representative may also be present during the oral part of the Qualifying Examination.
Graduate Student Coordinator of GPMEB

The Graduate Student Coordinator of GPMEB is the staff member responsible for processing and maintaining graduate student files; serving as liaison between the students, GPMEB Faculty, and the Graduate School; and making available application materials, Graduate School Forms, and other relevant documents. A permanent Department file on each student is maintained in the Marine Environmental Biology Program Office.

Student Advisement and Guidance

The First Year Advisor; Initial Advisement and Evaluation by Student's Advisor

Most students have a first-year advisor who is identified in the acceptance letter. This initial advisor may be replaced by another faculty member with whom the student has closer research affiliations at the request of the student and with the approval of the new advisor. If an incoming student has not chosen an advisor, this should be a priority during the first semester.

The Program provides an initial orientation for all incoming students. During registration week of a graduate student's first semester at USC, the student's initial advisor meets with the student to review his/her previous course work and experiences and to discuss career objectives. A primary purpose of this initial interview is to identify any major deficiencies in a student's preparation and to suggest means of remediying such deficiencies should they exist.

Screening Committee

A Screening Committee is created each year and consists of the members of the admissions committee plus the student's advisor. This committee will meet with incoming students as soon as possible to evaluate the student’s background and make recommendations for developing a solid base in marine biology. They will administer the Screening Examination, which is given near the end of the student's second semester of graduate work at USC. The Screening Committee will also be responsible for the student's advisement and guidance from the time of its appointment until the five-member Ph.D. Guidance Committee is established. Each student's performance will be reported in writing on the GPMEB's Report of the Screening Committee.

Requirements for the Ph.D. Degree

Time Schedule

All course requirements for the Ph.D. Degree are normally completed within three calendar years from the date on which the student took his/her first course at USC and must be completed within eight calendar years from that time.

General Requirements

A total of 60 units must be completed for the Ph.D. Degree.

Course Requirements--Core courses

Two core courses are currently required: BISC 582 and a new, 2-unit course (a Faculty Lecture Seminar) currently in development. These courses should be taken during the student’s first year at USC. Additionally, students will be required to take 4 units of BISC 529 (Marine Environmental Biology Seminar).

Students must receive a grade of B or better in each core class and maintain a cumulative 3.0 Grade Point Average in all coursework.
Official Guidance Committees

A five-person Ph.D. Guidance Committee should be established soon after the screening exam but no later than the fourth semester of enrollment for a student seeking a Ph.D. degree. After the student has passed the Qualifying Examination, the Ph.D. Guidance Committee is known as the Dissertation Committee.

The Student and His/Her Responsibilities

The student is ultimately responsible for his/her graduate career and must be familiar with Graduate School and GPMEB requirements and responsible for their timely completion.

If a student's needs are not being met, he/she should seek redress, using the following chain of command: advisor, advisory committee (screening, guidance, dissertation), Director of the Program, Department Chair, and Graduate School.

In addition to all other rules, the University has established codes of conduct to which all students must adhere. One aspect of graduate training -- service as a teaching assistant -- places them in a position of power over undergraduate students. That position implies added responsibilities and liabilities, especially in respect to such matters as fairness, equal treatment, sexual harassment, etc.

Information on University policies concerning conduct is available in SCampus. Further information or sources of information may be obtained from the Department office.

Formal Graduate Seminars

Students must complete a minimum of three (4) 2-unit graduate seminars. Because a critical feature of such seminars is exposure to current literature, all four required seminars must be completed during the student's tenure at USC. With the written permission of the student's committee, a formal course completed at another institution may be counted as one of the three required seminars (the course must have been completed during the student's tenure here, however).

Research Tool Requirement

Proficiency in statistics is a necessary skill for all scientists. Satisfactory skill level may be demonstrated by one of the following:

a) completion (grade of B or better) of a course approved by majority vote of the Marine Environmental Biology Program faculty.

b) acceptance of course work previously completed either at USC or elsewhere. The acceptability of a previously completed course will be made by an examiner selected by the Marine Environmental Biology Program faculty.

Research Units

BISC 790 Research units are normally taken whenever the student is conducting his/her doctoral research. Dissertation research will normally take the equivalent of about 2.5-3 years of full time work, but the number of research units taken usually does not reflect this. Typically advanced graduate students will take 6 units of 790 and possibly a 2-unit seminar each semester.
Grade Point Average Requirements
The student must maintain a grade point average of at least 3.0 in all courses taken at USC, in conformity with regulations of the Graduate School; work graded C- or below is not acceptable for either subject or unit credit. In addition to the overall GPA requirement, students must achieve at least a B- in each core and skill course.

If a student's cumulative grade point average falls below 3.0 at any time, the student will be placed on departmental academic probation. The cumulative average must be raised to 3.0 by the completion of the next two semesters of registration at USC in courses approved by the student's guidance committee. Note: this may require that the student take additional formal and/or seminar courses since directed research and dissertation units are on a Pass/No Pass basis and are not computed into the GPA. If the student does not improve his/her overall GPA to 3.0 within this period, the student will be dropped from the program. A student who has been removed from probation but subsequently fails to meet the scholarship requirement is subject to termination (will be terminated) from the program.

Marine Program Noon Seminar Series
Students must attend regularly the Marine Environmental Biology Noon Seminar series throughout their tenure at USC. In addition to attending other seminars, each student will present a 30-minute seminar on his/her current research once each academic year, beginning in their second year. A short written evaluation of the seminar will be provided by attending faculty to aid students in improving their public speaking skills. (See “Forms” section).

BISC 794 Doctoral Dissertation
After a student successfully completes the Qualifying Examination (and is therefore a formal candidate for the Ph.D.), he/she must register for BISC 794 Doctoral Dissertation each semester except summer. The student would sequentially register for BISC 794a, 794b, 794c, 794d in the first four semesters after completing the Qualifying Examination, and then BISC 794z each subsequent semester as needed. The student must have at least 4 units of 794 credit, but can receive no more than 8; hence BISC 794a-794d are valued at 2 units and BISC 794z at 0 units.

Other Course and Unit Requirements
Additional formal course requirements may be established by the Section and/or by the student's guidance committee and/or on advice of the committee, which evaluates the student's preparation in the Screening Examination.

The minimum number of units required for the Ph.D. by the Graduate School is 60. Units must include at least 4 units of BISC 794 credit (but no more than 8) and may be completed with other formal classes or BISC 790 work.

The student must be registered at USC during the semester that the dissertation is submitted.

Teaching Assistantship Requirement
Graduate students pursuing the Ph.D. in the GPMEB must serve as a teaching assistant for at least two semesters; ideally, the student should serve in at least two different courses.
Screening Examination

A Screening Examination is required by the Graduate School. The examination is oral, about one hour in length, and must be taken before the student has completed 24 units of graduate work at USC. The evaluation is administered by the Screening Committee. The purpose of the meeting will be to evaluate the student's preparation, determine competence to continue graduate study, and point out deficiencies to be remedied prior to the Qualifying Examination. Prior to the examination the student submits a 1-2 page document outlining his/her activities during the previous year and their present research interests. At the exam, the students presents a short (5-10 minute) description of their academic background and research interests.

The topics covered in the Screening Examination include:
- a summary by the student of their research while at USC
- biotic diversity, classification, and life histories
- organismal evolution and phylogeny; molecular evolution
- structure and physiology of cells and organisms
- biochemistry
- Mendelian, population, and molecular genetics
- biological, chemical, and physical oceanography
- statistics, experimental design, modeling and theoretical biology
- ecology and environmental sciences.

Each student's performance will be reported in writing to the student and a copy placed in the student's file.

Guidance Committee

Composition of the Guidance Committee

The student's program of studies is under the direction of a five-member guidance committee that must be established at least two semesters before the student takes his/her Qualifying Examination. Therefore the student should request appointment of the committee as soon as possible after the screening exam but certainly before the end of his/her third or fourth semester of enrollment in the Ph.D. program.

The composition of the guidance committee must meet the following guidelines:

a) One member of the committee must be from a department at USC other than Biological Sciences. This "outside member" serves as the representative of the Dean of Graduate School.

b) Normally, the other four members of the committee are tenure-track faculty of the Marine Environmental Program in the Department of Biological Sciences, but one of the members may be from another Program in Biological Sciences, and at least one must be tenured. The chair of the committee is called the student's advisor and must be from the Marine Environmental Program. Co-Chairs are normally not permitted unless required by the Graduate School (see next paragraph).

In exceptional cases of academic merit, a person not meeting the above guidelines may be approved by the Graduate School to serve on a Ph.D. committee. To request such an exception, the student must submit to the Graduate School a current Curriculum vitae of the proposed member and a letter from the chair of the committee citing the particular expertise of the person and the relevance of the requested appointment. A specially approved member may not serve as the outside member (see below) or as sole chair of the committee, but may serve as a co-chair with a regular faculty member of the Marine Environmental program. A guidance committee may include no more than one specially approved member unless the size of the committee is enlarged past five.

Request for changes in the composition of the Guidance Committee must be made in writing by the student to the Program. If approved, the committee is officially changed using the Graduate School's Request for Change of Committee form.
If the chair of the Guidance Committee is to be absent from the campus for any extended period of time (e.g., on leave) (s)he must appoint a temporary chair. The permanent chair will continue as a member of the Committee during his/her absence and will be in communication with the Guidance Committee. In the event that the permanent chair must be absent at the time of the Qualifying Examination or the defense of the dissertation, a petition for formal appointment of a temporary chair must be submitted to the Graduate School.

**Responsibilities of the Guidance Committee**

The Guidance Committee (as such or as the Dissertation Committee that it becomes) is responsible for the guidance and evaluation of the student during his/her graduate tenure. Specific responsibilities include:

a. Administration and evaluation of the Qualifying Examination.
b. Approval of the student's research and academic programs.
c. Monitoring the student's temporal progress in meeting degree deadlines.

To meet these responsibilities, the Committee may require the student to make periodic written reports and should meet at least once per year with the student (one appropriate time for an annual meeting is shortly after the student's presentation at the Marine Noon Seminar series). More frequent meetings are usually necessary as the student approaches completion of his/her degree work. A request for a meeting may be made by the student or any member of the committee. Normally the student is responsible for arranging a specific date, time and place for meetings. The Chair should write minutes of all committee meetings and submit one copy each to the student, the members of the committee, and the Marine Program office for inclusion in the student's permanent file.

**Qualifying Examination**

**Prerequisites for the Qualifying Examination**

During the semester the exam is taken, the student must be enrolled in a departmental graduate course or GRSC 800. The GPMB requires that students have completed:

a) All required core courses, each with a minimum grade of B-.
b) At least two graduate seminars.
c) The statistics research tool requirement.
d) Removal of inadequacies noted in the screening examination.
e) Completion of the Request to Take Qualifying Examination form.

Depending on how the above requirements were met, the student may have to take additional course work to satisfy the Graduate School requirements that students have completed at least 24 units of course work applicable to the degree while in residence and with a minimum cumulative GPA of 3.0.

**Timing of the Qualifying Examination**

The Qualifying Examination is normally taken during the student's fifth semester in the Ph.D. Program and must be taken before completion of his/her sixth semester.

**Components of the Qualifying Examination**

The Qualifying Examination consists of a written and an oral part, with both parts conducted and evaluated by the student's Guidance Committee.
The Written Examination

The written examination will consist of four or five sets of questions distributed over two consecutive days. This examination can be taken on a laptop computer supplied by the committee chair (i.e., the student cannot use their own computer). Each Guidance Committee member (with the possible exception of the "outside member" whose participation is optional here) submits three questions; the student must answer two of this set, spending about equal time on each and having a maximum of two hours per set. The order in which the sets of questions are taken is at the student's option.

Questions will be comprehensive in scope with respect to the student's chosen area of specialization and will be designed to test the student's conceptual, analytical and integrative ability and preparation.

Each member of the Examination Committee will grade his/her question on a scale of 1.0-5.0 using 0.5 unit steps if necessary (1.0 as poor and 5.0 as exceptional). The examination result will be calculated by averaging all the grades. A mean score of 3.3 or above for all questions is passing; below 3.0 is failing. Cases where the mean is between 3.0 and 3.3 or where two or more questions are graded below 3.0 are evaluated by the Guidance Committee followed by a vote, using a secret ballot. More than one negative vote of the Guidance Committee will result in failure of the student to pass the written examination.

The written part of the Qualifying Examination must be taken before (normally 2 weeks before) the oral examination described below. The results of the written examination and the oral examination are given only at the completion of the oral examination.

The Research Proposition (The Fifteen Pager) and its Preliminary Approval

Proposition Abstract

At least two months before the anticipated date of the oral examination, the student should meet with his/her Guidance Committee and provide them with a 1- or 2-page Research Abstract of the anticipated research program to be presented in the Research Proposition. The purpose of this meeting is to ascertain whether the anticipated research constitutes a defensible dissertation topic so that the student does not develop a detailed plan for a research program that has serious flaws and probably cannot be successfully defended in the oral examination. If the committee has reservations, modifications that are mutually satisfactory to the student and the committee can be worked out during this meeting or the student can be asked to submit a revised or new abstract.

Upon approval of the Proposition Abstract by the Guidance Committee, the student will develop it into a formal Written Proposition. This is to be in the form of a grant proposal and should include a short historical introduction, a statement of the problem and its significance, one or more hypotheses (if appropriate), the research design, anticipated results, methods to be used in interpretation of the results, and pertinent references. The treatment should be concise and should not exceed 15 double-spaced pages.

The Oral Examination

The oral examination will be in the area of the student's intended research and will be based on a research project selected and developed by the student into a Research Proposition. The oral examination is usually taken two weeks after and must be taken within one month of the written examination. At least two weeks before the date of the oral examination, the student must submit one copy of the Research Proposition to each member of the Examination Committee and one copy to the Marine Program's Student Affairs Administrator for the student's permanent file.
The oral examination will be conducted and evaluated by the student's full 5-member Guidance Committee. Typically, the Committee meets briefly without the student to review the student's course work, other preparation and progress; to review the student's performance on the screening examination (copies of the student's transcript and Screening examination report should be obtained for each committee member from the Graduate Student Administrator by the Chair); and to agree on the exact format and order of questioning during the oral examination. Subsequently, the student typically presents the highlights of the research proposition in 15 minutes or less. Then members of the committee ask two or more rounds of questions. The questions are largely focused on the student's ability to conceive, conduct, evaluate of independent research and to communicate the results of such work. However, the oral examination is not limited to the context of the Written Proposition; as specific examples, questions are often asked a) from the written examination and b) concerning the removal of deficiencies identified during the Screening Examination.

On completion of the examination, the Guidance Committee meets in executive session (without the student) to evaluate the student's performance on the oral examination. Each member has one vote, either pass or fail. More than one negative vote will result in failure of the student to pass the oral examination.

At the conclusion of the executive session, the student is notified of the results on the two portions of the Qualifying Examination. Although one could pass both the oral and written, only one of these exams, or neither, the student passes the Qualifying Examination (as a whole) only if his/her performances on both the written and oral portions are satisfactory. If the student passes both the oral and written examinations, he/she is indicated to have passed the Qualifying Examination on the Graduate School form Report on Ph.D. Qualifying Examination.

If the student fails either the written examination or the oral examination or both, the committee must indicate that the student failed the Qualifying Examination on the Graduate School form Report on Ph.D. Qualifying Examination. The committee must make recommendations concerning the student's continuation in the graduate program. The committee usually grants the student a second chance to pass the failed portions (either part satisfactorily completed in the first examination does not have to be retaken), but may recommend that the student not repeat the exam or even deny a second chance (the latter action would be appealed to the Graduate School). The second attempt is a final one and can be taken no sooner than six months nor later than twelve months after the initial failure.

Admission to Candidacy

After the student has passed the Qualifying Examination, the Guidance Committee recommends to the Graduate School that the student be admitted to candidacy for the Ph.D. Degree. Following admission to candidacy the student must register for BISC 794 Dissertation every semester, except summers, until the degree is awarded.

The full Guidance Committee will be known as the Dissertation Committee after the Qualifying Examination has been passed (The GPMEB does not allow the reduction of the Guidance Committee to a three-member Dissertation Committee as permitted by the Graduate School except under special circumstances. If these circumstances are met, at least 2 members must be from the GPMEB). The participation of all members of the Guidance Committee in the Dissertation Committee is indicated on the bottom of the form, Report on Ph.D. Qualifying Examination.

Research

A student must undertake original investigation of a selected problem in marine biology or biological oceanography. Normally this is based on the Written Proposition as presented in the Qualifying Examination, subject to its acceptance by the student's committee. Any subsequent changes of research direction or content must be approved in advance by the student's advisor and the Dissertation Committee.
Research Prior to Admission to Candidacy

Although the Graduate School regulations indicate that students cannot pursue research prior to their admission to candidacy, students in the GPMEB are encouraged to conduct research at their earliest opportunity. Ideally, this early research will develop into an appropriate dissertation topic. Certainly, the student will find it difficult to develop and defend a Research Proposition without significant exposure to research in general and the specific problem in particular. Such preliminary research should be based on a detailed plan prepared by the student and approved by his/her advisor.

Research Subsequent to Admission to Candidacy and its Relationship to the Written Proposition

As noted above, dissertation research is normally based on the Written Proposition as presented in the Qualifying Examination, subject to its acceptance by the student's committee. Frequently, difficulties force revision of the planned study, but any such changes of research direction or content must be approved by the student's Dissertation Committee in advance.

Publication Prior to Submittal of the Dissertation

Prompt publication of research results is very strongly encouraged in the GPMEB. Students should organize their research efforts into blocks that a) can be completed in sequence and b) represent topics for separate future papers so that submittal of one or more papers can be completed during their graduate tenure. Advisors often require that a student have submitted one or more papers before completing their dissertation.

Authorship of such papers is of significance. If the student is the sole author or if the student is the first author with the advisor as the only additional author, it implies that the student did most if not all of the research and hence the entire contents of the paper may be acceptable for incorporation into the dissertation. If the advisor contributed significantly to the research or if other individuals (other graduate students, faculty, post docs, research technicians, etc.) are co-authors, only that part of the paper which represents the student's work may be incorporated into the student's dissertation.

A published work may be incorporated into the body of the dissertation but may not be appended in the form of a reprint according to Graduate School regulations. The student is advised to seek the approval of the dissertation committee before submittal of a manuscript that is to be included in the dissertation since that committee must ultimately approve all contents of the dissertation. The fact that material has been submitted (accepted, published) does not mean that it will be allowed to be incorporated without revision by the committee.

Preparation and Defense of the Dissertation

A dissertation represents a significant contribution to science that is based on an original research program completed by the student. Determination of the adequacy of the research program is the sole responsibility of the student's Dissertation Committee. Approval of the dissertation itself is primarily the responsibility of the student's Dissertation Committee, but the completed dissertation must also be examined by the Thesis Editor of the Graduate School to determine if it meets the grammatical standards and other requirements described in Regulations for Format and Presentation of Theses and Dissertations published by the University of Southern California and available at the University Bookstore. Additional regulations and information on the organization and preparation of the dissertation are provided in Directions for Preparation of Dissertations and Research Reports as Required by the Graduate Program in Biology/University of Southern California. Students should obtain a copy of both sets of regulations before they initiate their writing.
GPMEB students defend an advanced draft of the dissertation rather than a "final" copy typed on dissertation paper. The advanced draft should be complete, including all text, figures, tables, references, etc. and the draft must be in a suitable form for final typing. Before assembly of a complete draft is initiated, the student should confer with his/her full committee to determine whether adequate research has been completed.

The student's advisor is the individual responsible for determining whether or not a draft is sufficiently refined for distribution to the full Dissertation Committee. Portions or all of earlier drafts may be submitted to some or all of the committee members for suggestions and evaluation at any time. The thesis draft to be defended must be given to the Dissertation Committee at least one month prior to the thesis defense date.

The presentation and oral defense of the dissertation are achieved in a formal seminar that is open to all members of the academic community and a closed meeting of the student with his/her Dissertation Committee.

Since the final typed copy of the dissertation must be presented to the Office of University Publications at least three weeks prior to the end of the term in which the degree is to be granted and since the student must allow adequate time after the defense for corrections and final typing, the defense should be scheduled at least six weeks before the end of the term in which the student plans to graduate.

Before undertaking the Dissertation Defense, the student must have completed (or be in progress of completing) all other degree requirements.

The Chair of the Dissertation Committee is required to notify the Student Affairs Administrator of the Marine Program of the date, time, and place of the defense of the dissertation, so that a notice of the Dissertation Seminar and Defense may be distributed to all faculty and graduate students of the Department at least two weeks in advance. The date selected for this defense cannot be on an official University holiday (e.g., Labor Day, President's Day, etc.).

The open oral defense of the dissertation is achieved in a formal 50-minute "research" seminar such as would be given by a visiting scholar. The presentation is open to the public and the student should be prepared to answer all questions from members of the audience, including those on the Dissertation Committee. The period of questioning is not to be limited in time.

The dissertation is also subject to a detailed defense made before the full Dissertation Committee in a meeting that is usually held shortly after the conclusions of the seminar. At this meeting, which is typically two-three hours in length, the Dissertation Committee must critically evaluate the dissertation and determine whether or not it is to be accepted. To be acceptable, the dissertation must represent a major, original contribution to science.

Only members of the Dissertation Committee may vote whether to pass or fail the student (accept or reject the dissertation and its open defense in the seminar). A vote to pass the student must be unanimous and such a vote does not preclude that the committee may require modifications of the dissertation. Reasons for failure of the defense should be clearly identified by the committee and may include a) a flawed research plan, b) nonconclusive or inadequate research results, c) major deficiencies in the dissertation, etc. A student who fails the defense the first time is normally given a second opportunity, but any decision on re-examination is at the discretion of the Dissertation Committee.

If the defense is satisfactory and no major revisions of the dissertation are required, all members of the Dissertation Committee sign the APPROVAL of DISSERTATION for FINAL TYPING (green card) and this is submitted to the Graduate School. If significant revisions of the manuscript are required, the card is not signed until such revisions have been completed. The Chair of the Dissertation Committee may be assigned full responsibility for determining that the required revisions have been made, but some or all other members of the committee may request that they also be involved in the final approval.
If the green card for final typing is signed and dated by the drop/add deadline for FALL or SPRING, no further registration is required.

The student also needs to prepare an abstract of the dissertation for publication in *Dissertation Abstracts, International.* The **DOCTORAL DISSERTATION ABSTRACT SUBMITTAL** form, signed by the Dissertation Committee chair, must be attached to the abstract and submitted to the Thesis Editor of the Graduate School.

The **SIGNATURE PAGE** is bound with the dissertation to verify that the dissertation has been approved by the Committee and accepted by the Graduate School. Signatures required on this form are those of the Committee and the Graduate School.

In addition to the original copy required by the Graduate School, one hardbound copy of the dissertation must be presented to the Department of Biological Sciences and another to the chair of the student's (Guidance and) Dissertation Committee.

The **TRIPLE CARD REPORT ON DISSERTATION & ORAL EXAMINATION for the Ph.D. DEGREE** must be signed by each Committee member, the Chair of the Department of Biological Sciences, the Thesis Editor, and the Graduation Counselor (for Dean of Registration & Records, GFS 315). The signed **TRIPLE CARD REPORT** signifies approval of the dissertation and defense by the committee, as well as acknowledging completion of all departmental degree requirements and all University degree requirements. Most important of all, it indicates that the degree has been cleared for conferral. The completed **TRIPLE CARD REPORT** is submitted to the Graduate School for approval.

The student must pay a Dissertation Fee for the microfilming and binding of the dissertation and publication of the abstract (see Tuition and Fees in the current University *Catalogue*). A copy of the receipt for payment of this fee must be submitted to the Thesis Editor.

The **DIPLOMA APPLICATION CARD FOR GRADUATE STUDENTS** notifies Registration and Records of how the student would like his/her name to appear on the diploma. This card must be completed and submitted to the Graduate School.

The **SURVEY OF EARNED DOCTORATES** must be completed and returned to the Graduate School for approval.

After approval by the Graduate School, the completed **TRIPLE CARD** is taken to the Degree Progress Department (SAS 010). Once this Department has signed the card, you have officially graduated!
COURSES AVAILABLE IN MARINE ENVIRONMENTAL BIOLOGY

BISC 582 Biological Oceanography (Core Course)  
(4 units)

BISC 584 Faculty Lecture Series  
(2 units)

BISC 585 Scientific Writing and Reviewing  
(2 units)

BISC 529 Marine Environmental Biology Seminar  
(1 unit; 4 units required, maximum)

BISC 532 Experimental Statistics

Seminars  
(Offered on a rotating basis; check current Schedule of Classes)  
(2 units; 8 units required)

- Plankton Biology
- Remote Sensing and Modeling
- Physiology of Marine Organisms
- Population Genetics of Marine Organisms
- Molecular Ecology
- Marine/Global N Cycle
‘Quick Check List’ of Student/Advisor Responsibilities

First Month (Late Summer/Early Fall; ASAP, before classes get going)
Each student meets with the "Screening Committee" (same composition as the Admissions Committee for that year, plus the student’s advisor). This committee will be the same one that administers the Screening Exam at the end of Year 1. The Screening Committee evaluates each student’s background and advises on courses to be taken in the first 1/2 years to develop each student’s background in marine science (and specific area of interest).

By the End of Year 1 (Summer)
Student completes the Screening Exam, which tests the student’s general scientific knowledge, and identifies weaknesses that need to be addressed. The student will receive written comments from the committee on the “Screening Examination Results” form.

Beginning of Year 2 (Fall)
Student and advisor compose and request appointment of a Ph.D. Guidance Committee, which meets with the student near the beginning of the second year. Prior to the meeting, the student submits a (at least) 1-2 page document outlining his/her proposed research. Following a brief presentation by the student, the committee provides feedback, which includes a second review of the student’s coursework and training, and any appropriate recommendations for further coursework or directed study.

Year 3
The student must complete the Qualifying Examination (as described in “Requirements and Policies” document) by the end of Year 3. At least one month prior to the exam, the student completes the “Request to Take Qualifying Examination” form (located in folder). At least two months prior to the exam, the student must submit a thesis proposal (the fifteen-pager) to the Guidance Committee and obtain permission to proceed to the exam. The Chair of the Guidance Committee should obtain the student’s file for the Qualifying Examination. A “Results of Qualifying Examination” form will be in the file for all committee members to sign. All committee members will continue as the student’s Dissertation Committee.

Years 3-5
Following successful completion of the Qualifying Examination, the Ph.D. Guidance Committee becomes the Dissertation Committee. The student meets at least annually with the committee. A short memo describing the students’ progress (signed by all committee members) is submitted to the Section office following each annual meeting.

Additional Annual Requirements:
Yearly Seminar: Each student must present a 30-minute seminar once each academic year beginning in their second year.
Yearly Progress Reports: On or by September 1, each student will complete and submit to the Section office a brief progress report (signed by each member of their Guidance or Dissertation Committee) detailing their activities during the previous 12 months (courses taken, research undertaken, seminars given at USC and elsewhere, participation in cruises, etc.). Forms for these reports will be emailed to students each summer as a reminder.
Screening Examination—Marine Biology

Student’s Name: ________________________________

ID#: __________________________________________

Date of Screening Examination: ________________

Pass ______________ No Pass ________________

(See below)

Comments:

_________________________________________________________________
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Suggested Courses:

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Signatures of Committee Members:

_________________________________________________________________
_________________________________________________________________
Yearly Evaluation—Marine Biology

Student’s Name: ______________________  ID#: ______________________
Student’s Advisor: ____________________  Date: ______________

Progress toward degree:
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TA Performance:
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## Marine Environmental Biology Faculty/Staff

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<td></td>
<td><a href="mailto:pieper@usc.edu">pieper@usc.edu</a></td>
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<tr>
<td>Popa, Radu</td>
<td>x12269</td>
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<td><a href="mailto:rpopa@usc.edu">rpopa@usc.edu</a></td>
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<tr>
<td>Thacker, Christine</td>
<td>763-3210</td>
<td>NatHistMus</td>
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<td><a href="mailto:thacker@nhm.org">thacker@nhm.org</a></td>
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<tr>
<td>Valdes, Angel</td>
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<td>NatHistMus</td>
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<td><a href="mailto:avaldes@nhm.org">avaldes@nhm.org</a></td>
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<tr>
<td>Ziebis, Wiebke</td>
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<td><a href="mailto:zimmer@usc.edu">zimmer@usc.edu</a></td>
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**Marine Biology Administration**

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<td>Bingham, Don</td>
<td>x05779</td>
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<td><a href="mailto:dbingham@usc.edu">dbingham@usc.edu</a></td>
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**Biological Sciences Graduate Student Coordinator**

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**FAX:**

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### Marine Environmental Biology Students

<table>
<thead>
<tr>
<th>NAME</th>
<th>PHONE</th>
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<tr>
<td>Chinen, Ann Marie</td>
<td>x09698</td>
<td>AHF 306</td>
<td><a href="mailto:achinen@usc.edu">achinen@usc.edu</a></td>
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<tr>
<td>Countway, Peter</td>
<td>x12123</td>
<td>AHF 301</td>
<td><a href="mailto:countway@usc.edu">countway@usc.edu</a></td>
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<tr>
<td>Finzi, Juliette (Ocean Sciences)</td>
<td>x11431</td>
<td>AHF 104</td>
<td><a href="mailto:finzi@usc.edu">finzi@usc.edu</a></td>
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<tr>
<td>Flood, Beverly</td>
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<td>Gilg, Ilana</td>
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<td>Ginsburg, Dave</td>
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<td><a href="mailto:dgarsbur@usc.edu">dgarsbur@usc.edu</a></td>
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<td>Griffith, John</td>
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<td>Yu, Pauline</td>
<td>x05794</td>
<td>AHF 210</td>
<td><a href="mailto:pcy@usc.edu">pcy@usc.edu</a></td>
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Welcome

Welcome to graduate study in Marine Environmental Biology at USC! You are officially embarking upon your professional career in academics, and we hope your years here are exciting, challenging, and fruitful. The purpose of this brochure is to try and help smooth the way during your first few weeks, as well as to provide some basic information with regard to our program, being a graduate student at USC, and life in LA in general. In addition to this guide, a good source of information is the free booklet entitled *SCampus*, which you can obtain at Topping Student Center. Of course, it is always a good idea to solicit information and advice from more senior graduate students and from faculty. Senior graduate students can be very helpful for adjusting to the “personal” side of life at USC, while Faculty and the Graduate Student Coordinator should be your source of information for “official” aspects of the program and academic life.

Our support staff is also available to help out with procedures for registration and other logistical details. Linda Bazilian, the Graduate Student Coordinator for Biological Sciences; is in AHF 107, mc 0371, x11088. Linda is highly knowledgeable concerning all aspects of the graduate program.

Once again, welcome to the program!

Douglas Capone
Director, Marine Environmental Biology
<table>
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<tr>
<th>DATE</th>
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<tr>
<td>August 13</td>
<td>Laboratory Safety Training</td>
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<tr>
<td>8:30am-5:00pm</td>
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<td>August 16</td>
<td>Orientation</td>
<td>Conference Room</td>
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<td>10:00am-11:00am</td>
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<tr>
<td>August 16</td>
<td>Biological Sciences Welcome Picnic</td>
<td>AHF Lawn</td>
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<td>(Monday)</td>
<td>(All students/faculty/staff are invited)</td>
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<tr>
<td>Noon</td>
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<td>August 18-19</td>
<td>College Teaching Assistant Training</td>
<td>Upstairs Commons</td>
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**NOTE:**
**Items in bold require your attendance.**

All students who are TA’s must attend the College Teaching Assistant Training sessions or you will not be allowed to teach in the fall semester. Additionally, all TA’s must attend the meetings on Friday, August 20.

Additional meetings to be arranged: Radiation Safety training will be required early in the semester.

If you have questions and/or conflicts with this schedule, please see Linda Bazilian immediately.
REGISTRATION PROCESS

ACTION

1) OASIS/Registration link: SEE

2) First-year students: Set up advisement appointment with your advisor Linda Bazilian, AHF 107, x1-1088

3) Obtain signed approval form from your advisor; return form to Linda Bazilian (AHF 107) for "D" clearance.

4) Get your fee bill and pay all necessary fees by deadline.

5) USC ID card (link: ) is a must for all USC students and should be carried at all times while on campus. The card, which identifies you as a currently enrolled student, entitles you to various privileges and potential uses on and off campus, including access to libraries and the recreation center.
   - Pick up your ID card from USCard services (Commons Lobby in the Student Union).
   - Domestic students get ID card with registration
   - International students get ID card with passport verification

6) Get validation sticker from Don Bingham, the MEB Administrative Coordinator.

7) Verify immunization for measles and tuberculosis See OASIS/Registration link

Registration-related Links

SCampus (a guidebook to USC)
Biological Sciences Homepage
OASIS link (Online Academic Student Info. System)
Financial Aid
Financial Services/Cashier
Office of International Students
Schedule of Classes
Tuition and Fees

(More links on Links page)
STUDENT HEALTH AND INSURANCE

The Student Health Center has primary care, basic emergency care, an urgent care clinic, Saturday clinics, specialist clinics, and a pharmacy. You are eligible for the Health Center if you are enrolled in classes.

USC covers Teaching Assistants’ and Research Assistants’ fees for student health insurance, use of the student health center, and dental care. Enroll in the USC health plan for coverage. The enrollment deadline for health insurance is Sept. 18. The Student Health Center has information and enrollment forms.

A Health Center fee is listed on your fee bill. Most care is free; however, there are nominal charges for some lab tests, prescriptions, orthopedic appliances, and copies of medical records. Also, if you are not taking classes (as in summer) you must pay the appropriate fee to use the Center. Hospitalization is NOT covered, but may be purchased separately.
MEB PROGRAM LIFE

MEB research labs are in AHF, the Allan Hancock Foundation Bldg. Most classes are held in ZHS, Zumberge Hall of Science.

Seminars

Each semester, MEB distributes a list of seminar speakers chosen and invited by MEB students and faculty. Seminar notices are also posted near AHF 107 and updated weekly on the Biological Sciences Homepage. Link:

MEB graduate students are to attend and participate in MEB research seminars, held Tuesdays from noon to 1:00pm in the AHF Torrey Webb Room (TWR). Seminars include a question and answer period; lunches with students and the speaker are sometimes scheduled. The seminars therefore give students a chance to learn about research outside their area of specialization and to converse with distinguished scientists from other institutions.

Seminars are also held by other USC departments, such as Neurobiology, Molecular Biology, Gerontology, Medical Sciences (Biochemistry, Microbiology, Pathology, Cell and Anatomy, Molecular Pharmacology and Toxicology). These seminars are posted outside AHF 107.

The Marine Environmental Biology Office (AHF 107)

While your faculty advisor will advise about academic matters, administrative support is available in AHF 107. **Questions about matters concerning your research or the graduate program**, first see Don Bingham, the Administrative Assistant for the Marine Environmental Biology program. Don deals with issues like MEB requirements, ordering office supplies, ordering, equipment maintenance, visitor parking, mail distribution, phone and computer line installation, and key acquisition.

**Questions about registration, grades, Graduate School requirements, etc.,** see Linda Bazilian, the BISC Graduate Programs Coordinator.

**Computer support**, see Keun Song, or call USC computer technical support at x 0-5555.

For University purposes, AHF 107 has a typewriter, computers, a scanner, a fax machine (213-740-8123), and copiers.

Mailroom/Post Offices/Fed Ex

Put outgoing campus and stamped mail in the AHF 107 mailroom. You will have a mailbox there.

**MEB’s complete address:**
USC, Marine Environmental Biology, Dept. of Biological Sciences,
AHF 107, Los Angeles, CA 90089-0371 ← important!

MEB’s mail code, 0371, directs intercampus mail to the AHF 107 mailroom.

**Fed Ex drop** is at Kinko’s, located below the USC bookstore. The pick up deadline is 4:00pm. **All Fed Ex’s must be charged to an account number. Your advisor can help you determine the account to charge.**

**Full service post office:** 3585 S. Vermont Ave., across from campus.

**Limited service post office:** in the Commons Lobby.

Keys, Security

Keys are distributed by the MEB Administrative Coordinator in AHF 107. Keys require a $10 refundable deposit.

Please help ensure the safety of MEB people and property. Never leave your keys unattended or loan them to others. Also, do not prop open any door to the outside. That invites theft, unsavory individuals, or both. If someone you don’t recognize loiters in AHF, call **Security = x0-6000 ---- Emergency = x04321.**

**Lock yourself out?** Call Security = x0-6000.
RESEARCH RESOURCES

Libraries

Seaver Science Library (SSL), in the Seaver Science Center, is the main science library on the University Park campus. Current journals are on open shelves on the first floor. Older journals are bound and shelved with books on the upper floors. Periodicals cannot be checked out, but copiers are available. Reference librarians on the first floor can help with database searches, computer networks, etc. Also, older materials may be ordered on-line from the Hancock storage area and picked up at this library.

Hancock Natural History Collection is in Special Collections on the second floor of Doheny Library (DML). The Collection has early research materials on systematics, oceanographic expeditions, and marine biology research published before 1900. You may also order hardcopy materials on-line from USC’s off-site Grand Depository via the HOMER online library catalog and pick them up at Doheny. Also, inter-campus loans may be requested through the Academic Resources Gateway Office (ARGO) (see Links page).

USC has on-line access to a vast number of natural history materials, such as Limnology & Oceanography, and Oceanic Abstracts. Visit library.usc.edu to access the electronic resources.

USC Library Card

Apply for a card at the main circulation desk in Doheny or Seaver library.

Off campus libraries

USC Norris Medical Library is on the Health Sciences Campus (HSC). Seaver Library reference librarians can help you have the library copy journal articles for you and send them to you at Mail Code 0371.

You may apply for a UC Los Angeles (UCLA) library card through UCLA’s Biomedical Library. This library is great because it can access almost any journal, no matter how obscure or old. On-site copy machines use debit cards you buy from library vending machines. UCLA is ten miles west of USC and accessible by bus.

Los Angeles County Natural History Museum library (213-763-3388 or 213-763-3387) is in Exposition Park, just south of campus. The library is open by appointment M-F 10:00 - 4:00.

Computer Services Information

Access the USC computer network from several public user rooms on campus, by modem from a home computer, and from any computer connected to local networks, such as the Ethernet in the molecular biology labs. A wide array of software is on the network, and services like e-mail and database searching are free to graduate students. The USC Computing Center offers advice and training sessions on the network and its software. The key to this world of information is a computer account. Computer accounts are automatically created for all students enrolled in a degree program. To activate your computer account, complete a Web based form and create a password. Get the form from one of five public computing areas: Leavey Information Commons, KOH 200, SAL 125, or WPH B34 on the University Park Campus (UPC), or Norris Medical Library on the Health Sciences Campus (HSC).

To connect to the USC network by modem, you must install and configure PPP software on their personal computers. Free PPP software can be downloaded from public machines in UCS user rooms.

Automatic accounts are available to enrolled students two weeks before classes begin. For more please contact USC’s Customer Support Center x05555.
HOUSING AND TRANSPORTATION

Housing

On-Campus: The USC Student Housing Office (x02546) is in Parking Structure C.

Off-Campus: Most graduate students live off-campus. Time permitting, walk or drive around a neighborhood you like and look for vacancy signs. Some resources are The Daily Trojan, USC’s school newspaper; the LA Times, Los Angeles’ major newspaper; and such nearby community newspapers as the Hollywood Press and Santa Monica Evening Outlook. Also consider The Daily Breeze for Redondo-Hermosa-Manhattan Beach areas; the Star News for the Pasadena area; and the Northeast Newspaper for Eagle Rock, El Sereno, and East Los Angeles areas. Classified ad papers, such as The Recycler, have many listings. On-line, Craigslist.org lets you look for rentals and post rentals wanted ads. Also, the UCLA (hiss, boo) Housing Office Web site has descriptions of areas west of USC.

Consider buying a Thomas Brothers Street Atlas of Los Angeles and Orange Counties from the USC bookstore. Then, you can quickly locate street addresses in LA and Orange counties. Yahoo Maps is also a good resource.

Non-University housing by campus is limited, and some areas are quite rough. Avoid renting in the south side of campus. Better is North University Park, located north of campus, across Jefferson Blvd. Alas, the area is small, rentals are rather few, and landlords often charge accordingly. Still, there are older places with "character" that are not too expensive. Caveat emptor.

Transportation, Parking, Commuting

USC Escort Service (x0-4911): At night, do not walk on campus alone! The Escort Service will bring you to locations within about one mile of campus.

USC Tram Service runs early morning until late at night on weekdays and services the nearby housing areas off campus, the Health Sciences Campus, and the campus parking lots, including the main off-campus one on Hope Street.

You don’t absolutely need a car in Los Angeles:

Metropolitan Transit Authority (MTA), the LA transportation system, can usually get you from here to there and points in between. You can contact MTA at MTA.net, 213/626-4455. (See the Links page).

USC’s Transportation Services Office is also very helpful. The Office is at x0-3575, 1012 Childs Way, Building 1. (see Links page).

Express buses run from several outlying cities to downtown LA. Routes include stops at or near USC, and buses and shuttles run from downtown to USC. Transportation Services has information.

Los Angeles subway and rail transit system Currently, the "Blue Line " runs south to Long Beach, the “Gold Line” runs east to Sierra Madre, and the "Red Line " runs west through the Wilshire Corridor. Wilshire Blvd. starts in downtown and extends about fifteen miles west, passing through Beverly Hills, Westwood (UCLA), and Brentwood, to the ocean at Santa Monica. Wilshire buses operate continuously.

Bicycle commuters: all bikes must be licensed—see procedures in Scampus. Unlocked bikes on or near campus will be stolen. Try to keep your bike in your apartment and in your office or lab.
Car Commuting

**Car commuters:** a **USC Parking Permit**, available via the Transportation Office, is a wise investment. **Off-campus street parking** is scarce and unsafe; plus, parking time restrictions are the rule. Wherever you park, always lock your car and leave nothing valuable (cd player, clothes, etc.) visible from the outside.

