1. Organization of Graduate Program

Participating Faculty, Departments and Institutes
The Cell and Molecular Biology (CMB) Graduate Program represents an interdisciplinary approach to graduate education and currently has ~75 graduate faculty members dedicated to helping qualified students pursue original research degrees at the Ph.D. and M.S. level. (http://www.catalog.hawaii.edu/schoolscolleges/interdisciplinary/cmb.htm). Many of our faculty members have split appointments within the university, including affiliations with both traditional academic departments and with organized research institutes. Some faculty have exclusive research appointments, while others pursue research in addition to their instructional duties with medical students, undergraduate students in the Biology Program, or undergraduate degree programs in Zoology, Botany, and Microbiology. Faculty contributing to the CMB Graduate Program are located in multiple departments in three colleges (College of Health Sciences and Social Welfare, College of Natural Sciences, and College of Tropical Agriculture and Human Resources) and in three research institutes, the Cancer Research Center of Hawaii (CRCH), the Institute for Biogenesis Research (IBR), and the Pacific Biomedical Research Institute (PBRC). Links to faculty, contact information, and short summaries of their research can be found on the web site www.hawaii.edu/cmb.

The program admitted its first cohort of students in August 2000, and there are currently ~37 full-time students enrolled in the M.S. and Ph.D. programs. The CMB graduate program replaces former graduate degree programs based in academic departments (Biomedical Sciences Ph.D program administered jointly through Genetics, and Anatomy and Reproductive Biology), and the Cell, Molecular, and Neurosciences Interdisciplinary Specialization. CMB has formal degree-granting program status within the John A. Burns School of Medicine, headed by Dean Jerris Hedges, MD, MS, MMM.

The CMB program has become one of the founding departments offering intellectual support for the developing interdisciplinary “Area of Concentration in Neuroscience”. This is a graduate “specialization” rather than a free-standing graduate program and requires that all students entering the program are first accepted by a participating graduate program. At this time the graduate programs that have agreed to participate are CMB, Psychology and Linguistics. The Neuroscience specialization has been approved to accept students as of Spring 2010. Fortunately, working with CMB, we have been able to recruit 4 students into CMB who will be eligible for the Neuroscience specialization. Theses students will take normal requirements for CMB and will take additional coursework as determined by the Neuroscience specialization. They will be eligible for graduate degrees in CMB (Neuroscience).

Graduate faculty committees
The CMB program is administered by a chair, Dr. Mariana Gerschenson and a co-chair, Dr. Marla Berry who represent the program to the University Graduate Council. They are assisted in their duties by an Executive Committee consisting of the chairs of three other committees: Admissions, Curriculum and Student Advisory and Development.
The Executive Committee is charged with the overall governance of the graduate program and its interactions with the University Graduate Division and Graduate Council.

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<tr>
<th>Faculty member</th>
<th>Office</th>
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<tbody>
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The Graduate Admissions Committee evaluates applicants for the CMB Graduate Program, determines who to admit, and prioritizes accepted applicants for fellowships. It also considers applications for transfer from other programs into the CMB program.

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The Graduate Curriculum Committee oversees the administration of a qualifying exam given to all students at the end of their first year of the program. It supervises the content and organization of the two required courses, CMB 621-622 and CMB 626. It also deals with specialized elective courses that enlarge specific topical areas that can only be covered in survey fashion in the core course. These include additional professional courses for students who want to pursue research in cancer biology, developmental biology, molecular genetics, and the neurosciences.

The Student Advisory and Development Committee is charged with helping students enrolled in the program advance through the process of obtaining their degrees in a timely fashion. This begins with identifying laboratories for rotations during the first year (Ph.D. students), followed by finding an appropriate thesis advisor after passing the qualifying exam, obtaining any necessary waivers or modifications of requirements, and determining if there are undergraduate deficiencies that are limiting the performance of students in research areas that they have chosen or wish to pursue for a
MS. The committee also organizes graduate student events including a welcoming and orientation day in the fall, a series of invited seminars throughout the year, and graduate student retreats. The committee searches out scholarship, fellowship, intern, and travel opportunities available to program members that will aid in their professional growth.