**Car and Vanpooling:** LA County sponsors "**Commuter Computer,**" a service to help commuters form car pools. If you wish to carpool, submit your name and commuting schedule to the "**Commuter Computer,**" 213/380-RIDE. They will try to match you with other interested commuters. "**Rideshare**" is USC’s on-campus car and vanpooling service. Rideshare operates out of the Transportation Services Office.
BANKS, BOOKS, FOOD, DMV

Banking and Shopping

Across from campus are a Citibank on Vermont Ave. and a Bank of America on Jefferson Blvd. After dark, never go to an ATM alone. Neighborhoods around USC are not particularly safe.

The on campus USC Federal Credit Union (KOH 200) offers good deals on checking and savings accounts and loans. Their ATMs are by the USC Bookstore, in the Commons Lobby, and in Kings Hall. (see Links page).

Bookstores

USC Bookstore/Computer Store (see Links page) on campus and The Paper Clip in University Village are convenient places to buy school and computer supplies. MEB graduate students are entitled to a 10% discount on some items in both stores. See Don Bingham for your 10% off sticker.

Local Markets

The 32nd Street Market in University Village will cash personal checks if you have a California Driver's License. Through them, you can also send telegrams, mail packages, and purchase money orders. Smart and Final, across from USC on Vermont Ave., has bulk foods and janitorial supplies at a discount. Ralph's Supermarket, at Vermont Ave. and Adams Blvd., is a mile north of campus.

CA Dept. of Motor Vehicles

The DMV is located two blocks east of USC at 3615 S. Hope Street. (See Links page).
CULTURE AND RECREATION
USC and Los Angeles

On-Campus

Get ready to see plays, concerts, films, and art exhibits. Oh, and sports. USC is gung-ho about its sports teams. Sure, going gaga over a football game is intellectually questionable, but the game against cross-town rival UCLA is worth experiencing once. If you plan to attend many USC sports events, buy a "Student Activity Card" during registration week. The Card is essentially a season ticket to all USC home games. It also gives you a chance to buy a Rose Bowl football ticket, should USC do well enough to play in it.

The Lyon Center has a weight room, racquetball courts, stationary bikes and treadmills. Locker rooms also lead to the McDonald's Olympic Swim Stadium. Nearby tennis courts and a track and soccer field are generally open to students. Students can form teams for intramural leagues in basketball, softball, coed water polo, and coed volleyball. Entrance and basic use of USC’s athletic facilities are free to students with current ID.

Off-campus

Show biz is ubiquitous in Los Angeles. Nevertheless, by being at USC, you also have unsurpassed access to other cultural and recreational activities, even without a car. In a few hours at most, you can reach all manner of museums, sports venues, amusement parks, bowling alleys, pool halls, ice skating rinks, beaches, mountains, deserts, islands, public parks, horseback riding trails, polo grounds, ski areas, golf courses, tennis courts, etc. Geez, what more do you want?

amusement parks: Disneyland, Magic Mountain
art museums: LA County art museums, J. Paul Getty museum
ethnic museums: Museum of Tolerance, the California Afro-American Museum
science museums: Museums of Natural History and of Science and Industry, the Page Museum & La Brea Tar Pits
classical music: Music Center, Hollywood Bowl
rock music: Greek Theater and Universal Amphitheater
classic theater and musicals: Shubert and Ahmanson theaters
first-run contemporary works: Mark Taper Forum and lots of small local theaters
zoos: Los Angeles, San Diego
aquariums: Long Beach, Sea World
horse racing: Hollywood Park, Santa Anita
hiking: Topanga State Park, Will Rogers State Park, Griffith Park
pro sports: baseball: Dodgers; hockey: Kings; basketball: Lakers, Clippers

Hancock Park area
Los Angeles Museum of Art
Page Museum and La Brea Tar Pits
Petersen Automotive Museum

Exposition Park
Located directly across from campus on Exposition Blvd.
Museum of Natural History
California Science Center
Aerospace museum
LA Sports Arena
LA Coliseum
Rose Garden
Swimming Center
Griffith Park, perhaps the largest municipal park in the U.S.
Observatory and planetarium
Greek Theatre, a natural amphitheatre for concerts
Merry Go Round
Autry Museum of Western Heritage
Los Angeles Zoo
Golf Course

Santa Catalina Island: MEB has ties to a marine research lab in Big Fisherman Cove at Two Harbors. A Wrigley Institute boat runs on Mondays and Thursdays. It's free! An Express boat runs more often, depending on the season, and costs about $48 roundtrip. For the Wrigley boat, contact Ann Close in AHF. For the Express, check the Catalina Express schedule, and look at the San Pedro to Two Harbors route. To stay overnight, contact Katie Boutillier of Wrigley. (see Links page).

Outdoor Warnings

The Sun

Protect your skin. Sunscreen with a minimum 30 SPF rating is not enough. For any extended exposure, cover up with a brimmed hat, long sleeves, and pants. Skin cancer due to sun exposure is epidemic in Southern California, as is looking like a dried up prune.

West Nile Virus/Lyme Disease

These are potentially devastating diseases. Mosquitoes spread West Nile; ticks spread Lyme Disease. If you hike or play in a park—even a city park—wear insect repellent and protect your skin and hair. Also, stay on trails cleared to help keep the tiny critters off of you. Back at home, check your skin for any freeloaders digging in, and wash clothes in hot water. When in doubt, visit the USC Health Center.
General Information about Financial Aid

Marine Environmental Biology Section intends to provide or arrange for the provision of financial support (stipend + tuition) for all of its Ph.D. students. Students should feel assured that the faculty will do everything possible to meet this goal. Please note that Graduate School rules prohibit full time student from accepting any employment above and beyond their graduate assistantships (see Graduate Assistantship Handbook). There are 4 main sources of support for graduate students: Teaching Assistantships, Research Assistantships, Training Grants, and Individual Fellowships and Grants.

1) Teaching Assistantships
We are fortunate to be part of a large undergraduate department, because this gives us access to many TAships. The exact number varies with enrollments, but is divided equally between the 3 research sections. TAships, which are generally awarded for an academic year, carry a stipend and full tuition remission. You must maintain at least a 3.0 GPA to receive the tuition remission. Nine monthly payments are made beginning September 26 and ending May 26. It is possible to arrange for payments to begin August 26 (for a total of ten payments). See Linda Bazilian for more information. The authority to offer TAships rests exclusively with the Biological Sciences Department Chair, Dr. David Caron. He consults extensively with the Graduate Admissions Committees of each of the sections, and with faculty instructors.

The workload associated with TAships varies with the course in question and the familiarity of the TA with the subject matter. Consult a few of the more advanced graduate students for tips on course selection. Keep in mind that the best way to learn a subject in detail is to attempt to teach it to someone else. Whatever course you are assigned, please take your responsibilities very seriously. You are under a moral and legal obligation to do your best for your students. Undergraduates pay a hefty tuition bill, so they are entitled to your best efforts. Learn the subject matter diligently and find creative ways to explain it. Practice your verbal communication skills. Make yourself available and approachable. Conform to high ethical standards and respect confidentialities of your position. All of these skills will be directly useful to you in your future careers as researchers and educators. We faculty view the TAships as an important part of your training. Please be aware that as with any other job, your TA position can be terminated for poor performance.

2) Research Assistantships
Research Assistants and TAs are paid on the same scale and receive identical benefits. The department funds TAships, and research grants of individual faculty fund RAships. As the name implies, RAs do research, usually directed the Specific Aims of the grant that funds the position. The time required is often more than that for a TAship, but this is usually not considered a burden because the work should be directly relevant to your research training. At a minimum, an RAship should be considered a 15-20 hour per week job. Students might opt to put in more time, depending on the relationship between RA duties and the dissertation project, or the likelihood of co-authoring resulting publications. The relation between the RA project and the dissertation project varies on the faculty member involved and other circumstances. In some cases, the two projects are the same and you will in effect be paid for doing your dissertation research. In others, efforts are made to keep the projects distinctly different. Good arguments can be made for either approach.

Research assistantships need to be cultivated. Try to identify your research interests as early as possible, certainly by the end of your second semester. Determine which professor best matches those interests. If necessary, do some reading to educate yourself about that professor's work and the field in general. Tell the professor you would like to work with him or her and inquire about the availability of RAships. Before you start an RAship, be sure you understand what is expected of you, what you can expect from the professor, and what relations might exist between your work and dissertation research.
TAships vs. RAships: Your teaching assistant experience can be very rewarding. You will learn a lot and have the satisfaction of seeing that knowledge take root in others. You may establish lasting friendships or mentor relationships with some of your students. On the other hand, you are primarily here to do research, not teach. If you are not very efficient in organizing your time, progress on your dissertation research may be slowed by extended service as a TA. Most agree that RAships are preferable. Try to be flexible, though. As grant budgets wax and wane, it may be necessary to RAships to cover lean periods.

The Wrigley Institute has just created a series of RAships for working at Catalina. Fellowships are available for the Summer, as well as for the Academic year. Wrigley link:

3) Individual Fellowships and Grants
An enormous number of grants and financial aid are available to students. Detailed information can be obtained from two sources. First, the Graduate School (UGR 105, x35179) has a partial listing of available grants. Second, there is a computerized database in Doheny Library (DHL reference section). This database contains literally hundreds of grants from which to choose.

4) Summer Support
Your decision to be a Ph.D. student is a year-round commitment. You should view the summer as an opportunity to engage intensively in research, free from the distractions of coursework, TA assignments, and the like. We expect you to be in the laboratories, engaged in full time research, every summer. We will do everything we can to provide the financial support to make this possible. Please be aware, however, that it is your responsibility to take the initiative in securing summer positions. Early in the spring semester, if not earlier, every new student should make at least a tentative decision about which laboratory to work in. Talk to that professor and see if support is available. The best plan would be to secure a RAship, although there are a few summer TAships available. These provide only partial support and you must put your bid in early to Carolyn Facer. If these possibilities don't work out, see one of the Graduate Advisors or the Section Director. They may be aware of other possibilities for summer funding.
DEPARTMENT OF BIOLOGICAL SCIENCES

GRADUATE PROGRAM IN MARINE ENVIRONMENTAL BIOLOGY

REQUIREMENTS AND POLICIES

Revised August, 2004
REQUIREMENTS AND POLICIES GOVERNING
THE GRADUATE PROGRAM IN MARINE ENVIRONMENTAL BIOLOGY

The Graduate Program in Marine Environmental Biology & its Administration

Introduction

Graduate students in the Graduate Program in Marine Environmental Biology (referred to subsequently as "GPMEB" or the "Program") may pursue a Ph.D. degree.

At the University of Southern California, graduate education is the responsibility of the Department, but the University's Graduate School establishes minimum requirements concerning grade point average, number and distribution of units, residency, time limits, etc. that are common to all advanced degrees offered within the College of Letters, Arts and Sciences at the University. Specific courses, examinations, skills, and research requirements are established by the student's program of study, in this case the Graduate Program in Marine Environmental Biology. Collectively, both sets of regulations constitute the student's "degree requirements," all of which must be met by the student.

Graduate School regulations are listed in the current University of Southern California Catalogue somewhat confusingly, one part of these are scattered in the section on "Academic Policies and Information" near the beginning of the USC Catalogue and the rest are found near the middle of the USC Catalogue under "The Graduate School." Those regulations, which most commonly affect GPMEB students, are included in this document, but this listing should not be considered definitive.

GPMEB regulations are listed in this document; the major requirements of degrees in the GPMEB are also listed in the USC Catalogue under "Department of Biological Sciences."

Program Administration--The Graduate School

The Graduate School maintains the University's official Permanent Graduate Student File and is ultimately responsible for admission of our graduate students and the awarding of their degrees. As noted above the Graduate School establishes requirements concerning grade point average, number and distribution of units, residency, and time limits that are common to advanced degree programs in all units under their jurisdiction, including the Department of Biological Sciences.

Official forms are used to track a student's progress by The Graduate School and completion and submittal of these usually is to be at a specified point in the student's tenure. Timetables for the completion of degree requirements are available at The Graduate School. The schedule for the Ph.D. student's final and penultimate semesters are especially detailed and need to be adhered to closely.

All Graduate School forms prepared by or on behalf of the student must be approved by the Director of the Program and by the Chair of the Department before their submittal to the Graduate School. All Graduate School forms are available from the Graduate Student Coordinator, Linda Bazilian.

Graduate Student Representatives

In late spring, GPMEB students select two graduate students to serve as Graduate Student Representative and Alternate Graduate Student Representative for the coming academic year. To be eligible for the posts, both students must have passed their Qualifying Examination. The Alternate will represent the graduate students in the Graduate Student Representative's absence or by the latter's appointment. The Graduate Student Representative has one vote in meetings of the GPMEB Faculty representing the opinions of the graduate students.

The Graduate Student Representative has no voting power in either the continuation of fellow graduate students or in the Qualifying Examination. At the option of the student examined, the Graduate Student Representative may also be present during the oral part of the Qualifying Examination.
Graduate Student Coordinator of GPMEB

The Graduate Student Coordinator of GPMEB is the staff member responsible for processing and maintaining graduate student files; serving as liaison between the students, GPMEB Faculty, and the Graduate School; and making available application materials, Graduate School Forms, and other relevant documents. A permanent Department file on each student is maintained in the Marine Environmental Biology Program Office.

Student Advisement and Guidance

The First Year Advisor; Initial Advisement and Evaluation by Student's Advisor

Most students have a first-year advisor who is identified in the acceptance letter. This initial advisor may be replaced by another faculty member with whom the student has closer research affiliations at the request of the student and with the approval of the new advisor. If an incoming student has not chosen an advisor, this should be a priority during the first semester.

The Program provides an initial orientation for all incoming students. During registration week of a graduate student's first semester, the student's initial advisor meets with the student to review his/her previous course work and experiences and to discuss career objectives. A primary purpose of this initial interview is to identify major deficiencies in a student's preparation and to suggest means of remedying any such deficiencies.

Screening Committee

A Screening Committee is created each year and consists of the members of the admissions committee plus the student's advisor. This committee will meet with incoming students as soon as possible to evaluate the student’s background and make recommendations for developing a solid base in marine environmental biology. They will administer the Screening Examination, which is given near the end of the student's second semester of graduate work at USC. The Screening Committee will also be responsible for the student's advisement and guidance from the time of its appointment until the five-member Ph.D. Guidance Committee is established. Each student's performance will be reported in writing on the GPMEB's Report of the Screening Committee.

Requirements for the Ph.D. Degree

Time Schedule

All course requirements for the Ph.D. degree are normally completed within three calendar years from the date on which the student took his/her first course at USC and must be completed within eight calendar years from that time.

General Requirements

A total of 60 units must be completed for the Ph.D. Degree.

Course Requirements--Core courses

Two core courses are currently required: BISC 582 and BISC 584 (The Faculty Lecture Series). These courses should be taken during the student’s first year at USC. Students are also required to take 4 units of BISC 529 (MEB Seminar).

Students must receive a grade of B or better in each core class and maintain a cumulative 3.0 Grade Point Average in all coursework.

Official Guidance Committees

A five-person Ph.D. Guidance Committee should be established soon after the screening exam, but no later than the fourth semester of enrollment for a student seeking a Ph.D. degree. After the student passes the Qualifying Examination, the Ph.D. Guidance Committee is called the Dissertation Committee.
The Student and His/Her Responsibilities

The student is ultimately responsible for his/her graduate career and must be familiar with Graduate School and GPMBE requirements and responsible for their timely completion.

If a student's needs are not being met, he/she should seek redress, using the following chain of command: advisor, advisory committee (screening, guidance, dissertation), Director of the Program, Department Chair, and Graduate School.

In addition to all other rules, the University has established codes of conduct and ethics to which all students must adhere. One aspect of graduate training -- service as a teaching assistant -- places them in a position of power over undergraduate students. The position implies added responsibilities and liabilities, especially in respect to such matters as fairness, equal treatment, sexual harassment, etc. Information on University policies concerning conduct is available in SCampus. Further information or sources of information may be obtained from the Department office. Ethics link:

Formal Graduate Seminars

Students must complete a minimum of four (4) 2-unit graduate seminars. Because a critical feature of such seminars is exposure to current literature, all four required seminars must be completed during the student's tenure at USC. With the written permission of the student's committee, a formal course completed at another institution may be counted as one of the four required seminars (the course must have been completed during the student's tenure here, however).

Research Tool Requirement

Proficiency in statistics is a necessary skill for all scientists. Satisfactory skill level may be demonstrated by

a) completion (grade of B or better) of a course approved by majority vote of the Marine Environmental Biology Program faculty.

b) acceptance of course work previously completed either at USC or elsewhere. The acceptability of a previously completed course will be made by an examiner selected by the Marine Environmental Biology Program faculty.

A rigorous grad level course in Biostatistics is available at the Medical School in the Department of Preventive Medicine. Course number is PM 510L. Permission is needed from the PM Department. A free shuttle bus runs routinely between the University Park and Med School Campuses.

PSYC 501, Statistics in Psychological Research, is given on the University Park campus.

Research Units

BISC 790 Research units are normally taken whenever the student is conducting his/her doctoral research. Dissertation research will normally take the equivalent of about 2.5-3 years of full time work, but the number of research units taken usually does not reflect this. Typically advanced graduate students will take 6 units of 790 and possibly a 2-unit seminar each semester.

Grade Point Average Requirements

Students must maintain a grade point average of at least 3.0 in all courses taken at USC, in conformity with regulations of the Graduate School; work graded C- or below is not acceptable for either subject or unit credit. In addition to the overall GPA requirement, students must achieve at least a B- in each core and skill course.

If a student's cumulative grade point average falls below 3.0 at any time, the student will be placed on departmental academic probation. The cumulative average must be raised to 3.0 by the completion of the next two semesters of registration at USC in courses approved by the student's guidance committee. Note: this may require that the student take additional formal and/or seminar courses since directed research and dissertation units are on a Pass/No Pass basis and are not computed into the GPA. If the student does not improve his/her overall GPA to 3.0 within this period, the student will be dropped from the program. A student who has been removed from probation but subsequently fails to meet the scholarship requirement is subject to termination (will be terminated) from the program.
Marine Program Noon Seminar Series

Students must regularly attend the Marine Environmental Biology Noon Seminar series throughout their tenure at USC. In addition to attending other seminars, each student presents a 30-minute seminar on his/her current research once each academic year, beginning in their second year. Attending faculty will provide short written evaluations of the seminar to help students improve their public speaking skills. (See “Forms” section).

BISC 794 Doctoral Dissertation

After a student successfully completes the Qualifying Examination and is therefore a formal candidate for the Ph.D., he/she must register for BISC 794 Doctoral Dissertation each semester except summer. The student would sequentially register for BISC 794a, 794b, 794c, 794d in the first four semesters after completing the Qualifying Examination, and then BISC 794z each subsequent semester as needed. Students must have at least 4 units of 794 credit, but can receive no more than 8; hence BISC 794a-794d are valued at 2 units and BISC 794z at 0 units.

Other Course and Unit Requirements

Additional formal course requirements may be established by the Section and/or by the student's guidance committee and/or on advice of the committee, which evaluates the student's preparation in the Screening Examination.

The minimum number of units required for the Ph.D. by the Graduate School is 60. Units must include 4, but no more than 8, units of BISC 794 credit and may be completed with other formal classes or BISC 790 work.

The student must be registered at USC during the semester that the dissertation is submitted.

Teaching Assistantship Requirement

Graduate students pursuing the Ph.D. in the GPMEB must serve as a teaching assistant for at least two semesters; ideally, the student should serve in at least two different courses.

Screening Examination

The Graduate School requires a Screening Examination. The exam is oral, about one hour in length, and must be taken before the student has completed 24 units of graduate work at USC. The Screening Committee administers the exam. The purpose of the meeting will be to evaluate the student's preparation, determine competence to continue graduate study, and point out deficiencies to be remedied prior to the Qualifying Examination. Prior to the exam, the student submits a 1-2 page document outlining his/her activities during the previous year and present research interests. At the exam, the student presents a short (5-10 minute) description of their academic background and research interests.

The topics covered in the Screening Examination include:

- a summary by the student of their research while at USC
- biotic diversity, classification, and life histories
- organismal evolution and phylogeny; molecular evolution
- structure and physiology of cells and organisms
- biochemistry
- Mendelian, population, and molecular genetics
- biological, chemical, and physical oceanography
- statistics, experimental design, modeling and theoretical biology
- ecology and environmental sciences.

Each student's performance will be reported in writing to the student. A copy is placed in the student's file.
Guidance Committee

Composition of the Guidance Committee

The student's program of studies is under the direction of a five-member guidance committee that must be established at least two semesters before the student takes his/her Qualifying Examination. Therefore, the student should request appointment of the committee as soon as possible after the screening exam but certainly before the end of his/her third or fourth semester of enrollment in the Ph.D. program.

The composition of the guidance committee must meet the following guidelines:

a) One member of the committee must be from a department at USC other than Biological Sciences. This "outside member" serves as the representative of the Dean of Graduate School.

b) Normally, the other four members of the committee are tenure-track faculty of the Marine Environmental Program in the Department of Biological Sciences, but one of the members may be from another Program in Biological Sciences, and at least one must be tenured. The chair of the committee is called the student's advisor and must be from the Marine Environmental Program. Co-Chairs are normally not permitted unless required by the Graduate School (see next paragraph).

In exceptional cases of academic merit, a person not meeting the above guidelines may be approved by the Graduate School to serve on a Ph.D. committee. To request such an exception, the student must submit to the Graduate School a current Curriculum vitae of the proposed member and a letter from the chair of the committee citing the particular expertise of the person and the relevance of the requested appointment. A specially approved member may not serve as the outside member (see below) or as sole chair of the committee, but may serve as a co-chair with a regular faculty member of the Marine Environmental program. A guidance committee may include no more than one specially approved member unless the size of the committee is enlarged past five.

Request for changes in the composition of the Guidance Committee must be made in writing by the student to the Program. If approved, the committee is officially changed using the Graduate School's Request for Change of Committee form.

If the chair of the Guidance Committee will be absent from campus for any extended period of time (e.g., on leave) (s)he must appoint a temporary chair. The permanent chair will continue as a member of the Committee during his/her absence and will be in communication with the Guidance Committee. If the permanent chair must be absent at the time of the Qualifying Examination or the defense of the dissertation, a petition for formal appointment of a temporary chair must be submitted to the Graduate School.

Responsibilities of the Guidance Committee

The Guidance Committee (as such or as the Dissertation Committee that it becomes) is responsible for the guidance and evaluation of the student during his/her graduate tenure. Specific responsibilities include:

a. Administration and evaluation of the Qualifying Examination.

b. Approval of the student's research and academic programs.

c. Monitoring the student's temporal progress in meeting degree deadlines.

d. Evaluation of the dissertation in the Oral Defense

To meet these responsibilities, the Committee may require the student to make periodic written reports and should meet at least once per year with the student (one appropriate time for an annual meeting is shortly after the student's presentation at the Marine Noon Seminar series). More frequent meetings are usually necessary as the student approaches completion of his/her degree work. The student or any member of the committee may request a meeting. Normally the student is responsible for arranging a specific date, time and place for meetings. The Chair should write minutes of all committee meetings and submit one copy each to the student, the members of the committee, and the Marine Program office for inclusion in the student's permanent file.
Qualifying Examination

Prerequisites for the Qualifying Examination

During the semester the exam is taken, the student must be enrolled in a departmental graduate course or GRSC 800. The GPMEB requires that students have completed:

- All required core courses, each with a minimum grade of B-.
- At least two graduate seminars.
- The statistics research tool requirement.
- Removal of inadequacies noted in the screening examination.
- Completion of the Request to Take Qualifying Examination form.

Depending on how the above requirements were met, the student may have to take additional course work to satisfy the Graduate School requirements that students have completed at least 24 units of course work applicable to the degree while in residence and with a minimum cumulative GPA of 3.0.

Timing of the Qualifying Examination

The Qualifying Examination is normally taken during the student's fifth semester in the Ph.D. Program and must be taken before completion of his/her sixth semester.

Components of the Qualifying Examination

The Qualifying Examination consists of a written and an oral part. The student's Guidance Committee conducts and evaluates both parts.

The Written Examination

The written examination will consist of four or five sets of questions distributed over two consecutive days. This examination can be taken on a laptop computer supplied by the committee chair (i.e., the student cannot use their own computer). Each Guidance Committee member (with the possible exception of the "outside member" whose participation is optional here) submits three questions; the student must answer two of this set, spending about equal time on each and having a maximum of two hours per set. The order in which the sets of questions are taken is at the student's option.

Questions will be comprehensive in scope with respect to the student's chosen area of specialization and will be designed to test the student's conceptual, analytical and integrative ability and preparation.

Each member of the Examination Committee will grade his/her question on a scale of 1.0-5.0 using 0.5 unit steps if necessary (1.0 as poor and 5.0 as exceptional). The examination result will be calculated by averaging all the grades. A mean score of 3.3 or above for all questions is passing; below 3.0 is failing. Cases where the mean is between 3.0 and 3.3 or where two or more questions are graded below 3.0 are evaluated by the Guidance Committee followed by a vote, using a secret ballot. More than one negative vote of the Guidance Committee will result in failure of the student to pass the written examination.

The written part of the Qualifying Examination must be taken before (normally 2 weeks before) the oral examination described below. The results of the written examination and the oral examination are given only at the completion of the oral examination.

The Research Proposition (The Fifteen Pager) and its Preliminary Approval

Proposition Abstract

At least two months before the anticipated date of the oral examination, the student should meet with his/her Guidance Committee and provide them with a 1- or 2-page Research Abstract of the anticipated research program to be presented in the Research Proposition. The purpose of this meeting is to ascertain whether the anticipated research constitutes a defensible dissertation topic so that the student does not develop a detailed plan for a research program that has serious flaws and probably cannot be successfully defended in the oral examination. If the committee has reservations, modifications that are mutually satisfactory to the student and the committee can be worked out during this meeting or the student can be asked to submit a revised or new abstract.
Upon approval of the Proposition Abstract by the Guidance Committee, the student will develop it into a formal Written Proposition. This is to be in the form of a grant proposal and should include a short historical introduction, a statement of the problem and its significance, one or more hypotheses (if appropriate), the research design, anticipated results, methods to be used in interpretation of the results, and pertinent references. The treatment should be concise and should not exceed 15 double-spaced pages.

The Oral Examination

The oral examination will be in the area of the student’s intended research and will be based on a research project selected and developed by the student into a Research Proposition.

The oral examination is usually taken two weeks after and must be taken within one month of the written examination. At least two weeks before the date of the oral examination, the student must submit one copy of the Research Proposition to each member of the Examination Committee and one copy to the Marine Program's Student Affairs Administrator for the student's permanent file.

The oral examination will be conducted and evaluated by the student's full 5-member Guidance Committee. Typically, the Committee meets briefly without the student to review the student's course work, other preparation and progress; to review the student's performance on the screening examination (copies of the student's transcript and Screening examination report should be obtained for each committee member from the Graduate Student Administrator by the Chair); and to agree on the exact format and order of questioning during the oral examination. Subsequently, the student typically presents the highlights of the research proposition in 15 minutes or less. Then members of the committee ask two or more rounds of questions. The questions are largely focused on the student's ability to conceive, conduct, evaluate of independent research and to communicate the results of such work. However, the oral examination is not limited to the context of the Written Proposition; as specific examples, questions are often asked a) from the written examination and b) concerning the removal of deficiencies identified during the Screening Examination.

On completion of the examination, the Guidance Committee meets in executive session (without the student) to evaluate the student's performance on the oral examination. Each member has one vote, pass or fail. More than one negative vote will result in failure of the student to pass the examination.

At the end of the executive session, the student is notified of the results on the two portions of the Qualifying Examination. Although one could pass both the oral and written, only one of these exams, or neither, the student passes the Qualifying Examination (as a whole) only if his/her performances on both the written and oral portions are satisfactory. If the student passes both the oral and written examinations, he/she is indicated to have passed the Qualifying Examination on the Graduate School form Report on Ph.D. Qualifying Examination.

If the student fails the written examination or the oral examination or both, the committee must indicate that the student failed the Qualifying Examination on the Graduate School form Report on Ph.D. Qualifying Examination. The committee must make recommendations concerning the student's continuation in the graduate program. The committee usually grants the student a second chance to pass the failed portions (either part satisfactorily completed in the first examination does not have to be retaken), but may recommend that the student not repeat the exam or even deny a second chance (the latter action would be appealed to the Graduate School). The second attempt is a final one and can be taken no sooner than six months or later than twelve months after the initial failure.

Admission to Candidacy

After the student passes the Qualifying Examination, the Guidance Committee recommends to the Graduate School that the student be admitted to candidacy for the Ph.D. Degree. Following admission to candidacy the student must register for BISC 794 Dissertation every semester, except summers, until the degree is awarded.

After the Qualifying Examination has been passed, the full Guidance Committee will be known as the Dissertation Committee. The GPMEB does not allow the reduction of the Guidance Committee to a three-member Dissertation Committee as permitted by the Graduate School except under special circumstances. If these circumstances are met, at least 2 members must be from the GPMEB). Participation of all members of the Guidance Committee in the Dissertation Committee is indicated on the bottom of the form, Report on Ph.D. Qualifying Examination.
Research

A student must undertake original investigation of a selected problem in marine biology or biological oceanography. This is normally based on the Written Proposition as presented in the Qualifying Examination, subject to acceptance by the student's committee. Subsequent changes of research direction or content must have advance approval by the student's advisor and Dissertation Committee.

Research Prior to Admission to Candidacy

Although the Graduate School regulations indicate that students cannot pursue research prior to their admission to candidacy, students in the GPMEB are encouraged to conduct research at their earliest opportunity. Ideally, this early research will develop into an appropriate dissertation topic. Certainly, the student will find it difficult to develop and defend a Research Proposition without significant exposure to research in general and the specific problem in particular. Such preliminary research should be based on a detailed plan prepared by the student and approved by his/her advisor.

Research Subsequent to Admission to Candidacy and its Relationship to the Written Proposition

As noted above, dissertation research is normally based on the Written Proposition as presented in the Qualifying Examination, subject to its acceptance by the student's committee. Difficulties frequently force revision of the planned study. The student's Dissertation Committee must approve in advance any such changes of research direction or content.

Publication Prior to Submittal of the Dissertation

Prompt publication of research results is very strongly encouraged in the GPMEB. Students should organize their research efforts into blocks that a) can be completed in sequence, and b) represent topics for separate future papers so that submittal of one or more papers can be completed during their graduate tenure. Advisors often require students to submit one or more papers before completing their dissertation.

Authorship of such papers is significant. If the student is the sole author or if the student is the first author with the advisor as the only additional author, it implies that the student did most if not all of the research and hence the entire contents of the paper may be acceptable for incorporation into the dissertation. If the advisor contributed significantly to the research or if other individuals (other graduate students, faculty, post docs, research technicians, etc.) are co-authors, only that part of the paper which represents the student's work may be incorporated into the student's dissertation.

A published work may be incorporated into the body of the dissertation but may not be appended in the form of a reprint according to Graduate School regulations. The student is advised to seek the approval of the dissertation committee before submittal of a manuscript that is to be included in the dissertation since that committee must ultimately approve all contents of the dissertation. The fact that material has been submitted (accepted, published) does not mean that it will be allowed to be incorporated without revision by the committee.

Preparation and Defense of the Dissertation

A dissertation represents a significant contribution to science that is based on an original research program completed by the student. Determination of the adequacy of the research program is the sole responsibility of the student's Dissertation Committee. Approval of the dissertation itself is primarily the responsibility of the student's Dissertation Committee, but the completed dissertation must also be examined by the Thesis Editor of the Graduate School to determine if it meets the grammatical standards and other requirements described in Regulations for Format and Presentation of Theses and Dissertations published by the University of Southern California and available at the University Bookstore. Additional regulations and information on the organization and preparation of the dissertation are provided in Directions for Preparation of Dissertations and Research Reports as Required by the Graduate Program in Biology/University of Southern California. Students should obtain a copy of both sets of regulations before they initiate their writing.

GPMEB students defend an advanced draft of the dissertation rather than a "final" copy typed on dissertation paper. The advanced draft should be complete, including all text, figures, tables, references, etc. and the draft must be in a suitable form for final typing. Before assembly of a complete draft is initiated, the student should confer with his/her full committee to determine whether adequate research has been completed.
The student's advisor is the individual responsible for determining whether or not a draft is sufficiently refined for distribution to the full Dissertation Committee. Portions or all of earlier drafts may be submitted to some or all of the committee members for suggestions and evaluation at any time. The thesis draft to be defended must be given to the Dissertation Committee at least one month prior to the thesis defense date.

Presentation and oral defenses of the dissertation are achieved in a formal seminar open to all members of the academic community and in a closed meeting of the student and the Dissertation Committee.

Since the final typed copy of the dissertation must be presented to the Office of University Publications at least three weeks prior to the end of the term in which the degree is to be granted and since the student must allow adequate time after the defense for corrections and final typing, the defense should be scheduled at least six weeks before the end of the term in which the student plans to graduate.

Before undertaking the Dissertation Defense, the student must have completed (or be in progress of completing) all other degree requirements.

The Chair of the Dissertation Committee is required to notify the Student Affairs Administrator of the Marine Program of the date, time, and place of the defense of the dissertation, so that a notice of the Dissertation Seminar and Defense may be distributed to all faculty and graduate students of the Department at least two weeks in advance. The date selected for this defense cannot be on an official University holiday (e.g., Labor Day, President's Day, etc.).

The open oral defense of the dissertation is achieved in a formal 50-minute "research" seminar such as would be given by a visiting scholar. The presentation is open to the public and the student should be prepared to answer all questions from members of the audience, including those on the Dissertation Committee. The period of questioning is not to be limited in time.

The dissertation is also subject to a detailed defense made before the full Dissertation Committee in a meeting that is usually held shortly after the conclusions of the seminar. At this meeting, which is typically two-three hours in length, the Dissertation Committee must critically evaluate the dissertation and determine whether or not it is to be accepted. To be acceptable, the dissertation must represent a major, original contribution to science.

Only members of the Dissertation Committee may vote whether to pass or fail the student (accept or reject the dissertation and its open defense in the seminar). A vote to pass the student must be unanimous and such a vote does not preclude that the committee may require modifications of the dissertation. Reasons for failure of the defense should be clearly identified by the committee and may include a) a flawed research plan, b) nonconclusive or inadequate research results, c) major deficiencies in the dissertation, etc. A student who fails the defense the first time is normally given a second opportunity, but any decision on re-examination is at the discretion of the Dissertation Committee.

If the defense is satisfactory and no major revisions of the dissertation are required, all members of the Dissertation Committee sign the APPROVAL OF DISSERTATION for FINAL TYPING (green card), which is submitted to the Graduate School. If significant revisions of the manuscript are required, the card is not signed until such revisions are completed. The Chair of the Dissertation Committee may be assigned full responsibility for determining that the required revisions have been made, but some or all other members of the committee may request that they also be involved in the final approval.

If the green card for final typing is signed and dated by the drop/add deadline for FALL or SPRING, no further registration is required.

The student also needs to prepare an abstract of the dissertation for publication in "Dissertation Abstracts, International." The DOCTORAL DISSERTATION ABSTRACT SUBMITTAL form, signed by the Dissertation Committee chair, must be attached to the abstract and submitted to the Thesis Editor of the Graduate School.

The SIGNATURE PAGE is bound with the dissertation to verify that the dissertation has been approved by the Committee and accepted by the Graduate School. Signatures required on this form are those of the Committee and the Graduate School.

In addition to the original copy required by the Graduate School, one hardbound copy of the dissertation must be presented to the Department of Biological Sciences and another to the chair of the student's (Guidance and) Dissertation Committee.
The **TRIPLE CARD REPORT ON DISSERTATION & ORAL EXAMINATION for the Ph.D. DEGREE** must be signed by each Committee member, the Chair of the Department of Biological Sciences, the Thesis Editor, and the Graduation Counselor (for Dean of Registration & Records, GFS 315). The signed **TRIPLE CARD REPORT** signifies approval of the dissertation and defense by the committee, as well as acknowledging completion of all departmental degree requirements and all University degree requirements. Most important of all, it indicates that the degree has been cleared for conferral. The completed **TRIPLE CARD REPORT** is submitted to the Graduate School for approval.

The student must pay a Dissertation Fee for the microfilming and binding of the dissertation and publication of the abstract (see Tuition and Fees in the current University "Catalogue"). A copy of the receipt for payment of this fee must be submitted to the Thesis Editor.

The **DIPLOMA APPLICATION CARD FOR GRADUATE STUDENTS** notifies Registration and Records of how the student would like his/her name to appear on the diploma. This card must be completed and submitted to the Graduate School.

The **SURVEY OF EARNED DOCTORATES** must be completed and returned to the Graduate School for approval.

After approval by the Graduate School, the completed **TRIPLE CARD** is taken to the Degree Progress Department (SAS 010). Once this Department has signed the card, you have officially graduated!
COURSES AVAILABLE IN MARINE ENVIRONMENTAL BIOLOGY

BISC 582 Biological Oceanography (Core Course) (4 units)
BISC 584 Faculty Lecture Series (2 units)
BISC 585 Scientific Writing and Reviewing (2 units)
BISC 529 Marine Environmental Biology Seminar (1 unit; 4 units required, maximum)

Seminars (Offered on a rotating basis; check current Schedule of Classes) (2 units; 8 units required)

BISC 530 Plankton Biology (Caron & Michaels)
BISC 531 Physiology of Marine Organisms (Manahan)
BISC 532 Molecular Ecology (Fuhrman)
BISC 533 Remote Sensing and Modeling (Kiefer)
BISC 534 Population Genetics of Marine Organisms (Edmands & Hedgecock)
BISC 536 Marine Biogeochemistry/Global N Cycle (Capone & Ziebis)
‘Quick Check List’ of Student/Advisor Responsibilities

First Month (Late Summer/Early Fall; ASAP, before classes get going)

Each student meets with the “Screening Committee” (same composition as the Admissions Committee for that year, plus the student’s advisor). This committee will be the same one that administers the Screening Exam at the end of Year 1. The Screening Committee evaluates each student’s background and advises on courses to be taken in the first 1/2 years to develop each student’s background in marine science (and specific area of interest).

By the End of Year 1 (Summer)

Student completes the Screening Exam, which tests the student’s general scientific knowledge, and identifies weaknesses that need to be addressed. The student will receive written comments from the committee on the “Screening Examination Results” form.

Beginning of Year 2 (Fall)

Student and advisor compose and request appointment of a Ph.D. Guidance Committee, which meets with the student near the beginning of the second year. Prior to the meeting, the student submits a (at least) 1-2 page document outlining his/her proposed research. Following a brief presentation by the student, the committee provides feedback, which includes a second review of the student’s coursework and training, and any appropriate recommendations for further course work or directed study.

Year 3

The student must complete the Qualifying Examination (as described in “Requirements and Policies” document) by the end of Year 3. At least one month prior to the exam, the student completes the “Request to Take Qualifying Examination” form (located in folder). At least two months prior to the exam, the student must submit a thesis proposal (the fifteen-pager) to the Guidance Committee and obtain permission to proceed to the exam. The Chair of the Guidance Committee should obtain the student’s file for the Qualifying Examination. A “Results of Qualifying Examination” form will be in the file for all committee members to sign. All committee members will continue as the student’s Dissertation Committee.

Years 3-5

Following successful completion of the Qualifying Examination, the Ph.D. Guidance Committee becomes the Dissertation Committee. The student meets at least annually with the committee. A short memo describing the students’ progress (signed by all committee members) is submitted to the Section office following each annual meeting.

Additional Annual Requirements:

Yearly Seminar: Each student must present a 30-minute seminar once each academic year beginning in their second year.

Yearly Progress Reports: On or by September 1, each student will complete and submit to the Section office a brief progress report (signed by each member of their Guidance or Dissertation Committee) detailing their activities during the previous 12 months (courses taken, research undertaken, seminars given at USC and elsewhere, participation in cruises, etc.). Forms for these reports will be emailed to students each summer as a reminder.
Screening Examination—Marine Biology

Student’s Name:______________________________________

ID#:_________________________________________________

Date of Screening Examination:_________________________

Pass_________________ No Pass______________________

(See below)

Comments:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Suggested Courses:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Signatures of Committee Members:

________________________________________________________________________

________________________________________________________________________
Yearly Evaluation—Marine Biology

Student’s Name:_________________________  ID#:_____________________________

Student’s Advisor:____________________________________  Date:_________________

Progress toward degree:

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

TA Performance:

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
## MEB Directories

(Just dial the extension)

**Marine Environmental Biology Faculty/Staff**

<table>
<thead>
<tr>
<th>NAME</th>
<th>EXT</th>
<th>OFFICE</th>
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<tr>
<td>Bakus, Gerald</td>
<td>x05790</td>
<td>AHF 130</td>
<td>0371</td>
<td><a href="mailto:bakus@worldnet.att.net">bakus@worldnet.att.net</a></td>
</tr>
<tr>
<td>Capone, Douglas</td>
<td>x02772</td>
<td>AHF 108</td>
<td>0371</td>
<td><a href="mailto:capone@usc.edu">capone@usc.edu</a></td>
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<tr>
<td>Caron, David</td>
<td>x00203</td>
<td>AHF 301</td>
<td>0371</td>
<td><a href="mailto:dcaron@usc.edu">dcaron@usc.edu</a></td>
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<td>Duguay, Linda</td>
<td>x11335</td>
<td>AHF 209</td>
<td>0371</td>
<td><a href="mailto:duguay@usc.edu">duguay@usc.edu</a></td>
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<tr>
<td>Edmands, Suzanne</td>
<td>x05548</td>
<td>AHF 306</td>
<td>0371</td>
<td><a href="mailto:sedmands@usc.edu">sedmands@usc.edu</a></td>
</tr>
<tr>
<td>Fitzhugh, Kirk</td>
<td>763-3367</td>
<td>NatHistMus</td>
<td></td>
<td><a href="mailto:fizhugh@usc.edu">fizhugh@usc.edu</a></td>
</tr>
<tr>
<td>Fuhrman, Jed</td>
<td>x05757</td>
<td>AHF B4</td>
<td>0371</td>
<td><a href="mailto:fuhrman@usc.edu">fuhrman@usc.edu</a></td>
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<tr>
<td>Hedgecock, Dennis</td>
<td>x1-2091</td>
<td>AHF 125/130</td>
<td>0371</td>
<td><a href="mailto:dhedge@usc.edu">dhedge@usc.edu</a></td>
</tr>
<tr>
<td>Hendler, Gordon</td>
<td>763-3526</td>
<td>NatHistMus</td>
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<td>Iturriaga, Rodolfo</td>
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<td>Jacobson, Myrna</td>
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<td>AHF M240</td>
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<td>Jones, Burton</td>
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<td>Kiefer, Dale</td>
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<td>Manahan, Donal</td>
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<tr>
<td>Martin, Joel</td>
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<tr>
<td>Michaels, Anthony</td>
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<tr>
<td>Nealson, Ken</td>
<td>x12271</td>
<td>SCI 225</td>
<td>0740</td>
<td><a href="mailto:knealson@usc.edu">knealson@usc.edu</a></td>
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<tr>
<td>Pieper, Richard</td>
<td>310/519-3180</td>
<td>S.C.M.I.</td>
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<td>Popa, Radu</td>
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<td>Soule, Dorothy</td>
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<tr>
<td>Thacker, Christine</td>
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<td><a href="mailto:thacker@nhm.org">thacker@nhm.org</a></td>
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<tr>
<td>Valdes, Angel</td>
<td>763-3380</td>
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<td><a href="mailto:avaldes@nhm.org">avaldes@nhm.org</a></td>
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<td>Ziebis, Wiebke</td>
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<tr>
<td>Zimmer, Russel</td>
<td>x05774</td>
<td>TBA</td>
<td>0371</td>
<td><a href="mailto:zimmer@usc.edu">zimmer@usc.edu</a></td>
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</table>

**AHF 107 Fax: 213-740-8123**

**Biological Sciences Business Mgr**

Christopher Yokas  
MEB Administrative Coordinator

<table>
<thead>
<tr>
<th>NAME</th>
<th>EXT</th>
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<td>Bingham, Don</td>
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<td>Bazilian, Linda</td>
<td>x11088</td>
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</table>
| Biological Sciences Webmaster  
Keun Song              | x0-5771| AHF 107      | 0371      | ksw@usc.edu           |
| Program Manager       |       |              |           |                       |
| Glen Smith            |       |              |           | glensmit@usc.edu      |
Marine Environmental Biology Graduate Students

<table>
<thead>
<tr>
<th>NAME</th>
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<tr>
<td>Chinen, Ann Marie</td>
<td>x09698</td>
<td>AHF 306</td>
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<tr>
<td>Countway, Peter</td>
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<td>AHF 301</td>
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<tr>
<td>Finzi, Juliette (Ocean Sciences)</td>
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<td>AHF 104</td>
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<td>x0-8802</td>
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<td>Green, Allison</td>
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<td>Romero, Isabel (Ocean Sciences)</td>
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<td>AHF 210</td>
<td><a href="mailto:pcy@usc.edu">pcy@usc.edu</a></td>
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New Students 2004

Bertics, Victoria
Cetinic, Ilona
Fabrega-Climent, Julia
Jones, Adriane
Lam, Chi Hin (Tim)
Plough, Louis
Reifel, Kristin
David Caron, Chair, Biological Sciences
Douglas Capone, Director of MEB
American Language Institute
ARGO (Academic Research Gateway Office)
California Dept. of Motor Vehicles
Craigslist Los Angeles
(MTA) Los Angeles Metropolitan Transportation Authority
USC Bookstore
USC Computer Support/ISD
USC Credit Union
USC Health Center
USC Office of International Studies
USC Sea Grant
USC Transportation Services
Wrigley Institute
Map of Los Angeles/Southern California
Travel to Catalina:

Ann Close
Catalina Express

For overnight stay:
Katie Boutillier of Wrigley
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Welcome from the Director

Orientation Schedule

Registration

Student Health and Insurance

Program Life

Personal Life: USC and Los Angeles
- Housing, transportation, banking, Dept. Motor Vehicles, recreation, etc.

General Information about Financial Aid

Requirements and Policies of the Graduate Program in Marine Environmental Biology

Appendix A--Guidelines for Ethical Faculty and Graduate Student Relations

Appendix B--Graduate School Bulletin
Welcome

Welcome to graduate study in Marine Environmental Biology at USC! You are officially embarking upon your professional career in academics, and we hope your years here are exciting, challenging, and fruitful. The purpose of this brochure is to try and help smooth the way during your first few weeks, as well as to provide some basic information with regard to our program, being a graduate student at USC, and life in LA in general. In addition to this guide, a good source of information is the free booklet entitled SCampus, which you can obtain at Topping Student Center. Of course, it is always a good idea to solicit information and advice from more senior graduate students and from faculty. Senior graduate students can be very helpful for adjusting to the “personal” side of life at USC, while Faculty and the Graduate Student Coordinator should be your source of information for “official” aspects of the program and academic life.

Our support staff is also available to help out with procedures for registration and other logistical details. Linda Bazilian, the Graduate Programs Manager for Biological Sciences; is in AHF 107-D, mc 0371, x11088. Linda is highly knowledgeable concerning all aspects of the graduate program.

Once again, welcome to the program!

Douglas Capone
Director, Marine Environmental Biology
# Orientation Schedule

**Marine Environmental Biology Graduate Program**

*Fall, 2005*

<table>
<thead>
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<th><strong>DATE</strong></th>
<th><strong>ACTIVITY</strong></th>
<th><strong>LOCATION</strong></th>
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<td>August 19</td>
<td>Laboratory Safety Training</td>
<td>ZHS 159</td>
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<tr>
<td>(Friday) 8:30am-5:00pm</td>
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<tr>
<td>TBA</td>
<td>Orientation</td>
<td>Conference Room</td>
</tr>
<tr>
<td>August 15</td>
<td>Biological Sciences Welcome Picnic (All students/faculty/staff are invited).</td>
<td>AHF Lawn</td>
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<tr>
<td>(Monday) Noon</td>
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<tr>
<td>August 18-19</td>
<td>College Teaching Assistant Training</td>
<td>Bovard Auditorium</td>
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<tr>
<td>(Wednesday-Thursday) 8:30am-5:00pm</td>
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<tr>
<td>August 16</td>
<td>Biological Sciences Teaching Assistant Meeting</td>
<td>ZHS-159</td>
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<tr>
<td>(Tuesday) 10:00am-11:30am</td>
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<tr>
<td>August 16</td>
<td>Individual Course Teaching Assistant Meetings</td>
<td>To be arranged</td>
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<tr>
<td>(Tuesday) 11:30am-2pm</td>
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**NOTE:**

*Items in bold require your attendance.*

All students who are TA’s must attend the College Teaching Assistant Training sessions or you will not be allowed to teach in the fall semester. Additionally, all TA’s must attend the meetings on Tuesday, August 16.

Additional meetings to be arranged: Radiation Safety training will be required early in the semester.

If you have questions and/or conflicts with this schedule, please see Linda Bazilian immediately.
Registration Process

**ACTION**

1) First-year students: Set up advisement appointment with your advisor  
   Continuing students: Check your e-mail for registration instructions  
   Linda Bazilian, AHF 107-D, x11088

2) Obtain signed approval form from your advisor and return it to Linda Bazilian for "D" clearance.

3) Register via WebRegistration (follow directions in the *Schedule of Classes*).

4) Get your fee bill and pay all necessary fees by deadline.  
   Domestic students pay online or at the Cashier’s Office. International students pay by check.  
   Fees:  
   - Graduate Orientation Fee (one-time fee)  
   - Topping Center Fee  
   - Graduate Student Services Fee  
   - Graduate Program Fee  
   If you have any problems with your fee bill, please see Linda Bazilian, Graduate Programs Manager (x11088).

   A couple of days after you register for classes, Information Services Division (ISD) will issue your USC email address. Check the status of your email address at [www.usc.edu/firstlogin](http://www.usc.edu/firstlogin). Registration is also needed to get a parking permit and to obtain a USCard, required for such activities as library and Lyon Center privileges.

5) Pick up your ID card from USCard services (Commons Lobby).

6) Get validation sticker, good for campus discounts, from Don Bingham, the MEB Administrative Coordinator.

**Registration Directory**

- **Registration Packets**  
  - Enrollment, Drop/Add & Audit  
  - Registration Bldg. (REG) 1st Floor

- **American Language Institute**  
  - ALI: HSS Building, 938 W. 34th Street

- **Office of International Students**  
  - STU 300

- **USCard**  
  - Commons Lobby

- **Health Insurance**  
  - A649 W. 34th Street (1st floor Parking Structure D)

- **Housing/Dining Services**  
  - Parking Structure C

- **Financial Aid**  
  - Hazel and Stanley Hall (HSH)

- **Parking Permits/Ridesharing**  
  - Transportation Svcs at Childs Way Bldg. 1

- **Payment of Fees/Cashier's Office**  
  - King Hall, 2nd Floor
**Student Health and Insurance**

USC pays Teaching Assistants’ and Research Assistants’ fees for student health insurance, use of the student health center, and dental care. All students registered for at least 6 units are automatically enrolled for health and dental insurance.

**Student Health Center (213/740-5344)**

The Student Health Center provides primary care, basic emergency care, an urgent care clinic, Saturday clinics, specialist clinics, and a pharmacy. You are eligible for the Health Center if you are enrolled in classes.

A Health Center fee is listed on your fee bill. Most care is free; however, there are nominal charges for some lab tests, prescriptions, orthopedic appliances, and copies of medical records. Also, if you are not taking classes (as in summer) you must pay the appropriate fee to use the Center. Hospitalization is NOT covered, but may be purchased separately.
**MEB Program Life**

**Seminars**

MEB graduate students are to attend and participate in MEB research seminars, held Tuesdays from noon to 1:00pm in the AHF Torrey Webb Room (TWR). Seminars have a question and answer period, and sometimes lunches with students and the speaker are scheduled. The seminars therefore give students a chance to learn about research outside their area of specialization and to meet distinguished scientists from other institutions.

Each semester, MEB distributes a list of seminar speakers chosen and invited by its students and faculty. Seminar notices are also posted near AHF 107 and updated weekly on the Biological Sciences Homepage.

Other USC departments, such as Neurobiology, Molecular Biology, Gerontology, Medical Sciences (Biochemistry, Microbiology, Pathology, Cell and Anatomy, Molecular Pharmacology and Toxicology) also hold seminars. These seminars and seminars offered at other universities are posted outside AHF 107.

**The Marine Environmental Biology Office (AHF 107)**

While your faculty advisor will advise about academic matters, administrative support is available from staff in AHF 107. For matters relating to your research or the graduate program, first see Don Bingham, the Administrative Assistant for the Marine Environmental Biology program. Don deals with issues like MEB requirements, ordering office supplies, maintaining equipment, visitor parking, mail distribution, phone and computer line installation, and key acquisition. Linda Bazilian, the BISC Graduate Programs Manager (x11088), handles questions about registration, grades, Graduate School requirements, etc. For computer support, see Keun Song, or call USC computer technical support at x 0-5555. Also in AHF 107 for your research purposes are a typewriter, computers, a scanner, a fax machine (213-740-8123), and two copiers.

**Mailroom/Post Offices/Fed Ex**

Put outgoing campus and stamped mail in the AHF 107 mailroom. You will have a mailbox there.

**MEB’s complete address:**
USC, Marine Environmental Biology, Dept. of Biological Sciences,
AHF 107, Los Angeles, CA  90089-0371 ← important!

MEB’s **mail code, 0371**, directs intercampus mail to the AHF 107 mailroom.

**Fed Ex** drop is at Kinko’s, located below the USC bookstore. The pick up deadline is 4:00pm. All Fed Ex’s must be charged either to an account number. Your advisor can help you determine the account to charge.

**Full service post office:** 3585 S. Vermont Ave., across from campus.
**Limited service post office:** in the Commons Lobby.

**Keys, Security**

The MEB Administrative Coordinator distributes keys. Each key requires a $10 refundable deposit.

Security is a very serious matter at USC. Please ensure the safety of MEB people and property. Never leave your keys unattended or loan them to others. Also, do not prop open any door to the outside. That invites theft, unsavory individuals, or both. If someone you don’t recognize loiters in AHF, call Security (x0-6000 or x04321—emergency).
Libraries

**Seaver Science Library** (SSL), in the Seaver Science Center, is the main science library on the University Park campus. Current journals are on open shelves on the first floor. Older journals are bound and shelved with books on the upper floors. Periodicals cannot be checked out, but copiers are available. Reference librarians on the first floor can help with database searches, computer networks, etc. Also, older materials may be ordered on-line from the Hancock storage area and picked up at this library.

**Hancock Natural History Collection** is in Special Collections on the second floor of **Doheny Library** (DML). The Collection has early research materials on systematics, oceanographic expeditions, and marine biology research published before 1900. You may also order hardcopy materials on-line from USC's off-site Grand Depository via the HOMER online library catalog and pick them up at Doheny. Also, inter-campus loans may be requested through the Academic Resources Gateway Office (ARGO).

USC has on-line access to a vast number of natural history materials, such as Limnology & Oceanography, and Oceanic Abstracts. Visit library.usc.edu to access the electronic resources.

**USC Library Card**

Apply for a card at the main circulation desk in Doheny or Seaver library.

**Off campus libraries**

**USC Norris Medical Library** is on the Health Sciences Campus (HSC). Seaver Library reference librarians can help you have the library copy journal articles for you and send them to you at Mail Code 0371.

You may apply for a UC Los Angeles (UCLA) library card through UCLA’s Biomedical Library. This library is great because it can access almost any journal, no matter how obscure or old. On-site copy machines use debit cards you buy from library vending machines. UCLA is ten miles west of USC and accessible by bus.

**Los Angeles County Natural History Museum library** (213-763-3388 or 213-763-3387) is in Exposition Park, just south of campus. The library is open by appointment M-F 10:00 - 4:00.

**Information on Computing**

Access the **USC computer network** from several public user rooms on campus, by modem from a home computer, and from any computer connected to local networks, such as the Ethernet in the molecular biology labs. A wide array of software is on the network, and services like e-mail and database searching are free to graduate students. The **USC Computing Center** offers advice and training sessions on the network and its software. The key to this world of information is a **computer account**. Computer accounts are automatically created for all students enrolled in a degree program. To activate your computer account, complete a Web based form and create a password. Get the form from one of five public computing areas: Leavey Information Commons, KOH 200, SAL 125, or WPH B34 on the University Park Campus (UPC), or Norris Medical Library on the Health Sciences Campus (HSC).

To connect to the USC network by modem, you must install and configure PPP software on their personal computers. Free PPP software can be downloaded from public machines in UCS user rooms.

Automatic accounts are available to enrolled students two weeks before classes begin. For more please contact USC’s **Customer Support Center** x05555.
Housing and Transportation

Housing

On-Campus: The USC Student Housing Office (x02546) is in Parking Structure C.

Off-Campus: Most graduate students live off-campus. Time permitting, walk or drive around a neighborhood you like, and look for vacancy signs. Some resources are The Daily Trojan, USC’s school newspaper; the LA Times, Los Angeles’ major newspaper; and such nearby community newspapers as the Hollywood Press and Santa Monica Evening Outlook. Also consider The Daily Breeze for Redondo-Hermosa-Manhattan Beach areas; the Star News for the Pasadena area; and the Northeast Newspaper for Eagle Rock, El Sereno, and East Los Angeles areas. Classified ad papers, such as The Recycler, have many listings. On-line, Craigslist.org lets you look for rentals and post rentals wanted ads. Also, the UCLA (hiss, boo) Housing Office Web site has descriptions of areas west of USC.

Consider buying a Thomas Brothers Street Atlas of Los Angeles and Orange Counties from the USC bookstore. Then, you can quickly locate street addresses in LA and Orange counties.

Non-University housing by campus is limited, and some areas are quite rough. Avoid renting in the south side of campus. Better is North University Park, north of campus, across Jefferson Blvd. Alas, the area is small, rentals are rather few, and landlords often charge accordingly. Still, you can find older places with "character" that are not too expensive. Caveat emptor.

Transportation and Parking

USC Escort Service (x0-4911): At night, do not walk on campus alone! The Escort Service will bring you to locations within about one mile of campus. See SCampus for information and schedules and Transportation Services.

USC Tram Service runs early morning until late at night on weekdays and services the nearby housing areas off campus, the Health Sciences Campus, and the campus parking lots, including the main off-campus one on Hope Street. Check transnet.usc.edu for schedules.

Despite LA’s reputation, you can get by without a car.

Metropolitan Transit Authority (MTA), the LA transportation system, can usually get you from here to there and points in between.

USC’s Transportation Services Office is also very helpful. The Office is at x0-3575, 1012 Childs Way, Building 1.

Express buses run from several outlying cities to downtown LA. Routes include stops at or near USC, and buses and shuttles run from downtown to USC. Transportation Services has information.

LA is constructing a new subway and rail transit system. Currently, the "Blue Line" runs south to Long Beach, the "Gold Line" runs east to Sierra Madre, and the "Red Line" runs west through the Wilshire Corridor. Wilshire Blvd. starts in downtown and extends about fifteen miles west, passing through Beverly Hills, Westwood (UCLA), and Brentwood, to the ocean at Santa Monica. Wilshire buses operate continuously.

Bicycle commuters: all bikes must be licensed--see procedures in Scampus. Unlocked bikes on or near campus will likely be stolen. Try to keep your bike in your apartment and in your office or lab.

Car commuters: a USC Parking Permit, available via the Transportation Office, is a wise investment. Off-campus street parking is scarce and unsafe; plus, parking time restrictions are the rule. Wherever you park, always lock your car and leave nothing valuable (cd player, clothes, etc.) visible from the outside.
Car and Vanpooling: LA County sponsors "Commuter Computer," a service to help commuters form car pools. If you wish to carpool, submit your name and commuting schedule to the "Commuter Computer,” 213/380-RIDE. They will try to match you with other interested commuters. "Rideshare" is USC’s on-campus car and vanpooling service. Rideshare operates out of the Transportation Services Office.

Banking and Shopping

Across from campus are a  
Citibank on Vermont Ave. and a  
Bank of America on Jefferson Blvd. After dark, never go to an ATM alone. Neighborhoods around USC are not particularly safe.

The on campus  
USC Federal Credit Union (KOH 200) offers good deals on checking and savings accounts and loans. Their ATMs are by the USC Bookstore, in the Commons Lobby, and in Kings Hall.

Bookstores

USC Bookstore/Computer Store on campus and The Paper Clip in University Village are convenient places to buy school and computer supplies. MEB graduate students are entitled to a 10% discount on some items in both stores. The graduate student sticker, which provides Bookstore discounts, will be put in your mailbox.

Local Markets

The 32nd Street Market in University Village will cash personal checks if you have a California Driver's License. Through them, you can also send telegrams, mail packages, and purchase money orders. Smart and Final, across from USC on Vermont Ave., has bulk foods and janitorial supplies at a discount. Ralph's Supermarket, at Vermont Ave. and Adams Blvd., is a mile north of campus.

Dept. of Motor Vehicles

The California Department of Motor Vehicles (DMV) is two blocks east of USC (3615 S. Hope Street).
On-Campus Cultural Events and Recreation

Get ready for plays, concerts, films, and art exhibits. Oh, and sports. USC is gung-ho about its sports teams. Sure, going gaga over a football game is intellectually questionable, but the game against cross-town rival UCLA is worth experiencing once. If you plan to attend many USC sports events, buy a "Student Activity Card" during registration week. The Card is essentially a season ticket to all USC home games and gives you a chance to buy a Rose Bowl football ticket if USC plays in it.

The Lyon Center has a weight room, racquetball courts, stationary bikes and treadmills. Locker rooms also lead to the McDonald's Olympic Swim Stadium. Nearby tennis courts and a track and soccer field are generally open to students. Students can form teams for intramural leagues in basketball, softball, coed water polo, and coed volleyball. Entrance and basic use of USC’s athletic facilities are free to students with current ID.

Off-campus Activities

Southern California cultural and recreational areas are quite accessible from USC. In a few hours at most, you can reach all manner of museums, theaters, sports complexes, amusement parks, zoos, bowling alleys, pool halls, ice skating rinks, beaches, tide pools, mountains, deserts, islands, public parks, horseback riding trails, polo fields, ski areas, golf courses, tennis courts, etc. Geez, what more do you want?

A sampling of what awaits:

amusement parks: Disneyland, Magic Mountain
art museums: LA County art museums, J. Paul Getty museum
ethnic museums: Museum of Tolerance, the California Afro-American Museum
science museums: Museums of Natural History and of Science and Industry, the Page Museum & La Brea Tar Pits
classical music: Music Center, Hollywood Bowl
rock music: Greek Theater and Universal Amphitheater
classic theater and musicals: Shubert and Ahmanson theaters
first-run contemporary works: Mark Taper Forum and lots of small local theaters
zoos: Los Angeles, San Diego
aquariums: Long Beach, Sea World
horse racing: Hollywood Park, Santa Anita
Hiking: Topanga State Park, Will Rogers State Park, Griffith Park
pro sports: baseball: Dodgers; hockey: Kings; basketball: Lakers, Clippers

Hancock Park area
On Wilshire near Fairfax Avenue
Los Angeles Museum of Art
Page Museum and La Brea Tar Pits
Petersen Automotive Museum
**Exposition Park**
On Exposition Blvd., directly across from campus
Museum of Natural History
California Science Center
Aerospace museum
LA Sports Arena
LA Coliseum
Rose Garden
Swimming Center

**Griffith Park**
Perhaps the largest municipal park in the U.S.
Observatory and planetarium
Greek Theatre, a natural amphitheatre for concerts
Merry Go Round
Autry Museum of Western Heritage
Los Angeles Zoo
Golf Course

**Santa Catalina Island:** MEB has ties to a marine research lab in Big Fisherman Cove at Two Harbors. A Wrigley Institute boat runs on Mondays and Thursdays. It's free! An Express boat runs more often, depending on the season, and costs about $48 roundtrip. For the Wrigley boat, contact Ann Close in AHF. For the Express, check the Catalina Express schedule, and look at the San Pedro to Two Harbors route. To stay overnight, contact Katie Boutillier of Wrigley.

**Warnings**

**Fun in the Sun**

Although the sun is fun, you must protect your skin. Sunscreen with a minimum 30 SPF rating is not enough. For any extended exposure, cover up with a brimmed hat, long sleeves, and pants. Skin cancer due to sun exposure is epidemic in Southern California, as is looking like a dried up prune. Protect yourself.

**West Nile Virus, Avian Flu, and Lyme Disease**

These are potentially devastating diseases. Mosquitoes spread West Nile; ticks spread Lyme Disease. If you hike or play in a park--even a city park--wear insect repellent and clothe your skin and hair. Also, stay on trails cleared to help keep the tiny critters off of you. Back at home, check your skin for any freeloaders digging in, and wash clothes in hot water. Stay away from all dead birds, especially the big black ones. Call the Public Health Department to report dead bird sightings. When in doubt, visit the USC Health Center.
General Information about Financial Aid

Marine Environmental Biology Section intends to provide or arrange for the provision of financial support (stipend + tuition) for all of its Ph.D. students. Students should feel assured that the faculty will do everything possible to meet this goal. Please note that Graduate School rules prohibit full time student from accepting any employment above and beyond their graduate assistantships (see Graduate Assistantship Handbook). There are 4 main sources of support for graduate students: Teaching Assistantships, Research Assistantships, Training Grants, and Individual Fellowships and Grants.

1) Teaching Assistantships
We are fortunate to be part of a large undergraduate department, because this gives us access to many TAships. The exact number varies with enrollments, but is divided equally between the 3 research sections. TAships, which are generally awarded for an academic year, carry a stipend and full tuition remission. You must maintain at least a 3.0 GPA to receive the tuition remission. Ten monthly payments are made beginning August 26 and ending May 26. It is possible to arrange for payments to begin August 26 (for a total of ten payments). See Linda Bazilian for more information. The authority to offer TAships rests exclusively with the Biological Sciences Department Chair, Dr. David Caron. He consults extensively with the Graduate Admissions Committees of each of the sections, and with faculty instructors.

The workload associated with TAships varies with the course in question and the familiarity of the TA with the subject matter. Consult a few of the more advanced graduate students for tips on course selection. Keep in mind that the best way to learn a subject in detail is to attempt to teach it to someone else. Whatever course you are assigned, please take your responsibilities very seriously. You are under a moral and legal obligation to do your best for your students. Undergraduates pay a hefty tuition bill, so they are entitled to your best efforts. Learn the subject matter diligently and find creative ways to explain it. Practice your verbal communication skills. Make yourself available and approachable. Conform to high ethical standards and respect confidentialities of your position. All of these skills will be directly useful to you in your future careers as researchers and educators. We faculty view the TAships as an important part of your training. Please be aware that as with any other job, your TA position can be terminated for poor performance.

2) Research Assistantships
Research Assistants and TAs are paid on the same scale and receive identical benefits. Nine monthly payments are made beginning September 26 and ending May 26. The department funds TAships, and research grants of individual faculty fund RAships. As the name implies, RAs do research, usually directed the Specific Aims of the grant that funds the position. The time required is often more than that for a TAship, but this is usually not considered a burden because the work should be directly relevant to your research training. At a minimum, an RAship should be considered a 15-20 hour per week job. Students might opt to put in more time, depending on the relationship between RA duties and the dissertation project, or the likelihood of co-authoring resulting publications. The relation between the RA project and the dissertation project varies on the faculty member involved and other circumstances. In some cases, the two projects are the same and you will in effect be paid for doing your dissertation research. In others, efforts are made to keep the projects distinctly different. Good arguments can be made for either approach.

Research assistantships need to be cultivated. Try to identify your research interests as early as possible, certainly by the end of your second semester. Determine which professor best matches those interests. If necessary, do some reading to educate yourself about that professor's work and the field in general. Tell the professor you would like to work with him or her and inquire about the availability of RAships. Before you start an RAship, be sure you understand what is expected of you, what you can expect from the professor, and what relations might exist between your work and dissertation research.

TAships vs. RAships: Your teaching assistant experience can be very rewarding. You will learn a lot and have the satisfaction of seeing that knowledge take root in others. You may establish lasting friendships or mentor relationships with some of your students. On the other hand, you are primarily here to do research, not teach. If you are not very efficient in organizing your time, progress on your dissertation research may be slowed by extended service as a TA. Most agree that RAships are preferable. Try to be flexible, though. As grant budgets wax and wane, it may be necessary to RAs to take TAships to cover lean periods.
The Wrigley Institute has just created a series of RAs for working at Catalina. Fellowships are available for the Summer, as well as for the Academic year.

3) Individual Fellowships and Grants
An enormous number of grants and financial aid are available to students. Detailed information can be obtained from two sources. First, the Graduate School (GFS 315, x35179) has a partial listing of available grants. Second, there is a computerized database in Doheny Library (DHL reference section). This database contains literally hundreds of grants from which to choose.

4) Summer Support
Your decision to be a Ph.D. student is a year-round commitment. You should view the summer as an opportunity to engage intensively in research, free from the distractions of coursework, TA assignments, and the like. We expect you to be in the laboratories, engaged in full time research, every summer. We will do everything we can to provide the financial support to make this possible. Please be aware, however, that it is your responsibility to take the initiative in securing summer positions. Early in the spring semester, if not earlier, every new student should make at least a tentative decision about which laboratory to work in. Talk to that professor and see if support is available. The best plan would be to secure a RAship, although there are a few summer TAships available. These provide only partial support and you must put your bid in early to Don Bingham. If these possibilities don't work out, see Linda Bazilian or Doug Capone. They may be aware of other possibilities for summer funding.
The Graduate Program in Marine Environmental Biology & its Administration

Introduction

Graduate students in the Graduate Program in Marine Environmental Biology (referred to subsequently as "GPMEB" or the "Program") may pursue a Ph.D. degree.

At the University of Southern California, graduate education is the responsibility of the Department, but the University's Graduate School establishes minimum requirements concerning grade point average, number and distribution of units, residency, time limits, etc. that are common to all advanced degrees offered within the College of Letters, Arts and Sciences at the University. Specific courses, examinations, skills, and research requirements are established by the student's program of study, in this case the Graduate Program in Marine Environmental Biology. Collectively, both sets of regulations constitute the student's "degree requirements," all of which must be met by the student.

Graduate School regulations are listed in the current *University of Southern California Catalogue* somewhat confusingly, one part of these are scattered in the section on "Academic Policies and Information" near the beginning of the *USC Catalogue* and the rest are found near the middle of the *USC Catalogue* under "The Graduate School." Those regulations, which most commonly affect GPMEB students, are included in this document, but this listing should not be considered definitive.

GPMEB regulations are listed in this document; the major requirements of degrees in the GPMEB are also listed in the *USC Catalogue* under "Department of Biological Sciences."

Program Administration--The Graduate School

The Graduate School maintains the University's official Permanent Graduate Student File and is ultimately responsible for admission of our graduate students and the awarding of their degrees. As noted above the Graduate School establishes requirements concerning grade point average, number and distribution of units, residency, and time limits that are common to advanced degree programs in all units under their jurisdiction, including the Department of Biological Sciences.

Official forms are used to track a student's progress by The Graduate School and completion and submittal of these usually is to be at a specified point in the student's tenure. Timetables for the completion of degree requirements are available at The Graduate School. The schedule for the Ph.D. student's final and penultimate semesters are especially detailed and need to be adhered to closely.

All Graduate School forms prepared by or on behalf of the student must be approved by the Director of the Program and by the Chair of the Department before their submittal to the Graduate School. All Graduate School forms are available from the Graduate Student Coordinator, Linda Bazilian.

Graduate Student Representatives

In late spring, GPMEB students select two graduate students to serve as Graduate Student Representative and Alternate Graduate Student Representative for the coming academic year. To be eligible for the posts, both students must have passed their Qualifying Examination. The Alternate will represent the graduate students in the Graduate Student Representative's absence or by the latter's appointment. The Graduate Student Representative has one vote in meetings of the GPMEB Faculty representing the opinions of the graduate students.

The Graduate Student Representative has no voting power in either the continuation of fellow graduate students or in the Qualifying Examination. At the option of the student examined, the Graduate Student Representative may also be present during the oral part of the Qualifying Examination.
Graduate Student Coordinator of GPMEB

The Graduate Student Coordinator of GPMEB is the staff member responsible for processing and maintaining graduate student files; serving as liaison between the students, GPMEB Faculty, and the Graduate School; and making available application materials, Graduate School Forms, and other relevant documents. A permanent Department file on each student is maintained in the Marine Environmental Biology Program Office.

Student Advisement and Guidance

The First Year Advisor; Initial Advisement and Evaluation by Student's Advisor

Most students have a first-year advisor who is identified in the acceptance letter. This initial advisor may be replaced by another faculty member with whom the student has closer research affiliations at the request of the student and with the approval of the new advisor. If an incoming student has not chosen an advisor, this should be a priority during the first semester.

The Program provides an initial orientation for all incoming students. During registration week of a graduate student's first semester, the student's initial advisor meets with the student to review his/her previous course work and experiences and to discuss career objectives. A primary purpose of this initial interview is to identify major deficiencies in a student's preparation and to suggest means of remediating any such deficiencies.

Screening Committee

A Screening Committee is created each year and consists of the members of the admissions committee plus the student's advisor. This committee will meet with incoming students as soon as possible to evaluate the student's background and make recommendations for developing a solid base in marine biology. They will administer the Screening Examination, which is given near the end of the student's second semester of graduate work at USC. The Screening Committee will also be responsible for the student's advisement and guidance from the time of its appointment until the five-member Ph.D. Guidance Committee is established. Each student's performance will be reported in writing on the GPMEB's Report of the Screening Committee.

Requirements for the Ph.D. Degree

Time Schedule

All course requirements for the Ph.D. degree are normally completed within three calendar years from the date on which the student took his/her first course at USC and must be completed within eight calendar years from that time.

General Requirements

A total of 60 units must be completed for the Ph.D. Degree.

Course Requirements--Core courses

Two core courses are currently required: BISC 582 and BISC 584. These courses should be taken during the student’s first year at USC. Students are also required to take 4 units of BISC 529 (MEB Seminar).

Students must receive a grade of B or better in each core class and maintain a cumulative 3.0 Grade Point Average in all coursework.

Official Guidance Committees

A five-person Ph.D. Guidance Committee should be established soon after the screening exam, but no later than the fourth semester of enrollment for a student seeking a Ph.D. degree. After the student passes the Qualifying Examination, the Ph.D. Guidance Committee is called the Dissertation Committee.
The Student and His/Her Responsibilities

The student is ultimately responsible for his/her graduate career and must be familiar with Graduate School and GPMEB requirements and responsible for their timely completion.

If a student's needs are not being met, he/she should seek redress, using the following chain of command: advisor, advisory committee (screening, guidance, dissertation), Director of the Program, Department Chair, and Graduate School.

In addition to all other rules, the University has established codes of conduct to which all students must adhere. One aspect of graduate training -- service as a teaching assistant -- places them in a position of power over undergraduate students. The position implies added responsibilities and liabilities, especially in respect to such matters as fairness, equal treatment, sexual harassment, etc. Information on University policies concerning conduct is available in SCampus. Further information or sources of information may be obtained from the Department office.

Formal Graduate Seminars

Students must complete a minimum of four (4) 2-unit graduate seminars. Because a critical feature of such seminars is exposure to current literature, all four required seminars must be completed during the student's tenure at USC. With the written permission of the student's committee, a formal course completed at another institution may be counted as one of the four required seminars (the course must have been completed during the student's tenure here, however).

Research Tool Requirement

Proficiency in statistics is a necessary skill for all scientists. Satisfactory skill level may be demonstrated by

a) completion (grade of B or better) of a course approved by majority vote of the Marine Environmental Biology Program faculty.

b) acceptance of course work previously completed either at USC or elsewhere. The acceptability of a previously completed course will be made by an examiner selected by the Marine Environmental Biology Program faculty.

A rigorous grad level course in Biostatistics is available at the Medical School in the Department of Preventive Medicine. Course number is PM 510L. Permission is needed from the PM Department. A free shuttle bus runs routinely between the University Park and Med School Campuses. Other BioStat options are listed in the appendix.

Research Units

BISC 790 Research units are normally taken whenever the student is conducting his/her doctoral research. Dissertation research will normally take the equivalent of about 2.5-3 years of full time work, but the number of research units taken usually does not reflect this. Typically advanced graduate students will take 6 units of 790 and possibly a 2-unit seminar each semester.

Grade Point Average Requirements

Students must maintain a grade point average of at least 3.0 in all courses taken at USC, in conformity with regulations of the Graduate School; work graded C- or below is not acceptable for either subject or unit credit. In addition to the overall GPA requirement, students must achieve at least a B- in each core and skill course.

If a student's cumulative grade point average falls below 3.0 at any time, the student will be placed on departmental academic probation. The cumulative average must be raised to 3.0 by the completion of the next two semesters of registration at USC in courses approved by the student's guidance committee. Note: this may require that the student take additional formal and/or seminar courses since directed research and dissertation units are on a Pass/No Pass basis and are not computed into the GPA. If the student does not improve his/her overall GPA to 3.0 within this period, the student will be dropped from the program. A student who has been removed from probation but subsequently fails to meet the scholarship requirement is subject to termination (will be terminated) from the program.
Marine Program Noon Seminar Series

Students must regularly attend the Marine Environmental Biology Noon Seminar series throughout their tenure at USC. In addition to attending other seminars, each student presents a 30-minute seminar on his/her current research once each academic year, beginning in their second year. Attending faculty will provide short written evaluations of the seminar to help students in improve their public speaking skills. (See “Forms” section).

BISC 794 Doctoral Dissertation

After a student successfully completes the Qualifying Examination and is therefore a formal candidate for the Ph.D., he/she must register for BISC 794 Doctoral Dissertation each semester except summer. The student would sequentially register for BISC 794a, 794b, 794c, 794d in the first four semesters after completing the Qualifying Examination, and then BISC 794z each subsequent semester as needed. Students must have at least 4 units of 794 credit, but can receive no more than 8; hence BISC 794a-794d are valued at 2 units and BISC 794z at 0 units.

Other Course and Unit Requirements

Additional formal course requirements may be established by the Section and/or by the student's guidance committee and/or on advice of the committee, which evaluates the student's preparation in the Screening Examination.

The minimum number of units required for the Ph.D. by the Graduate School is 60. Units must include 4, but no more than 8, units of BISC 794 credit and may be completed with other formal classes or BISC 790 work.

The student must be registered at USC during the semester that the dissertation is submitted.

Teaching Assistantship Requirement

Graduate students pursuing the Ph.D. in the GPMEB must serve as a teaching assistant for at least two semesters; ideally, the student should serve in at least two different courses.

Screening Examination

The Graduate School requires a Screening Examination. The exam is oral, about one hour in length, and must be taken before the student has completed 24 units of graduate work at USC. The Screening Committee administers the exam. The purpose of the meeting will be to evaluate the student's preparation, determine competence to continue graduate study, and point out deficiencies to be remedied prior to the Qualifying Examination. Prior to the exam, the student submits a 1-2 page document outlining his/her activities during the previous year and present research interests. At the exam, the student presents a short (5-10 minute) description of their academic background and research interests.

The topics covered in the Screening Examination include:

- a summary by the student of their research while at USC
- biotic diversity, classification, and life histories
- organismal evolution and phylogeny; molecular evolution
- structure and physiology of cells and organisms
- biochemistry
- Mendelian, population, and molecular genetics
- biological, chemical, and physical oceanography
- statistics, experimental design, modeling and theoretical biology
- ecology and environmental sciences.

Each student's performance will be reported in writing to the student. A copy is placed in the student's file.
Guidance Committee

Composition of the Guidance Committee

The student's program of studies is under the direction of a five-member guidance committee that must be established at least two semesters before the student takes his/her Qualifying Examination. Therefore, the student should request appointment of the committee as soon as possible after the screening exam but certainly before the end of his/her third or fourth semester of enrollment in the Ph.D. program.

The composition of the guidance committee must meet the following guidelines:

a) One member of the committee must be from a department at USC other than Biological Sciences. This "outside member" serves as the representative of the Dean of Graduate School.

b) Normally, the other four members of the committee are tenure-track faculty of the Marine Environmental Program in the Department of Biological Sciences, but one of the members may be from another Program in Biological Sciences, and at least one must be tenured. The chair of the committee is called the student's advisor and must be from the Marine Environmental Program. Co-Chairs are normally not permitted unless required by the Graduate School (see next paragraph).

In exceptional cases of academic merit, a person not meeting the above guidelines may be approved by the Graduate School to serve on a Ph.D. committee. To request such an exception, the student must submit to the Graduate School a current Curriculum vitae of the proposed member and a letter from the chair of the committee citing the particular expertise of the person and the relevance of the requested appointment. A specially approved member may not serve as the outside member (see below) or as sole chair of the committee, but may serve as a co-chair with a regular faculty member of the Marine Environmental program. A guidance committee may include no more than one specially approved member unless the size of the committee is enlarged past five.

Request for changes in the composition of the Guidance Committee must be made in writing by the student to the Program. If approved, the committee is officially changed using the Graduate School's Request for Change of Committee form.

If the chair of the Guidance Committee will be absent from campus for any extended period of time (e.g., on leave) he must appoint a temporary chair. The permanent chair will continue as a member of the Committee during his/her absence and will be in communication with the Guidance Committee. If the permanent chair must be absent at the time of the Qualifying Examination or the defense of the dissertation, a petition for formal appointment of a temporary chair must be submitted to the Graduate School.

Responsibilities of the Guidance Committee

The Guidance Committee (as such or as the Dissertation Committee that it becomes) is responsible for the guidance and evaluation of the student during his/her graduate tenure. Specific responsibilities include:

a. Administration and evaluation of the Qualifying Examination.

b. Approval of the student's research and academic programs.

c. Monitoring the student's temporal progress in meeting degree deadlines.

d. Evaluation of the dissertation in the Oral Defense

To meet these responsibilities, the Committee may require the student to make periodic written reports and should meet at least once per year with the student (one appropriate time for an annual meeting is shortly after the student's presentation at the Marine Noon Seminar series). More frequent meetings are usually necessary as the student approaches completion of his/her degree work. The student or any member of the committee may request a meeting. Normally the student is responsible for arranging a specific date, time and place for meetings. The Chair should write minutes of all committee meetings and submit one copy each to the student, the members of the committee, and the Marine Program office for inclusion in the student's permanent file.
Qualifying Examination

Prerequisites for the Qualifying Examination

During the semester the exam is taken, the student must be enrolled in a departmental graduate course or GRSC 800. The GPMEB requires that students have completed:

a) All required core courses, each with a minimum grade of B-.

b) At least two graduate seminars.

c) The statistics research tool requirement.

e) Removal of inadequacies noted in the screening examination.

f) Completion of the Request to Take Qualifying Examination form.

Depending on how the above requirements were met, the student may have to take additional course work to satisfy the Graduate School requirements that students have completed at least 24 units of course work applicable to the degree while in residence and with a minimum cumulative GPA of 3.0.

Timing of the Qualifying Examination

The Qualifying Examination is normally taken during the student's fifth semester in the Ph.D. Program and must be taken before completion of his/her sixth semester.

Components of the Qualifying Examination

The Qualifying Examination consists of a written and an oral part. The student's Guidance Committee conducts and evaluates both parts.