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**Student Advisory and Development Committee**

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**Interactions with other university graduate programs**

The CMB Program in the Biomedical Sciences is part of the University of Hawai‘i’s Graduate Division. The Graduate Division is headed by a Dean, Dr. Peter V. Garrod. The Dean of the Graduate Division chairs the Graduate Council and the Senate of the Graduate Division; these bodies determine Graduate Division policy for the University. Dr. Garrod is assisted by the Associate Dean of the Graduate Division, Dr Kenneth Tokuno. The Associate Dean oversees all of the graduate programs including CMB, and also supervises selection and administration of graduate fellowships and advises the Graduate Student Organization. Students who are awarded NSF predoctoral fellowships will find Dr. Tokuno’s advice very helpful in determining how to set up the administration of their awards. The Associate Dean oversees the Student Services Offices (Admissions and Records), interprets Graduate Division policies and approves exceptions. When you and your advisor forget to file appropriate forms or you need to ask permission for an unusual course of action, this is the person who fixes things. The Associate Dean also acts as an ombudsman and counselor for graduate students with academic or personal problems. This includes professional conflicts of interest, harassment, and other ethical concerns that a student may not feel comfortable discussing with their own faculty advisor or committee members. The Graduate Division offices are on the 3rd floor of Spalding Hall, adjacent to Edmonson Hall on the UH Manoa Mall.
2. Program Activities

Seminars  
Students are expected to attend seminars in the CMB graduate program seminar series. In addition, they are encouraged to attend seminars hosted by other programs that will introduce them to areas they have not had the opportunity to explore as a professional biologist. Seminars are good ways of finding out what new areas of research are opening up, because of new advances in technology or theory. They will direct you to sources of further information in journals or on-line, and help you put real faces to the names you have read about in your textbooks.

CMB Graduate student seminar series  
Students have the opportunity to present their research to other students, postdocs and faculty in the program in a one-hour research-in-progress series that meets every other week throughout the academic year. This allows each student from the second year on the opportunity to present their work in a longer format than afforded by the retreats and other venues.

CMB Department seminar series  
Faculty with appointments in academic departments participate in a formal seminar series that includes Manoa professors as well as invited speakers from other institutions, governmental organizations and private companies. Students participate in nominating and voting for invited speakers from outside Hawaii, as well as hosting the speakers during their visit. These seminars are generally listed in the university’s online publication at www.hawaii.edu, and are always open to the public and any interested person is invited to attend. This site may also contain information about seminars at off-campus research institutes and hospitals.

The Department of Cell and Molecular Biology holds its seminars on Wednesdays at 4pm in the MEB auditorium during the academic year (http://www.hawaii.edu/cmb/seminars.html) and CMB students are required to attend. The Department of Zoology holds it seminars on Friday afternoons at 3:30pm in St. John. 11. The Departments of Microbiology and Botany also schedule seminars. We encourage you to also check the UH Manoa web site (www.hawaii.edu) for additional information. These sessions are forums for research presentations including dissertation defenses from our own students, reports on recent advances from department professors, and talks from guests outside the university.

Research Institute seminars  
Organized research institutes hold their own seminar series that students and faculty are invited to attend. These are usually in the afternoon, but may occur at other times at short notice in order to coincide with a visiting scientist’s travel to the islands before and after international research meetings. The schedule of speakers and abstracts of the research they will present are often available on-line.
CMB Graduate Program Retreats
Graduate student retreats are held each year to provide opportunities for the graduate students to give short oral presentations of their work, for new students to meet current students and faculty, and for all students and faculty to get better acquainted.

Biomedical Science Symposium
The John A. Burns School of Medicine hosts an annual symposium to highlight projects that feature the research of undergraduates, graduate students, medical students, postdoctoral fellows, medical residents, and faculty. Students submit short abstracts and present their projects in poster format. Awards are given for the best posters in each category of participants. The deadline for submission of abstracts for the symposium is usually in March, and the symposium is held in April. To go along with these events, a prominent scientist is chosen by the organizing committee to come to Honolulu and give an invited research seminar. Students are encouraged to interact informally with the speaker, who also reads their posters and participates in the judging of them.

Tester Symposium
The Department of Zoology sponsors an annual research symposium named after a former faculty member Albert L. Tester, who was a world expert in shark morphology, behavior, and evolution. Graduate students from all departments on campus with research interests in the natural sciences at all levels are encouraged to participate, and this event usually takes place over two days in late March or early April at the East-West Center. A distinguished scientist chosen by a committee of students and faculty participates in the symposium and serves as one of the judges. Students must submit abstracts, give 12 minute oral presentations, and answer questions from the audience. Prizes are also given for best presentations, and the symposium concludes with an awards banquet, often at the Honolulu Aquarium or Lyon Arboretum. The winners from one year become part of the panel of judges for the next year. This is a good event for CMB graduate students to meet and mix with their peers in Oceanography, Botany, Entomology, Microbiology, Horticulture, and Zoology. The Zoology Department usually sends out announcements in December or early January.

Distinguished Lecture Series of Manoa
Each year, the office of the Senior Vice President for Academic Affairs commissions a faculty committee to invite 4 world renowned individuals to our campus for a series of public lectures, usually one that is geared to a general audience and a second talk sponsored by an academic department. The committee balances their invitations between two arts and humanities speakers and two scientists. These events often attract hundreds of listeners, and are well publicized by the local media. Nominations for speakers are solicited in the fall from students and faculty, a committee ranks them, issues invitations, and then goes about scheduling the visit over a four day period. (This process may take several years, because of the celebrity status many of these individuals possess, and the need to arrange extra security for some of them during their visits). Sponsoring departments or programs usually arrange a reception to be held in the speaker’s honor, and all students are invited to attend.
3. Program Requirements
This handbook is a summary, but not a complete description of all requirements, rules, and procedures. The current University of Hawaii at Manoa General Catalogue, the Graduate Division Manual (http://www.catalog.hawaii.edu/ and http://www.catalog.hawaii.edu/grad-ed/grad-div.htm), the CMB Graduate Program Chair, or Graduate Division staff should be consulted for more detailed and complete information.

Entering students
Students should arrange to arrive on campus approximately a week before the start of the fall semester so that they can sign necessary appointment papers, complete course registration so that they can get campus ID cards that will allow them to use the UH Hamilton library, meet other students, and talk to the faculty that they may be interested in working with. Faculty often travel in the summer but are generally expected to be back on duty the week before the semester begins. New students are encouraged to make an appointment early with the program chair. They should come in to the program with a general idea of a set of topics they are most interested in, and use the required first year survey course (CMB 621-622) as a way to explore those topics professionally by learning how to read critically the original scientific literature.

In addition, by the end of the first week of the fall semester, students should have contacted faculty members to inquire about research rotation possibilities during the year. PhD students are required to perform 3 research rotations (CMB 631) consisting of 13 weeks each during their first year in the program. Upon completion of each rotation, students are required to prepare a written report summarizing their research experience, with one copy to the faculty advisor and one copy in the student’s academic file. Students in the Masters program are not required to perform research rotations, but are strongly encouraged to do so as it gives them flexibility and exposure to multiple areas of bench science.

Undergraduate deficiencies may be revealed as a result of these activities, and students will be encouraged to make up any deficiencies in the first year. Since research goals may change upon exposure to new ideas, students should not be surprised if they discover their undergraduate course work was not an adequate preparation for a certain topic. Undergraduate courses at a 400 level or higher may get graduate credit. Failure to maintain a 3.0 GPA will result in a student being placed on a probationary status by the Graduate Division.

After completing the first year of course work, all students are expected to take a qualifying exam administered in their second year that will allow them to continue in the program. The qualifying exam consists of two parts: written and oral. If the student does not pass one or both parts, the student may repeat that part of the exam in the second year. If the student fails after a 2nd attempt, the student cannot advance to degree status. By the end of the first year, each student should have chosen his/her research advisor. This person is typically one of the faculty with whom the student did a rotation, but need not be. Students may change advisors at any time in their graduate studies, but such a change usually delays progress through the program.
Upon passing the qualifying exam and in consultation with their advisor, the student prepares a research proposal, forms a thesis committee, and files the appropriate Graduate Division Form. For the PhD degree, the committee is at least four faculty within the CMB program and a non-CMB faculty member who is a full member in the UH graduate school. For the MS plan A (thesis) or plan B (non-thesis) degree there are 2 CMB faculty members and 1 outside member from the UH graduate school. Qualified persons who are not on the UH graduate faculty may serve on MS plan A committees by petition to the Graduate Division. The advisor, the student, and the committee members meet to consider the research proposal formulated by the student, and make recommendations to implement or strengthen this proposal. The committee also determines if any additional course work will be required in order to successfully complete the proposal as planned. Research involving human subjects, dangerous physical conditions, laboratory animals, radioactivity, bio-hazardous materials, or certain chemicals is strongly regulated and requires approval of university regulatory committees before this research can be legally conducted. You may be required to attend special training classes in order to conduct your research. This requirement is intended for your own protection, as well as our custodians or those working around you in the lab. A copy of the approved proposal should be forwarded to the Graduate Chair.