The Written Examination

The written examination will consist of four or five sets of questions distributed over two consecutive days. This examination can be taken on a laptop computer supplied by the committee chair (i.e., the student cannot use their own computer). Each Guidance Committee member (with the possible exception of the "outside member" whose participation is optional here) submits three questions; the student must answer two of this set, spending about equal time on each and having a maximum of two hours per set. The order in which the sets of questions are taken is at the student's option.

Questions will be comprehensive in scope with respect to the student's chosen area of specialization and will be designed to test the student's conceptual, analytical and integrative ability and preparation.

Each member of the Examination Committee will grade his/her question on a scale of 1.0-5.0 using 0.5 unit steps if necessary (1.0 as poor and 5.0 as exceptional). The examination result will be calculated by averaging all the grades. A mean score of 3.3 or above for all questions is passing; below 3.0 is failing. Cases where the mean is between 3.0 and 3.3 or where two or more questions are graded below 3.0 are evaluated by the Guidance Committee followed by a vote, using a secret ballot. More than one negative vote of the Guidance Committee will result in failure of the student to pass the written examination.

The written part of the Qualifying Examination must be taken before (normally 2 weeks before) the oral examination described below. The results of the written examination and the oral examination are given only at the completion of the oral examination.

The Research Proposition (The Fifteen Pager) and its Preliminary Approval

Proposition Abstract

At least two months before the anticipated date of the oral examination, the student should meet with his/her Guidance Committee and provide them with a 1- or 2-page Research Abstract of the anticipated research program to be presented in the Research Proposition. The purpose of this meeting is to ascertain whether the anticipated research constitutes a defensible dissertation topic so that the student does not develop a detailed plan for a research program that has serious flaws and probably cannot be successfully defended in the oral examination. If the committee has reservations, modifications that are mutually satisfactory to the student and the committee can be worked out during this meeting or the student can be asked to submit a revised or new abstract.
Upon approval of the Proposition Abstract by the Guidance Committee, the student will develop it into a formal Written Proposition. This is to be in the form of a grant proposal and should include a short historical introduction, a statement of the problem and its significance, one or more hypotheses (if appropriate), the research design, anticipated results, methods to be used in interpretation of the results, and pertinent references. The treatment should be concise and should not exceed 15 double-spaced pages.

The Oral Examination

The oral examination will be in the area of the student's intended research and will be based on a research project selected and developed by the student into a Research Proposition.

The oral examination is usually taken two weeks after and must be taken within one month of the written examination. At least two weeks before the date of the oral examination, the student must submit one copy of the Research Proposition to each member of the Examination Committee and one copy to the Marine Program's Student Affairs Administrator for the student's permanent file.

The oral examination will be conducted and evaluated by the student's full 5-member Guidance Committee. Typically, the Committee meets briefly without the student to review the student's course work, other preparation and progress; to review the student's performance on the screening examination (copies of the student's transcript and Screening examination report should be obtained for each committee member from the Graduate Student Administrator by the Chair); and to agree on the exact format and order of questioning during the oral examination. Subsequently, the student typically presents the highlights of the research proposition in 15 minutes or less. Then members of the committee ask two or more rounds of questions. The questions are largely focused on the student's ability to conceive, conduct, evaluate of independent research and to communicate the results of such work. However, the oral examination is not limited to the context of the Written Proposition; as specific examples, questions are often asked a) from the written examination and b) concerning the removal of deficiencies identified during the Screening Examination.

On completion of the examination, the Guidance Committee meets in executive session (without the student) to evaluate the student's performance on the oral examination. Each member has one vote, pass or fail. More than one negative vote will result in failure of the student to pass the examination.

At the end of the executive session, the student is notified of the results on the two portions of the Qualifying Examination. Although one could pass both the oral and written, only one of these exams, or neither, the student passes the Qualifying Examination (as a whole) only if his/her performances on both the written and oral portions are satisfactory. If the student passes both the oral and written examinations, he/she is indicated to have passed the Qualifying Examination on the Graduate School form Report on Ph.D. Qualifying Examination.

If the student fails the written examination or the oral examination or both, the committee must indicate that the student failed the Qualifying Examination on the Graduate School form Report on Ph.D. Qualifying Examination. The committee must make recommendations concerning the student's continuation in the graduate program. The committee usually grants the student a second chance to pass the failed portions (either part satisfactorily completed in the first examination does not have to be retaken), but may recommend that the student not repeat the exam or even deny a second chance (the latter action would be appealed to the Graduate School). The second attempt is a final one and can be taken no sooner than six months or later than twelve months after the initial failure.

Admission to Candidacy

After the student passes the Qualifying Examination, the Guidance Committee recommends to the Graduate School that the student be admitted to candidacy for the Ph.D. Degree. Following admission to candidacy the student must register for BISC 794 Dissertation every semester, except summers, until the degree is awarded.

After the Qualifying Examination has been passed, the full Guidance Committee will be known as the Dissertation Committee. The GPMEB does not allow the reduction of the Guidance Committee to a three-member Dissertation Committee as permitted by the Graduate School except under special circumstances. If these circumstances are met, at least 2 members must be from the GPMEB. Participation of all members of the Guidance Committee in the Dissertation Committee is indicated on the bottom of the form, Report on Ph.D. Qualifying Examination.
Research

A student must undertake original investigation of a selected problem in marine biology or biological oceanography. This is normally based on the Written Proposition as presented in the Qualifying Examination, subject to acceptance by the student's committee. Subsequent changes of research direction or content must have advance approval by the student's advisor and Dissertation Committee.

Research Prior to Admission to Candidacy

Although the Graduate School regulations indicate that students cannot pursue research prior to their admission to candidacy, students in the GPMEB are encouraged to conduct research at their earliest opportunity. Ideally, this early research will develop into an appropriate dissertation topic. Certainly, the student will find it difficult to develop and defend a Research Proposition without significant exposure to research in general and the specific problem in particular. Such preliminary research should be based on a detailed plan prepared by the student and approved by his/her advisor.

Research Subsequent to Admission to Candidacy and its Relationship to the Written Proposition

As noted above, dissertation research is normally based on the Written Proposition as presented in the Qualifying Examination, subject to its acceptance by the student's committee. Difficulties frequently force revision of the planned study. The student's Dissertation Committee must approve in advance any such changes of research direction or content.

Publication Prior to Submittal of the Dissertation

Prompt publication of research results is very strongly encouraged in the GPMEB. Students should organize their research efforts into blocks that a) can be completed in sequence, and b) represent topics for separate future papers so that submittal of one or more papers can be completed during their graduate tenure. Advisors often require students to submit one or more papers before completing their dissertation.

Authorship of such papers is significant. If the student is the sole author or if the student is the first author with the advisor as the only additional author, it implies that the student did most if not all of the research and hence the entire contents of the paper may be acceptable for incorporation into the dissertation. If the advisor contributed significantly to the research or if other individuals (other graduate students, faculty, post docs, research technicians, etc.) are co-authors, only that part of the paper which represents the student's work may be incorporated into the student's dissertation.

A published work may be incorporated into the body of the dissertation but may not be appended in the form of a reprint according to Graduate School regulations. The student is advised to seek the approval of the dissertation committee before submittal of a manuscript that is to be included in the dissertation since that committee must ultimately approve all contents of the dissertation. The fact that material has been submitted (accepted, published) does not mean that it will be allowed to be incorporated without revision by the committee.

Preparation and Defense of the Dissertation

A dissertation represents a significant contribution to science that is based on an original research program completed by the student. Determination of the adequacy of the research program is the sole responsibility of the student's Dissertation Committee. Approval of the dissertation itself is primarily the responsibility of the student's Dissertation Committee, but the completed dissertation must also be examined by the Thesis Editor of the Graduate School to determine if it meets the grammatical standards and other requirements described in Regulations for Format and Presentation of Theses and Dissertations published by the University of Southern California and available at the University Bookstore. Additional regulations and information on the organization and preparation of the dissertation are provided in Directions for Preparation of Dissertations and Research Reports as Required by the Graduate Program in Biology/University of Southern California. Students should obtain a copy of both sets of regulations before they initiate their writing.

GPMEB students defend an advanced draft of the dissertation rather than a "final" copy typed on dissertation paper. The advanced draft should be complete, including all text, figures, tables, references, etc. and the draft must be in a suitable form for final typing. Before assembly of a complete draft is initiated, the student should confer with his/her full committee to determine whether adequate research has been completed.
The student's advisor is the individual responsible for determining whether or not a draft is sufficiently refined for distribution to the full Dissertation Committee. Portions or all of earlier drafts may be submitted to some or all of the committee members for suggestions and evaluation at any time. The thesis draft to be defended must be given to the Dissertation Committee at least one month prior to the thesis defense date.

Presentation and oral defenses of the dissertation are achieved in a formal seminar open to all members of the academic community and in a closed meeting of the student and the Dissertation Committee.

Since the final typed copy of the dissertation must be presented to the Office of University Publications at least three weeks prior to the end of the term in which the degree is to be granted and since the student must allow adequate time after the defense for corrections and final typing, the defense should be scheduled at least six weeks before the end of the term in which the student plans to graduate.

Before undertaking the Dissertation Defense, the student must have completed (or be in progress of completing) all other degree requirements.

The Chair of the Dissertation Committee is required to notify the Student Affairs Administrator of the Marine Program of the date, time, and place of the defense of the dissertation, so that a notice of the Dissertation Seminar and Defense may be distributed to all faculty and graduate students of the Department at least two weeks in advance. The date selected for this defense cannot be on an official University holiday (e.g., Labor Day, President's Day, etc.).

The open oral defense of the dissertation is achieved in a formal 50-minute "research" seminar such as would be given by a visiting scholar. The presentation is open to the public and the student should be prepared to answer all questions from members of the audience, including those on the Dissertation Committee. The period of questioning is not to be limited in time.

The dissertation is also subject to a detailed defense made before the full Dissertation Committee in a meeting that is usually held shortly after the conclusions of the seminar. At this meeting, which is typically two-three hours in length, the Dissertation Committee must critically evaluate the dissertation and determine whether or not it is to be accepted. To be acceptable, the dissertation must represent a major, original contribution to science.

Only members of the Dissertation Committee may vote whether to pass or fail the student (accept or reject the dissertation and its open defense in the seminar). A vote to pass the student must be unanimous and such a vote does not preclude that the committee may require modifications of the dissertation. Reasons for failure of the defense should be clearly identified by the committee and may include a) a flawed research plan, b) nonconclusive or inadequate research results, c) major deficiencies in the dissertation, etc. A student who fails the defense the first time is normally given a second opportunity, but any decision on re-examination is at the discretion of the Dissertation Committee.

If the defense is satisfactory and no major revisions of the dissertation are required, all members of the Dissertation Committee sign the APPROVAL of DISSERTATION for FINAL TYPING (green card), which is submitted to the Graduate School. If significant revisions of the manuscript are required, the card is not signed until such revisions are completed. The Chair of the Dissertation Committee may be assigned full responsibility for determining that the required revisions have been made, but some or all other members of the committee may request that they also be involved in the final approval.

If the green card for final typing is signed and dated by the drop/add deadline for FALL or SPRING, no further registration is required.

The student also needs to prepare an abstract of the dissertation for publication in "Dissertation Abstracts, International." The DOCTORAL DISSERTATION ABSTRACT SUBMITTAL form, signed by the Dissertation Committee chair, must be attached to the abstract and submitted to the Thesis Editor of the Graduate School.

The SIGNATURE PAGE is bound with the dissertation to verify that the dissertation has been approved by the Committee and accepted by the Graduate School. Signatures required on this form are those of the Committee and the Graduate School.

In addition to the original copy required by the Graduate School, one hardbound copy of the dissertation must be presented to the Department of Biological Sciences and another to the chair of the student's (Guidance and) Dissertation Committee.
The **TRIPLE CARD REPORT ON DISSERTATION & ORAL EXAMINATION for the Ph.D. DEGREE** must be signed by each Committee member, the Chair of the Department of Biological Sciences, the Thesis Editor, and the Graduation Counselor (for Dean of Registration & Records, GFS 315). The signed **TRIPLE CARD REPORT** signifies approval of the dissertation and defense by the committee, as well as acknowledging completion of all departmental degree requirements and all University degree requirements. Most important of all, it indicates that the degree has been cleared for conferral. The completed **TRIPLE CARD REPORT** is submitted to the Graduate School for approval.

The student must pay a Dissertation Fee for the microfilming and binding of the dissertation and publication of the abstract (see Tuition and Fees in the current University "Catalogue"). A copy of the receipt for payment of this fee must be submitted to the Thesis Editor.

The **DIPLOMA APPLICATION CARD FOR GRADUATE STUDENTS** notifies Registration and Records of how the student would like his/her name to appear on the diploma. This card must be completed and submitted to the Graduate School.

The **SURVEY OF EARNED DOCTORATES** must be completed and returned to the Graduate School for approval.

After approval by the Graduate School, the completed **TRIPLE CARD** is taken to the Degree Progress Department (SAS 010). Once this Department has signed the card, you have officially graduated!
COURSES AVAILABLE IN MARINE ENVIRONMENTAL BIOLOGY

BISC 582 Biological Oceanography (Core Course) - each Fall (Fuhrman & Capone)  
(4 units)

BISC 584 Faculty Lecture Series - each Spring (all MEB Faculty)  
(2 units)

BISC 585 Scientific Writing and Reviewing - each Spring (Caron & Michaels)  
(2 units)

BISC 529 Marine Environmental Biology Seminar  
(1 unit; 4 units required, maximum)

Advanced Seminars  
(2 units; 8 units required)

530 Advanced Seminar in Plankton Biology (2 units) (Caron & Michaels)  Fall 04
531 Advanced Seminar in Physiology of Marine Organisms (2 units) (Gracey)  Fall 05
532 Advanced Seminar in Molecular and Microbial Ecology (2 units) (Fuhrman)  Spr 04
533 Advanced Seminar in Remote Sensing (2 units) (Kiefer)  Spr 06
534 Advanced Seminar in Population Genetics (2 units) (Edmands & Hedgecock)  Fall 03 Fall 07
or Seminar in Quantitative Traits (2 Units) (Hedgecock)  Spr 04
536 Advanced Seminar in Marine Biogeochemistry & Microbial Ecology  Spr 04
(2 units) (Capone & Ziebis)
‘Quick Check List’ of Student/Advisor Responsibilities

First Month (Late Summer/Early Fall; ASAP, before classes get going)
Each student meets with the "Screening Committee" (same composition as the Admissions Committee for that year, plus the student’s advisor). This committee will be the same one that administers the Screening Exam at the end of Year 1. The Screening Committee evaluates each student’s background and advises on courses to be taken in the first 1/2 years to develop each student’s background in marine science (and specific area of interest).

By the End of Year 1 (Summer)
Student completes the Screening Exam, which tests the student’s general scientific knowledge, and identifies weaknesses that need to be addressed. The student will receive written comments from the committee on the “Screening Examination Results” form.

Beginning of Year 2 (Fall)
Student and advisor compose and request appointment of a Ph.D. Guidance Committee, which meets with the student near the beginning of the second year. Prior to the meeting, the student submits a (at least) 1-2 page document outlining his/her proposed research. Following a brief presentation by the student, the committee provides feedback, which includes a second review of the student’s coursework and training, and any appropriate recommendations for further course work or directed study.

Year 3
The student must complete the Qualifying Examination (as described in “Requirements and Policies” document) by the end of Year 3. At least one month prior to the exam, the student completes the “Request to Take Qualifying Examination” form (located in folder). At least two months prior to the exam, the student must submit a thesis proposal (the fifteen-pager) to the Guidance Committee and obtain permission to proceed to the exam. The Chair of the Guidance Committee should obtain the student’s file for the Qualifying Examination. A “Results of Qualifying Examination” form will be in the file for all committee members to sign. All committee members will continue as the student’s Dissertation Committee.

Years 3-5
Following successful completion of the Qualifying Examination, the Ph.D. Guidance Committee becomes the Dissertation Committee. The student meets at least annually with the committee. A short memo describing the students’ progress (signed by all committee members) is submitted to the Section office following each annual meeting.

Additional Annual Requirements:
Yearly Seminar: Each student must present a 30-minute seminar once each academic year beginning in their second year.
Yearly Progress Reports: On or by September 1, each student will complete and submit to the Section office a brief progress report (signed by each member of their Guidance or Dissertation Committee) detailing their activities during the previous 12 months (courses taken, research undertaken, seminars given at USC and elsewhere, participation in cruises, etc.). Forms for these reports will be emailed to students each summer as a reminder.
Screening Examination—Marine Biology

Student’s Name:______________________________________

ID#:_________________________________________________

Date of Screening Examination:_________________________

Pass_________________ No Pass______________________

(See below)

Comments:

____________________________________________________

____________________________________________________

____________________________________________________

____________________________________________________

____________________________________________________

____________________________________________________

____________________________________________________

Suggested Courses:

____________________________________________________

____________________________________________________

____________________________________________________

____________________________________________________

____________________________________________________

Signature of Committee Members:

____________________________________________________

____________________________________________________
Date: ____________________________

Student: ____________________________________________

Advisor: ______________________________________________

Year in Program: ____________________________ (year begins fall semester)

Financial Support (Type & No. of months this year): ____________________________

Present Committee Members: ________________________________________________

______________________________________________

______________________________________________

______________________________________________

(Screening, Guidance or Dissertation Committee?): ____________________________

Date of Last Full Committee Meeting: ____________________________

Anticipated (or Completion) Dates for:
  Screening Exam: ____________________________
  Formation of Ph.D. Guidance Committee: ____________________________
  Qualifying Exam: ____________________________
  First Meeting of Dissertation Committee: ____________________________
  Completion of Research: ____________________________
  Dissertation Defense: ____________________________

Please attach a brief summary of your progress during the past year
(some guidelines listed below; but feel free to add items)
  • BRIEF summary of research progress, problems, future plans.
  • List of all courses completed or audited.
  • TA duties.
  • Participation in lab and field research.
  • Meetings/workshops attended.
  • Seminars given (USC and elsewhere) include titles, locations, etc.
  • Manuscripts submitted, in press or published.

Signature of Student: ________________________________________________
APPENDIX 1. MEB Relevant Courses

BISC Courses offered on the UPC

- 403 Advanced Molecular Biology (4 units)
- 419 Environmental Microbiology (4 units)
- 435 Advanced Biochemistry (4 units)
- 450 Principles of Immunology (4 units)
- 460 Seminar in Marine and Environmental Biology (2 units)
- 469L Marine Biology (4 units)
- 483 Geobiology and Astrobiology (4 units)
- 502ab Molecular Genetics and Biochemistry (4, 4 units)
- 510 Integrative and Evolutionary Biology (4 units)
- 530 Advanced Seminar in Plankton Biology (2 units) (Caron & Michaels)
- 531 Advanced Seminar in Physiology of Marine Organisms (2 units) (Gracey)
- 532 Advanced Seminar in Molecular and Microbial Ecology (2 units) (Fuhrman)
- 533 Advanced Seminar in Remote Sensing (2 units) (Kiefer)
- 534 Advanced Seminar in Population Genetics (2 units) (Edmands & Hedgecock)
- 536 Advanced Seminar in Marine Biogeochemistry & Microbial Ecology (2 units) (Capone & Ziebis)
- 582 Advanced Biological Oceanography (4 units)
- [583 Biochemistry and Physiology of Marine Organisms (4 units)]
- 584 MEB Faculty Lecture Series (2 units) - Spring
- 585 Scientific Writing (2 units) (Michaels & Caron) - spring

Related Advanced Courses in Other Departments that can be used to meet course requirements

- GEOL 412 Oceans, Climate and Environment (4 units)
- GEOL 460L Geochemistry and Hydrogeology (4 units)
- GEOL 500 Paleoeocology (3 units)
- GEOL 501 Paleobiology (3 units)
- GEOL 512 Introduction to Physical and Chemical Oceanography (3 units)
- GEOL 514 Marine Geology (3 units)
- GEOL 555 Paleo-oceanography (3 units)
- GEOL 560 Marine Geochemistry (3 units)
- GEOL 564 Isotope Geochemistry (3 units)
- GEOL 567 Stable Isotope Geochemistry (3 units)
- GEOL 577 Micropaleontology (3 units)
GEOG 587 GPS/GIS Field Techniques (Catalina Island Summer Source) (4 units)

PPD 694 Coastal Policy and Planning (4 units)

ENG 443 Environmental Chemistry (3 units)
ENG 463L Water Chemistry and Analysis (3 units)
ENG 503 Microbiology in Environmental Engineering (3 units)
ENG 513L Instrumental Analysis (3 units)
CTSE 507 Issues, History & Rationale of Science Education (McComas)
CTSE 509 Advanced Science Teaching Methods (McComas)

Statistics Courses

BISC 499 : Statistics for the Biological Sciences (Waterman and Tavare- Fall 05)

PSYC 501 Statistics in Psychological Research (4, Fa) Principles of descriptive and inferential statistics for psychological research; introduction to analysis of variance and regression. Computer methods. Prerequisite: PSYC 274. (Wilcox)

PSYC 502 Analysis of Variance and Experimental Design (4, Sp) Experimental designs and their analyses of variance beyond straightforward factorial, nested, or repeated measures designs. Prerequisite: PSYC 501.

PSYC 503L Regression and the General Linear Model (4, Fa) Multiple regression as a tool in experimental and non-experimental data; analysis of variance and covariance as regression on coded variables. Computer applications Laboratory exercises. Prerequisite: PSYC 501.

HP 340L Health Behavior Statistical Methods (4, FaSp) Intermediate statistics for health behavior studies; topics include descriptive statistics, hypothesis testing, correlation and regression, and use of computer software in data analysis.

HP 510L Principles of Biostatistics (4) Concepts of biostatistics; appropriate uses and common misuses of health statistics; practice in the application of statistical procedures; introduction to statistical software including EXCEL, SPSS, nQuery. Laboratory.

HP 511abL Data Analysis (4-4, a: Fa, b: Sp) a: Major parametric and nonparametric statistical tools used in biomedical research, computer packages including SAS. Includes laboratory. Lecture, 3 hours; laboratory, 1 hour. Prerequisite: PM 510L. b: Exploratory data analysis, detection of outliers, robust methods, fitting data with linear and nonlinear regression models, computer packages including BMDP. Includes laboratory. Lecture, 3 hours; laboratory, 1 hour. Prerequisite: PM 511aL.
Catalina Semester Courses:

419L Environmental Microbiology (4, F)
499L Molecular Approaches to Microbial Diversity (4, F)
474L Ecosystem Function and Earth Systems (4, F)

447L Natural History and Island Ecology (4, Sp)
373L Conservation Biology (4, Sp)
437L Comparative Physiology of Marine Animals (4, Sp)

490 Independent Research (4, F, Sp)
590 Independent Research (4, F, Sp)
The Graduate Program in Marine Environmental Biology & its Administration

Introduction

Graduate students in the Graduate Program in Marine Environmental (referred to subsequently as "GPMEB" or the "Program") may pursue a Ph.D. degree.

At the University of Southern California, graduate education is the responsibility of the Department, but the University's Graduate School establishes minimum requirements concerning grade point average, number and distribution of units, residency, time limits, etc. that are common to all advanced degrees offered within the College of Letters, Arts and Sciences at the University. Specific courses, examinations, skills, and research requirements are established by the student's program of study, in this case the Graduate Program in Marine Environmental Biology. Collectively, both sets of regulations constitute the student's "degree requirements," all of which must be met by the student.

Graduate School regulations are listed in the current University of Southern California Catalogue somewhat confusingly, one part of these are scattered in the section on "Academic Policies and Information" near the beginning of the USC Catalogue and the rest are found near the middle of the USC Catalogue under "The Graduate School." Those regulations, which most commonly affect GPMEB students, are included in this document, but this listing should not be considered definitive.

GPMEB regulations are listed in this document; the major requirements of degrees in the GPMEB are also listed in the USC Catalogue under "Department of Biological Sciences."

Program Administration--The Graduate School

The Graduate School maintains the University's official Permanent Graduate Student File and is ultimately responsible for admission of our graduate students and the awarding of their degrees. As noted above the Graduate School establishes requirements concerning grade point average, number and distribution of units, residency, and time limits that are common to advanced degree programs in all units under their jurisdiction, including the Department of Biological Sciences.

Official forms are used to track a student's progress by The Graduate School and completion and submittal of these usually is to be at a specified point in the student's tenure. Timetables for the completion of degree requirements are available at The Graduate School. The schedule for the Ph.D. student's final and penultimate semesters are especially detailed and need to be adhered to closely.

All Graduate School forms prepared by or on behalf of the student must be approved by the Director of the Program and by the Chair of the Department before their submittal to the Graduate School. All Graduate School forms are available from the Graduate Student Coordinator, Linda Bazilian.

Graduate Student Representatives

In late spring, GPMEB students select two graduate students to serve as Graduate Student Representative and Alternate Graduate Student Representative for the coming academic year. To be eligible for the posts, both students must have passed their Qualifying Examination. The Alternate will represent the graduate students in the Graduate Student Representative's absence or by the latter's appointment. The Graduate Student Representative has one vote in meetings of the GPMEB Faculty representing the opinions of the graduate students.

The Graduate Student Representative has no voting power in either the continuation of fellow graduate students or in the Qualifying Examination. At the option of the student examined, the Graduate Student Representative may also be present during the oral part of the Qualifying Examination.

Graduate Student Coordinator of GPMEB

The Graduate Student Coordinator of GPMEB is the staff member responsible for processing and maintaining
graduate student files; serving as liaison between the students, GPMEB Faculty, and the Graduate School; and making available application materials, Graduate School Forms, and other relevant documents. A permanent Department file on each student is maintained in the Marine Environmental Biology Program Office.

**Student Advisement and Guidance**

**The First Year Advisor; Initial Advisement and Evaluation by Student's Advisor**

Most students have a first-year advisor who is identified in the acceptance letter. This initial advisor may be replaced by another faculty member with whom the student has closer research affiliations at the request of the student and with the approval of the new advisor. If an incoming student has not chosen an advisor, this should be a priority during the first semester.

The Program provides an initial orientation for all incoming students. During registration week of a graduate student's first semester, the student's initial advisor meets with the student to review his/her previous course work and experiences and to discuss career objectives. A primary purpose of this initial interview is to identify major deficiencies in a student's preparation and to suggest means of remedying any such deficiencies.

**Screening Committee**

A Screening Committee is created each year and consists of the members of the admissions committee plus the student's advisor. This committee will meet with incoming students as soon as possible to evaluate the student’s background and make recommendations for developing a solid base in marine biology. They will administer the Screening Examination, which is given near the end of the student's second semester of graduate work at USC. The Screening Committee will also be responsible for the student's advisement and guidance from the time of its appointment until the five-member Ph.D. Guidance Committee is established. Each student's performance will be reported in writing on the GPMEB's Report of the Screening Committee.

**Requirements for the Ph.D. Degree**

**Time Schedule**

All course requirements for the Ph.D. degree are normally completed within three calendar years from the date on which the student took his/her first course at USC and must be completed within eight calendar years from that time.

**General Requirements**

A total of 60 units must be completed for the Ph.D. Degree.

**Course Requirements--Core courses**

Two core courses are currently required: BISC 582 and BISC 584. These courses should be taken during the student’s first year at USC. Students are also required to take 4 units of BISC 529 (MEB Seminar).

Students must receive a grade of B or better in each core class and maintain a cumulative 3.0 Grade Point Average in all coursework.

**Official Guidance Committees**

A five-person Ph.D. Guidance Committee should be established soon after the screening exam, but no later than the fourth semester of enrollment for a student seeking a Ph.D. degree. After the student passes the Qualifying Examination, the Ph.D. Guidance Committee is called the Dissertation Committee.

**The Student and His/Her Responsibilities**

The student is ultimately responsible for his/her graduate career and must be familiar with Graduate School and GPMEB requirements and responsible for their timely completion.

If a student's needs are not being met, he/she should seek redress, using the following chain of command:
advisor, advisory committee (screening, guidance, dissertation), Director of the Program, Department Chair, and Graduate School.

In addition to all other rules, the University has established codes of conduct to which all students must adhere. One aspect of graduate training -- service as a teaching assistant -- places them in a position of power over undergraduate students. The position implies added responsibilities and liabilities, especially in respect to such matters as fairness, equal treatment, sexual harassment, etc. Information on University policies concerning conduct is available in SCampus. Further information or sources of information may be obtained from the Department office.

**Formal Graduate Seminars**

Students must complete a minimum of four (4) 2-unit graduate seminars. Because a critical feature of such seminars is exposure to current literature, all four required seminars must be completed during the student's tenure at USC. With the written permission of the student's committee, a formal course completed at another institution may be counted as one of the four required seminars (the course must have been completed during the student's tenure here, however).

**Research Tool Requirement**

Proficiency in statistics is a necessary skill for all scientists. Satisfactory skill level may be demonstrated by

a) completion (grade of B or better) of a course approved by majority vote of the Marine Environmental Biology Program faculty.

b) acceptance of course work previously completed either at USC or elsewhere. The acceptability of a previously completed course will be made by an examiner selected by the Marine Environmental Biology Program faculty.

A rigorous grad level course in Biostatistics is available at the Medical School in the Department of Preventive Medicine. Course number is PM 510L. Permission is needed from the PM Department. A free shuttle bus runs routinely between the University Park and Med School Campuses. Other BioStat options are listed in the appendix.

**Research Units**

BISC 790 Research units are normally taken whenever the student is conducting his/her doctoral research. Dissertation research will normally take the equivalent of about 2.5-3 years of full time work, but the number of research units taken usually does not reflect this. Typically advanced graduate students will take 6 units of 790 and possibly a 2-unit seminar each semester.

**Grade Point Average Requirements**

Students must maintain a grade point average of at least 3.0 in all courses taken at USC, in conformity with regulations of the Graduate School; work graded C- or below is not acceptable for either subject or unit credit. In addition to the overall GPA requirement, students must achieve at least a B- in each core and skill course.

If a student's cumulative grade point average falls below 3.0 at any time, the student will be placed on departmental academic probation. The cumulative average must be raised to 3.0 by the completion of the next two semesters of registration at USC in courses approved by the student's guidance committee. Note: this may require that the student take additional formal and/or seminar courses since directed research and dissertation units are on a Pass/No Pass basis and are not computed into the GPA. If the student does not improve his/her overall GPA to 3.0 within this period, the student will be dropped from the program. A student who has been removed from probation but subsequently fails to meet the scholarship requirement is subject to termination (will be terminated) from the program.

**Marine Program Noon Seminar Series**

Students must regularly attend the Marine Environmental Biology Noon Seminar series throughout their
tenure at USC. In addition to attending other seminars, each student presents a 30-minute seminar on his/her current research once each academic year, beginning in their second year. Attending faculty will provide short written evaluations of the seminar to help students in improve their public speaking skills. (See “Forms” section).

BISC 794 Doctoral Dissertation

After a student successfully completes the Qualifying Examination and is therefore a formal candidate for the Ph.D., he/she must register for BISC 794 Doctoral Dissertation each semester except summer. The student would sequentially register for BISC 794a, 794b, 794c, 794d in the first four semesters after completing the Qualifying Examination, and then BISC 794e each subsequent semester as needed. Students must have at least 4 units of 794 credit, but can receive no more than 8; hence BISC 794a-794d are valued at 2 units and BISC 794e at 0 units.

Other Course and Unit Requirements

Additional formal course requirements may be established by the Section and/or by the student's guidance committee and/or on advice of the committee, which evaluates the student's preparation in the Screening Examination.

The minimum number of units required for the Ph.D. by the Graduate School is 60. Units must include 4, but no more than 8, units of BISC 794 credit and may be completed with other formal classes or BISC 790 work.

The student must be registered at USC during the semester that the dissertation is submitted.

Teaching Assistantship Requirement

Graduate students pursuing the Ph.D. in the GPMEB must serve as a teaching assistant for at least two semesters; ideally, the student should serve in at least two different courses.

Screening Examination

The Graduate School requires a Screening Examination. The exam is oral, about one hour in length, and must be taken before the student has completed 24 units of graduate work at USC. The Screening Committee administers the exam. The purpose of the meeting will be to evaluate the student's preparation, determine competence to continue graduate study, and point out deficiencies to be remedied prior to the Qualifying Examination. Prior to the exam, the student submits a 1-2 page document outlining his/her activities during the previous year and present research interests. At the exam, the student presents a short (5-10 minute) description of their academic background and research interests.

The topics covered in the Screening Examination include:
- a summary by the student of their research while at USC
- biotic diversity, classification, and life histories
- organismal evolution and phylogeny; molecular evolution
- structure and physiology of cells and organisms
- biochemistry
- Mendelian, population, and molecular genetics
- biological, chemical, and physical oceanography
- statistics, experimental design, modeling and theoretical biology
- ecology and environmental sciences.

Each student's performance will be reported in writing to the student. A copy is placed in the student's file.

Guidance Committee

Composition of the Guidance Committee

The student's program of studies is under the direction of a five-member guidance committee that must be established at least two semesters before the student takes his/her Qualifying Examination. Therefore, the student should request appointment of the committee as soon as possible after the screening exam but certainly before the
end of his/her third or fourth semester of enrollment in the Ph.D. program.

The composition of the guidance committee must meet the following guidelines:

a) One member of the committee must be from a department at USC other than Biological Sciences. This "outside member" serves as the representative of the Dean of Graduate School.

b) Normally, the other four members of the committee are tenure-track faculty of the Marine Environmental Program in the Department of Biological Sciences, but one of the members may be from another Program in Biological Sciences, and at least one must be tenured. The chair of the committee is called the student's advisor and must be from the Marine Environmental Program. Co-Chairs are normally not permitted unless required by the Graduate School (see next paragraph).

In exceptional cases of academic merit, a person not meeting the above guidelines may be approved by the Graduate School to serve on a Ph.D. committee. To request such an exception, the student must submit to the Graduate School a current Curriculum vitae of the proposed member and a letter from the chair of the committee citing the particular expertise of the person and the relevance of the requested appointment. A specially approved member may not serve as the outside member (see below) or as sole chair of the committee, but may serve as a co-chair with a regular faculty member of the Marine Environmental program. A guidance committee may include no more than one specially approved member unless the size of the committee is enlarged past five.

Request for changes in the composition of the Guidance Committee must be made in writing by the student to the Program. If approved, the committee is officially changed using the Graduate School's Request for Change of Committee form.

If the chair of the Guidance Committee will be absent from campus for any extended period of time (e.g., on leave) (s)he must appoint a temporary chair. The permanent chair will continue as a member of the Committee during his/her absence and will be in communication with the Guidance Committee. If the permanent chair must be absent at the time of the Qualifying Examination or the defense of the dissertation, a petition for formal appointment of a temporary chair must be submitted to the Graduate School.

Responsibilities of the Guidance Committee

The Guidance Committee (as such or as the Dissertation Committee that it becomes) is responsible for the guidance and evaluation of the student during his/her graduate tenure. Specific responsibilities include:

a. Administration and evaluation of the Qualifying Examination.

b. Approval of the student's research and academic programs.

c. Monitoring the student's temporal progress in meeting degree deadlines.

d. Evaluation of the dissertation in the Oral Defense

To meet these responsibilities, the Committee may require the student to make periodic written reports and should meet at least once per year with the student (one appropriate time for an annual meeting is shortly after the student's presentation at the Marine Noon Seminar series). More frequent meetings are usually necessary as the student approaches completion of his/her degree work. The student or any member of the committee may request a meeting. Normally the student is responsible for arranging a specific date, time and place for meetings. The Chair should write minutes of all committee meetings and submit one copy each to the student, the members of the committee, and the Marine Program office for inclusion in the student's permanent file.

Qualifying Examination

Prerequisites for the Qualifying Examination

During the semester the exam is taken, the student must be enrolled in a departmental graduate course or GRSC 800. The GPMEB requires that students have completed:

a) All required core courses, each with a minimum grade of B-.

b) At least two graduate seminars.

c) The statistics research tool requirement.

e) Removal of inadequacies noted in the screening examination.

f) Completion of the Request to Take Qualifying Examination form.
Depending on how the above requirements were met, the student may have to take additional course work to satisfy the Graduate School requirements that students have completed at least 24 units of course work applicable to the degree while in residence and with a minimum cumulative GPA of 3.0.

**Timing of the Qualifying Examination**

The Qualifying Examination is normally taken during the student's fifth semester in the Ph.D. Program and must be taken before completion of his/her sixth semester.

**Components of the Qualifying Examination**

The Qualifying Examination consists of a written and an oral part. The student's Guidance Committee conducts and evaluates both parts.

**The Written Examination**

The written examination will consist of four or five sets of questions distributed over two consecutive days. This examination can be taken on a laptop computer supplied by the committee chair (i.e., the student cannot use their own computer). Each Guidance Committee member (with the possible exception of the "outside member" whose participation is optional here) submits three questions; the student must answer two of this set, spending about equal time on each and having a maximum of two hours per set. The order in which the sets of questions are taken is at the student's option.

Questions will be comprehensive in scope with respect to the student's chosen area of specialization and will be designed to test the student's conceptual, analytical and integrative ability and preparation.

Each member of the Examination Committee will grade his/her question on a scale of 1.0-5.0 using 0.5 unit steps if necessary (1.0 as poor and 5.0 as exceptional). The examination result will be calculated by averaging all the grades. A mean score of 3.3 or above for all questions is passing; below 3.0 is failing. Cases where the mean is between 3.0 and 3.3 or where two or more questions are graded below 3.0 are evaluated by the Guidance Committee followed by a vote, using a secret ballot. More than one negative vote of the Guidance Committee will result in failure of the student to pass the written examination.

The written part of the Qualifying Examination must be taken before (normally 2 weeks before) the oral examination described below. The results of the written examination and the oral examination are given only at the completion of the oral examination.

**The Research Proposition (The Fifteen Pager) and its Preliminary Approval**

**Proposition Abstract**

At least two months before the anticipated date of the oral examination, the student should meet with his/her Guidance Committee and provide them with a 1- or 2-page Research Abstract of the anticipated research program to be presented in the Research Proposition. The purpose of this meeting is to ascertain whether the anticipated research constitutes a defensible dissertation topic so that the student does not develop a detailed plan for a research program that has serious flaws and probably cannot be successfully defended in the oral examination. If the committee has reservations, modifications that are mutually satisfactory to the student and the committee can be worked out during this meeting or the student can be asked to submit a revised or new abstract.

Upon approval of the Proposition Abstract by the Guidance Committee, the student will develop it into a formal Written Proposition. This is to be in the form of a grant proposal and should include a short historical introduction, a statement of the problem and its significance, one or more hypotheses (if appropriate), the research design, anticipated results, methods to be used in interpretation of the results, and pertinent references. The treatment should be concise and should not exceed 15 double-spaced pages.

**The Oral Examination**

The oral examination will be in the area of the student's intended research and will be based on a research project selected and developed by the student into a Research Proposition.

The oral examination is usually taken two weeks after and must be taken within one month of the written
At least two weeks before the date of the oral examination, the student must submit one copy of the Research Proposition to each member of the Examination Committee and one copy to the Marine Program's Student Affairs Administrator for the student's permanent file.

The oral examination will be conducted and evaluated by the student's full 5-member Guidance Committee. Typically, the Committee meets briefly without the student to review the student's course work, other preparation and progress; to review the student's performance on the screening examination (copies of the student's transcript and Screening examination report should be obtained for each committee member from the Graduate Student Administrator by the Chair); and to agree on the exact format and order of questioning during the oral examination. Subsequently, the student typically presents the highlights of the research proposition in 15 minutes or less. Then members of the committee ask two or more rounds of questions. The questions are largely focused on the student's ability to conceive, conduct, evaluate of independent research and to communicate the results of such work. However, the oral examination is not limited to the context of the Written Proposition; as specific examples, questions are often asked a) from the written examination and b) concerning the removal of deficiencies identified during the Screening Examination.

On completion of the examination, the Guidance Committee meets in executive session (without the student) to evaluate the student's performance on the oral examination. Each member has one vote, pass or fail. More than one negative vote will result in failure of the student to pass the examination.

At the end of the executive session, the student is notified of the results on the two portions of the Qualifying Examination. Although one could pass both the oral and written, only one of these exams, or neither, the student passes the Qualifying Examination (as a whole) only if his/her performances on both the written and oral portions are satisfactory. If the student passes both the oral and written examinations, he/she is indicated to have passed the Qualifying Examination on the Graduate School form Report on Ph.D. Qualifying Examination.

If the student fails the written examination or the oral examination or both, the committee must indicate that the student failed the Qualifying Examination on the Graduate School form Report on Ph.D. Qualifying Examination. The committee must make recommendations concerning the student's continuation in the graduate program. The committee usually grants the student a second chance to pass the failed portions (either part satisfactorily completed in the first examination does not have to be retaken), but may recommend that the student not repeat the exam or even deny a second chance (the latter action would be appealed to the Graduate School). The second attempt is a final one and can be taken no sooner than six months or later than twelve months after the initial failure.

Admission to Candidacy

After the student passes the Qualifying Examination, the Guidance Committee recommends to the Graduate School that the student be admitted to candidacy for the Ph.D. Degree. Following admission to candidacy the student must register for BISC 794 Dissertation every semester, except summers, until the degree is awarded.

After the Qualifying Examination has been passed, the full Guidance Committee will be known as the Dissertation Committee. The GPMEB does not allow the reduction of the Guidance Committee to a three-member Dissertation Committee as permitted by the Graduate School except under special circumstances. (If these circumstances are met, at least 2 members must be from the GPMEB). Participation of all members of the Guidance Committee in the Dissertation Committee is indicated on the bottom of the form, Report on Ph.D. Qualifying Examination.

Research

A student must undertake original investigation of a selected problem in marine biology or biological oceanography. This is normally based on the Written Proposition as presented in the Qualifying Examination, subject to acceptance by the student's committee. Subsequent changes of research direction or content must have advance approval by the student's advisor and Dissertation Committee.