Annual Requirements for all students

All CMB graduate students (except those in their first year) are required to prepare a yearly progress report for their committee with a copy to the Graduate Chair. This short report should describe research accomplishments, progress in mastering new techniques, difficulties encountered, course work completed, meetings attended, and include copies of any abstracts or publications where the student is an author. It should also outline plans for the coming year and report on plans for meeting any additional course work that the thesis committee may have recommended. Each CMB graduate student is required to meet with his/her committee at least once each year. During this meeting, students should be prepared to make a formal presentation of their progress on the dissertation proposal, using the report they prepared as a basis for further discussion by the committee. If not already in use for a formal class or seminar, students may ask to borrow the CMB program’s laser projector to make their presentations.
Master’s Degree  Thesis (Plan A)

Requirements:
Residency. Master’s degree students must complete at least 2 semesters of full-time work (or four 6-week summer sessions) or the equivalent.
Course requirements: The plan A MS requires a minimum of 30 credits in 400-700 level courses. Four courses, CMB 621, CMB 622, CMB 626 and 611 are required. At least 6 credits of thesis 700 are required. Plan A students must be enrolled in thesis 700 in the semester in which they graduate.
Annual requirements: see annual requirements for all students (part 2)
Time limit: All requirements for the MS degree must have been completed within five years of the date on which the degree is conferred. Extensions of this time limit require approval by the Graduate Division. Students may apply for a leave of absence with the Graduate Division if they have personal or medical needs that inhibit their progress to completion of the degree, for up to one year. Approved leave of absence is not counted against this time limit.
Thesis committee: Three members, at least two from CMB graduate faculty are required.

Admission to candidacy for the MS plan A follows completion of all required courses and passage of the qualifying exam, and is recorded by Graduate Division Form I. A thesis proposal is prepared within one semester after admission to candidacy. The proposal is reviewed and accepted by the thesis committee, and recorded on Graduate Division Form II. The student may then enroll in thesis research in subsequent semesters (the relevant 700 level designation depending on departmental affiliation of the major advisor).

Thesis defense: The final examination for the MS plan A is a thesis defense: an oral presentation of the work and questions on that work from the thesis committee. The defense is open to all faculty and students, and usually takes the form of a 50-minute long presentation, followed by questions from the audience.

Copies of the completed thesis must be submitted to the committee members at least two weeks prior to the date of the final examination. All members of the thesis committee must be present at the defense; see “Proxy members in thesis defenses” in the graduate division manual -for exceptions. A majority of the committee must vote to pass, otherwise the candidate fails. Students failing the defense may repeat it only once. Students who fail the second examination are dropped from the program.

The thesis: See “Theses and Dissertations” and the Dissertation and Thesis Specifications issued by the Graduate Division. Two copies of the thesis, one with the original signature page signed by members of the committee in black ink, the other with a copy of the signature page, must be deposited with the Graduate Division. A copy of the thesis must also be deposited with the Graduate Chair for retention in the CMB program office. Publication of the thesis is optional for MS students. Theses to be published must adhere to all requirements for dissertations except that the abstract must be no more than 150 words.
Timeline summary for MS Plan A:
Start of year 1: meet with CMB program chair
End of year 1: choose advisor, submit proposal plan, make-up any undergrad deficiencies,
Start of year 2: pass qualifying exam, form committee, submit thesis proposal for approval, apply for admission to candidacy, begin research
Within 5 years of admission to program: complete degree requirements, conduct thesis research and write thesis
   2 weeks before thesis defense: thesis to committee
   by Grad division deadline for the semester: thesis defense
   by Grad division deadline for the semester: thesis approval and submission
Master’s Degree  Non-Thesis (Plan B)

Requirements:
Residency. Master’s degree students must complete at least 2 semesters of full-time work (or four 6-week summer sessions) or the equivalent.
Course requirements: The plan B- MS requires a minimum of 30 credits in 400-700 level courses. Four courses: CMB 621, CMB 622, CMB 626 and 611 are required. Students who have met all degree course requirements may register in 500 level (Directed Studies) courses appropriate to their interest.
Annual requirements: see annual requirements for all students (part 2)
Time limit: All requirements for the MS degree must have been completed within five years of the date on which the degree is conferred. Extensions of this time limit require approval by the Graduate Division. Students may apply for a leave of absence if they have personal or medical needs that inhibit their progress to completion of the degree, as with the MS plan A.
Program committee: The program committee must have 3 members, including an advisor. Committee members must be on the UH graduate faculty, and at least two (including the advisor) should be CMB graduate faculty.

Admission to candidacy for the MS plan B follows completion of all required courses and passage of the qualifying exam, and is recorded on Graduate Form I. The advisor and the program committee are responsible for approval of a coherent program of courses and a research topic that will be the subject of the student’s Master’s paper. After completing the course work, the student writes a short research paper and makes an oral presentation of the work to the program committee. When this is completed, the chair informs the Graduate Division by memo that the student has completed all requirements. Students must notify graduate division of their intent to graduate with the appropriate form in order to have the degree awarded. it is not automatically awarded upon completion of all course requirements.

Timeline summary for MS Plan B:
Start of year 1: meet with CMB program chair
End of year 1: choose advisor, submit program plan, make up any undergrad deficiencies, pass qualifying exam, apply for admission to candidacy
Start of year 2: form program committee, get proposed course work approved, begin thinking about topic of research paper.
Within 5 years of admission to program: complete degree requirements, write research paper
2 weeks before oral presentation: paper to committee
by Grad division deadline for the semester: present paper to committee

Doctor of Philosophy Degree
Students may apply directly for admission to the Ph.D. program without first completing a MS degree, or may transfer into the Ph.D. program upon completion of the MS. In either case, applications for admission to the Ph.D. program are submitted to the Graduate Division and go to the admissions committee. This application must include a written statement of the goals and accomplishments of the applicant,
transcripts, GRE exam scores, letters of support from faculty members who know the applicant well, and any material (reprints of publications, abstracts, board certifications, patent applications etc.) that give evidence of the student’s accomplishments and maturity to begin doctoral studies.

Applicants wishing to transfer to the Ph.D. program upon completion of a MS degree at UH Manoa may request a waiver of the first year fellowship requirement if they meet the following conditions:
1) Documentation of completion of three research rotations in CMB graduate faculty laboratories
2) Completion of CMB 621-622 course with grade of B or higher in both semesters.
3) Documentation of support from a faculty member willing to serve as Dissertation advisor.

Requirements:
Residency. Doctoral degree students must complete at least 3 semesters of full-time work (or the equivalent in credit hours) at UH Manoa.
Course requirements: No coursework or minimum number of credits is required of transferring MS students other than as specified by the student’s Ph.D. committee. Students entering with MD, BA, or BS degrees or their equivalents must complete the CMB 621-622 core course and three research rotations (CMB 631). In addition, they must complete CMB 626, Ethics in Biomedical Research, by the end of the second year in the program. CMB 611 Seminar in Biomedical Sciences must be taken each semester until the student passes Graduate Form II. Depending on their area of research interest, their Dissertation advisor and Dissertation Committee may specify additional required course work.
Publication requirement: All PhD students are required to have one peer-reviewed publication accepted prior to awarding of the degree.
Annual requirements: see annual requirements for all students (part 2)
Teaching experience: Faculty in the CMB graduate program consider teaching as an integral part of the academic training program and teaching experience is recommended for all doctoral students, especially those who anticipate applying for university teaching positions in US institutions of higher learning as faculty members. This experience is usually in the form of a teaching assistantship but students must not divert their efforts in the first year of training by taking student teaching assistantships (Graduate Assistantships) while they are being supported by program fellowships.
Time limit: All requirements for the Ph.D. degree must have been completed within seven years of the date on which the degree is conferred. Entering students with bachelor’s degrees traditionally take 6 years to finish a Ph.D. in the biological sciences, based on statistics compiled by the National Research Council. The University of Hawaii time limit to obtain a Ph.D. is 7 years and extensions of this time limit require approval by the Graduate Division. Students may apply for a leave of absence with the Graduate Division if they have personal or medical needs that inhibit their progress to completion of the degree, for up to one year. Approved leave of absence is not counted against this time limit. Extensions of this time limit require approval of the Graduate Chair and the Graduate Division.
Dissertation committee: Five members, at least four from CMB graduate faculty (including the Dissertation advisor) are required. The advisor must be a full member of
the CMB graduate faculty. Any member of the UH graduate faculty can serve on a CMB dissertation committee; to include persons not on the UH graduate faculty (for instance, a physician who may provide assistance with clinical applications in a particular medical research problem), a petition with their CV should be submitted to the Graduate Chair, for approval by the Graduate Division.

**Outside member:** One member of the dissertation committee is the “outside” member. While this person may be very helpful towards the dissertation research, the primary function of the outside member is to serve as a representative of the Graduate Division, in order to ensure that procedures and regulations are followed fairly. The Ph.D. degree is awarded by the University, not a department or a program, and therefore university requirements may be more stringent than a particular program’s individual standards. The outside member must therefore be what is called a “full” member of the “regular” graduate faculty at UH: this means, most importantly, that s/he must be hired as a member of the UH faculty. The outside member must not be a CMB program member.