Research Prior to Admission to Candidacy

Although the Graduate School regulations indicate that students cannot pursue research prior to their admission to candidacy, students in the GPMEB are encouraged to conduct research at their earliest opportunity.
Ideally, this early research will develop into an appropriate dissertation topic. Certainly, the student will find it difficult to develop and defend a Research Proposition without significant exposure to research in general and the specific problem in particular. Such preliminary research should be based on a detailed plan prepared by the student and approved by his/her advisor.

**Research Subsequent to Admission to Candidacy and its Relationship to the Written Proposition**

As noted above, dissertation research is normally based on the Written Proposition as presented in the Qualifying Examination, subject to its acceptance by the student's committee. Difficulties frequently force revision of the planned study. The student's Dissertation Committee must approve in advance any such changes of research direction or content.

**Publication Prior to Submittal of the Dissertation**

Prompt publication of research results is very strongly encouraged in the GPMEB. Students should organize their research efforts into blocks that a) can be completed in sequence, and b) represent topics for separate future papers so that submittal of one or more papers can be completed during their graduate tenure. Advisors often require students to submit one or more papers before completing their dissertation.

Authorship of such papers is significant. If the student is the sole author or if the student is the first author with the advisor as the only additional author, it implies that the student did most if not all of the research and hence the entire contents of the paper may be acceptable for incorporation into the dissertation. If the advisor contributed significantly to the research or if other individuals (other graduate students, faculty, post docs, research technicians, etc.) are co-authors, only that part of the paper which represents the student's work may be incorporated into the student's dissertation.

A published work may be incorporated into the body of the dissertation but may not be appended in the form of a reprint according to Graduate School regulations. The student is advised to seek the approval of the dissertation committee before submittal of a manuscript that is to be included in the dissertation since that committee must ultimately approve all contents of the dissertation. The fact that material has been submitted (accepted, published) does not mean that it will be allowed to be incorporated without revision by the committee.

**Preparation and Defense of the Dissertation**

A dissertation represents a significant contribution to science that is based on an original research program completed by the student. Determination of the adequacy of the research program is the sole responsibility of the student's Dissertation Committee. Approval of the dissertation itself is primarily the responsibility of the student's Dissertation Committee, but the completed dissertation must also be examined by the Thesis Editor of the Graduate School to determine if it meets the grammatical standards and other requirements described in *Regulations for Format and Presentation of Theses and Dissertations* published by the University of Southern California and available at the University Bookstore. Additional regulations and information on the organization and preparation of the dissertation are provided in *Directions for Preparation of Dissertations and Research Reports as Required by the Graduate Program in Biology/University of Southern California*. Students should obtain a copy of both sets of regulations before they initiate their writing.

GPMEB students defend an advanced draft of the dissertation rather than a "final" copy typed on dissertation paper. The advanced draft should be complete, including all text, figures, tables, references, etc. and the draft must be in a suitable form for final typing. Before assembly of a complete draft is initiated, the student should confer with his/her full committee to determine whether adequate research has been completed.

The student's advisor is the individual responsible for determining whether or not a draft is sufficiently refined for distribution to the full Dissertation Committee. Portions or all of earlier drafts may be submitted to some or all of the committee members for suggestions and evaluation at any time. The thesis draft to be defended must be given to the Dissertation Committee at least one month prior to the thesis defense date.

Presentation and oral defenses of the dissertation are achieved in a formal seminar open to all members of the academic community and in a closed meeting of the student and the Dissertation Committee.
Since the final typed copy of the dissertation must be presented to the Office of University Publications at least three weeks prior to the end of the term in which the degree is to be granted and since the student must allow adequate time after the defense for corrections and final typing, the defense should be scheduled at least six weeks before the end of the term in which the student plans to graduate.

Before undertaking the Dissertation Defense, the student must have completed (or be in progress of completing) all other degree requirements.

The Chair of the Dissertation Committee is required to notify the Student Affairs Administrator of the Marine Program of the date, time, and place of the defense of the dissertation, so that a notice of the Dissertation Seminar and Defense may be distributed to all faculty and graduate students of the Department at least two weeks in advance. The date selected for this defense cannot be on an official University holiday (e.g., Labor Day, President's Day, etc.).

The open oral defense of the dissertation is achieved in a formal 50-minute "research" seminar such as would be given by a visiting scholar. The presentation is open to the public and the student should be prepared to answer all questions from members of the audience, including those on the Dissertation Committee. The period of questioning is not to be limited in time.

The dissertation is also subject to a detailed defense made before the full Dissertation Committee in a meeting that is usually held shortly after the conclusions of the seminar. At this meeting, which is typically two-three hours in length, the Dissertation Committee must critically evaluate the dissertation and determine whether or not it is to be accepted. To be acceptable, the dissertation must represent a major, original contribution to science.

Only members of the Dissertation Committee may vote whether to pass or fail the student (accept or reject the dissertation and its open defense in the seminar). A vote to pass the student must be unanimous and such a vote does not preclude that the committee may require modifications of the dissertation. Reasons for failure of the defense should be clearly identified by the committee and may include a) a flawed research plan, b) nonconclusive or inadequate research results, c) major deficiencies in the dissertation, etc. A student who fails the defense the first time is normally given a second opportunity, but any decision on re-examination is at the discretion of the Dissertation Committee.

If the defense is satisfactory and no major revisions of the dissertation are required, all members of the Dissertation Committee sign the APPROVAL of DISSERTATION for FINAL TYPING (green card), which is submitted to the Graduate School. If significant revisions of the manuscript are required, the card is not signed until such revisions are completed. The Chair of the Dissertation Committee may be assigned full responsibility for determining that the required revisions have been made, but some or all other members of the committee may request that they also be involved in the final approval.

If the green card for final typing is signed and dated by the drop/add deadline for FALL or SPRING, no further registration is required.

The student also needs to prepare an abstract of the dissertation for publication in "Dissertation Abstracts, International." The DOCTORAL DISSERTATION ABSTRACT SUBMITTAL form, signed by the Dissertation Committee chair, must be attached to the abstract and submitted to the Thesis Editor of the Graduate School.

The SIGNATURE PAGE is bound with the dissertation to verify that the dissertation has been approved by the Committee and accepted by the Graduate School. Signatures required on this form are those of the Committee and the Graduate School.

In addition to the original copy required by the Graduate School, one hardbound copy of the dissertation must be presented to the Department of Biological Sciences and another to the chair of the student's (Guidance and) Dissertation Committee.

The TRIPLE CARD REPORT ON DISSERTATION & ORAL EXAMINATION for the Ph.D. DEGREE must be signed by each Committee member, the Chair of the Department of Biological Sciences, the Thesis Editor, and the Graduation Counselor (for Dean of Registration & Records, GFS 315). The signed TRIPLE CARD REPORT signifies approval of the dissertation and defense by the committee, as well as acknowledging completion of all departmental degree requirements and all University degree requirements. Most
important of all, it indicates that the degree has been cleared for conferral. The completed TRIPLE CARD REPORT is submitted to the Graduate School for approval.

The student must pay a Dissertation Fee for the microfilming and binding of the dissertation and publication of the abstract (see Tuition and Fees in the current University "Catalogue"). A copy of the receipt for payment of this fee must be submitted to the Thesis Editor.

The DIPLOMA APPLICATION CARD FOR GRADUATE STUDENTS notifies Registration and Records of how the student would like his/her name to appear on the diploma. This card must be completed and submitted to the Graduate School.

The SURVEY OF EARNED DOCTORATES must be completed and returned to the Graduate School for approval.

After approval by the Graduate School, the completed TRIPLE CARD is taken to the Degree Progress Department (SAS 010). Once this Department has signed the card, you have officially graduated!
<table>
<thead>
<tr>
<th>COURSES AVAILABLE IN MARINE ENVIRONMENTAL BIOLOGY</th>
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<tbody>
<tr>
<td>BISC 582 Biological Oceanography (Core Course) - each Fall (Fuhrman &amp; Capone) (4 units)</td>
</tr>
<tr>
<td>BISC 584 Faculty Lecture Series - each Spring (all MEB Faculty) (2 units)</td>
</tr>
<tr>
<td>BISC 585 Scientific Writing and Reviewing - each Spring (Caron &amp; Michaels) (2 units)</td>
</tr>
<tr>
<td>BISC 529 Marine Environmental Biology Seminar (1 unit; 4 units required, maximum)</td>
</tr>
<tr>
<td>Advanced Seminars (Offered on a rotating basis; check current Schedule of Classes) (2 units; 8 units required)</td>
</tr>
<tr>
<td>530 Advanced Seminar in Plankton Biology (2 units) (Caron &amp; Michaels) Fall 04</td>
</tr>
<tr>
<td>531 Advanced Seminar in Physiology of Marine Organisms (2 units) (Gracey) Fall 05</td>
</tr>
<tr>
<td>532 Advanced Seminar in Molecular and Microbial Ecology (2 units) (Fuhrman) Spr 04</td>
</tr>
<tr>
<td>533 Advanced Seminar in Remote Sensing (2 units) (Kiefer) Spr 06</td>
</tr>
<tr>
<td>534 Advanced Seminar in Population Genetics (2 units) (Edmands &amp; Hedgecock) Fall 03 Fall 07</td>
</tr>
<tr>
<td>or Seminar in Quantitative Traits (2 Units) (Hedgecock) Spr 04</td>
</tr>
<tr>
<td>536 Advanced Seminar in Marine Biogeochemistry &amp; Microbial Ecology (2 units) (Capone &amp; Ziebris) Spr 04</td>
</tr>
</tbody>
</table>
‘Quick Check List’ of Student/Advisor Responsibilities

First Month (Late Summer/Early Fall; ASAP, before classes get going)

Each student meets with the "Screening Committee" (same composition as the Admissions Committee for that year, plus the student’s advisor). This committee will be the same one that administers the Screening Exam at the end of Year 1. The Screening Committee evaluates each student’s background and advises on courses to be taken in the first 1/2 years to develop each student’s background in marine science (and specific area of interest).

By the End of Year 1 (Summer)

Student completes the Screening Exam, which tests the student’s general scientific knowledge, and identifies weaknesses that need to be addressed. The student will receive written comments from the committee on the “Screening Examination Results” form.

Beginning of Year 2 (Fall)

Student and advisor compose and request appointment of a Ph.D. Guidance Committee, which meets with the student near the beginning of the second year. Prior to the meeting, the student submits a (at least) 1-2 page document outlining his/her proposed research. Following a brief presentation by the student, the committee provides feedback, which includes a second review of the student’s coursework and training, and any appropriate recommendations for further coursework or directed study.

Year 3

The student must complete the Qualifying Examination (as described in “Requirements and Policies” document) by the end of Year 3. At least one month prior to the exam, the student completes the “Request to Take Qualifying Examination” form (located in folder). At least two months prior to the exam, the student must submit a thesis proposal (the fifteen-pager) to the Guidance Committee and obtain permission to proceed to the exam. The Chair of the Guidance Committee should obtain the student’s file for the Qualifying Examination. A “Results of Qualifying Examination” form will be in the file for all committee members to sign. All committee members will continue as the student’s Dissertation Committee.

Years 3-5

Following successful completion of the Qualifying Examination, the Ph.D. Guidance Committee becomes the Dissertation Committee. The student meets at least annually with the committee. A short memo describing the students’ progress (signed by all committee members) is submitted to the Section office following each annual meeting.

Additional Annual Requirements:

Yearly Seminar: Each student must present a 30-minute seminar once each academic year beginning in their second year.

Yearly Progress Reports: On or by September 1, each student will complete and submit to the Section office a brief progress report (signed by each member of their Guidance or Dissertation Committee) detailing their activities during the previous 12 months (courses taken, research undertaken, seminars given at USC and elsewhere, participation in cruises, etc.). Forms for these reports will be emailed to students each summer as a reminder.
Screening Examination—Marine Biology

Student’s Name:______________________________________

ID#:_________________________________________________

Date of Screening Examination:_________________________

Pass_________________ No Pass______________________

(See below)

Comments:

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________

Suggested Courses:

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________

Signatures of Committee Members:

_________________________________________________________________

_________________________________________________________________
Date: ______________________

Student: ______________________________________________________

Advisor: ______________________________________________________

Year in Program: __________________ (year begins fall semester)

Financial Support (Type & No. of months this year): ________________

Present Committee Members:

______________________________________________________________

______________________________________________________________

______________________________________________________________

(Screening, Guidance or Dissertation Committee?): ________________

Date of Last Full Committee Meeting: _____________________________

Anticipated (or Completion) Dates for:

Screening Exam: __________________________

Formation of Ph.D. Guidance Committee: _________________________

Qualifying Exam: __________________________

First Meeting of Dissertation Committee: ________________

Completion of Research: __________________________

Dissertation Defense: __________________________

Please attach a brief summary of your progress during the past year
(some guidelines listed below; but feel free to add items)

• BRIEF summary of research progress, problems, future plans.
• List of all courses completed or audited.
• TA duties.
• Participation in lab and field research.
• Meetings/workshops attended.
• Seminars given (USC and elsewhere) include titles, locations, etc.
• Manuscripts submitted, in press or published.

Signature of Student: ___________________________________________
APPENDIX 1. MEB Relevant Courses

BISC Courses offered on the UPC

- 403 Advanced Molecular Biology (4 units)
- 419 Environmental Microbiology (4 units)
- 435 Advanced Biochemistry (4 units)
- 450 Principles of Immunology (4 units)
- 460 Seminar in Marine and Environmental Biology (2 units)
- 469L Marine Biology (4 units)
- 483 Geobiology and Astrobiology (4 units)
- 502ab Molecular Genetics and Biochemistry (4, 4 units)
- 510 Integrative and Evolutionary Biology (4 units)
- 530 Advanced Seminar in Plankton Biology (2 units) (Caron & Michaels)
- 531 Advanced Seminar in Physiology of Marine Organisms (2 units) (Gracey)
- 532 Advanced Seminar in Molecular and Microbial Ecology (2 units) (Fuhrman)
- 533 Advanced Seminar in Remote Sensing (2 units) (Kiefer)
- 534 Advanced Seminar in Population Genetics (2 units) (Edmands & Hedgecock)
- 536 Advanced Seminar in Marine Biogeochemistry & Microbial Ecology (2 units) (Capone & Ziebis)
- 582 Advanced Biological Oceanography (4 units)
- 583 Biochemistry and Physiology of Marine Organisms (4 units)
- 584 MEB Faculty Lecture Series (2 units) - Spring
- 585 Scientific Writing (2 units) (Michaels & Caron) - spring

Related Advanced Courses in Other Departments that can be used to meet course requirements

- GEOL 412 Oceans, Climate and Environment (4 units)
- GEOL 460L Geochemistry and Hydrogeology (4 units)
- GEOL 500 Paleocology (3 units)
- GEOL 501 Paleobiology (3 units)
- GEOL 512 Introduction to Physical and Chemical Oceanography (3 units)
- GEOL 514 Marine Geology (3 units)
- GEOL 555 Paleo-oceanography (3 units)
- GEOL 560 Marine Geochemistry (3 units)
- GEOL 564 Isotope Geochemistry (3 units)
- GEOL 567 Stable Isotope Geochemistry (3 units)
- GEOL 577 Micropaleontology (3 units)

- GEOG 587 GPS/GIS Field Techniques (Catalina Island Summer Source) (4 units)

- PPD 694 Coastal Policy and Planning (4 units)

- ENG 443 Environmental Chemistry (3 units)
- ENG 463L Water Chemistry and Analysis (3 units)
- ENG 503 Microbiology in Environmental Engineering (3 units)
- ENG 513L Instrumental Analysis (3 units)
- CTSE 507 Issues, History & Rationale of Science Education (McComas)
- CTSE 509 Advanced Science Teaching Methods (McComas)
Statistics Courses

BISC 499: Statistics for the Biological Sciences (Waterman and Tavare- Fall 05)

PSYC 501 Statistics in Psychological Research (4, Fa) Principles of descriptive and inferential statistics for psychological research; introduction to analysis of variance and regression. Computer methods. Prerequisite: PSYC 274. (Wilcox)

PSYC 502 Analysis of Variance and Experimental Design (4, Sp) Experimental designs and their analyses of variance beyond straightforward factorial, nested, or repeated measures designs. Prerequisite: PSYC 501.

PSYC 503L Regression and the General Linear Model (4, Fa) Multiple regression as a tool in experimental and non-experimental data; analysis of variance and covariance as regression on coded variables. Computer applications Laboratory exercises. Prerequisite: PSYC 501.

HP 340L Health Behavior Statistical Methods (4, FaSp) Intermediate statistics for health behavior studies; topics include descriptive statistics, hypothesis testing, correlation and regression, and use of computer software in data analysis.

HP 510L Principles of Biostatistics (4) Concepts of biostatistics; appropriate uses and common misuses of health statistics; practice in the application of statistical procedures; introduction to statistical software including EXCEL, SPSS, nQuery. Laboratory.

HP 511abL Data Analysis (4-4, a: Fa, b: Sp) a: Major parametric and nonparametric statistical tools used in biomedical research, computer packages including SAS. Includes laboratory. Lecture, 3 hours; laboratory, 1 hour. Prerequisite: PM 510L. b: Exploratory data analysis, detection of outliers, robust methods, fitting data with linear and nonlinear regression models, computer packages including BMDP. Includes laboratory. Lecture, 3 hours; laboratory, 1 hour. Prerequisite: PM 511aL.

Catalina Semester Courses:

419L Environmental Microbiology (4, F)
499L Molecular Approaches to Microbial Diversity (4, F)
474L Ecosystem Function and Earth Systems (4, F)

447L Natural History and Island Ecology (4, Sp)
373L Conservation Biology (4, Sp)
437L Comparative Physiology of Marine Animals (4, Sp)

490 Independent Research (4, F, Sp)
590 Independent Research (4, F, Sp)
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Appendix B--Graduate School Bulletin
Welcome

Welcome to graduate study in Marine Environmental Biology at USC! You are officially embarking upon your professional career in academics, and we hope your years here are exciting, challenging, and fruitful. The purpose of this brochure is to try and help smooth the way during your first few weeks, as well as to provide some basic information with regard to our program, being a graduate student at USC, and life in LA in general. In addition to this guide, a good source of information is the free booklet entitled SCampus, which you can obtain at Topping Student Center. Of course, it is always a good idea to solicit information and advice from more senior graduate students and from faculty. Senior graduate students can be very helpful for adjusting to the “personal” side of life at USC, while Faculty and the Graduate Programs Manager should be your source of information for “official” aspects of the program and academic life.

Our support staff is also available to help out with procedures for registration and other logistical details. Linda Bazilian, the Graduate Programs Manager for Biological Sciences; is in AHF 107-D, mc 0371, x11088. Linda is highly knowledgeable concerning all aspects of the graduate program.

Once again, welcome to the program!

Dennis Hedgecock
Director, Marine Environmental Biology
### ~Orientation Schedule ~

**Marine Environmental Biology Graduate Program**

**Fall, 2007**

<table>
<thead>
<tr>
<th>DATE</th>
<th>ACTIVITY</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 17</td>
<td>Laboratory Safety Training</td>
<td>ZHS 159</td>
</tr>
<tr>
<td>(Friday)</td>
<td>8:30am-5:00pm</td>
<td></td>
</tr>
<tr>
<td>August 20</td>
<td>Graduate Orientation</td>
<td>Bovard Auditorium</td>
</tr>
<tr>
<td>11:30am – 5:30pm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>August 21</td>
<td>MEB Orientation</td>
<td>AHF Torrey Webb Room</td>
</tr>
<tr>
<td>(Tuesday)</td>
<td>10am - noon</td>
<td></td>
</tr>
<tr>
<td>August 18 - 19</td>
<td>College Teaching Assistant Training</td>
<td>Bing Theater</td>
</tr>
<tr>
<td>(Wednesday-Thursday)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8:30am-5:00pm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>August 24</td>
<td>Biological Sciences Teaching Assistant Meeting</td>
<td>ZHS-159</td>
</tr>
<tr>
<td>(Friday)</td>
<td>9:30am-11:30am</td>
<td></td>
</tr>
<tr>
<td>August 24</td>
<td>Individual Course Teaching Assistant Meetings</td>
<td>To be arranged</td>
</tr>
<tr>
<td>(Friday)</td>
<td>2 – 5pm</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:**

Items in bold require your attendance.

All students who are TA’s must attend the College Teaching Assistant Training sessions or you will not be allowed to teach in the fall semester. Additionally, all TA’s must attend the meetings on Friday, August 24.

Additional meetings to be arranged: Radiation Safety training will be required early in the semester.

If you have questions and/or conflicts with this schedule, please see Linda Bazilian immediately.
**New Student Orientation Checklist**

* Requirement for registration.
** Registration required.

1. **Information for All Students**

   - **Immunization Requirements***
     - Measles *(domestic & international)*
     - Tuberculosis *(international)*

   Immunization requirements must be satisfied prior to registering for classes. For more information on required documentation or on immunization clinics available on campus, go to [www.usc.edu/uphc](http://www.usc.edu/uphc) or visit the Student Health Center (SHC, Phone 213/740-0551, Fax 213/740-9229).

   - **Degree Verification**

     Required if USC has not received final transcripts (undergraduate or graduate) from last institution attended. Go to Degree Progress located at JHH 010, the basement level of the Student Administrative Services Building. Requirement must be fulfilled by end of your 1st year.

   - **Academic Advisement and D-Clearance***

     The faculty mentor(s), will advise all new students on the courses they need to take before each semester of their first year and sign-off on their Academic Advisement form.

     Take signed Academic Advisement form to Linda Bazilian (AHF 107D, 213/821-1088, bazilian@usc.edu) for D-Clearance. For more information about D-Clearance go to the following website: [http://www.usc.edu/dept/GRADSCHL/dclearance_students.html](http://www.usc.edu/dept/GRADSCHL/dclearance_students.html)

   - **Conditional Admission**

     If you received a welcome letter from the Graduate School indicating that you have “conditions on your admission” they must be cleared by the end of the first semester. If you have an ALI hold, you must go to the Registration Building (REG 101, x08500) and register in person.

   - **Registration**

     On-line registration: Go to [http://www.usc.edu/student_life/academics/](http://www.usc.edu/student_life/academics/) and click on “web registration.”

     You will be asked to enter the following information:

     - Students ID: 10-digit ID #
     - PIN: 6-digit Birthdate (mmdddy)

     If you do not know your student ID#, contact Linda Bazilian (AHF 107D, 213/821-1088, bazilian@usc.edu) or Adolfo dela Rosa (AHF 107E, 213/821-3164, adolfode@usc.edu).
☐ USC Student ID card (USCard):

You must complete the following before you are able to obtain your USCard.

- Passport Verification with OIS (International students only)
- Registration for classes (Domestic students only)

Go to USCard Customer Service office located in the Commons Lobby at the University Park campus or in the Seaver’s Lobby at the Health Science campus.

☐ USC Computer Account Creation and Email**

Once you obtain your USCard and register for classes, you need to activate your USC computer account. For instructions, call 213.740.5555 or visit www.usc.edu/firstlogin.

➢ Make sure that you update your email account on OASIS, www.usc.edu/oasis and if you have direct deposit on the e-trac system, www.usc.edu/etrac, as well. Also, please notify Adolfo dela Rosa of your new email address at adolfode@usc.edu.

☐ Update OASIS with local address and USC email information

Go to www.usc.edu/oasis. Your email address and both your local and permanent mailing addresses must be current at ALL times to ensure that you receive important documents such as health benefits card and paychecks. Your first check will be mailed to your “local” address.

☐ College Business Office Documentation Processing (All students EXCEPT Domestic Fellowship Holders)

Go to the College Business Office, PED 130, ONLY during the document processing hours (9:00 a.m. – 10:30 a.m. or 2:30 p.m. – 4:00 p.m.) Arrive no later than 30 minutes before the end of a session to allow time for processing paperwork. Tell front-desk staff your correct title – either - “Research Assistant, Teaching Assistant or Fellowship Holder”. It is important that you use the exact title stated your offer letter.

International fellowship holders MUST complete W-8BEN form. You must have either an original social security card or a"Document Processing Receipt" and a "Social Security Letter Receipt" from OIS

International Teaching and Research Assistants:

Domestic Teaching and Research Assistants Domestic Students (Teaching Assistants and Research Assistants):
Award letter AND driver’s license and original social security card or birth certificate with same name - OR - Active or expired U.S. Passport with adult photograph

☐ Direct Deposit (International Fellowship Students are not eligible)
If interested, pick up form at College Business office front counter (PED130) or complete form available online: http://ais-ss.usc.edu/empldoc/forms/directdeposit_form.pdf

☐ Payment of Fees
Fees to be paid by all students: Topping Student Center Fee, Orientation Fee (first semester only), Graduate Programs Fee and any “access” or “laboratory” fees appearing on fee bill. Do not pay tuition, health insurance, Health Center Fee or tuition insurance fee. If any of these fees appear on your fee bill contact Linda Bazilian to remove (AHF 107D, 213/821-1088, bazilian@usc.edu). Fees can be paid online through OASIS (www.usc.edu) or you can go to the Cashier’s Office (LRC, x 07471)
Laboratory Safety Training

The basic Laboratory Safety Training course is required for all students prior to working in a lab. If you plan to work in a lab with animals or radioactive materials, you will need to take additional safety training courses during the semester. Contact Linda Bazilian for date and time (AHF 107D, 213/821-1088, bazilian@usc.edu).

TA Requirements (All MEB students will TA at least 2 semesters of their academic career)

- College TA Training: Required for all students who will be a teaching assistant for any College courses. Contact Linda Bazilian for date and time (AHF 107D, 213/821-1088, bazilian@usc.edu).

- ITA Institute Oral Exam: All International TA’s (Exception: Students who received bachelor’s degree from an English speaking institution) must take the ITA Institute oral exam given at the end of a weeklong program. Contact Linda Bazilian for date and time (AHF 107D, 213/821-1088, bazilian@usc.edu). ITA Institute website: http://www.usc.edu/programs/cet/programs/ita_training/

2. Additional Requirements for International Students

ISE Exam (International Students ONLY) *

If #6 on your SEVIS I-20 states, "The student does not have the required English proficiency" you are required to take the International Student English Exam. You can register for the ISE Exam at the American Language Institute (HSS building, Phone 213/740-0079, Fax 213/740-8549, website: http://www.usc.edu/dept/LAS/ALI/ISE.html)
Student Health and Insurance

USC pays Teaching Assistants’ and Research Assistants’ fees for student health insurance, use of the student health center, and dental care. All students registered for at least 6 units are automatically enrolled for health and dental insurance.

Student Health Center (213/740-5344)

The Student Health Center provides primary care, basic emergency care, an urgent care clinic, Saturday clinics, specialist clinics, and a pharmacy. You are eligible for the Health Center if you are enrolled in classes.

A Health Center fee is listed on your fee bill. Most care is free; however, there are nominal charges for some lab tests, prescriptions, orthopedic appliances, and copies of medical records. Also, if you are not taking classes (as in summer) you must pay the appropriate fee to use the Center. Hospitalization is NOT covered, but may be purchased separately.
MEB Program Life

Seminars

MEB graduate students are to attend and participate in MEB research seminars, held Tuesdays from noon to 1:00pm in the AHF Torrey Webb Room (TWR). Seminars have a question and answer periods, and sometimes, lunches with students and the speaker are scheduled. The seminars therefore give students a chance to learn about research outside their area of specialization and to meet distinguished scientists from other institutions.

Each semester, MEB distributes a list of seminar speakers chosen and invited by its students and faculty. Seminar notices are also posted near AHF 107 and updated weekly on the Biological Sciences Homepage.

Other USC departments, such as Neurosciences, Molecular Biology, Gerontology, Medical Sciences (Biochemistry, Microbiology, Pathology, Cell and Anatomy, Molecular Pharmacology and Toxicology) also hold seminars. These seminars and seminars offered at other universities are posted in AHF 107.

The Marine Environmental Biology Office (AHF 107)

While your faculty advisor will advise about academic matters, administrative support is available from staff in AHF 107. For matters relating to your research or the graduate program, first see Don Bingham, the Administrative Assistant for the Marine Environmental Biology program. Don deals with issues like MEB requirements, ordering office supplies, maintaining equipment, visitor parking, mail distribution, phone and computer line installation, and key acquisition. Linda Bazilian, the BISC Graduate Programs Manager (x11088), handles questions about registration, grades, Graduate School requirements, etc. For computer support, see Keun Song, or call USC computer technical support at x 0-5555. Also in AHF 107 for your research purposes are a typewriter, computers, a scanner, a fax machine (213-740-8123), and two copiers.

Mailroom/Post Offices/Fed Ex

Put outgoing campus and stamped mail in the AHF 107 mailroom. You will have a mailbox there.

MEB’s complete address:
USC, Marine Environmental Biology, Dept. of Biological Sciences,
AHF 107, Los Angeles, CA 90089-0371 — important!

MEB’s mail code, 0371, directs intercampus mail to the AHF 107 mailroom.

Fed Ex Express drop is outside of Don Bingham’s office (AHF 107A). The pick up deadline is 3:00pm. All Fed Ex’s must be charged to an account number, and the number put in the Internal Reference box on the FedEx mailing label. Your advisor can help you determine the account to charge.

Full service post office: 3585 S. Vermont Ave., across from campus.
Limited service post office: in the Commons Lobby.

Keys, Security

The MEB Administrative Coordinator distributes keys. Each key requires a $10 refundable deposit. Security is a very serious matter at USC. Please ensure the safety of MEB people and property. Never leave your keys unattended or loan them to others. Also, do not prop open any door to the outside. That invites theft, unsavory individuals, or both. If someone you don’t recognize loiters in AHF, call Security (x0-6000 or x0-4321—emergency).
**Libraries**

**Seaver Science Library** (SSL), in the Seaver Science Center, is the main science library on the University Park campus. Current journals are on open shelves on the first floor. Older journals are bound and shelved with books on the upper floors. Periodicals cannot be checked out, but copiers are available. Reference librarians on the first floor can help with database searches, computer networks, etc. Also, older materials may be ordered on-line from the Hancock storage area and picked up at this library.

**Hancock Natural History Collection** is in Special Collections on the second floor of **Doheny Library** (DML). The Collection has early research materials on systematics, oceanographic expeditions, and marine biology research published before 1900. You may also order hardcopy materials on-line from USC's off-site Grand Depository via the HOMER online library catalog and pick them up at Doheny. Also, inter-campus loans may be requested through the Academic Resources Gateway Office (ARGO).

USC has on-line access to a vast number of natural history materials, such as Limnology & Oceanography, and Oceanic Abstracts. Visit library.usc.edu to access the electronic resources.

**USC Library Card**

Apply for a card at the main circulation desk in Doheny or Seaver library.

**Off campus libraries**

**USC Norris Medical Library** is on the Health Sciences Campus (HSC). Seaver Library reference librarians can help you have the library copy journal articles for you and send them to you at Mail Code 0371.

You may apply for a UC Los Angeles (UCLA) library card through UCLA’s Biomedical Library. This library is great because it can access almost any journal, no matter how obscure or old. On-site copy machines use debit cards you buy from library vending machines. UCLA is ten miles west of USC and accessible by bus.

**Los Angeles County Natural History Museum library** (213-763-3388 or 213-763-3387) is in Exposition Park, just south of campus. The library is open by appointment M-F 10:00 - 4:00.

**Information on Computing**

Access the **USC computer network** from several public user rooms on campus, by modem from a home computer, and from any computer connected to local networks, such as the Ethernet in the molecular biology labs. A wide array of software is on the network, and services like e-mail and database searching are free to graduate students. The **USC Computing Center** offers advice and training sessions on the network and its software. The key to this world of information is a **computer account**. Computer accounts are automatically created for all students enrolled in a degree program. To activate your computer account, complete a Web based form and create a password. Get the form from one of five public computing areas: Leavey Information Commons, KOH 200, SAL 125, or WPH B34 on the University Park Campus (UPC), or Norris Medical Library on the Health Sciences Campus (HSC).

To connect to the USC network by modem, you must install and configure PPP software on their personal computers. Free PPP software can be downloaded from public machines in UCS user rooms.

Automatic accounts are available to enrolled students two weeks before classes begin. For more please contact USC’s **Customer Support Center** x05555.
Housing and Transportation

Housing

On-Campus: The USC Student Housing Office (x02546) is in Parking Structure C.

Off-Campus: Most graduate students live off-campus. Time permitting, walk or drive around a neighborhood you like, and look for vacancy signs. Some resources are The Daily Trojan, USC’s school newspaper; the LA Times, Los Angeles’ major newspaper; and such nearby community newspapers as the Hollywood Press and Santa Monica Evening Outlook. Also consider The Daily Breeze for Redondo-Hermosa-Manhattan Beach areas; the Star News for the Pasadena area; and the Northeast Newspaper for Eagle Rock, El Sereno, and East Los Angeles areas. Classified ad papers, such as The Recycler, have many listings. On-line, Craigslist.org lets you look for rentals and post rentals wanted ads. Also, the UCLA (hiss, boo) Housing Office Web site has descriptions of areas west of USC.

Consider buying a Thomas Brothers Street Atlas of Los Angeles and Orange Counties from the USC bookstore. Then, you can quickly locate street addresses in LA and Orange counties.

Non-University housing by campus is limited, and some areas are quite rough. Avoid renting in the south side of campus. Better is North University Park, north of campus, across Jefferson Blvd. Alas, the area is small, rentals are rather few, and landlords often charge accordingly. Still, you can find older places with "character" that are not too expensive. Caveat emptor.

Transportation and Parking

USC Campus Cruiser (x0-4911): At night, do not walk on campus alone! The Campus Cruiser will bring you to locations within about one mile of campus. See SCampus for information and schedules and Transportation Services.

USC Tram Service runs early morning until late at night on weekdays and services the nearby housing areas off campus, the Health Sciences Campus, and the campus parking lots, including the main off-campus one on Hope Street. Check transnet.usc.edu for schedules.

Despite LA’s reputation, you can get by without a car.

Metropolitan Transit Authority (MTA), the LA transportation system, can usually get you from here to there and points in between.

USC’s Transportation Services Office is also very helpful. The Office is at x0-3575, 1012 Childs Way, Building 1.

Express buses run from several outlying cities to downtown LA. Routes include stops at or near USC, and buses and shuttles run from downtown to USC. Transportation Services has information.

LA is constructing a new subway and rail transit system. Currently, the "Blue Line" runs south to Long Beach, the "Gold Line" runs east to Sierra Madre, and the "Red Line" runs west through the Wilshire Corridor. Wilshire Blvd. starts in downtown and extends about fifteen miles west, passing through Beverly Hills, Westwood (UCLA), and Brentwood, to the ocean at Santa Monica. Wilshire buses operate continuously.

Bicycle commuters: all bikes must be licensed--see procedures in Scampus. Unlocked bikes on or near campus will likely be stolen. Try to keep your bike in your apartment and in your office or lab.
Car commuters: a USC Parking Permit, available via the Transportation Office, is a wise investment. Off-campus street parking is scarce and unsafe; plus, parking time restrictions are the rule. Wherever you park, always lock your car and leave nothing valuable (cd player, clothes, etc.) visible from the outside.

Car and Vanpooling: LA County sponsors "Commuter Computer," a service to help commuters form car pools. If you wish to carpool, submit your name and commuting schedule to the "Commuter Computer," 213/380-RIDE. They will try to match you with other interested commuters. "Rideshare" is USC’s on-campus car and vanpooling service. Rideshare operates out of the Transportation Services Office.

Banking and Shopping

Across from campus are a Citibank on Vermont Ave. and a Bank of America on Jefferson Blvd. After dark, never go to an ATM alone. Neighborhoods around USC are not particularly safe.

The on campus USC Federal Credit Union (KOH 200) offers good deals on checking and savings accounts and loans. Their ATMs are by the USC Bookstore, in the Commons Lobby, and in Kings Hall.

Bookstores

USC Bookstore/Computer Store on campus is a convenient place to buy school and computer supplies. MEB graduate students are entitled to a 10% discount on some items in both stores. The graduate student sticker, which provides Bookstore discounts, will be available from Adolfo dela Rosa.

Local Markets

The Superior Market in University Village will cash personal checks if you have a California Driver's License. Through them, you can also send telegrams, mail packages, and purchase money orders. Smart and Final, across from USC on Vermont Ave., has bulk foods and janitorial supplies at a discount. Ralph's Supermarket, at Vermont Ave. and Adams Blvd., is a mile north of campus.

Dept. of Motor Vehicles

The California Department of Motor Vehicles (DMV) is two blocks east of USC (3615 S. Hope Street).
Personal Life
USC and Los Angeles

On-Campus Cultural Events and Recreation

Get ready for plays, concerts, films, and art exhibits. Oh, and sports. USC is gung-ho about its sports teams. Sure, going gaga over a football game is intellectually questionable, but the game against cross-town rival UCLA is worth experiencing once. If you plan to attend many USC sports events, buy a "Student Activity Card" during registration week. The Card is essentially a season ticket to all USC home games and gives you a chance to buy a Rose Bowl football ticket if USC plays in it.

The Lyon Center has a weight room, racquetball courts, stationary bikes and treadmills. Locker rooms also lead to the McDonald's Olympic Swim Stadium. Nearby tennis courts and a track and soccer field are generally open to students. Students can form teams for intramural leagues in basketball, softball, coed water polo, and coed volleyball. Entrance and basic use of USC’s athletic facilities are free to students with current ID.

Off-campus Activities

Southern California cultural and recreational areas are quite accessible from USC. In a few hours at most, you can reach all manner of museums, theaters, sports complexes, amusement parks, zoos, bowling alleys, pool halls, ice skating rinks, beaches, tide pools, mountains, deserts, islands, public parks, horseback riding trails, polo fields, ski areas, golf courses, tennis courts, etc. Geez, what more do you want?

A sampling of what awaits:

- amusement parks: Disneyland, Magic Mountain
- art museums: LA County art museums, J. Paul Getty museum
- ethnic museums: Museum of Tolerance, the California Afro-American Museum
- science museums: Museums of Natural History and of Science and Industry, the Page Museum & La Brea Tar Pits
- classical music: Music Center, Hollywood Bowl
- rock music: Greek Theater and Universal Amphitheater
- classic theater and musicals: Shubert and Ahmanson theaters
- first-run contemporary works: Mark Taper Forum and lots of small local theaters
- zoos: Los Angeles, San Diego
- aquariums: Long Beach, Sea World
- horse racing: Hollywood Park, Santa Anita
- Hiking: Topanga State Park, Will Rogers State Park, Griffith Park
- pro sports: baseball: Dodgers; hockey: Kings; basketball: Lakers, Clippers

Hancock Park area
On Wilshire near Fairfax Avenue
Los Angeles Museum of Art
Page Museum and La Brea Tar Pits
Petersen Automotive Museum
Exposition Park
On Exposition Blvd., directly across from campus
Museum of Natural History
California Science Center
Aerospace museum
LA Sports Arena
LA Coliseum
Rose Garden
Swimming Center

Griffith Park
Perhaps the largest municipal park in the U.S.
Observatory and planetarium
Greek Theatre, a natural amphitheatre for concerts
Merry Go Round
Autry Museum of Western Heritage
Los Angeles Zoo
Golf Course

Santa Catalina Island: MEB has ties to a marine research lab in Big Fisherman Cove at Two Harbors. A Wrigley Institute boat runs on Mondays and Thursdays. It's free! An Express boat runs more often, depending on the season, and costs about $48 roundtrip. For the Wrigley boat, contact Ann Close in AHF. For the Express, check the Catalina Express schedule, and look at the San Pedro to Two Harbors route. To stay overnight, contact Katie Boutillier of Wrigley.

Warnings

Fun in the Sun

Although the sun is fun, you must protect your skin. Sunscreen with a minimum 30 SPF rating is not enough. For any extended exposure, cover up with a brimmed hat, long sleeves, and pants. Skin cancer due to sun exposure is epidemic in Southern California, as is looking like a dried up prune. Protect yourself.

West Nile Virus, Avian Flu, and Lyme Disease

These are potentially devastating diseases. Mosquitoes spread West Nile; ticks spread Lyme Disease. If you hike or play in a park--even a city park--wear insect repellent and clothe your skin and hair. Also, stay on trails cleared to help keep the tiny critters off of you. Back at home, check your skin for any freeloaders digging in, and wash clothes in hot water. Stay away from all dead birds, especially the big black ones. Call the Public Health Department to report dead bird sightings. When in doubt, visit the USC Health Center.
General Information about Financial Aid

Marine Environmental Biology Section intends to provide or arrange for the provision of financial support (stipend + tuition) for all of its Ph.D. students. Students should feel assured that the faculty will do everything possible to meet this goal. Please note that Graduate School rules prohibit full time student from accepting any employment above and beyond their graduate assistantships (see Graduate Assistantship Handbook). There are 4 main sources of support for graduate students: Teaching Assistantships, Research Assistantships, Training Grants, and Individual Fellowships and Grants.

1) Teaching Assistantships
We are fortunate to be part of a large undergraduate department, because this gives us access to many TAships. The exact number varies with enrollments, but is divided equally between the 3 research sections. TAships, which are generally awarded for an academic year, carry a stipend and full tuition remission. You must maintain at least a 3.0 GPA to receive the tuition remission. Nine monthly payments are made beginning August 16 and ending May 15. See Linda Bazilian for more information. The authority to offer TAships rests exclusively with the Biological Sciences Department Chair, Doug Capone, who consults extensively with the Graduate Admissions Committees of each of the sections, and with faculty instructors.

The workload associated with TAships varies with the course in question and the familiarity of the TA with the subject matter. Consult a few of the more advanced graduate students for tips on course selection. Keep in mind that the best way to learn a subject in detail is to attempt to teach it to someone else. Whatever course you are assigned, please take your responsibilities very seriously. You are under a moral and legal obligation to do your best for your students. Undergraduates pay a hefty tuition bill, so they are entitled to your best efforts. Learn the subject matter diligently and find creative ways to explain it. Practice your verbal communication skills. Make yourself available and approachable. Conform to high ethical standards and respect confidentialities of your position. All of these skills will be directly useful to you in your future careers as researchers and educators. We faculty view the TAships as an important part of your training. Please be aware that as with any other job, your TA position can be terminated for poor performance.

2) Research Assistantships
Research Assistants and TAs are paid on the same scale and receive identical benefits. Nine monthly payments are made beginning August 16 and ending May 15. The department funds TAships, and research grants of individual faculty fund RAships. As the name implies, RAs do research, usually directed the Specific Aims of the grant that funds the position. The time required is often more than that for a TAship, but this is usually not considered a burden because the work should be directly relevant to your research training. At a minimum, an RAship should be considered a 15-20 hour per week job. Students might opt to put in more time, depending on the relationship between RA duties and the dissertation project, or the likelihood of co-authoring resulting publications. The relation between the RA project and the dissertation project varies on the faculty member involved and other circumstances. In some cases, the two projects are the same and you will in effect be paid for doing your dissertation research. In others, efforts are made to keep the projects distinctly different. Good arguments can be made for either approach.

Research assistantships need to be cultivated. Try to identify your research interests as early as possible, certainly by the end of your second semester. Determine which professor best matches those interests. If necessary, do some reading to educate yourself about that professor's work and the field in general. Tell the professor you would like to work with him or her and inquire about the availability of RAships. Before you start an RAship, be sure you understand what is expected of you, what you can expect from the professor, and what relations might exist between your work and dissertation research.

TAships vs. RAships: Your teaching assistant experience can be very rewarding. You will learn a lot and have the satisfaction of seeing that knowledge take root in others. You may establish lasting friendships or mentor relationships with some of your students. On the other hand, you are primarily here to do research, not teach. If you are not very efficient in organizing your time, progress on your dissertation research may be slowed by extended service as a TA. Most agree that RAships are preferable. Try to be flexible, though. As grant budgets wax and wane, it may be necessary to RAs to take TAships to cover lean periods.

The Wrigley Institute has just created a series of RAships for working at Catalina. Fellowships are available for the
Summer, as well as for the Academic year.

3) **Individual Fellowships and Grants**
   An enormous number of grants and financial aid are available to students. Detailed information can be obtained from two sources. First, the Graduate School (GFS 315, x09033) has a partial listing of available grants on its Web site. Second, there is a computerized database in Doheny Library (DHL reference section). This database contains literally hundreds of grants from which to choose.

4) **Summer Support**
   Your decision to be a Ph.D. student is a year-round commitment. You should view the summer as an opportunity to engage intensively in research, free from the distractions of coursework, TA assignments, and the like. We expect you to be in the laboratories, engaged in full time research, every summer. We will do everything we can to provide the financial support to make this possible. Please be aware, however, that it is your responsibility to take the initiative in securing summer positions. Early in the spring semester, if not earlier, every new student should make at least a tentative decision about which laboratory to work in. Talk to that professor and see if support is available. The best plan would be to secure a RAship, although there are a few summer TAships available. These provide only partial support and you must put your bid in early to Linda Bazilian. If these possibilities don't work out, see Linda Bazilian or Dennis Hedgecock. They may be aware of other possibilities for summer funding.
REQUIREMENTS AND POLICIES GOVERNING  
THE GRADUATE PROGRAM IN MARINE ENVIRONMENTAL BIOLOGY  
Revised August, 2007

The Graduate Program in Marine Environmental Biology & its Administration

Introduction

Graduate students in the Graduate Program in Marine Environmental (referred to subsequently as "GPMEB" or the "Program") may pursue a Ph.D. degree.

At the University of Southern California, graduate education is the responsibility of the Department, but the University's Graduate School establishes minimum requirements concerning grade point average, number and distribution of units, residency, time limits, etc. that are common to all advanced degrees offered within the College of Letters, Arts and Sciences at the University. Specific courses, examinations, skills, and research requirements are established by the student's program of study, in this case the Graduate Program in Marine Environmental Biology. Collectively, both sets of regulations constitute the student's "degree requirements," all of which must be met by the student.

Graduate School regulations are listed in the current University of Southern California Catalogue somewhat confusingly, one part of these are scattered in the section on "Academic Policies and Information" near the beginning of the USC Catalogue and the rest are found near the middle of the USC Catalogue under "The Graduate School." Those regulations, which most commonly affect GPMEB students, are included in this document, but this listing should not be considered definitive.

GPMEB regulations are listed in this document; the major requirements of degrees in the GPMEB are also listed in the USC Catalogue under "Department of Biological Sciences."

Program Administration--The Graduate School

The Graduate School maintains the University's official Permanent Graduate Student File and is ultimately responsible for admission of our graduate students and the awarding of their degrees. As noted above the Graduate School establishes requirements concerning grade point average, number and distribution of units, residency, and time limits that are common to advanced degree programs in all units under their jurisdiction, including the Department of Biological Sciences.

Official forms are used to track a student's progress by The Graduate School and completion and submittal of these usually is to be at a specified point in the student's tenure. Timetables for the completion of degree requirements are available at The Graduate School. The schedule for the Ph.D. student's final and penultimate semesters are especially detailed and need to be adhered to closely.

All Graduate School forms prepared by or on behalf of the student must be approved by the Director of the Program and by the Chair of the Department before their submittal to the Graduate School. All Graduate School forms are available from the Graduate Programs Manager, Linda Bazilian.

Graduate Student Representatives

In late spring, GPMEB students select two graduate students to serve as Graduate Student Representative and Alternate Graduate Student Representative for the coming academic year. To be eligible for the posts, both students must have passed their Qualifying Examination. The Alternate will represent the graduate students in the Graduate Student Representative's absence or by the latter's appointment. The Graduate Student Representative has one vote in meetings of the GPMEB Faculty representing the opinions of the graduate students.

The Graduate Student Representative has no voting power in either the continuation of fellow graduate students or in the Qualifying Examination. At the option of the student examined, the Graduate Student Representative may also be present during the oral part of the Qualifying Examination.
Graduate Student Coordinator of GPMEB

The Graduate Student Coordinator of GPMEB is the staff member responsible for processing and maintaining graduate student files; serving as liaison between the students, GPMEB Faculty, and the Graduate School; and making available application materials, Graduate School Forms, and other relevant documents. A permanent Department file on each student is maintained in the Marine Environmental Biology Program Office.

Student Advisement and Guidance

The First Year Advisor; Initial Advisement and Evaluation by Student's Advisor

Most students have a first-year advisor who is identified in the acceptance letter. This initial advisor may be replaced by another faculty member with whom the student has closer research affiliations at the request of the student and with the approval of the new advisor. If an incoming student has not chosen an advisor, this should be a priority during the first semester.

The Program provides an initial orientation for all incoming students. During registration week of a graduate student's first semester, the student's initial advisor meets with the student to review his/her previous course work and experiences and to discuss career objectives. A primary purpose of this initial interview is to identify major deficiencies in a student's preparation and to suggest means of remedying any such deficiencies.

Screening Committee

A Screening Committee is created each year and consists of the members of the admissions committee plus the student's advisor. This committee will meet with incoming students as soon as possible to evaluate the student’s background and make recommendations for developing a solid base in marine biology. They will administer the Screening Examination, which is given near the end of the student's second semester of graduate work at USC. The Screening Committee will also be responsible for the student's advisement and guidance from the time of its appointment until the five-member Ph.D. Guidance Committee is established. Each student's performance will be reported in writing on the GPMEB's Report of the Screening Committee.

Requirements for the Ph.D. Degree

Time Schedule

All course requirements for the Ph.D. degree must be completed by the end of the second calendar year from the date on which the student took his/her first course at USC and must be completed within eight calendar years from that time.

General Requirements

A total of 60 units must be completed for the Ph.D. Degree.

Course Requirements--Core courses

Three core courses are currently required: BISC 582 (Advanced Biological Oceanography), BISC 584 (MEB Faculty Lecture Series), and BISC 585 (Scientific Writing). The first two courses should be taken during the student’s first year at USC; BISC 585 is open to second year students only. Students are also required to take 4 units of BISC 529 (MEB Seminar) and four advanced graduate seminars (8 units total). Finally, students are required to take an approved course in statistics (e.g. PM 510L).

Students must receive a grade of B or better in each core class and maintain a cumulative Grade Point Average of 3.0 or above in all coursework

Official Guidance Committees

A five-person Ph.D. Guidance Committee should be established soon after the screening exam, but no later than the fourth semester of enrollment for a student seeking a Ph.D. degree. After the student passes the Qualifying Examination, the Ph.D. Guidance Committee is called the Dissertation Committee.
The Student and His/Her Responsibilities

The student is ultimately responsible for his/her graduate career and must be familiar with Graduate School and GPMEB requirements and responsible for their timely completion.

If a student's needs are not being met, he/she should seek redress, using the following chain of command: advisor, advisory committee (screening, guidance, dissertation), Director of the Program, Department Chair, and Graduate School.

In addition to all other rules, the University has established codes of conduct to which all students must adhere. One aspect of graduate training -- service as a teaching assistant -- places them in a position of power over undergraduate students. The position implies added responsibilities and liabilities, especially in respect to such matters as fairness, equal treatment, sexual harassment, etc. Information on University policies concerning conduct is available in SCampus. Further information or sources of information may be obtained from the Department office.

Formal Graduate Seminars

Students must complete a minimum of four (4) 2-unit graduate seminars. Because a critical feature of such seminars is exposure to current literature, all four required seminars must be completed during the student's tenure at USC. With the written permission of the student's committee, a formal course completed at another institution may be counted as one of the four required seminars (the course must have been completed during the student's tenure here, however).

Research Tool Requirement

Proficiency in statistics is a necessary skill for all scientists. Satisfactory skill level may be demonstrated by

a) completion (grade of B or better) of a course approved by majority vote of the Marine Environmental Biology Program faculty.

b) acceptance of course work previously completed either at USC or elsewhere. The acceptability of a previously completed course will be made by an examiner selected by the Marine Environmental Biology Program faculty.

A rigorous grad level course in Biostatistics is available at the Medical School in the Department of Preventive Medicine. Course number is PM 510L. Permission is needed from the PM Department. A free shuttle bus runs routinely between the University Park and Med School Campuses. Other BioStat options are listed in the appendix.

Research Units

BISC 790 Research units are normally taken whenever the student is conducting his/her doctoral research. Dissertation research will normally take the equivalent of about 2.5-3 years of full time work, but the number of research units taken usually does not reflect this. Typically advanced graduate students will take 6 units of 790 and possibly a 2-unit seminar each semester.

Grade Point Average Requirements

Students must maintain a grade point average of at least 3.0 in all courses taken at USC, in conformity with regulations of the Graduate School; work graded C- or below is not acceptable for either subject or unit credit. In addition to the overall GPA requirement, students must achieve at least a B- in each core and skill course.

If a student's cumulative grade point average falls below 3.0 at any time, the student will be placed on departmental academic probation. The cumulative average must be raised to 3.0 by the completion of the next two semesters of registration at USC in courses approved by the student's guidance committee. Note: this may require that the student take additional formal and/or seminar courses since directed research and dissertation units are on a Pass/No Pass basis and are not computed into the GPA. If the student does not improve his/her overall GPA to 3.0 within this period, the student will be dropped from the program. A student who has been removed from probation but subsequently fails to meet the scholarship requirement is subject to termination (will be terminated) from the program.
Marine Program Noon Seminar Series

Students must regularly attend the Marine Environmental Biology Noon Seminar series throughout their tenure at USC. In addition to attending other seminars, each student presents a 30-minute seminar on his/her current research once each academic year, beginning in their second year. Attending faculty will provide short written evaluations of the seminar to help students in improve their public speaking skills. (See “Forms” section).

BISC 794 Doctoral Dissertation

After a student successfully completes the Qualifying Examination and is therefore a formal candidate for the Ph.D., he/she must register for BISC 794 Doctoral Dissertation each semester except summer. The student would sequentially register for BISC 794a, 794b, 794c, 794d in the first four semesters after completing the Qualifying Examination, and then BISC 794z each subsequent semester as needed. Students must have at least 4 units of 794 credit, but can receive no more than 8; hence BISC 794a-794d are valued at 2 units and BISC 794z at 0 units.

Other Course and Unit Requirements

Additional formal course requirements may be established by the Section and/or by the student's guidance committee and/or on advice of the committee, which evaluates the student's preparation in the Screening Examination.

The minimum number of units required for the Ph.D. by the Graduate School is 60. Units must include 4, but no more than 8, units of BISC 794 credit and may be completed with other formal classes or BISC 790 work.

The student must be registered at USC during the semester that the dissertation is submitted.

Teaching Assistantship Requirement

Graduate students pursuing the Ph.D. in the GPMEB must serve as a teaching assistant for at least two semesters; ideally, the student should serve in at least two different courses.

Screening Examination

The Graduate School requires a Screening Examination. The exam is oral, about one hour in length, and must be taken before the student has completed 24 units of graduate work at USC. The Screening Committee administers the exam. The purpose of the meeting will be to evaluate the student's preparation, determine competence to continue graduate study, and point out deficiencies to be remedied prior to the Qualifying Examination. Prior to the exam, the student submits a 1-2 page document outlining his/her activities during the previous year and present research interests. At the exam, the student presents a short (5-10 minute) description of their academic background and research interests.

The topics covered in the Screening Examination include:

- a summary by the student of their research while at USC
- biotic diversity, classification, and life histories
- organismal evolution and phylogeny; molecular evolution
- structure and physiology of cells and organisms
- biochemistry
- Mendelian, population, and molecular genetics
- biological, chemical, and physical oceanography
- statistics, experimental design, modeling and theoretical biology
- ecology and environmental sciences.

Each student's performance will be reported in writing to the student. A copy is placed in the student's file.
Guidance Committee

Composition of the Guidance Committee

The student's program of studies is under the direction of a five-member guidance committee that must be established at least two semesters before the student takes his/her Qualifying Examination. Therefore, the student should request appointment of the committee as soon as possible after the screening exam but certainly before the end of his/her third or fourth semester of enrollment in the Ph.D. program.

The composition of the guidance committee must meet the following guidelines:

a) One member of the committee must be from a department at USC other than Biological Sciences. This "outside member" serves as the representative of the Dean of Graduate School.

b) Normally, the other four members of the committee are tenure-track faculty of the Marine Environmental Program in the Department of Biological Sciences, but one of the members may be from another Program in Biological Sciences, and at least one must be tenured. The chair of the committee is called the student's advisor and must be from the Marine Environmental Program. Co-Chairs are normally not permitted unless required by the Graduate School (see next paragraph).

In exceptional cases of academic merit, a person not meeting the above guidelines may be approved by the Graduate School to serve on a Ph.D. committee. To request such an exception, the student must submit to the Graduate School a current Curriculum vitae of the proposed member and a letter from the chair of the committee citing the particular expertise of the person and the relevance of the requested appointment. A specially approved member may not serve as the outside member (see below) or as sole chair of the committee, but may serve as a co-chair with a regular faculty member of the Marine Environmental program. A guidance committee may include no more than one specially approved member unless the size of the committee is enlarged past five.

Request for changes in the composition of the Guidance Committee must be made in writing by the student to the Program. If approved, the committee is officially changed using the Graduate School's Request for Change of Committee form.

If the chair of the Guidance Committee will be absent from campus for any extended period of time (e.g., on leave) (s)he must appoint a temporary chair. The permanent chair will continue as a member of the Committee during his/her absence and will be in communication with the Guidance Committee. If the permanent chair must be absent at the time of the Qualifying Examination or the defense of the dissertation, a petition for formal appointment of a temporary chair must be submitted to the Graduate School.

Responsibilities of the Guidance Committee

The Guidance Committee (as such or as the Dissertation Committee that it becomes) is responsible for the guidance and evaluation of the student during his/her graduate tenure. Specific responsibilities include:

a. Administration and evaluation of the Qualifying Examination.

b. Approval of the student's research and academic programs.

c. Monitoring the student's temporal progress in meeting degree deadlines.

d. Evaluation of the dissertation in the Oral Defense

To meet these responsibilities, the Committee may require the student to make periodic written reports and should meet at least once per year with the student (one appropriate time for an annual meeting is shortly after the student's presentation at the Marine Noon Seminar series). More frequent meetings are usually necessary as the student approaches completion of his/her degree work. The student or any member of the committee may request a meeting. Normally the student is responsible for arranging a specific date, time and place for meetings. The Chair should write minutes of all committee meetings and submit one copy each to the student, the members of the committee, and the Marine Program office for inclusion in the student's permanent file.
Qualifying Examination

Prerequisites for the Qualifying Examination

During the semester the exam is taken, the student must be enrolled in a departmental graduate course or GRSC 800. The GPMEB requires that students have completed:

a) All required core courses, each with a minimum grade of B-.
b) At least two graduate seminars.
c) The statistics research tool requirement.
e) Removal of inadequacies noted in the screening examination.
f) Completion of the Request to Take Qualifying Examination form.

Depending on how the above requirements were met, the student may have to take additional course work to satisfy the Graduate School requirements that students have completed at least 24 units of course work applicable to the degree while in residence and with a minimum cumulative GPA of 3.0.

Timing of the Qualifying Examination

The Qualifying Examination is normally taken during the student's fifth semester in the Ph.D. Program and must be taken before completion of his/her sixth semester.

Components of the Qualifying Examination

The Qualifying Examination consists of a written and an oral part. The student's Guidance Committee conducts and evaluates both parts.

The Written Examination

The written examination will consist of four or five sets of questions distributed over two consecutive days. This examination can be taken on a laptop computer supplied by the committee chair (i.e., the student cannot use their own computer). Each Guidance Committee member (with the possible exception of the "outside member" whose participation is optional here) submits three questions; the student must answer two of this set, spending about equal time on each and having a maximum of two hours per set. The order in which the sets of questions are taken is at the student's option.

Questions will be comprehensive in scope with respect to the student's chosen area of specialization and will be designed to test the student's conceptual, analytical and integrative ability and preparation.

Each member of the Examination Committee will grade his/her question on a scale of 1.0-5.0 using 0.5 unit steps if necessary (1.0 as poor and 5.0 as exceptional). The examination result will be calculated by averaging all the grades. A mean score of 3.3 or above for all questions is passing; below 3.0 is failing. Cases where the mean is between 3.0 and 3.3 or where two or more questions are graded below 3.0 are evaluated by the Guidance Committee followed by a vote, using a secret ballot. More than one negative vote of the Guidance Committee will result in failure of the student to pass the written examination.

The written part of the Qualifying Examination must be taken before (normally 2 weeks before) the oral examination described below. The results of the written examination and the oral examination are given only at the completion of the oral examination.

The Research Proposition (The Fifteen Pager) and its Preliminary Approval

Proposition Abstract

At least two months before the anticipated date of the oral examination, the student should meet with his/her Guidance Committee and provide them with a 1- or 2-page Research Abstract of the anticipated research program to be presented in the Research Proposition. The purpose of this meeting is to ascertain whether the anticipated research constitutes a defensible dissertation topic so that the student does not develop a detailed plan for a research program that has serious flaws and probably cannot be successfully defended in the oral examination. If the committee has reservations, modifications that are mutually satisfactory to the student and the committee can be worked out during this meeting or the student can be asked to submit a revised or new abstract.
Upon approval of the Proposition Abstract by the Guidance Committee, the student will develop it into a formal Written Proposition. This is to be in the form of a grant proposal and should include a short historical introduction, a statement of the problem and its significance, one or more hypotheses (if appropriate), the research design, anticipated results, methods to be used in interpretation of the results, and pertinent references. The treatment should be concise and should not exceed 15 double-spaced pages.

The Oral Examination

The oral examination will be in the area of the student's intended research and will be based on a research project selected and developed by the student into a Research Proposition. The oral examination is usually taken two weeks after and must be taken within one month of the written examination. At least two weeks before the date of the oral examination, the student must submit one copy of the Research Proposition to each member of the Examination Committee and one copy to the Marine Program's Student Affairs Administrator for the student's permanent file.

The oral examination will be conducted and evaluated by the student's full 5-member Guidance Committee. Typically, the Committee meets briefly without the student to review the student's course work, other preparation and progress; to review the student's performance on the screening examination (copies of the student's transcript and Screening examination report should be obtained for each committee member from the Graduate Student Administrator by the Chair); and to agree on the exact format and order of questioning during the oral examination. Subsequently, the student typically presents the highlights of the research proposition in 15 minutes or less. Then members of the committee ask two or more rounds of questions. The questions are largely focused on the student's ability to conceive, conduct, evaluate independent research and to communicate the results of such work. However, the oral examination is not limited to the context of the Written Proposition; as specific examples, questions are often asked a) from the written examination and b) concerning the removal of deficiencies identified during the Screening Examination.

On completion of the examination, the Guidance Committee meets in executive session (without the student) to evaluate the student's performance on the oral examination. Each member has one vote, pass or fail. More than one negative vote will result in failure of the student to pass the examination.

At the end of the executive session, the student is notified of the results on the two portions of the Qualifying Examination. Although one could pass both the oral and written, only one of these exams, or neither, the student passes the Qualifying Examination (as a whole) only if his/her performances on both the written and oral portions are satisfactory. If the student passes both the oral and written examinations, he/she is indicated to have passed the Qualifying Examination on the Graduate School form Report on Ph.D. Qualifying Examination.

If the student fails the written examination or the oral examination or both, the committee must indicate that the student failed the Qualifying Examination on the Graduate School form Report on Ph.D. Qualifying Examination. The committee must make recommendations concerning the student's continuation in the graduate program. The committee usually grants the student a second chance to pass the failed portions (either part satisfactorily completed in the first examination does not have to be retaken), but may recommend that the student not repeat the exam or even deny a second chance (the latter action would be appealed to the Graduate School). The second attempt is a final one and can be taken no sooner than six months or later than twelve months after the initial failure.

Admission to Candidacy

After the student passes the Qualifying Examination, the Guidance Committee recommends to the Graduate School that the student be admitted to candidacy for the Ph.D. Degree. Following admission to candidacy the student must register for BISC 794 Dissertation every semester, except summers, until the degree is awarded.

After the Qualifying Examination has been passed, the full Guidance Committee will be known as the Dissertation Committee. The GPMEB does not allow the reduction of the Guidance Committee to a three-member Dissertation Committee as permitted by the Graduate School except under special circumstances. If these circumstances are met, at least 2 members must be from the GPMEB).

Research

A student must undertake original investigation of a selected problem in marine biology or biological
Research Prior to Admission to Candidacy

Although the Graduate School regulations indicate that students cannot pursue research prior to their admission to candidacy, students in the GPMEB are encouraged to conduct research at their earliest opportunity. Ideally, this early research will develop into an appropriate dissertation topic. Certainly, the student will find it difficult to develop and defend a Research Proposition without significant exposure to research in general and the specific problem in particular. Such preliminary research should be based on a detailed plan prepared by the student and approved by his/her advisor.

Research Subsequent to Admission to Candidacy and its Relationship to the Written Proposition

As noted above, dissertation research is normally based on the Written Proposition as presented in the Qualifying Examination, subject to its acceptance by the student's committee. Difficulties frequently force revision of the planned study. The student's Dissertation Committee must approve in advance any such changes of research direction or content.

Publication Prior to Submittal of the Dissertation

Prompt publication of research results is very strongly encouraged in the GPMEB. Students should organize their research efforts into blocks that a) can be completed in sequence, and b) represent topics for separate future papers so that submittal of one or more papers can be completed during their graduate tenure. Advisors often require students to submit one or more papers before completing their dissertation.

Authorship of such papers is significant. If the student is the sole author or if the student is the first author with the advisor as the only additional author, it implies that the student did most if not all of the research and hence the entire contents of the paper may be acceptable for incorporation into the dissertation. If the advisor contributed significantly to the research or if other individuals (other graduate students, faculty, post docs, research technicians, etc.) are co-authors, only that part of the paper which represents the student's work may be incorporated into the student's dissertation.

A published work may be incorporated into the body of the dissertation but may not be appended in the form of a reprint according to Graduate School regulations. The student is advised to seek the approval of the dissertation committee before submittal of a manuscript that is to be included in the dissertation since that committee must ultimately approve all contents of the dissertation. The fact that material has been submitted (accepted, published) does not mean that it will be allowed to be incorporated without revision by the committee.

Preparation and Defense of the Dissertation

A dissertation represents a significant contribution to science that is based on an original research program completed by the student. Determination of the adequacy of the research program is the sole responsibility of the student's Dissertation Committee. Approval of the dissertation itself is primarily the responsibility of the student's Dissertation Committee, but the completed dissertation must also be examined by the Thesis Editor of the Graduate School to determine if it meets the grammatical standards and other requirements described in Regulations for Format and Presentation of Theses and Dissertations published by the University of Southern California and available at the University Bookstore. Additional regulations and information on the organization and preparation of the dissertation are provided in Directions for Preparation of Dissertations and Research Reports as Required by the Graduate Program in Biology/University of Southern California. Students should obtain a copy of both sets of regulations before they initiate their writing.

GPMEB students defend an advanced draft of the dissertation rather than a "final" copy typed on dissertation paper. The advanced draft should be complete, including all text, figures, tables, references, etc. and the draft must be in a suitable form for final typing. Before assembly of a complete draft is initiated, the student should confer with his/her full committee to determine whether adequate research has been completed.
The student's advisor is the individual responsible for determining whether or not a draft is sufficiently refined for distribution to the full Dissertation Committee. Portions or all of earlier drafts may be submitted to some or all of the committee members for suggestions and evaluation at any time. The thesis draft to be defended must be given to the Dissertation Committee at least one month prior to the thesis defense date.

Presentation and oral defenses of the dissertation are achieved in a formal seminar open to all members of the academic community and in a closed meeting of the student and the Dissertation Committee.

Since the final typed copy of the dissertation must be presented to the Office of University Publications at least three weeks prior to the end of the term in which the degree is to be granted and since the student must allow adequate time after the defense for corrections and final typing, the defense should be scheduled at least six weeks before the end of the term in which the student plans to graduate.

Before undertaking the Dissertation Defense, the student must have completed (or be in progress of completing) all other degree requirements.

The Chair of the Dissertation Committee is required to notify the Student Affairs Administrator of the Marine Program of the date, time, and place of the defense of the dissertation, so that a notice of the Dissertation Seminar and Defense may be distributed to all faculty and graduate students of the Department at least two weeks in advance. The date selected for this defense cannot be on an official University holiday (e.g., Labor Day, President's Day, etc.).

The open oral defense of the dissertation is achieved in a formal 50-minute "research" seminar such as would be given by a visiting scholar. The presentation is open to the public and the student should be prepared to answer all questions from members of the audience, including those on the Dissertation Committee. The period of questioning is not to be limited in time.

The dissertation is also subject to a detailed defense made before the full Dissertation Committee in a meeting that is usually held shortly after the conclusions of the seminar. At this meeting, which is typically two-three hours in length, the Dissertation Committee must critically evaluate the dissertation and determine whether or not it is to be accepted. To be acceptable, the dissertation must represent a major, original contribution to science.

Only members of the Dissertation Committee may vote whether to pass or fail the student (accept or reject the dissertation and its open defense in the seminar). A vote to pass the student must be unanimous and such a vote does not preclude that the committee may require modifications of the dissertation. Reasons for failure of the defense should be clearly identified by the committee and may include a) a flawed research plan, b) nonconclusive or inadequate research results, c) major deficiencies in the dissertation, etc. A student who fails the defense the first time is normally given a second opportunity, but any decision on re-examination is at the discretion of the Dissertation Committee.

If the defense is satisfactory and no major revisions of the dissertation are required, all members of the Dissertation Committee sign the APPROVAL to submit DISSERTATION, which is submitted to the Graduate School. If significant revisions of the manuscript are required, the form is not signed until such revisions are completed. The Chair of the Dissertation Committee may be assigned full responsibility for determining that the required revisions have been made, but some or all other members of the committee may request that they also be involved in the final approval.

If the Approval form is signed and dated by the drop/add deadline for FALL or SPRING, no further registration is required.

The student also needs to prepare an abstract of the dissertation for publication in "Dissertation Abstracts, International."

The SIGNATURE PAGE is bound with the dissertation to verify that the dissertation has been approved by the Committee and accepted by the Graduate School. Signatures required on this form are those of the Committee and the Graduate School.

In addition to the original copy required by the Graduate School, one hardbound copy of the dissertation must be presented to the Department of Biological Sciences and another to the chair of the student's (Guidance and) Dissertation Committee.

The TRIPLE CARD REPORT ON DISSERTATION & ORAL EXAMINATION for the Ph.D. DEGREE must be signed by each Committee member, the Chair of the Department of Biological Sciences,
the Thesis Editor, and the Graduation Counselor (for Dean of Registration & Records, GFS 315). The signed TRIPLE CARD REPORT signifies approval of the dissertation and defense by the committee, as well as acknowledging completion of all departmental degree requirements and all University degree requirements. Most important of all, it indicates that the degree has been cleared for conferral. The completed TRIPLE CARD REPORT is submitted to the Graduate School for approval.

The student must pay a Dissertation Fee for the microfilming and binding of the dissertation and publication of the abstract (see Tuition and Fees in the current University "Catalogue"). A copy of the receipt for payment of this fee must be submitted to the Thesis Editor.

The DIPLOMA APPLICATION CARD FOR GRADUATE STUDENTS notifies Registration and Records of how the student would like his/her name to appear on the diploma. This card must be completed and submitted to the Graduate School.

The SURVEY OF EARNED DOCTORATES must be completed and returned to the Graduate School for approval.

After approval to upload the dissertation by the Graduate School, you have officially graduated!
## COURSES AVAILABLE IN MARINE ENVIRONMENTAL BIOLOGY

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor(s)</th>
<th>Semester(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BISC 582</td>
<td>Biological Oceanography (Core Course)</td>
<td>Sanudo Wilhelmy, Hutchins, Kiefer</td>
<td>Fall 2007</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(4 units)</td>
<td></td>
</tr>
<tr>
<td>BISC 584</td>
<td>Faculty Lecture Series</td>
<td>MEB Faculty</td>
<td>Spring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2 units)</td>
<td></td>
</tr>
<tr>
<td>BISC 585</td>
<td>Scientific Writing and Reviewing</td>
<td>Caron &amp; Michaels</td>
<td>Spring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2 units)</td>
<td></td>
</tr>
<tr>
<td>BISC 529</td>
<td>Marine Environmental Biology Seminar</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>(1 unit; 4 units required, maximum)</td>
<td></td>
</tr>
</tbody>
</table>

Advanced Graduate Seminars, offered on a rotating basis; check current Schedule of Classes
(2 units each; 8 units required)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor(s)</th>
<th>Semester(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>530 Plankton Biology</td>
<td>Caron &amp; K. Heidelberg, Schnetzer</td>
<td></td>
<td>F07</td>
</tr>
<tr>
<td>531 Physiology of Marine Organisms</td>
<td>Gracey</td>
<td></td>
<td>F08</td>
</tr>
<tr>
<td>532 Molecular and Microbial Ecology</td>
<td>Fuhrman</td>
<td></td>
<td>S08</td>
</tr>
<tr>
<td>532(^1) Antarctica and the Southern Ocean</td>
<td>Sullivan</td>
<td></td>
<td>F07</td>
</tr>
<tr>
<td>533 Remote Sensing and Modeling</td>
<td>Kiefer</td>
<td></td>
<td>S08</td>
</tr>
<tr>
<td>534 Population Genetics of Marine Organisms</td>
<td>Edmands &amp; Hedgecock</td>
<td></td>
<td>F07</td>
</tr>
<tr>
<td>536 Marine Biogeochemistry &amp; Microbial Ecology</td>
<td>Capone &amp; Ziebis</td>
<td></td>
<td>S08</td>
</tr>
<tr>
<td>599 Ocean Optics</td>
<td>Jones</td>
<td></td>
<td>S08</td>
</tr>
<tr>
<td>599 Communicating Ocean Science</td>
<td>Lemus</td>
<td></td>
<td>S08</td>
</tr>
</tbody>
</table>

\(^1\) Needs a new course number; Fall 07 Schedule labels as Molecular and Microbial Ecology
‘Quick Check List’ of Student/Advisor Responsibilities

First Month (Late Summer/Early Fall; ASAP, before classes get going)
Each student meets with the "Screening Committee" (same composition as the Admissions Committee for that year, plus the student’s advisor). This committee will be the same one that administers the Screening Exam at the end of Year 1. The Screening Committee evaluates each student’s background and advises on courses to be taken in the first 1/2 years to develop each student’s background in marine science (and specific area of interest).

By the End of Year 1 (Summer)
Student completes the Screening Exam, which tests the student’s general scientific knowledge, and identifies weaknesses that need to be addressed. The student will receive written comments from the committee on the “Screening Examination Results” form.

Beginning of Year 2 (Fall)
Student and advisor compose and request appointment of a Ph.D. Guidance Committee, which meets with the student near the beginning of the second year. Prior to the meeting, the student submits a (at least) 1-2 page document outlining his/her proposed research. Following a brief presentation by the student, the committee provides feedback, which includes a second review of the student’s coursework and training, and any appropriate recommendations for further course work or directed study.

Year 3
The student must complete the Qualifying Examination (as described in “Requirements and Policies” document) by the end of Year 3. At least one month prior to the exam, the student completes the “Request to Take Qualifying Examination” form (located in folder). At least two months prior to the exam, the student must submit a thesis proposal (the fifteen-pager) to the Guidance Committee and obtain permission to proceed to the exam. The Chair of the Guidance Committee should obtain the student’s file for the Qualifying Examination. A “Results of Qualifying Examination” form will be in the file for all committee members to sign. All committee members will continue as the student’s Dissertation Committee.

Years 3-5
Following successful completion of the Qualifying Examination, the Ph.D. Guidance Committee becomes the Dissertation Committee. The student meets at least annually with the committee. A short memo describing the students’ progress (signed by all committee members) is submitted to the Section office following each annual meeting.

Additional Annual Requirements:

Yearly Seminar: Each student must present a 30-minute seminar once each academic year beginning in their second year.

Yearly Progress Reports: On or by September 1, each student will complete and submit to the Section office a brief progress report (signed by each member of their Guidance or Dissertation Committee) detailing their activities during the previous 12 months (courses taken, research undertaken, seminars given at USC and elsewhere, participation in cruises, etc.). Forms for these reports will be emailed to students each summer as a reminder.
Screening Examination—Marine Biology

Student’s Name:______________________________________

ID#:_________________________________________________

Date of Screening Examination:_________________________

Pass_________________ No Pass______________________

(See below)

Comments:
____________________________________________________
____________________________________________________
____________________________________________________
____________________________________________________
____________________________________________________

Suggested Courses:
____________________________________________________
____________________________________________________
____________________________________________________
____________________________________________________

Signatures of Committee Members:
____________________________________________________
____________________________________________________
Date: ________________________

Student: ____________________________

Advisor: ______________________________

Year in Program: ____________________ (year begins fall semester)

Financial Support (Type & No. of months this year): ___________________________

Present Committee Members: _______________________________________________
_________________________________________________________________________
_________________________________________________________________________

(Screening, Guidance or Dissertation Committee?): __________________________

Date of Last Full Committee Meeting: __________________________

Anticipated (or Completion) Dates for:
   Screening Exam: ______________________
   Formation of Ph.D. Guidance Committee: ______________________
   Qualifying Exam: ______________________
   First Meeting of Dissertation Committee: ______________________
   Completion of Research: ______________________
   Dissertation Defense: ______________________

Please attach a brief summary of your progress during the past year
(some guidelines listed below; but feel free to add items)
  • BRIEF summary of research progress, problems, future plans.
  • List of all courses completed or audited.
  • TA duties.
  • Participation in lab and field research.
  • Meetings/workshops attended.
  • Seminars given (USC and elsewhere) include titles, locations, etc.
  • Manuscripts submitted, in press or published.

Signature of Student: _______________________________________________________
APPENDIX 1. MEB Relevant Courses

BISC Courses offered on the UPC

403 Advanced Molecular Biology (4 units)
419 Environmental Microbiology (4 units)
435 Advanced Biochemistry (4 units)
460 Seminar in Marine and Environmental Biology (2 units)
469L Marine Biology (4 units)
483 Geobiology and Astrobiology (4 units)
502ab Molecular Genetics and Biochemistry (4, 4 units)
510 Integrative and Evolutionary Biology (4 units)

530 Advanced Seminar in Plankton Biology (2 units) (Caron & Michaels)
531 Advanced Seminar in Physiology of Marine Organisms (2 units) (Gracey)
532 Advanced Seminar in Molecular and Microbial Ecology (2 units) (Fuhrman)
533 Advanced Seminar in Remote Sensing (2 units) (Kiefer)
534 Advanced Seminar in Population Genetics (2 units) (Edmands & Hedgecock)
536 Advanced Seminar in Marine Biogeochemistry & Microbial Ecology
   (2 units) (Capone & Ziebis)
582 Advanced Biological Oceanography (4 units)
[583 Biochemistry and Physiology of Marine Organisms (4 units)]
584 MEB Faculty Lecture Series (2 units) - Spring
585 Scientific Writing (2 units) (Michaels & Caron) - spring

Related Advanced Courses in Other Departments that can be used to meet course requirements

GEOL 412 Oceans, Climate and Environment (4 units)
GEOL 460L Geochemistry and Hydrogeology (4 units)
GEOL 500 Paleoeocology (3 units)
GEOL 501 Paleobiology (3 units)
GEOL 512 Introduction to Physical and Chemical Oceanography (3 units)
GEOL 514 Marine Geology (3 units)
GEOL 555 Paleo-oceanography (3 units)
GEOL 560 Marine Geochemistry (3 units)
GEOL 564 Isotope Geochemistry (3 units)
GEOL 567 Stable Isotope Geochemistry (3 units)
GEOL 577 Micropaleontology (3 units)
GEOG 587 GPS/GIS Field Techniques (Catalina Island Summer Source) (4 units)

PPD 694 Coastal Policy and Planning (4 units)

ENG 443 Environmental Chemistry (3 units)
ENG 463L Water Chemistry and Analysis (3 units)
ENG 503 Microbiology in Environmental Engineering (3 units)
ENG 513L Instrumental Analysis (3 units)
CTSE 507 Issues, History & Rationale of Science Education (McComas)
CTSE 509 Advanced Science Teaching Methods (McComas)

Statistics Courses

BISC 499: Statistics for the Biological Sciences (Waterman and Tavare- Fall 07)

PSYC 501 Statistics in Psychological Research (4, Fa) Principles of descriptive and inferential statistics for psychological research; introduction to analysis of variance and regression. Computer methods. Prerequisite: PSYC 274. (Wilcox)

PSYC 502 Analysis of Variance and Experimental Design (4, Sp) Experimental designs and their analyses of variance beyond straightforward factorial, nested, or repeated measures designs. Prerequisite: PSYC 501.

PSYC 503L Regression and the General Linear Model (4, Fa) Multiple regression as a tool in experimental and non-experimental data; analysis of variance and covariance as regression on coded variables. Computer applications Laboratory exercises. Prerequisite: PSYC 501.

HP 340L Health Behavior Statistical Methods (4, FaSp) Intermediate statistics for health behavior studies; topics include descriptive statistics, hypothesis testing, correlation and regression, and use of computer software in data analysis.

HP 510L Principles of Biostatistics (4) Concepts of biostatistics; appropriate uses and common misuses of health statistics; practice in the application of statistical procedures; introduction to statistical software including EXCEL, SPSS, nQuery. Laboratory.

HP 511abL Data Analysis (4-4, a: Fa, b: Sp) a: Major parametric and nonparametric statistical tools used in biomedical research, computer packages including SAS. Includes laboratory. Lecture, 3 hours; laboratory, 1 hour. Prerequisite: PM 510L. b: Exploratory data analysis, detection of outliers, robust methods, fitting data with linear and nonlinear regression models, computer packages including BMDP. Includes laboratory. Lecture, 3 hours; laboratory, 1 hour. Prerequisite: PM 511aL.
Catalina Semester Courses:

419L Environmental Microbiology (4, F)
499L Molecular Approaches to Microbial Diversity (4, F)
474L Ecosystem Function and Earth Systems (4, F)

447L Natural History and Island Ecology (4, Sp)
373L Conservation Biology (4, Sp)
437L Comparative Physiology of Marine Animals (4, Sp)

490 Independent Research (4, F, Sp)
590 Independent Research (4, F, Sp)
REQUIREMENTS AND POLICIES GOVERNING
THE GRADUATE PROGRAM IN MARINE ENVIRONMENTAL BIOLOGY

Revised October, 2007; Applies to students entering in Fall 2008

The Graduate Program in Marine Environmental Biology & its Administration

Introduction

Graduate students in the Graduate Program in Marine Environmental (referred to subsequently as "GPMEB" or the "Program") may pursue a Ph.D. degree.

At the University of Southern California, graduate education is the responsibility of the Department, but the University's Graduate School establishes minimum requirements concerning grade point average, number and distribution of units, residency, time limits, etc. that are common to all advanced degrees offered within the College of Letters, Arts and Sciences at the University. Specific courses, examinations, skills, and research requirements are established by the student's program of study, in this case the Graduate Program in Marine Environmental Biology. Collectively, both sets of regulations constitute the student's "degree requirements," all of which must be met by the student.

Graduate School regulations are listed in the current University of Southern California Catalogue somewhat confusingly, one part of these are scattered in the section on "Academic Policies and Information" near the beginning of the USC Catalogue and the rest are found near the middle of the USC Catalogue under "The Graduate School." Those regulations, which most commonly affect GPMEB students, are included in this document, but this listing should not be considered definitive.

GPMEB regulations are listed in this document; the major requirements of degrees in the GPMEB are also listed in the USC Catalogue under "Department of Biological Sciences."

Program Administration--The Graduate School

The Graduate School maintains the University's official Permanent Graduate Student File and is ultimately responsible for admission of our graduate students and the awarding of their degrees. As noted above the Graduate School establishes requirements concerning grade point average, number and distribution of units, residency, and time limits that are common to advanced degree programs in all units under their jurisdiction, including the Department of Biological Sciences.