**Advancement to Candidacy:** After completing all coursework required to either fulfill the degree requirements or to remedy undergraduate deficiencies and passage of the qualifying exam, the student will be admitted to candidacy. This is reported by Graduate Division Form I. Admission to candidacy should be attained within two years after entering the PhD program.

**Approval of dissertation proposal:** A dissertation proposal must be prepared and accepted by the dissertation committee within two semesters of admission to candidacy. This is recorded by Graduate Division Form II. The student may then enroll in dissertation research (a departmental 800 level distinction) in subsequent semesters.

**Comprehensive exam:** The comprehensive examination, administered by the Dissertation Committee, consists of an oral examination that emphasizes dissertation field areas of research, but may in fact cover any facet of cell and molecular biology. The entire Dissertation Committee must be present at the exam, and any other member of the UH graduate faculty may also attend. A majority of the Dissertation Committee, including the chair, must vote “pass”, otherwise the student fails the exam. Students failing the comprehensive exam may repeat it only once. Students who fail the second examination are dropped from the program. Students must complete the comprehensive examination within two semesters of admission to the PhD candidacy (that is, within three years of their entry into the PhD program). The status of the student’s performance on the comprehensive exam is also recorded on Graduate Form II.

**Dissertation defense:** Under the guidance of the Dissertation Committee, the candidate prepares a doctoral dissertation according to the rules established by the Graduate Division (see below, Theses and Dissertations). The candidate then defends the Dissertation before the committee and the acceptance of the Dissertation is ruled complete by the filing of Form III. All doctoral students are required to publish their dissertations with UMI (University Microfilm International) or some other equivalent publishing firm suggested by the student and approved by the Graduate Division. Doctoral students are required to submit two unbound copies of their dissertations to the Graduate Division, and are expected to provide one copy for the CMB Program office.
Theses and Dissertations

The format for theses and dissertations is specified by the Graduate Field (CMB faculty) and subject to approval by the Graduate Dean. Each candidate for the Plan A Masters and the PhD should obtain a copy of “Instructions for the Preparation of Theses and Dissertations” from the Graduate Division before beginning to write the dissertation or thesis. A brief summary follows:

The CMB program permits two types of theses/dissertations:
1) The thesis/dissertation may take the traditional form with an introduction stating the problem, background scholarship to put the problem into perspective, a review of the literature, a section on materials and methods, chapters that describe the results, and one or more chapters of discussion and conclusions, and a section of Literature Cited.
2) The thesis/dissertation may consist of a series of published papers. In this form, there must be a comprehensive abstract at the beginning of the dissertation, even if there is an abstract that appears with each article. There must be an introductory chapter integrating the general theme of the research and the relationships between the chapters, this chapter may also include a review of literature relevant to the dissertation, but that does not appear in subsequent chapters. There must be adequate referencing of where the individual papers have been published. The submitted material must conform to standards set by the Graduate Division with respect to format, organization of contents, legibility, and reproducibility.

Graduate Division requirements: The Graduate Dean must approve publication of papers to be included in the dissertation prior to their publication. This requirement is for the protection of the student. In the case of multiple authors, the role that the dissertation author had in the research and the production of the published paper should be clearly indicated in the preface or other introductory sections of the dissertation. It is expected that the doctoral candidate will be the senior or sole author on at least one of the papers and will have made a major contribution to the research and writing of all papers included in the dissertation. Written permission for all copyrighted materials must be attached to the Publication Agreement. It is the responsibility of the graduate student and the faculty s/he works with to discuss their expectations concerning assignment of authorship of publications resulting from theses, dissertations, or other collaborative research projects. An essential aspect of thesis/dissertation research is the free and full dissemination of research results. If a faculty member is conducting proprietary research funded by a private company, the student and Dissertation Committee should come to a clear understanding early on about what types of publications and what aspects of the project the student can fruitfully work on, so that free disclosure is not prohibited by patent or other legal concerns.

The thesis/dissertation must be orally defended in a public examination. Therefore, proprietary or classified information is not suitable for a thesis/dissertation; data that cannot be made public at the time of the final defense should not be incorporated in the student’s thesis or dissertation.
**Proxy members in thesis/dissertation defenses:** As a general rule, the Graduate Division discourages the use of proxies for Theses and Dissertation defenses. The preferred alternatives are to 1) postpone the defense; 2) use teleconferencing; 3) videotape the defense, having one of the members present ask previously prepared questions on behalf of the absent member; or 4) restructure the committee. If a proxy member is the only practical solution that does not unduly penalize the student, the Graduate Division will permit a faculty member to serve as proxy for a committee member, but the proxy is expected to officially replace the committee member until s/he returns. That is, the proxy is expected to ask any questions s/he deems appropriate; the proxy may require the student to revise, modify, add, or delete portions of the thesis or dissertation; and, the proxy must indicate on Student Progress Form III whether or not, in her/his judgment, the student successfully defended the thesis or dissertation. Committee members who do not participate in the defense should not sign Form III Assuming that the absent committee member has read the thesis/dissertation, the absent member should indicate his/her approval (or disapproval) on Form III. Only members approving the thesis/dissertation should sign the signature page. If the absent member has not read the thesis/dissertation, the committee should be restructured.