Official forms are used to track a student's progress by The Graduate School and completion and submittal of these usually is to be at a specified point in the student's tenure. Timetables for the completion of degree requirements are available at The Graduate School. The schedule for the Ph.D. student's final and penultimate semesters is especially detailed and needs to be adhered to closely.

All Graduate School forms prepared by or on behalf of the student must be approved by the Director of the Program or by the Chair of the Department before their submittal to the Graduate School. All Graduate School forms are available online at http://www.usc.edu/schools/GraduateSchool/current_guidelines_forms.html or from the Graduate Programs Manager, Linda Bazilian. Please turn in all forms to Linda Bazilian who will submit them to the proper office on your behalf.

Graduate Student Representatives

In late spring, GPMEB students select two graduate students to serve as Graduate Student Representative and Alternate Graduate Student Representative for the coming academic year. To be eligible for the posts, both students must have passed their Qualifying Examination. The Alternate will represent the graduate students in the Graduate Student Representative's absence or by the latter's appointment. The Graduate Student Representative has one vote in meetings of the GPMEB Faculty
representing the opinions of the graduate students.

The Graduate Student Representative has no voting power in either the continuation of fellow graduate students or in the Qualifying Examination. At the option of the student examined, the Graduate Student Representative may also be present during the oral part of the Qualifying Examination.

**Graduate Programs Manager of GPMEB**

The Graduate Programs Manager of GPMEB is the staff member responsible for processing and maintaining graduate student files; serving as liaison between the students, GPMEB Faculty, and the Graduate School; and making available application materials, Graduate School Forms, and other relevant documents. A permanent Department file on each student is maintained in the Marine Environmental Biology Program Office.

**Student Advisement and Guidance**

**The First Year Advisor; Initial Advisement and Evaluation by Student's Advisor**

Most students have a first-year advisor who is identified in the acceptance letter. This initial advisor may be replaced by another faculty member with whom the student has closer research affiliations at the request of the student and with the approval of the new advisor. If an incoming student has not chosen an advisor, this should be a priority during the first semester.

The Program provides an initial orientation for all incoming students. During registration week of a graduate student's first semester, the student's initial advisor meets with the student to review his/her previous course work and experiences and to discuss career objectives. A primary purpose of this initial interview is to identify major deficiencies in a student's preparation and to suggest means of remediaying any such deficiencies.

**Screening Committee**

Advisors and members of the Screening Committee, a standing MEB faculty committee, meet with incoming students, as soon as possible, to evaluate the student’s background and make recommendations for developing a solid base in marine biology. The Screening Committee administers the Screening Examination near the end of the student's second semester of graduate work at USC, and before the student has taken more than 24 units. The Screening Committee, together with the advisor, is responsible for the student's advisement and guidance until the five-member Ph.D. Guidance Committee is established. Each student's performance will be reported in writing on the GPMEB's *Report of the Screening Committee*.

**Requirements for the Ph.D. Degree**

**Time Schedule**

All course requirements for the Ph.D. degree are normally completed within three calendar years from the date on which the student took his/her first course at USC and must be completed within eight calendar years from that time.

**General Requirements**

A total of 60 units must be completed for the Ph.D. Degree.

**Course Requirements--Core courses**

Three core courses are currently required: BISC 582 (Advanced Biological Oceanography), BISC 584 (MEB Faculty Lecture Series), and BISC 585 (Scientific Writing). The first two courses should be taken during the student’s first year at USC; BISC 585 is open to second year students only. Students are
also required to take 4 units of BISC 529 (MEB Seminar) and four advanced graduate seminars (8 units total). Finally, students are required to take an approved course in statistics (e.g. PM 510L).

Students must receive a grade of B or better in each core class and maintain a cumulative Grade Point Average of 3.0 or above in all coursework.

**Official Guidance Committees**

A five-person Ph.D. Guidance Committee should be established soon after the screening exam, but no later than the fourth semester of enrollment for a student seeking a Ph.D. degree. After the student passes the Qualifying Examination, the Ph.D. Guidance Committee is dissolved and a new Dissertation Committee is formed.

**The Student and His/Her Responsibilities**

The student is ultimately responsible for his/her graduate career and must be familiar with Graduate School and GPMEB requirements and responsible for their timely completion.

If a student's needs are not being met, he/she should seek redress, using the following chain of command: advisor, advisory committee (screening, guidance, dissertation), Director of the Program, Department Chair, and Graduate School.

In addition to all other rules, the University has established codes of conduct to which all students must adhere. One aspect of graduate training -- service as a teaching assistant -- places them in a position of power over undergraduate students. The position implies added responsibilities and liabilities, especially in respect to such matters as fairness, equal treatment, sexual harassment, etc. Information on University policies concerning conduct is available in *SCampus*. Further information or sources of information may be obtained from the Department office.

**Formal Graduate Seminars**

Students must complete a minimum of four (4) 2-unit graduate seminars. Because a critical feature of such seminars is exposure to current literature, all four required seminars must be completed during the student's tenure at USC. With the written permission of the student's committee, a formal course completed at another institution may be counted as one of the four required seminars (the course must have been completed during the student's tenure here, however).

**Research Tool Requirement**

Proficiency in statistics is a necessary skill for all scientists. Satisfactory skill level may be demonstrated by

a) completion (grade of B or better) of a course approved by majority vote of the Marine Environmental Biology Program faculty.

b) acceptance of course work previously completed either at USC or elsewhere. The acceptability of a previously completed course will be made by an examiner selected by the Marine Environmental Biology Program faculty.

A rigorous grad level course in Biostatistics is available at the Medical School in the Department of Preventive Medicine, PM 510L. Permission is needed from the PM Department. A free shuttle bus runs routinely between the University Park and Med School Campuses. Other statistics courses are listed in the appendix.

**Research Units**

BISC 790 Research units are normally taken whenever the student is conducting his/her doctoral
research. Dissertation research will normally take the equivalent of about 2.5-3 years of full time work, but the number of research units taken usually does not reflect this. Typically advanced graduate students will take 6 units of 790 and possibly a 2-unit seminar each semester.

Grade Point Average Requirements

Students must maintain a grade point average of at least 3.0 in all courses taken at USC, in conformity with regulations of the Graduate School; work graded C- or below is not acceptable for either subject or unit credit. In addition to the overall GPA requirement, students must achieve at least a B- in each core and skill course.

If a student's cumulative grade point average falls below 3.0 at any time, the student will be placed on departmental academic probation. The cumulative average must be raised to 3.0 by the completion of the next two semesters of registration at USC in courses approved by the student's guidance committee. Note: this may require that the student take additional formal and/or seminar courses since directed research and dissertation units are on a Pass/No Pass basis and are not computed into the GPA. If the student does not improve his/her overall GPA to 3.0 within this period, the student will be dropped from the program. A student who has been removed from probation but subsequently fails to meet the scholarship requirement is subject to termination (will be terminated) from the program.

Marine Program Noon Seminar Series

Students must regularly attend the Marine Environmental Biology Noon Seminar series throughout their tenure at USC. In addition to attending other seminars, each student presents a 20-minute seminar on his/her current research once each academic year, beginning in their second year. Attending faculty will provide short written evaluations of the seminar to help students in improve their public speaking skills. (See “Forms” section).

BISC 794 Doctoral Dissertation

After a student successfully completes the Qualifying Examination and is therefore a formal candidate for the Ph.D., he/she must register for BISC 794 Doctoral Dissertation each semester except summer. The student would sequentially register for BISC 794a, 794b, 794c, 794d in the first four semesters after completing the Qualifying Examination, and then BISC 794z each subsequent semester as needed. Students must have at least 4 units of 794 credit, but can receive no more than 8; hence BISC 794a-794d are valued at 2 units and BISC 794z at 0 units.

Other Course and Unit Requirements

Additional formal course requirements may be established by the Section and/or by the student's guidance committee and/or on advice of the committee, which evaluates the student's preparation in the Screening Examination.

The minimum number of units required for the Ph.D. by the Graduate School is 60. Units must include 4, but no more than 8, units of BISC 794 credit and may be completed with other formal classes or BISC 790 work.

The student must be registered at USC during the semester that the dissertation is submitted.

Teaching Assistantship Requirement

Graduate students pursuing the Ph.D. in the GPMEB must serve as a teaching assistant for at least two semesters; ideally, the student should serve in at least two different courses.
**Screening Examination**

The Graduate School requires a Screening Examination. The exam is oral, about one hour in length, and must be taken before the student has completed 24 units of graduate work at USC. The Screening Committee administers the exam. The purpose of the meeting will be to evaluate the student's preparation, determine competence to continue graduate study, and point out deficiencies to be remedied prior to the Qualifying Examination. Prior to the exam, the student submits a 1-2 page document outlining his/her activities during the previous year and present research interests. At the exam, the student presents a short (5-10 minute) description of their academic background and research interests.

The topics covered in the Screening Examination include:

- a summary by the student of their research while at USC
- biotic diversity, classification, and life histories
- organismal evolution and phylogeny; molecular evolution
- structure and physiology of cells and organisms
- biochemistry
- Mendelian, population, and molecular genetics
- biological, chemical, and physical oceanography
- statistics, experimental design, modeling and theoretical biology
- ecology and environmental sciences.

Each student's performance will be reported in writing to the student. A copy is placed in the student's file.

**Guidance Committee**

**Composition of the Guidance Committee**

The student's program of study is under the direction of the student’s advisor and a five-member Guidance Committee that must be established at least one semester before the student takes his/her Qualifying Examination. Members of the Guidance Committee and its Chair are proposed to the Graduate School via the Appointment of Committee form by the student, with the advice and consent of the student’s advisor. Therefore, the student should request appointment of the committee as soon as possible after the screening exam but certainly before the end of his/her third or fourth semester of enrollment in the Ph.D. program.

The composition of the guidance committee must meet the following guidelines:

a) One member of the committee must be a tenured or tenure-track professor from a Ph.D. granting department at USC other than Biological Sciences. This “outside member” serves as the representative of the Vice Provost for Graduate Programs. For information see: [http://www.usc.edu/schools/GraduateSchool/documents/StuServices/Role_of_Outside_Member.pdf](http://www.usc.edu/schools/GraduateSchool/documents/StuServices/Role_of_Outside_Member.pdf)

b) Normally, the other four members of the committee are tenure-track faculty of the Marine Environmental Biology Section of the Department of Biological Sciences, but one of the members may be from another Section in Biological Sciences, and at least one must be tenured. The chair of the committee must be from the Marine Environmental Biology section. Co-Chairs are normally not permitted unless required by the Vice Dean of the College, Office of Graduate Programs (see next paragraph). The student’s advisor cannot be a member of the Guidance Committee but may attend and observe the Qualifying Examination and the subsequent executive session, in which the student’s performance is evaluated.
In exceptional cases of academic merit, a person not meeting the above guidelines may be approved by the Graduate School to serve on a Guidance Committee. To request such an exception, the student must submit to the Graduate School a current Curriculum Vitae of the proposed member and a letter from the chair of the committee citing the particular expertise of the person and the relevance of the requested appointment along with the Appointment of Committee form. A specially approved member may not serve as the outside member (see below) or as sole chair of the committee, but may serve as a co-chair with a regular faculty member of the Marine Environmental Biology section. A guidance committee may include no more than one specially approved member unless the size of the committee is enlarged past five.

Request for changes in the composition of the Guidance Committee must be made in writing by the student to the Program. If approved, the committee is officially changed using the Graduate School's Request for Change of Committee form.

If the chair of the Guidance Committee will be absent from campus for any extended period of time (e.g., on leave) (s)he must appoint a temporary chair. The permanent chair will continue as a member of the Committee during his/her absence and will be in communication with the Guidance Committee. If the permanent chair must be absent at the time of the Qualifying Examination or the defense of the dissertation, a petition for formal appointment of a temporary chair must be submitted to the Graduate School.

Responsibilities of the Guidance Committee

The Guidance Committee is responsible, in consultation with the student’s advisor, for preparing the student for the Qualifying Examination. The Guidance Committee is responsible for the evaluation of the student’s performance on the Qualifying Examination. Specific responsibilities include:

a. Meeting with the student and the student's advisor to evaluate progress towards meeting the recommendations of the Screening Committee and preparedness to take the Qualifying Examination.

b. Monitoring the student's compliance with deadlines leading to the Qualifying Examination.


d. Administration and evaluation of the written and oral parts of the Qualifying Examination.

Qualifying Examination

Prerequisites for the Qualifying Examination

During the semester the exam is taken, the student must be enrolled in a departmental graduate course or GRSC 800. Permission to enroll in GRSC 800 is needed from the Graduate School. Students may register for GRSC-800 up to three times without having to petition. However, students are strongly encouraged to complete the qualifying examination during the first semester of GRSC 800. The GPMEB requires that students have completed:

a) All required core courses, each with a minimum grade of B.

b) At least two graduate seminars.

c) The statistics research tool requirement.

d) Removal of inadequacies noted in the screening examination.

f) Completion of the Request to Take Ph.D. Qualifying Examination form.

Depending on how the above requirements were met, the student may have to take additional course work to satisfy the Graduate School requirements that students have completed at least 24 units of course work applicable to the degree while in residence and with a minimum cumulative GPA of 3.0.
Timing of the Qualifying Examination

The Qualifying Examination is normally taken during the student's fifth semester in the Ph.D. Program and must be taken before completion of his/her sixth semester.

Components of the Qualifying Examination

The Qualifying Examination consists of a written and an oral part. The student's Guidance Committee conducts and evaluates both parts.

The Written Examination

The written examination will consist of four or five sets of questions distributed over two consecutive days. This examination can be taken on a laptop computer supplied by the committee chair (i.e., the student cannot use their own computer). Each Guidance Committee member (with the possible exception of the "outside member" whose participation is optional here) submits three questions; the student must answer two of this set, spending about equal time on each and having a maximum of two hours per set. The order in which the sets of questions are taken is at the student's option.

Questions will be comprehensive in scope with respect to the student's chosen area of specialization and will be designed to test the student's conceptual, analytical and integrative ability and preparation.

Each member of the Examination Committee will grade his/her question on a scale of 1.0-5.0 using 0.5 unit steps if necessary (1.0 as poor and 5.0 as exceptional). The examination result will be calculated by averaging all the grades. A mean score of 3.3 or above for all questions is passing; below 3.0 is failing. Cases where the mean is between 3.0 and 3.3 or where two or more questions are graded below 3.0 are evaluated by the Guidance Committee followed by a vote, using a secret ballot. More than one negative vote of the Guidance Committee will result in failure of the student to pass the written examination.

The written part of the Qualifying Examination must be taken before (normally 2 weeks before) the oral examination described below. The results of the written examination and the oral examination are given only at the completion of the oral examination.

The Research Proposition (The Fifteen Pager) and its Preliminary Approval

Proposition Abstract

At least two months before the anticipated date of the oral examination, the student should meet with his/her Guidance Committee and provide them with a 1- or 2-page Research Abstract of the anticipated research program to be presented in the Research Proposition. The purpose of this meeting is to ascertain whether the anticipated research constitutes a defensible dissertation topic so that the student does not develop a detailed plan for a research program that has serious flaws and probably cannot be successfully defended in the oral examination. If the committee has reservations, modifications that are mutually satisfactory to the student and the committee can be worked out during this meeting or the student can be asked to submit a revised or new abstract.

Upon approval of the Proposition Abstract by the Guidance Committee, the student will develop it into a formal Written Proposition. This is to be in the form of a grant proposal and should include a short historical introduction, a statement of the problem and its significance, one or more hypotheses (if appropriate), the research design, anticipated results, methods to be used in interpretation of the results, and pertinent references. The treatment should be concise and should not exceed 15 double-spaced pages, including tables and figures but not references. The Written Proposition must have 1-inch margins all around, use an approved typeface (Arial, Courier New, or Palatino Linotype at a font size of 10 points or larger [Macintosh users also may use Helvetica and Palatino typefaces], Times New Roman at a font size of 11 points or larger, or Computer Modern
The Oral Examination

The oral examination will be in the area of the student's intended research and will be based on a research project selected and developed by the student into a Research Proposition.

The oral examination is usually taken two weeks after and must be taken within one month of the written examination. At least two weeks before the date of the oral examination, the student must submit one copy of the Research Proposition to each member of the Examination Committee and one copy to the Marine Program's Student Affairs Administrator for the student's permanent file.

The oral examination will be conducted and evaluated by the student's full 5-member Guidance Committee. Typically, the Committee meets briefly without the student to review the student's course work, other preparation and progress; to review the student's performance on the screening examination (copies of the student's transcript and Screening examination report should be obtained for each committee member from the Graduate Student Administrator by the Chair); and to agree on the exact format and order of questioning during the oral examination. Subsequently, the student typically presents the highlights of the research proposition in 15 minutes or less. Then members of the committee ask two or more rounds of questions. The questions are largely focused on the student's ability to conceive, conduct, evaluate of independent research and to communicate the results of such work. However, the oral examination is not limited to the context of the Written Proposition; as specific examples, questions are often asked a) from the written examination and b) concerning the removal of deficiencies identified during the Screening Examination.

On completion of the examination, the Guidance Committee meets in executive session (without the student) to evaluate the student's performance on the oral examination. Each member has one vote, pass or fail. More than one negative vote will result in failure of the student to pass the examination.

At the end of the executive session, the student is notified of the results on the two portions of the Qualifying Examination. Although one could pass both oral and written exams, only one of these exams, or neither exam, the student passes the Qualifying Examination (as a whole) only if his/her performances on both the written and oral portions are satisfactory. If the student passes both the oral and written examinations, he/she is indicated to have passed the Qualifying Examination on the Graduate School form Report on Ph.D. Qualifying Examination.

If the student fails the written examination or the oral examination or both, the committee must indicate that the student failed the Qualifying Examination on the Graduate School form Report on Ph.D. Qualifying Examination. The committee must make recommendations concerning the student's continuation in the graduate program. The committee usually grants the student a second chance to pass the failed portions (either part satisfactorily completed in the first examination does not have to be retaken), but may recommend that the student not repeat the exam or even deny a second chance (the latter action would be appealed to the Graduate School). The second attempt is a final one and can be taken no sooner than six months or later than twelve months after the initial failure.

Admission to Candidacy

After the student passes the Qualifying Examination, the Guidance Committee recommends to the Graduate School that the student be admitted to candidacy for the Ph.D. Degree. Following admission to candidacy the student must register for BISC 794 Dissertation every semester, except summers, until the degree is awarded.

After the Qualifying Examination has been passed, the Guidance Committee will be dissolved and a Dissertation Committee requested via an Appointment of Committee form. The Dissertation Committee will comprise the student’s advisor, serving as Chair, an outside member as required by
the Graduate School, and two members of the GPMEB. The GPMEB does not allow the reduction of the Guidance Committee to a three-member Dissertation Committee as permitted by the USC Catalogue, except under special circumstances. If these circumstances are met, at least 2 members must be from the GPMEB).

Research

A student must undertake original investigation of a selected problem in marine biology or biological oceanography. This is normally based on the Written Proposition as presented in the Qualifying Examination, subject to acceptance by the student's committee. Subsequent changes of research direction or content must have advance approval by the student's advisor and Dissertation Committee.

Research Prior to Admission to Candidacy

Students in the GPMEB are encouraged to conduct research at their earliest opportunity. Credit may be obtained for this research by registering for BISC 790. Ideally, this early research will develop into an appropriate dissertation topic. Certainly, the student will find it difficult to develop and defend a Research Proposition without significant exposure to research in general and the specific problem in particular. Such preliminary research should be based on a detailed plan prepared by the student and approved by his/her advisor.

Research Subsequent to Admission to Candidacy and its Relationship to the Written Proposition

As noted above, dissertation research is normally based on the Written Proposition as presented in the Qualifying Examination, subject to its acceptance by the student's committee. Difficulties frequently force revision of the planned study. The student's Dissertation Committee must approve in advance any such changes of research direction or content.

Publication Prior to Submittal of the Dissertation

Prompt publication of research results is very strongly encouraged in the GPMEB. Students should organize their research efforts into blocks that a) can be completed in sequence, and b) represent topics for separate future papers so that submittal of one or more papers can be completed during their graduate tenure. Advisors often require students to submit one or more papers before completing their dissertation.

Authorship of such papers is significant. If the student is the sole author or if the student is the first author with the advisor as the only additional author, it implies that the student did most if not all of the research and hence the entire contents of the paper may be acceptable for incorporation into the dissertation. If the advisor contributed significantly to the research or if other individuals (other graduate students, faculty, post docs, research technicians, etc.) are co-authors, only that part of the paper which represents the student's work may be incorporated into the student's dissertation.

A published work may be incorporated into the body of the dissertation but may not be appended in the form of a reprint according to Graduate School regulations. The student is advised to seek the approval of the dissertation committee before submittal of a manuscript that is to be included in the dissertation since that committee must ultimately approve all contents of the dissertation. The fact that material has been submitted (accepted, published) does not mean that it will be allowed to be incorporated without revision by the committee.

Preparation and Defense of the Dissertation

A dissertation represents a significant contribution to science that is based on an original research program completed by the student. Determination of the adequacy of the research program is the sole responsibility of the student's Dissertation Committee. Approval of the dissertation itself is primarily the responsibility of the student's Dissertation Committee, but the completed dissertation must also be
examine by the Thesis Editor of the Graduate School to determine if it meets the grammatical standards and other requirements described in *Guidelines for the Format and Presentation of Theses and Dissertations* published by the University of Southern California and available online at [http://www.usc.edu/schools/GraduateSchool/current_thesis_dissert_05.html](http://www.usc.edu/schools/GraduateSchool/current_thesis_dissert_05.html). Additional regulations and information on the organization and preparation of the dissertation are provided in *Directions for Preparation of Dissertations and Research Reports as Required by the Graduate Program in Biology/University of Southern California*. Students should obtain a copy of both sets of regulations before they initiate their writing.

GPMEB students defend an advanced draft of the dissertation rather than a "final" copy typed on dissertation paper. The advanced draft should be complete, including all text, figures, tables, references, etc. and the draft must be in a suitable form for final typing. Before assembly of a complete draft is initiated, the student should confer with his/her full committee to determine whether adequate research has been completed.

The student's advisor is the individual responsible for determining whether or not a draft is sufficiently refined for distribution to the full Dissertation Committee. Portions or all of earlier drafts may be submitted to some or all of the committee members for suggestions and evaluation at any time. The thesis draft to be defended must be given to the Dissertation Committee at least one month prior to the thesis defense date.

Presentation and oral defenses of the dissertation are achieved in a formal seminar open to all members of the academic community and in a closed meeting of the student and the Dissertation Committee.

Since the final copy of the dissertation must be uploaded to the Graduate School and Library at least three weeks prior to the end of the term in which the degree is to be granted and since the student must allow adequate time after the defense for corrections and final typing, the defense should be scheduled at least six weeks before the end of the term in which the student plans to graduate.

Before undertaking the Dissertation Defense, the student must have completed (or be in progress of completing) all other degree requirements.

The Chair of the Dissertation Committee is required to notify the Student Affairs Administrator of the Marine Program of the date, time, and place of the defense of the dissertation, so that a notice of the Dissertation Seminar and Defense may be distributed to all faculty and graduate students of the Department at least two weeks in advance. The date selected for this defense cannot be on an official University holiday (e.g., Labor Day, President's Day, etc.).

The open oral defense of the dissertation is achieved in a formal 50-minute "research" seminar such as would be given by a visiting scholar. The presentation is open to the public and the student should be prepared to answer all questions from members of the audience, including those on the Dissertation Committee. The period of questioning is not to be limited in time.

The dissertation is also subject to a detailed defense made before the full Dissertation Committee in a meeting that is usually held shortly after the conclusions of the seminar. At this meeting, which is typically two-three hours in length, the Dissertation Committee must critically evaluate the dissertation and determine whether or not it is to be accepted. To be acceptable, the dissertation must represent a major, original contribution to science.

Only members of the Dissertation Committee may vote whether to pass or fail the student (accept or reject the dissertation and its open defense in the seminar). A vote to pass the student must be unanimous and such a vote does not preclude that the committee may require modifications of the dissertation. Reasons for failure of the defense should be clearly identified by the committee and may include a) a flawed research plan, b) nonconclusive or inadequate research results, c) major deficiencies in the dissertation, etc. A student who fails the defense the first time is normally given a second opportunity,
but any decision on re-examination is at the discretion of the Dissertation Committee.

If the defense is satisfactory and no major revisions of the dissertation are required, all members of the Dissertation Committee sign the **Approval to Submit Defended and Final Copy of Doctoral Work form**, which is submitted to the Graduate School. If significant revisions of the manuscript are required, the **Approval** form is not signed until such revisions are completed. The Chair of the Dissertation Committee may be assigned full responsibility for determining that the required revisions have been made, but some or all other members of the committee may request that they also be involved in the final approval. The signed **Approval** form signifies approval of the dissertation and defense by the committee.

**If the Approval form is signed and dated by the drop/add deadline for FALL or SPRING, no further registration is required.**

Once the student has successfully defended the dissertation, a dissertation profile should be created on the Graduate School web site [http://grad.usc.edu/WebThesis/](http://grad.usc.edu/WebThesis/) as well as completion of the document checklist process. When approved, the manuscript can be uploaded in PDF format for review by the editing staff. The student also needs to prepare and upload an abstract of the dissertation.

The **SIGNATURE PAGE** is bound with the dissertation to verify that the dissertation has been approved by the Committee and accepted by the Graduate School. Signatures required on this form are those of the Committee and the Graduate School.

In addition to the original copy required by the Graduate School, one hardbound copy of the dissertation must be presented to the Department of Biological Sciences and another to the chair of the student's (Guidance and) Dissertation Committee.

The student must pay a Publication and Processing Fee in the University’s Cashier’s office and submit a receipt of payment to the Graduate School upon submitting the dissertation.

The **SURVEY OF EARNED DOCTORATES** must be completed and returned to the Graduate School for approval.

The **Verification of Completion of the Requirements for the Doctoral Degree** form must be signed by the Chair of the Department of Biological Sciences. The signed **Verification** form signifies completion of all departmental degree requirements and all University degree requirements. Most important of all, it indicates that the degree has been cleared for conferral. The completed **Verification** form is submitted by the Graduate Programs Manager to the Graduate School for approval. Once the Graduate School has received and approved the form, you have officially graduated!
COURSES AVAILABLE IN MARINE ENVIRONMENTAL BIOLOGY

BISC 582 Biological Oceanography (Core Course), offered each Fall (Sañudo Wilhelmy, Fuhrman, Kiefer teaching Fall 2008)
(4 units)

BISC 584 Faculty Lecture Series, offered each Spring (MEB Faculty)
(2 units)

BISC 585 Scientific Writing and Reviewing, offered each Spring (Caron & Michaels)
(2 units)

BISC 529 Marine Environmental Biology Seminar
(1 unit; 4 units required, maximum)

Advanced Graduate Seminars, offered on a rotating basis; check current Schedule of Classes
(2 units each; 8 units required)

530 Plankton Biology (Caron & K. Heidelberg, Schnetzer) F08
531 Physiology of Marine Organisms (Gracey, Manahan) S08
532 Molecular and Microbial Ecology (Fuhrman) S08
533 Remote Sensing and Modeling (Kiefer) S08
534 Population Genetics of Marine Organisms (Edmands & Hedgecock) F07
536 Marine Biogeochemistry & Microbial Ecology (Capone & Ziebis) F08
599 Ocean Optics (Jones) S08
599 Communicating Ocean Science (Jacobsen, Michaels, Sullivan) F08
‘Quick Check List’ of Student/Advisor Responsibilities

First Month (Late Summer/Early Fall; ASAP, before classes get going)
Each student meets with the "Screening Committee" (same composition as the Admissions Committee for that year, plus the student’s advisor). This committee will be the same one that administers the Screening Exam at the end of Year 1. The Screening Committee evaluates each student’s background and advises on courses to be taken in the first 1/2 years to develop each student’s background in marine science (and specific area of interest).

By the End of Year 1 (Summer)
Student completes the Screening Exam, which tests the student’s general scientific knowledge, and identifies weaknesses that need to be addressed. The student will receive written comments from the committee on the “Screening Examination Results” form.

Beginning of Year 2 (Fall)
Student and advisor compose and request appointment of a Ph.D. Guidance Committee, which meets with the student near the beginning of the second year. Prior to the meeting, the student submits a (at least) 1-2 page document outlining his/her proposed research. Following a brief presentation by the student, the committee provides feedback, which includes a second review of the student’s coursework and training, and any appropriate recommendations for further course work or directed study.

Year 3
The student must complete the Qualifying Examination (as described in “Requirements and Policies” document) by the end of Year 3. At least one month prior to the exam, the student completes the “Request to Take Ph.D.Qualifying Examination” form (available online). At least two months prior to the exam, the student must submit a thesis proposal (the fifteen-pager) to the Guidance Committee and obtain permission to proceed to the exam. The Chair of the Guidance Committee should obtain the student’s file for the Qualifying Examination. A “Report on Ph.D. Qualifying Examination” form will be in the file for all committee members to sign.

Years 3-5
Following successful completion of the Qualifying Examination, the Ph.D. Guidance Committee is dissolved and a new Dissertation Committee is requested. The student meets at least annually with the committee. A short memo describing the students’ progress (signed by all committee members) is submitted to the Section office following each annual meeting.

Additional Annual Requirements:
Yearly Seminar: Each student must present a 20-minute seminar once each academic year beginning in their second year.
Yearly Progress Reports: On or by May 15th, each student will complete and submit to the Section office a brief progress report (signed by each member of their Guidance or Dissertation Committee) detailing their activities during the previous 12 months (courses taken, research undertaken, seminars given at USC and elsewhere, participation in cruises, etc.). Forms for these reports will be emailed to students each summer as a reminder.
Report of the Graduate Screening Committee

Committee members: __________________________   __________________________

__________________________   __________________________

__________________________   __________________________

__________________________   __________________________

Student: __________________________

Faculty Advisor: __________________________

Attached are the results of the screening evaluation. A copy of this evaluation will be placed in the student’s permanent file.

Explanation of the evaluation:

The committee seeks to evaluate the general undergraduate-level background of each student in a broad range of topics in biology. While our coverage is necessarily cursory and superficial, we believe that the format is sufficient to reveal the student’s preparation. We rate the student in each of the subject areas as:

**Good.** Better than average grasp of the topic. This level of understanding is expected of all students in topics near their chosen field of specialty. With continued normal study in and outside of the classroom, the student is on the right track for their professional career.

**Adequate.** Minimal acceptable grasp of the topic. This level is expected of all students in those topics that are outside of their area of concentration. For topics near one’s specialty, this rating may be considered below that preferred at this stage in the student’s studies. With extra attention to these areas, the student should be developing to broaden their knowledge in this topic.

**Inadequate.** Below the minimal grasp of a subject area. Students MUST strive to exceed this level in all areas covered. This rating represents a deficiency, and the student should recognize that a greater than normal effort must be devoted to studying and gaining a grasp of terms and concepts in this field.

We emphasize that the screening exam is advisory. Doing well does not guarantee the student an easy time on future exams, nor does doing poorly guarantee an especially hard time for you. Indeed, it is the goal of this process to offer guidance that will enrich your career development in science, not just to pass any upcoming test.
Screening Evaluation Report Sheet

Student: ___________________________  Date: ___________________________

<table>
<thead>
<tr>
<th>TOPICS</th>
<th>COMMENTS</th>
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<tbody>
<tr>
<td>1. Evolutionary Biology</td>
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<tr>
<td>a. Phylogeny and classification</td>
<td></td>
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<tr>
<td>b. Plant and animal diversity</td>
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<tr>
<td>c. Functional morphology</td>
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<tr>
<td>d. Life history strategies</td>
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<tr>
<td>2. Genetics</td>
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<tr>
<td>a. Mendelian</td>
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<td>b. Molecular</td>
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<tr>
<td>c. Population</td>
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<tr>
<td>3. Biochemistry</td>
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<tr>
<td>a. Structural</td>
<td></td>
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<tr>
<td>b. Functional</td>
<td></td>
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<tr>
<td>c. Metabolism (incl. respir. &amp; photosyn.)</td>
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<tr>
<td>4. Physiology</td>
<td></td>
</tr>
<tr>
<td>a. Cellular</td>
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<tr>
<td>b. Systems</td>
<td></td>
</tr>
<tr>
<td>c. Organismic</td>
<td></td>
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<tr>
<td>5. Ecology</td>
<td></td>
</tr>
<tr>
<td>a. Organismic</td>
<td></td>
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<tr>
<td>b. Population, species</td>
<td></td>
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<tr>
<td>c. Systems, cycles</td>
<td></td>
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<tr>
<td>6. Quantitative skills and reasoning</td>
<td></td>
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<tr>
<td>a. Units</td>
<td></td>
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<tr>
<td>b. Equations</td>
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**Course of Action:**

If you received a rating of *Good* in your specialty and *Adequate* in other areas, continued attention and normal growth in these topics through classroom, library, and laboratory work will probably be proper preparation.

*Adequate* in your specialty suggests that you should seek specific opportunities to increase your familiarity in and grasp of these areas. Especially good options include participating/auditing/TAing an undergraduate course covering this area, as suggested by the committee, and focusing on graduate seminars and readings.

*Inadequate* suggests specific remedial action. Specific attention should be paid by the student and the advisor to address these potential problem areas. At a minimum we expect you to understand at the level of the freshman biology text now in use. You will want to read the appropriate chapters of that text. TAing a general class on the deficient topic will provide an opportunity to attend lectures and read the textbook, more than needed for general TAing duties. In many cases, formally taking an undergraduate class (if available) may be the appropriate action. Few students are well prepared across the board, and 8 units of undergraduate classes at the 400-level are fully acceptable for graduate credit.

In all cases, regardless of your evaluation, use this time to think a bit about how you approach the various academic opportunities you are encountering. In our experience, successful graduate students all make a transition from an “undergraduate mentality” to a graduate “professional mentality”. Part of this transition involves taking responsibility for your own development and maturation as a scientist. Seek to build a unified conceptual framework.

**Suggested Remediation:**

**Timeline to completion:**

**Other comments:**
APPENDIX 1. MEB Relevant Courses

BISC Courses offered on the UPC (other than MEB graduate courses listed above)

- 403 Advanced Molecular Biology (4 units)
- 419 Environmental Microbiology (4 units)
- 435 Advanced Biochemistry (4 units)
- 450 Principles of Immunology (4 units)
- 460 Seminar in Marine and Environmental Biology (2 units)
- 469L Marine Biology (4 units)
- 483 Geobiology and Astrobiology (4 units)
- 502ab Molecular Genetics and Biochemistry (4, 4 units)
- 510 Integrative and Evolutionary Biology (4 units)
- 549 Seminar in Integrative and Evolutionary Biology (2 units)

Related Advanced Courses in Other Departments that can be used to meet course requirements

- GEOL 412 Oceans, Climate and Environment (4 units)
- GEOL 460L Geochemistry and Hydrogeology (4 units)
- GEOL 500 Paleocology (3 units)
- GEOL 501 Paleobiology (3 units)
- GEOL 512 Introduction to Physical and Chemical Oceanography (3 units)
- GEOL 514 Marine Geology (3 units)
- GEOL 555 Paleo-oceanography (3 units)
- GEOL 560 Marine Geochemistry (3 units)
- GEOL 564 Isotope Geochemistry (3 units)
- GEOL 567 Stable Isotope Geochemistry (3 units)
- GEOL 577 Micropaleontology (3 units)

- GEOG 587 GPS/GIS Field Techniques (Catalina Island Summer Source) (4 units)

- PPD 694 Coastal Policy and Planning (4 units)

- ENG 443 Environmental Chemistry (3 units)
- ENG 463L Water Chemistry and Analysis (3 units)
- ENG 503 Microbiology in Environmental Engineering (3 units)
- ENG 513L Instrumental Analysis (3 units)
- CTSE 507 Issues, History & Rationale of Science Education (McComas)
- CTSE 509 Advanced Science Teaching Methods (McComas)

Statistics Courses

BISC 499 Introduction to Statistics for Biologists (Waterman, Chen - Fall 07)

PSYC 501 Statistics in Psychological Research (4, Fa) Principles of descriptive and inferential statistics for psychological research; introduction to analysis of variance and regression. Computer methods. Prerequisite: PSYC 274. (Wilcox)

PSYC 502 Analysis of Variance and Experimental Design (4, Sp) Experimental designs and their analyses of variance beyond straightforward factorial, nested, or repeated measures designs. Prerequisite: PSYC 501.
PSYC 503L Regression and the General Linear Model (4, Fa) Multiple regression as a tool in experimental and non-experimental data; analysis of variance and covariance as regression on coded variables. Computer applications Laboratory exercises. Prerequisite: PSYC 501.

PM 340L Health Behavior Statistical Methods (4, FaSp) Intermediate statistics for health behavior studies; topics include descriptive statistics, hypothesis testing, correlation and regression, and use of computer software in data analysis.

PM 510L Principles of Biostatistics (4) Concepts of biostatistics; appropriate uses and common misuses of health statistics; practice in the application of statistical procedures; introduction to statistical software including EXCEL, SPSS, nQuery. Laboratory.

PM 511abL Data Analysis (4-4, a: Fa, b: Sp) a: Major parametric and nonparametric statistical tools used in biomedical research, computer packages including SAS. Includes laboratory. Lecture, 3 hours; laboratory, 1 hour. Prerequisite: PM 510L. b: Exploratory data analysis, detection of outliers, robust methods, fitting data with linear and nonlinear regression models, computer packages including BMDP. Includes laboratory. Lecture, 3 hours; laboratory, 1 hour. Prerequisite: PM 511aL.

Catalina Semester Courses:

- 419L Environmental Microbiology (4, F)
- 499L Molecular Approaches to Microbial Diversity (4, F)
- 474L Ecosystem Function and Earth Systems (4, F)
- 447L Natural History and Island Ecology (4, Sp)
- 456L Conservation Biology (4, Sp)
- 437L Comparative Physiology of Marine Animals (4, Sp)
- 490 Independent Research (4, F, Sp)
- 590 Independent Research (4, F, Sp)
REQUIREMENTS AND POLICIES GOVERNING
GRADUATE PROGRAM IN MARINE BIOLOGY AND BIOLOGICAL OCEANOGRAPHY

Revised August 2011; Applies to students entering in Fall 2009, 2010, and 2011

The Graduate Program in Marine Biology and Biological Oceanography & its Administration

Introduction

Graduate students in the Graduate Program in Marine Biology and Biological Oceanography (referred to subsequently as "GPMBBO" or the "Program") may pursue a Ph.D. degree within the Marine Environmental Biology section of the Department of Biological Sciences at USC (referred to subsequently as “MEB”).

At the University of Southern California, graduate education is the responsibility of the Department, but the University's Graduate School establishes minimum requirements concerning grade point average, number and distribution of units, residency, time limits, etc. that are common to all advanced degrees offered within the College of Letters, Arts and Sciences at the University. Specific courses, examinations, skills, and research requirements are established by the student's program of study, in this case the Graduate Program in Marine Environmental Biology. Collectively, both sets of regulations constitute the student's "degree requirements," all of which must be met by the student.

Graduate School regulations are listed in the current University of Southern California Catalogue in several locations. One part of these are located in the section on "Academic Policies and Information" near the beginning of the USC Catalogue and the rest are found near the middle of the USC Catalogue under "The Graduate School." Those regulations, which most commonly affect GPMBBO students, are included in this document, but the information in the University of Southern California Catalogue should be considered definitive.

GPMBBO regulations are listed in this document; the major requirements of degrees in the GPMBBO are also listed in the USC Catalogue under "Department of Biological Sciences."

Program Administration--The Graduate School

The Graduate School maintains the University's official Permanent Graduate Student File and is ultimately responsible for admission of our graduate students and the awarding of their degrees. As noted above the Graduate School establishes requirements concerning grade point average, number and distribution of units, residency, and time limits that are common to advanced degree programs in all units under their jurisdiction, including the Department of Biological Sciences.

Official forms are used to track a student's progress by The Graduate School and completion and submittal of these usually is to be at a specified point in the student's tenure. Timetables for the completion of degree requirements are available at The Graduate School. The schedule for the Ph.D. student's final and penultimate semesters is especially detailed and needs to be adhered to closely.

All Graduate School forms prepared by or on behalf of the student must be approved by the Director of the Program (David Caron) or by the Chair of the Department (Douglas Capone) before their submittal to the Graduate School. All Graduate School forms are available online at http://www.usc.edu/schools/GraduateSchool/current_guidelines_forms.html or from the Graduate Programs Manager, Linda Bazilian. Please turn in all forms to Linda Bazilian who will submit them to the proper office on your behalf.

Graduate Student Representatives
In late spring, GPMBBO students select two graduate students to serve as Graduate Student Representative and Alternate Graduate Student Representative for the coming academic year. To be eligible for the posts, both students must have passed their Qualifying Examination. The Alternate will represent the graduate students in the Graduate Student Representative's absence or by the latter's appointment. The Graduate Student Representative has one vote in meetings of the MEB Faculty representing the opinions of the graduate students.

The Graduate Student Representative has no voting power in either the continuation of fellow graduate students or in the Qualifying Examination. At the option of the student examined, the Graduate Student Representative may also be present during the oral part of the Qualifying Examination.

In late spring, the students will also elect a Graduate Student Mentor whose job will be to help facilitate incoming MBBO students with the transition of moving to Los Angeles and the USC campus (issues involving transportation, housing, dining and entertainment). The mentor may also provide written material and serve as a conduit to faculty, staff or graduate students who may be of assistance. At no time will the mentor comment on MBBO program requirements or policies, including class requirements, screening exam or qualifying exam. Only the MEB staff, Biological Sciences faculty or the MBBO program director is authorized to address questions regarding MEB program requirements or policies. The mentor should contact incoming students sometime early in the summer, before they make permanent living arrangements.