**Timeline summary for the PhD degree**
Start of year 1: preliminary conference with Graduate chair
End of year 1: complete CMB 621-622 course, and undergraduate deficiencies
Start of year 2: pass qualifying exam, gain admission to candidacy (Form I), choose an advisor, submit a program plan to advisor, prepare to form a committee, work on program plan with advisor
End of year 2: Complete CMB 626 (Ethics) course, appoint a dissertation committee (Form II)
Within 2 semesters after admission to candidacy: obtain dissertation proposal approval (Form II), pass oral comprehensive exam (Form II)
Within 7 years of program: completion of degree
  4 weeks before defense: dissertation to committee
  3 weeks before defense: defense scheduled and Graduate Division notified by Grad Division deadline for semester: dissertation defense (Form III)
  by Grad Division deadline for semester: dissertation approved and submitted to Grad Division (Form III)
Specialized Courses for Elective Credit
You, your advisor, and your committee can decide what electives are important for you to fulfill the necessary unit requirements for your degree from this list and other courses offered on a specialized basis.

**Cell Biology**
- HORT 614 Cellular Genetics of Crops
- MICR 641 Ultrastructure of Cells
- MICR 655 Advanced Virology
- PMP 620 Plant Biochemistry
- RRB 603 Biology of Gametes, Fertilization, and Embryos
- ZOOL 610 Topics in Developmental and Reproductive Biology
- TRMD 604 Infectious Disease Microbiology
- TRMD 671 Advanced Medical Protozoology
- TRMD 690 Seminar in Tropical Medicine and Public Health

**Molecular Biology**
- CMB 604 Evolutionary Genetics
- CMB 680 Molecular Genetics
- CMB 654 Seminars in Human, Molecular, and Evolutionary Genetics
- CMB 625 Advanced Topics in Genetics
- MBBE 691 Experimental Techniques & Bioinformatics
- MICR 625 Advanced Immunology
- MICR 632 Advanced Microbial Physiology
- MICR 661 Regulation of Gene Expression in Microorganisms
- MICR 671 Bacterial Genetics
- PMP 673 Organization and Expression of the Plant Genome
- PMP 680 Methods in Plant Molecular Biology

**Neurobiology**
- CMB 606 Human Neurophysiology
- CMB 705 Special topics in Neurosciences
- PHRM 640 Neuroopharmacology
- PHYL 607 Membrane Physiology
- PHYL 615 Introduction to Axonology
- PHYL/ZOOL 642 Cellular Neurophysiology
- ZOOL 712 Topics in Nerve/Muscle Physiology


**Minimum GPA:** Graduate students are required to maintain a 3.0 GPA
In all UH courses that are to be applied to degree requirements
In all courses taken as a classified degree-seeking graduate student
In all graduate (400-level or higher) courses.
Students may petition Graduate Division to exclude from the GPA up to two grades lower than B for undergraduate courses taken in the first semester of graduate school. If this is done those courses cannot be counted towards degree requirements. Doctoral students may petition to be exempted from the GPA minimum requirements for one semester.

**Academic probation:** Students whose cumulative grade point average fails to meet these GPA minimum requirements after completing 12 credit hours or two semesters of course work are placed on academic probation for the following semester. Students admitted conditionally (due to low undergraduate GPA) will be placed on academic probation if they fail to meet the minimum GPA requirement after completing one semester. Students who fail to attain the required minimum GPA at the end of the probationary semester are dismissed from graduate school.

**Enrollment:** After admission to candidacy, students must be registered each semester (excluding summer session) for course work, thesis/dissertation, or research credit. Students who are not enrolled or on approved leaves of absence are regarded as having withdrawn from the degree program, and will be required to apply for readmission if they wish to resume graduate studies.