Graduate Programs Manager of GPMBBO

The Graduate Programs Manager of GPMBBO is the staff member responsible for processing and maintaining graduate student files; serving as liaison between the students, GPMBBO Faculty, and the Graduate School; and making available application materials, Graduate School Forms, and other relevant documents. A permanent Department file on each student is maintained in the GPMBBO Office.

Student Advisement and Guidance

The First Year Advisor; Initial Advisement and Evaluation by Student's Advisor

Most students have a first-year advisor who is identified in the acceptance letter. This initial advisor may be replaced by another faculty member with whom the student has closer research affiliations at the request of the student and with the approval of the GPMBBO Program Director and the new advisor. That request can be made by the student to the GPMBBO program office or of the GPMBBO Program Director. If an incoming student has not chosen an advisor or been appointed one, this should be a priority during the first semester.

The Program provides an initial orientation for all incoming students. During registration week of a graduate student's first semester, the student's initial advisor meets with the student to review his/her previous course work and experiences and to discuss career objectives. A primary purpose of this initial interview is to identify major deficiencies in a student's preparation and to suggest means of remedying any such deficiencies.

Screening Committee

The purpose of the Screening Exam is to identify individual strengths and weaknesses of each student, in an effort to determine what steps might be taken to address those weaknesses. It is designed to be an examination that will help the students improve their individual professional development, and the recommendations of the Screening Committee will be specific for each student. Those steps might include specific courses, performing teaching assistant duties for pertinent courses, directed readings. In some cases, the decision of the committee may be the dismissal of the student from the program. The
Screening Exam is an oral examination. Information discussed during the exam should not be conveyed to other students, in order not to undermine the overall purpose of the exam.

Advisors and members of the Screening Committee, a standing MEB faculty committee, meet with incoming students, as soon as possible, to evaluate the student’s background and make recommendations for developing a solid base in marine biology. The Screening Committee administers the Screening Examination near the end of the student's second semester of graduate work at USC, and before the student has taken more than 24 units. The Screening Committee, together with the advisor, is responsible for the student's advisement and guidance until the five-member Ph.D. Guidance Committee is established. Following evaluation of perceived strengths and weaknesses, and in recognition of the research subdiscipline identified by the student, the Committee will provide specific recommendations on reading, coursework, teaching assistantships or other forms of training that the student might need in order to fill deficiencies in his/her background. Each student's performance will be reported in writing on the GPMBO's *Report of the Screening Committee*.

**Requirements for the Ph.D. Degree**

**Time Schedule**

All course requirements for the Ph.D. degree are normally completed within three calendar years from the date on which the student took his/her first course at USC and must be completed within eight calendar years from that time.

**General Requirements**

A total of 60 units must be completed for the Ph.D. Degree.

**Course Requirements--Core courses**

Five core courses are currently required: BISC 582 (Advanced Biological Oceanography), BISC 583 (Evolution and Adaptation of Marine Organisms), BISC 584 (MEB Faculty Lecture Series), BISC 585 (Scientific Writing and Reviewing), and BISC 586 (Biological Oceanographic Instrumentation). BISC 582, 583 and 586 should be taken during the student’s first year at University of Southern California (582 and 586 in the Fall semester, 583 in the Spring semester); BISC 585 is open to second year students only (Spring semester). Students are also required to take 4 units of BISC 529 (MEB Seminar) and four advanced graduate seminars (8 units total). Finally, students are required to take an approved course in statistics (e.g. PM 510L).

Students must receive a grade of B or better in each core class and maintain a cumulative Grade Point Average of 3.0 or above in all coursework in order to fulfill the requirements of the MBBO Program.

**Official Guidance Committees**

A five-person Ph.D. Guidance Committee should be established soon after the screening exam, but no later than the fourth semester of enrollment for a student seeking a Ph.D. degree. After the student passes the Qualifying Examination, the Ph.D. Guidance Committee is dissolved and a new Dissertation Committee is formed.

**The Student and His/Her Responsibilities**

The student is ultimately responsible for his/her graduate career and must be familiar with Graduate School and GPMBO requirements and responsible for their timely completion.

If a student's needs are not being met, he/she should seek redress, using the following chain of command: advisor, advisory committee (screening, guidance, dissertation), Director of the Program,
Department Chair, and Graduate School. The Director of the GPMBBO Program is always available to provide guidance on how to deal with particular situations.

In addition to all other rules, the University has established codes of conduct to which all students must adhere. One aspect of graduate training -- service as a teaching assistant -- places them in a position of power over undergraduate students. The position implies added responsibilities and liabilities, especially in respect to such matters as fairness, equal treatment, sexual harassment, etc. Information on University policies concerning conduct is available in SCampus. Further information or sources of information may be obtained from the Department office.

**Formal Graduate Seminars**

Students must complete a minimum of four (4) 2-unit graduate seminars. Because a critical feature of such seminars is exposure to current literature, all four required seminars must be completed during the student's tenure at USC. With the written permission of the student's committee, a formal course completed at another institution may be counted as one of the four required seminars (the course must have been completed during the student's tenure at USC).

**Research Tool Requirement**

Proficiency in statistics is a necessary skill for all scientists. Satisfactory skill level may be demonstrated by

a) completion (grade of B or better) of a course approved by majority vote of the MEB faculty. Several courses with the University are available.

b) acceptance of course work previously completed either at USC or elsewhere. The acceptability of a previously completed course will be made by an examiner selected by the GPMBBO Program faculty.

A rigorous grad level course in Biostatistics is available at the Medical School in the Department of Preventive Medicine, PM 510L. Permission is needed from the PM Department. A free shuttle bus runs routinely between the University Park and Med School Campuses. Other statistics courses are listed in the appendix.

**Research Units**

BISC 790 Research units are normally taken whenever the student is conducting his/her doctoral research. Dissertation research will normally take the equivalent of about 2.5-3 years of full time work, but the number of research units taken usually does not reflect this. Typically advanced graduate students will take 6 units of 790 and possibly a 2-unit seminar each semester. Graduate Programs Manager, Linda Bazilian can provide guidance on balancing course and research units.

**Grade Point Average Requirements**

Students must maintain a grade point average of at least 3.0 in all courses taken at USC, in conformity with regulations of the university; work graded C- or below is not acceptable for either subject or unit credit. In addition to the overall GPA requirement of the university, the MBBO Program requires that students must achieve at least a B in each core course in order to satisfactorily complete that material. If a student receives a B- or less, the course must be retaken even if the Graduate School grants credit for the course. Students must receive at least a B for the retaken course(s).

If a student's cumulative grade point average falls below 3.0 at any time, the student will be placed on departmental academic probation. The cumulative average must be raised to 3.0 by the completion of the next two semesters of registration at USC in courses approved by the student's guidance committee. Note: this may require that the student take additional formal and/or seminar courses since directed
research and dissertation units are on a Pass/No Pass basis and are not computed into the GPA. If the student does not improve his/her overall GPA to 3.0 within this period, the student will be dismissed from the program. A student who has been removed from probation but subsequently fails to meet the scholarship requirement is subject to termination (will be terminated) from the program.

Marine Program Noon Seminar Series

Students must regularly attend the Marine Environmental Biology Noon Seminar series throughout their tenure at USC (traditionally held on Tuesdays). In addition to attending other seminars, each student presents a 20-minute seminar on his/her current research once each academic year, beginning in their second year. Attending faculty will provide short written evaluations of the seminar to help students improve their public speaking skills. (See “Forms” section).

BISC 794 Doctoral Dissertation

After a student successfully completes the Qualifying Examination (see below) and is therefore a formal candidate for the Ph.D., he/she must register for BISC 794 Doctoral Dissertation each semester except summer. The student would sequentially register for BISC 794a, 794b, 794c, 794d in the first four semesters after completing the Qualifying Examination, and then BISC 794z each subsequent semester as needed. Students must have at least 4 units of 794 credit, but can receive no more than 8; hence BISC 794a-794d are valued at 2 units and BISC 794z at 0 units. Graduate Programs Manager, Linda Bazilian can provide guidance on balancing course and research units.

Other Course and Unit Requirements

Additional formal course requirements may be established by the Section and/or by the student's guidance committee and/or on advice of the committee, which evaluates the student's preparation in the Screening Examination.

A course in scientific ethics is strongly recommended, although not a course requirement for the program.

The minimum number of units required for the Ph.D. by the Graduate School is 60. Units must include 4, but no more than 8, units of BISC 794 credit and may be completed with other formal classes or BISC 790 work.

The student must be registered at USC during the semester that the dissertation is submitted.

Teaching Assistantship Requirement

Graduate students pursuing the Ph.D. in the GPMBBO must serve as a teaching assistant for at least two semesters; ideally, the student should serve in at least two different courses.

Student Progress Committee

Student progress will be evaluated annually by a standing committee of MEB faculty (the Student Progress Committee). Each student and his/her advisor will complete an annual evaluation form (Annual Student Progress Report Form by student, Faculty Evaluation Form by advisor; see forms attached at end). The information contained in these reports will be used to judge the progress of each student toward degree, including course preparation and grades achieved, research training, manuscript preparation, seminars presented, and the level and type of student support. Each student (and his/her advisor) will receive a report of his/her progress following a formal committee meeting and review.
Screening Examination

The Graduate School requires a Screening Examination. The exam is oral, about one hour in length, and should be taken before the student has completed 24 units of graduate work at USC. The Screening Committee (a standing committee within the MEB section) administers the exam. The purpose of the Exam is to evaluate the student's academic preparation, determine competence to continue graduate study, and (in collaboration with the student’s advisor) identify deficiencies to be remedied prior to the Qualifying Examination (e.g. specific courses, reading or training). Prior to the Screening Exam, the student submits a 1-2 page to the Committee document outlining his/her academic background, activities during the previous year and present (and projected) research interests. The Exam begins with a short (5-10 minute) presentation by the student of their academic background and research interests.

The topics covered in the Screening Examination include:
- a summary by the student of their research while at USC
- biotic diversity, classification, and life histories
- organismal evolution and phylogeny; molecular evolution
- structure and physiology of cells and organisms
- biochemistry
- Mendelian, population, and molecular genetics
- biological, chemical, and physical oceanography
- statistics, experimental design, modeling and theoretical biology
- ecology and environmental sciences.

Each student's performance will be reported in writing to the student. A copy is placed in the student's file.

Guidance Committee

Composition of the Guidance Committee

Upon completion of the Screening Examination, the student's program of study is placed under the direction of the student’s advisor and a five-member Guidance Committee. The Guidance Committee must be established at least one semester before the student takes his/her Qualifying Examination. Members of the Guidance Committee and its Chair are proposed to the Graduate School via the Appointment of Committee form by the student, with the advice and consent of the student’s advisor. Therefore, the student should request appointment of the committee as soon as possible after the screening exam but certainly before the end of his/her third or fourth semester of enrollment in the Ph.D. program.

The composition of the guidance committee must meet the following guidelines:

a) One member of the committee must be a tenured or tenure-track professor from a Ph.D. granting department at USC other than Biological Sciences. This “outside member” serves as the representative of the Vice Provost for Graduate Programs. For information see: http://www.usc.edu/schools/GraduateSchool/documents/StuServices/Role_of_Outside_Member.pdf

b) Normally, the other four members of the committee are tenure-track faculty of the Marine Environmental Biology Section of the Department of Biological Sciences, but one of the members may be from another Section in Biological Sciences, and at least one must be tenured. The chair of the committee must be from the Marine Environmental Biology section. Co-Chairs are normally not permitted unless required by the Vice Dean of the
College, Office of Graduate Programs (see next paragraph). The student’s advisor cannot be a member of the Guidance Committee but may attend and observe the Qualifying Examination and the subsequent executive session, in which the student’s performance is evaluated.

In exceptional cases of academic merit, a person not meeting the above guidelines may be approved by the Graduate School to serve on a Guidance Committee. To request such an exception, the student must submit to the Graduate School a current Curriculum Vitae of the proposed member and a letter from the chair of the committee citing the particular expertise of the person and the relevance of the requested appointment along with the Appointment of Committee form. A specially approved member may not serve as the outside member (see below) or as sole chair of the committee, but may serve as a co-chair with a regular faculty member of the Marine Environmental Biology section. A guidance committee may include no more than one specially approved member unless the size of the committee is enlarged past five.

Request for changes in the composition of the Guidance Committee must be made in writing by the student to the Program. If approved, the committee is officially changed using the Graduate School's Request for Change of Committee form.

If the chair of the Guidance Committee will be absent from campus for any extended period of time (e.g., on leave) he must appoint a temporary chair. The permanent chair will continue as a member of the Committee during his/her absence and will be in communication with the Guidance Committee. If the permanent chair must be absent at the time of the Qualifying Examination or the defense of the dissertation, a petition for formal appointment of a temporary chair must be submitted to the Graduate School.

Responsibilities of the Guidance Committee

The Guidance Committee is responsible, in consultation with the student’s advisor, for preparing the student for the Qualifying Examination. The Guidance Committee is responsible for the evaluation of the student’s performance on the Qualifying Examination. Specific responsibilities include:

a. Meeting with the student and the student's advisor to evaluate progress towards meeting the recommendations of the Screening Committee and preparedness to take the Qualifying Examination.

b. Monitoring the student's compliance with deadlines leading to the Qualifying Examination.


d. Administration and evaluation of the written and oral parts of the Qualifying Examination.

Qualifying Examination

Prerequisites for the Qualifying Examination

During the semester the exam is taken, the student must be enrolled in a departmental graduate course or GRSC 800. Permission to enroll in GRSC 800 is needed from the Graduate School. Students may register for GRSC-800 up to three times without having to petition. However, students are strongly encouraged to complete the qualifying examination during the first semester of GRSC 800. The GPMBBO requires that students have completed:

a) All required core courses, each with a minimum grade of B.

b) At least two graduate seminars.

c) The statistics research tool requirement.

d) Removal of inadequacies noted in the screening examination.

f) Completion of the Request to Take Ph.D. Qualifying Examination form.
Depending on how the above requirements were met, the student may have to take additional course work to satisfy the Graduate School requirements that students have completed at least 24 units of course work applicable to the degree while in residence and with a minimum cumulative GPA of 3.0.

Timing of the Qualifying Examination

The Qualifying Examination is normally taken during the student's fifth semester in the Ph.D. Program and must be taken before completion of his/her sixth semester.

Components of the Qualifying Examination

The Qualifying Examination consists of a written and an oral part. The student's Guidance Committee conducts and evaluates both parts. Prior to the Qualifying Exam, the student must compose his/her research proposition. At least two weeks before the date of the oral examination, the student must submit one copy of the Research Proposition to each member of the Guidance Committee and one copy to the Marine Program's Student Affairs Administrator for the student's permanent file.

The Research Proposition (The Fifteen Pager) and its Preliminary Approval

At least two months before the anticipated date of the written examination, the student should meet with his/her Guidance Committee and provide them with a 1- or 2-page Research Abstract of the anticipated research program to be presented in the Research Proposition. The purpose of this meeting is to ascertain whether the anticipated research constitutes a defensible dissertation topic so that the student does not develop a detailed plan for a research program that has serious flaws and probably cannot be successfully defended in the oral examination. It is also to evaluate the student’s academic preparedness for the Qualifying Exam. If the committee has reservations, modifications that are mutually satisfactory to the student and the committee can be worked out during this meeting or the student can be asked to submit a revised or new abstract.

Upon approval of the Proposition Abstract by the Guidance Committee, the student will develop it into a formal Written Proposition. This is to be in the form of a grant proposal and should include a short historical introduction, a statement of the problem and its significance, one or more hypotheses (if appropriate), the research design, anticipated results, methods to be used in interpretation of the results, and pertinent references. The treatment should be concise and should not exceed 15 single-spaced pages, including tables and figures but not references. The Written Proposition must have 1-inch margins all around, use an approved typeface (Arial, Courier New, or Palatino Linotype at a font size of 10 points or larger [Macintosh users also may use Helvetica and Palatino typefaces], Times New Roman at a font size of 11 points or larger, or Computer Modern family of fonts at a font size of 11 points or larger), black font color, and no more than 3 lines of text per inch.

The Written Examination

The written examination will consist of two sets of questions each day continuing over consecutive days until all sets of questions are complete. This examination can be taken on a laptop computer supplied by the MEB department administrator (i.e., the student cannot use their own computer). Each Guidance Committee member (with the possible exception of the "outside member" whose participation is optional here) submits three questions; the student must answer two of this set, spending about equal time on each and having a maximum of two hours per set. The order in which the sets of questions are taken is at the student's option.

Questions will be comprehensive in scope with respect to the student's chosen area of specialization and will be designed to test the student's conceptual, analytical and integrative ability and preparation.

Each member of the Examination Committee will grade his/her question on a scale of 1.0-5.0 using
0.5 unit steps if necessary (1.0 as poor and 5.0 as exceptional). The examination result will be calculated by averaging all the grades. Scores are tallied by the Chair of the Guidance Committee at the time of the oral exam, just prior to conducting the oral examination. A mean score of 3.3 or above for all questions is passing; below 3.0 is failing. Cases where the mean is between 3.0 and 3.3 or where two or more questions are graded below 3.0 are evaluated by the Guidance Committee followed by a vote, using a secret ballot. More than one negative vote of the Guidance Committee will result in failure of the student to pass the written examination.

The written part of the Qualifying Examination must be taken before (normally 2 weeks before) the oral examination described below. The results of the written examination and the oral examination are given only at the completion of the oral examination.

The Oral Examination

The oral examination will be in the area of the student's intended research and will be based on a research project selected and developed by the student into a Research Proposition.

The oral examination is usually taken two weeks after and must be taken within one month of the written examination.

The oral examination will be conducted and evaluated by the student's full 5-member Guidance Committee. Typically, the Committee meets briefly without the student to review the student's course work, other preparation and progress; to review the student's performance on the screening examination (copies of the student's transcript and Screening examination report should be obtained for each committee member from the Graduate Student Administrator by the Chair); and to agree on the exact format and order of questioning during the oral examination. Subsequently, the student typically presents the highlights of the research proposition [15 minutes or less]. Then members of the committee ask two or more rounds of questions. The questions are largely focused on the student's ability to conceive, conduct, evaluate of independent research and to communicate the results of such work. However, the oral examination is not limited to the context of the Written Proposition; as specific examples, questions are often asked a) from the written examination and b) concerning the removal of deficiencies identified during the Screening Examination.

On completion of the examination, the Guidance Committee meets in executive session (without the student) to evaluate the student's performance on the oral examination. Each member has one vote, pass or fail. More than one negative vote will result in failure of the student to pass the examination.

At the end of the executive session, the student is notified of the results on the two portions of the Qualifying Examination. Although one could pass both oral and written exams, only one of these exams, or neither exam, the student passes the Qualifying Examination (as a whole) only if his/her performances on both the written and oral portions are satisfactory. If the student passes both the oral and written examinations, he/she is indicated to have passed the Qualifying Examination on the Graduate School form Report on Ph.D. Qualifying Examination.

If the student fails the written examination or the oral examination or both, the committee must indicate that the student failed the Qualifying Examination on the Graduate School form Report on Ph.D. Qualifying Examination. The committee must make recommendations concerning the student's continuation in the graduate program. The committee usually grants the student a second chance to pass the failed portions (either part satisfactorily completed in the first examination does not have to be retaken), but may recommend that the student not repeat the exam or even deny a second chance (the latter action could be appealed to the Graduate School). The second attempt is a final one and can be taken no sooner than six months or later than twelve months after the initial failure.

Admission to Candidacy

After the student passes the Qualifying Examination, the Guidance Committee recommends to the
Graduate School that the student be admitted to candidacy for the Ph.D. Degree. Following admission to candidacy the student must register for BISC 794 Dissertation every semester, except summers, until the degree is awarded.

After the Qualifying Examination has been passed, the Guidance Committee will be dissolved and a Dissertation Committee requested via an Appointment of Committee form. The Dissertation Committee will comprise the student's advisor, serving as Chair, an outside member as required by the Graduate School, and two members of the GPMBBO faculty. Service on the Guidance Committee does not preclude or necessitate service on the Dissertation Committee. The GPMBBO does not allow the reduction of the Guidance Committee to a three-member Dissertation Committee as permitted by the USC Catalogue, except under special circumstances. If these circumstances are met, at least 2 members must be from the GPMBBO faculty.

Research

A student must undertake original investigation of a selected problem in marine biology or biological oceanography. This is normally based on the Written Proposition as presented in the Qualifying Examination, subject to acceptance by the student's committee. Subsequent changes of research direction or content must have advance approval by the student's advisor and Dissertation Committee.

Research Prior to Admission to Candidacy

Students in the GPMBBO are encouraged to conduct research at their earliest opportunity. Credit may be obtained for this research by registering for BISC 790. Ideally, this early research will develop into an appropriate dissertation topic. Certainly, the student will find it difficult to develop and defend a Research Proposition without significant exposure to research in general and the specific problem in particular. Such preliminary research should be based on a detailed plan prepared by the student and approved by his/her advisor.

Research Subsequent to Admission to Candidacy and its Relationship to the Written Proposition

As noted above, dissertation research is normally based on the Written Proposition as presented in the Qualifying Examination, subject to its acceptance by the student's committee. Difficulties frequently force revision of the planned study. The student's Dissertation Committee must approve in advance any such changes of research direction or content. *It is the student's responsibility to keep their Dissertation Committee members apprised of progress and/or changes. At least annual meetings between the student and the Dissertation Committee will be held, preferably shortly after the student’s annual presentation in the weekly seminar series.*

Publication Prior to Submittal of the Dissertation

Prompt publication of research results is very strongly encouraged in the GPMBBO. Students should organize their research efforts into blocks that a) can be completed in sequence, and b) represent topics for separate future papers so that submittal of one or more papers can be completed during their graduate tenure. Advisors often require students to submit one or more papers before completing their dissertation.

Authorship of such papers is significant. If the student is the sole author or if the student is the first author with the advisor as the only additional author, it implies that the student did most if not all of the research and hence the entire contents of the paper may be acceptable for incorporation into the dissertation. If the advisor contributed significantly to the research or if other individuals (other graduate students, faculty, post docs, research technicians, etc.) are co-authors, only that part of the paper which represents the student's work may be incorporated into the student's dissertation.

A published work may be incorporated into the body of the dissertation but may not be appended in the form of a reprint according to Graduate School regulations. The student is advised to seek the
approval of the dissertation committee before submittal of a manuscript that is to be included in the
dissertation since that committee must ultimately approve all contents of the dissertation. The fact that
material has been submitted (accepted, published) does not mean that it will be allowed to be incorporated
without revision by the committee.

Preparation and Defense of the Dissertation

A dissertation represents a significant contribution to science that is based on an original research
program completed by the student. Determination of the adequacy of the research program is the sole
responsibility of the student's Dissertation Committee. Approval of the dissertation itself is primarily the
responsibility of the student's Dissertation Committee, but the completed dissertation must also be
examined by the Thesis Editor of the Graduate School to determine if it meets the grammatical standards
and other requirements described in Guidelines for the Format and Presentation of Theses and
Dissertations published by the University of Southern California and available online at
http://www.usc.edu/schools/GraduateSchool/current_thesis_dissert_05.html. Additional regulations and
information on the organization and preparation of the dissertation are provided in Directions for
Preparation of Dissertations and Research Reports as Required by the Graduate Program in
Biology/University of Southern California. Students should obtain a copy of both sets of regulations
before they initiate their writing.

GPMBBO students defend an advanced draft of the dissertation rather than a "final" copy typed on
dissertation paper. The advanced draft should be complete, including all text, figures, tables, references,
etc. and the draft must be in a suitable form for final typing. Before assembly of a complete draft is
initiated, the student should confer with his/her full committee to determine whether adequate research
has been completed.

The student's advisor is the individual responsible for determining whether or not a draft is
sufficiently refined for distribution to the full Dissertation Committee. Portions or all of earlier drafts
may be submitted to some or all of the committee members for suggestions and evaluation at any time.
The thesis draft to be defended must be given to the Dissertation Committee at least one month prior to
the thesis defense date.

Presentation and oral defenses of the dissertation are achieved in a formal seminar open to all
members of the academic community and in a closed meeting of the student and the Dissertation
Committee.

Since the final copy of the dissertation must be uploaded to the Graduate School and Library at least
three weeks prior to the end of the term in which the degree is to be granted and since the student must
allow adequate time after the defense for corrections and final typing, the defense should be scheduled at
least six weeks before the end of the term in which the student plans to graduate. Please consult with the
Graduate Program Coordinator in order to ensure that all requirements and deadlines are met.

Before undertaking the Dissertation Defense, the student must have completed (or be in progress of
completing) all other degree requirements.

The Chair of the Dissertation Committee is required to notify the Student Affairs Administrator of the
GPMBBO of the date, time, and place of the defense of the dissertation, so that a notice of the
Dissertation Seminar and Defense may be distributed to all faculty and graduate students of the
Department at least two weeks in advance. The date selected for this defense cannot be on an official
University holiday (e.g., Labor Day, President's Day, etc.).

The open oral defense of the dissertation is achieved in a formal 50-minute "research" seminar such as
would be given by a visiting scholar. The presentation is open to the public and the student should be
prepared to answer all questions from members of the audience, including those on the Dissertation
Committee. The period of questioning is not to be limited in time.
The dissertation is also subject to a detailed defense made before the full Dissertation Committee in a meeting that is usually held shortly after the conclusions of the seminar. At this meeting, which is typically two-three hours in length, the Dissertation Committee must critically evaluate the dissertation and determine whether or not it is to be accepted. To be acceptable, the dissertation must represent a major, original contribution to science.

Only members of the Dissertation Committee may vote whether to pass or fail the student (accept or reject the dissertation and its open defense in the seminar). A vote to pass the student must be unanimous and such a vote does not preclude that the committee may require modifications of the dissertation. Reasons for failure of the defense should be clearly identified by the committee and may include a) a flawed research plan, b) nonconclusive or inadequate research results, c) major deficiencies in the dissertation, etc. A student who fails the defense the first time is normally given a second opportunity, but any decision on re-examination is at the discretion of the Dissertation Committee.

If the defense is satisfactory and no major revisions of the dissertation are required, all members of the Dissertation Committee sign the **Approval to Submit Defended and Final Copy of Doctoral Work form**, which is submitted to the Graduate School. If significant revisions of the manuscript are required, the **Approval** form is not signed until such revisions are completed. The Chair of the Dissertation Committee may be assigned full responsibility for determining that the required revisions have been made, but some or all other members of the committee may request that they also be involved in the final approval. The signed **Approval** form signifies approval of the dissertation and defense by the committee.

If the **Approval** form is signed and dated by the drop/add deadline for FALL or SPRING, no further registration is required.

Once the student has successfully defended the dissertation, a dissertation profile should be created on the Graduate School web site [http://grad.usc.edu/WebThesis](http://grad.usc.edu/WebThesis) as well as completion of the document checklist process. When approved, the manuscript can be uploaded in PDF format for review by the editing staff. The student also needs to prepare and upload an abstract of the dissertation.

The **SIGNATURE PAGE** is bound with the dissertation to verify that the dissertation has been approved by the Committee and accepted by the Graduate School. Signatures required on this form are those of the Committee and the Graduate School.

In addition to the original copy required by the Graduate School, one hardbound copy of the dissertation must be presented to the Department of Biological Sciences and another to the chair of the student's (Guidance and) Dissertation Committee.

The student must pay a Publication and Processing Fee in the University’s Cashier’s office and submit a receipt of payment to the Graduate School upon submitting the dissertation.

The **SURVEY OF EARNED DOCTORATES** must be completed and returned to the Graduate School for approval.

The **Verification of Completion of the Requirements for the Doctoral Degree** form must be signed by the Chair of the Department of Biological Sciences. The signed **Verification** form signifies completion of all departmental degree requirements and all University degree requirements. Most important of all, it indicates that the degree has been cleared for conferral. The completed **Verification** form is submitted by the Graduate Programs Manager to the Graduate School for approval. Once the Graduate School has received and approved the form, you have officially graduated!
COURSES AVAILABLE IN MARINE ENVIRONMENTAL BIOLOGY

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Offered Information</th>
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<tbody>
<tr>
<td>BISC 582</td>
<td>Biological Oceanography</td>
<td>offered each Fall.</td>
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<tr>
<td>BISC 583</td>
<td>Evolution and Adaptation of Marine Organisms</td>
<td>offered each Spring.</td>
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<tr>
<td>BISC 584</td>
<td>Faculty Lecture Series</td>
<td>offered each Spring (MEB Faculty)</td>
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<td></td>
<td>(2 units)</td>
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<tr>
<td>BISC 585</td>
<td>Scientific Writing and Reviewing</td>
<td>offered each Spring</td>
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<td></td>
<td>(2 units)</td>
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<tr>
<td>BISC 586</td>
<td>Biological Oceanographic Instrumentation</td>
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<tr>
<td>BISC 529</td>
<td>Marine Environmental Biology Seminar</td>
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<td>(1 unit; 4 units required, maximum)</td>
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Advanced Graduate Seminars, offered on a rotating basis; check current Schedule of Classes
(2 units each; 8 units required)

- 530 Plankton Biology (Caron & K. Heidelberg, Schnetzer)
- 531 Physiology of Marine Organisms (Gracey, Manahan)
- 532 Molecular and Microbial Ecology (Fuhrman)
- 533 Remote Sensing and Modeling (Kiefer)
- 534 Population Genetics of Marine Organisms (Edmands & Hedgecock)
- 536 Marine Biogeochemistry & Microbial Ecology (Capone & Ziebis)
- 538 Metals and Biology in Oceanic Regimes
- 599 Ocean Optics (Jones)
- 599 Communicating Ocean Science (Jacobsen, Michaels, Sullivan)
‘Quick Check List’ of Student/Advisor Responsibilities

First Month (Late Summer/Early Fall; ASAP, before classes get going)
Each student meets with the “Screening Committee” (same composition as the Admissions Committee for that year, plus the student’s advisor). This committee will be the same one that administers the Screening Exam at the end of Year 1. The Screening Committee evaluates each student’s background and advises on courses to be taken in the first 1/2 years to develop each student’s background in marine science (and specific area of interest).

By the End of Year 1 (Summer)
Student completes the Screening Exam, which tests the student’s general scientific knowledge, and identifies weaknesses that need to be addressed. The student will receive written comments from the committee on the “Screening Examination Results” form.

Beginning of Year 2 (Fall)
Student and advisor compose and request appointment of a Ph.D. Guidance Committee, which meets with the student near the beginning of the second year. Prior to the meeting, the student submits a (at least) 1-2 page document outlining his/her proposed research. Following a brief presentation by the student, the committee provides feedback, which includes a second review of the student’s coursework and training, and any appropriate recommendations for further course work or directed study.

Year 3
The student must complete the Qualifying Examination (as described in “Requirements and Policies” document) by the end of Year 3. At least one month prior to the exam, the student completes the “Request to Take Ph.D.Qualifying Examination” form (available online). At least two months prior to the exam, the student must submit a thesis proposal (the fifteen-pager) to the Guidance Committee and obtain permission to proceed to the exam. The Chair of the Guidance Committee should obtain the student’s file for the Qualifying Examination. A “Report on Ph.D. Qualifying Examination” form will be in the file for all committee members to sign.

Years 3-5
Following successful completion of the Qualifying Examination, the Ph.D. Guidance Committee is dissolved and a new Dissertation Committee is requested. The student meets at least annually with the committee. A short memo describing the students’ progress (signed by all committee members) is submitted to the Section office following each annual meeting.

Additional Annual Requirements:
Yearly Seminar: Each student must present a 20-minute seminar once each academic year beginning in their second year.
Yearly Progress Reports: On or by May 15th, each student will complete and submit to the Section office a brief progress report (signed by each member of their Guidance or Dissertation Committee) detailing their activities during the previous 12 months (courses taken, research undertaken, seminars given at USC and elsewhere, participation in cruises, etc.). Forms for these reports will be emailed to students as a reminder.
Annual Student Progress Report
(June 1, XXXX – May 31, XXXX)

Date: _______________________

Student: _________________________________

Advisor: _________________________________

Year(s) in Program: ______________________

Financial Support (Type & No. of months this year): ______________________

Present Committee Members: _________________________________

_______________________________

_______________________________

_______________________________

(Screening, Guidance or Dissertation Committee?): ______________________

Date of Last Full Committee Meeting: ______________________

Anticipated (or Completion) Dates for:

Screening Exam: ______________________

Formation of Ph.D. Guidance Committee: ______________________

Qualifying Exam: ______________________

First Meeting of Dissertation Committee: ______________________

Completion of Research: ______________________

Dissertation Defense: ______________________

Please attach a summary of your progress during the past year (June-May):

What have you been doing during the last year; guidelines below, but feel free to add items; bulleted accomplishments are fine. Note any difficulties you are having.

- BRIEF summary of research progress, problems, future plans.
- Courses completed or audited.
- TA duties.
- Participation in lab and field research.
- Meetings/workshops attended.
- Seminars given (USC and elsewhere) include titles, locations, etc.
- Citations for manuscripts submitted, in press or published.
Faculty Evaluation Form
(June 1, XXXX – May 31, XXXX)

Date: ______________________

Student: ________________________________

Advisor: ________________________________

Overall evaluation:
   _____ Making excellent progress
   _____ Making good progress
   _____ Making minimal-to-fair progress
   _____ Making little or no progress

Specific evaluation of student’s progress:
   Things to consider:
      Is he/she on track for graduation in a reasonable amount of time?
      Any noteworthy accomplishments?
      Progress on coursework and/or research satisfactory?
      Preparation for quals satisfactory?

Problems or issues that need to be addressed or noted:
   Academic (coursework/grade) problems?
   Time management issues?
   Writing or research problems?

Feel free to add any pertinent information.
Report of the Graduate Screening Committee

Committee members: __________________________  __________________________

________________________  __________________________

Student: __________________________

Faculty Advisor: __________________________

Attached are the results of the screening evaluation. A copy of this evaluation will be placed in the student’s permanent file.

Explanation of the evaluation:

The committee seeks to evaluate the general undergraduate-level background of each student in a broad range of topics in biology. While our coverage is necessarily cursory and superficial, we believe that the format is sufficient to reveal the student’s preparation. We rate the student in each of the subject areas as:

**Good.** Better than average grasp of the topic. This level of understanding is expected of all students in topics near their chosen field of specialty. With continued normal study in and outside of the classroom, the student is on the right track for their professional career.

**Adequate.** Minimal acceptable grasp of the topic. This level is expected of all students in those topics that are outside of their area of concentration. For topics near one’s specialty, this rating may be considered below that preferred at this stage in the student’s studies. With extra attention to these areas, the student should be developing to broaden their knowledge in this topic.

**Inadequate.** Below the minimal grasp of a subject area. Students MUST strive to exceed this level in all areas covered. This rating represents a deficiency, and the student should recognize that a greater than normal effort must be devoted to studying and gaining a grasp of terms and concepts in this field.

We emphasize that the screening exam is advisory. Doing well does not guarantee the student an easy time on future exams, nor does doing poorly guarantee an especially hard time for you. Indeed, it is the goal of this process to offer guidance that will enrich your career development in science, not just to pass any upcoming test.
## Screening Evaluation Report Sheet

<table>
<thead>
<tr>
<th>Student: ___________________________</th>
<th>Date: ___________________________</th>
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### TOPICS

<table>
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<tr>
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<th>COMMENTS</th>
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<tbody>
<tr>
<td>1. Evolutionary Biology</td>
<td></td>
</tr>
<tr>
<td>a. Phylogeny and classification</td>
<td></td>
</tr>
<tr>
<td>b. Plant and animal diversity</td>
<td></td>
</tr>
<tr>
<td>c. Functional morphology</td>
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<tr>
<td>d. Life history strategies</td>
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<tr>
<td>2. Genetics</td>
<td></td>
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<tr>
<td>a. Mendelian</td>
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<tr>
<td>b. Molecular</td>
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<tr>
<td>c. Population</td>
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<tr>
<td>3. Biochemistry</td>
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<tr>
<td>a. Structural</td>
<td></td>
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<tr>
<td>b. Functional</td>
<td></td>
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<tr>
<td>c. Metabolism (incl. respir. &amp; photosyn.)</td>
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</tr>
<tr>
<td>4. Physiology</td>
<td></td>
</tr>
<tr>
<td>a. Cellular</td>
<td></td>
</tr>
<tr>
<td>b. Systems</td>
<td></td>
</tr>
<tr>
<td>c. Organismic</td>
<td></td>
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<tr>
<td>5. Ecology</td>
<td></td>
</tr>
<tr>
<td>a. Organismic</td>
<td></td>
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<tr>
<td>b. Population, species</td>
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<tr>
<td>c. Systems, cycles</td>
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<tr>
<td>6. Quantitative skills and reasoning</td>
<td></td>
</tr>
<tr>
<td>a. Units</td>
<td></td>
</tr>
<tr>
<td>b. Equations</td>
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</table>
Course of Action:

If you received a rating of *Good* in your specialty and *Adequate* in other areas, continued attention and normal growth in these topics through classroom, library, and laboratory work will probably be proper preparation.

*Adequate* in your specialty suggests that you should seek specific opportunities to increase your familiarity in and grasp of these areas. Especially good options include participating/auditing/TAing an undergraduate course covering this area, as suggested by the committee, and focusing on graduate seminars and readings.

*Inadequate* suggests specific remedial action. Specific attention should be paid by the student and the advisor to address these potential problem areas. At a minimum we expect you to understand at the level of the freshman biology text now in use. You will want to read the appropriate chapters of that text. TAing a general class on the deficient topic will provide an opportunity to attend lectures and read the textbook, more than needed for general TAing duties. In many cases, formally taking an undergraduate class (if available) may be the appropriate action. Few students are well prepared across the board, and 8 units of undergraduate classes at the 400-level are fully acceptable for graduate credit.

In all cases, regardless of your evaluation, use this time to think a bit about how you approach the various academic opportunities you are encountering. In our experience, successful graduate students all make a transition from an “undergraduate mentality” to a graduate “professional mentality”. Part of this transition involves taking responsibility for your own development and maturation as a scientist. Seek to build a unified conceptual framework.

Suggested Remediation:

Timeline to completion:

Other comments:
APPENDIX 1. MEB Relevant Courses

BISC Courses offered on the UPC (other than MEB graduate courses listed above)

403 Advanced Molecular Biology (4 units)
419 Environmental Microbiology (4 units)
435 Advanced Biochemistry (4 units)
450 Principles of Immunology (4 units)
460 Seminar in Marine and Environmental Biology (2 units)
469L Marine Biology (4 units)
483 Geobiology and Astrobiology (4 units)
502ab Molecular Genetics and Biochemistry (4, 4 units)
510 Integrative and Evolutionary Biology (4 units)
549 Seminar in Integrative and Evolutionary Biology (2 units)

Related Advanced Courses in Other Departments that can be used to meet course requirements

GEOL 412 Oceans, Climate and Environment (4 units)
GEOL 460L Geochemistry and Hydrogeology (4 units)
GEOL 500 Paleoecology (3 units)
GEOL 501 Paleobiology (3 units)
GEOL 512 Introduction to Physical and Chemical Oceanography (3 units)
GEOL 514 Marine Geology (3 units)
GEOL 555 Paleo-oceanography (3 units)
GEOL 560 Marine Geochemistry (3 units)
GEOL 564 Isotope Geochemistry (3 units)
GEOL 567 Stable Isotope Geochemistry (3 units)
GEOL 577 Micropaleontology (3 units)
GEOG 587 GPS/GIS Field Techniques (Catalina Island Summer Source) (4 units)
PPD 694 Coastal Policy and Planning (4 units)
ENG 443 Environmental Chemistry (3 units)
ENG 463L Water Chemistry and Analysis (3 units)
ENG 503 Microbiology in Environmental Engineering (3 units)
ENG 513L Instrumental Analysis (3 units)
CTSE 507 Issues, History & Rationale of Science Education (McComas)
CTSE 509 Advanced Science Teaching Methods (McComas)

Statistics Courses

BISC 305 Introduction to Statistics for Biologists (Waterman, Chen - Fall 07)

PSYC 501 Statistics in Psychological Research (4, Fa) Principles of descriptive and inferential statistics for psychological research; introduction to analysis of variance and regression. Computer methods. Prerequisite: PSYC 274. (Wilcox)

PSYC 502 Analysis of Variance and Experimental Design (4, Sp) Experimental designs and their analyses of variance beyond straightforward factorial, nested, or repeated measures designs. Prerequisite: PSYC 501.
PSYC 503L Regression and the General Linear Model (4, Fa) Multiple regression as a tool in experimental and non-experimental data; analysis of variance and covariance as regression on coded variables. Computer applications Laboratory exercises. Prerequisite: PSYC 501.

PM 340L Health Behavior Statistical Methods (4, FaSp) Intermediate statistics for health behavior studies; topics include descriptive statistics, hypothesis testing, correlation and regression, and use of computer software in data analysis.

PM 510L Principles of Biostatistics (4) Concepts of biostatistics; appropriate uses and common misuses of health statistics; practice in the application of statistical procedures; introduction to statistical software including EXCEL, SPSS, nQuery. Laboratory.

PM 511abL Data Analysis (4-4, a: Fa, b: Sp) a: Major parametric and nonparametric statistical tools used in biomedical research, computer packages including SAS. Includes laboratory. Lecture, 3 hours; laboratory, 1 hour. Prerequisite: PM 510L. b: Exploratory data analysis, detection of outliers, robust methods, fitting data with linear and nonlinear regression models, computer packages including BMDP. Includes laboratory. Lecture, 3 hours; laboratory, 1 hour. Prerequisite: PM 511aL.

Catalina Semester Courses:

- 431L Environmental Microbiology (4, F)
- 455L Molecular Approaches to Microbial Diversity (4, F)
- 474L Ecosystem Function and Earth Systems (4, F)

- 447L Natural History and Island Ecology (4, Sp)
- 456L Conservation Biology (4, Sp)
- 437L Comparative Physiology of Marine Animals (4, Sp)

- 490 Independent Research (4, F, Sp)
- 590 Independent Research (4, F, Sp)