**Course loads:** A graduate student is considered as enrolled full time if her/his course load is:
- 8-16 credits if not a graduate assistant (TA)
- 6-9 credits if a graduate assistant (TA)
- at least one credit of Dissertation 800 if a doctoral candidate
- one credit of Thesis 700 if a MS Plan A candidate and all degree requirements, including that for Thesis 700, have been met

Audited courses do not count towards these course load limits. The upper limits may be exceeded with permission from the student’s advisor, the Graduate Chair, and the Graduate Division.

**Students must be enrolled in at least one course or register for one credit of 500, 700, or 800 during the semester in which they graduate.** 500 level courses may be taken by MS plan B students who have fulfilled all degree course requirements. It does not carry credit but does require payment of tuition. 700-level (thesis 700) may only be taken by MS Plan A candidates, and only after the thesis proposal has been approved and Form II has been filed. Six credits of thesis 700 are required for the Plan A degree, and students must be registered for thesis 700 in the semester in which they graduate. 800-level courses may only be taken by PhD candidates, and only after the dissertation proposal has been approved and Form II filed. Students must be registered for dissertation 800 the semester in which they graduate.

**Grades:** Only courses in which a letter grade of B or better can be counted towards degree requirements. Graduate students may take courses credit/no credit (CR/NC) or may audit courses, but such courses cannot be counted towards degree requirements.
Incompletes: An “I” (Incomplete) is given to students who fail to complete a small but important part of a semester’s work in a course before the semester grades are determined. Students are expected to complete all courses and will be allowed to graduate with “I” grades on their transcript only by permission from the Graduate Chair and the Graduate Division. Students receiving an “I” should contact the instructor to determine the steps to be taken to remove the “I”.

Transfer of credits: Credits for courses taken prior to entering the graduate program, or at another institution while in the graduate program at UH, may be transferred and applied to graduate degree requirements, subject to the following conditions. Transfer of credits does not reduce the minimum residence requirements.

1. UH unclassified credits: Up to 15 credits earned at UH as an unclassified post baccalaureate student prior to entering the graduate program may be transferred. Courses must have been taken within five years of entry into the graduate program. Credits for directed research (699) cannot be transferred. The request to transfer credits must be made during the first semester in the graduate program, and must be approved by the Graduate Chair and the Graduate Division.

2. Other institution credits: Up to 15 credits earned at another accredited institution may be transferred. No more than one-half of the credits required in graduate courses (600 and above) may be transferred. Credits may be transferred only for courses in which a letter grade of B or better was earned, and were taken within seven years of completion of the degree, and which were not used to earn a previous degree.

Transfer of credits can be requested by submitting a Petition to Transfer Credits form with transcripts and a memo from the Department Chair to the Graduate Dean. Credits with a grade of B or above are transferable. The request must be made during the first semester in the graduate program, and must be approved by the Graduate Chair and the Graduate Dean. With prior approval, up to six hours of course work completed at another accredited institution after admission to candidacy at UH may be transferred (within the limit of 15 credits total to be transferred).

Leaves of absence: Students who have been admitted to candidacy may be granted leave from their studies on recommendation of the Graduate Chair and approval by the Dean of the Graduate Division. Leave of absence is not normally granted for a period longer than one year. The date of return from a leave must be set at the time the leave is requested. Students not returning from leave on time will be required to apply for readmission to the university in accordance with established regulations.

Students on approved leave do not pay tuition, fees, and time on approved leave is not counted against the five or seven year limits for completion of degree programs, and no readmission procedure is required. Students returning from approved leave should request the bio/info and residency forms from the Graduate Division Records office, by the established returnee deadline so that registration materials can be readied.

Research regulations: Federal, State, and University regulations require that proposed research projects of certain types be reviewed and approved to ensure that the
proposed research complies with applicable protective standards and laws. Students who are unsure whether these regulations apply to their research should consult with their advisor, their Dissertation or Thesis Committee members, with Graduate Division, or with the Office of Research Services (Sakamaki Hall, 2nd floor).

1. **Animal care and use**: University employees or students intending to conduct research involving non-human vertebrate animals must submit an application to the Animal Care and Use Committee for review and approval prior to any such use of animals. Applications and information may be obtained from the Laboratory Animals Services Office.

2. **Human subjects**: University employees or students intending to conduct research involving human subjects must submit an application to the Committee on Human Studies for review and approval prior to any such use of human subjects. Applications and information may be obtained from the Office of Research Services.

3. **Environmental health and safety hazards**: University employees or students whose research may involve recombinant DNA, radioactive materials, scuba diving, or hazardous materials should contact the Environmental Health and Safety Office for information and guidance. This office provides information about appropriate safety and laboratory standards, as well as applications for approvals from the Institutional Biosafety Committee, the Radiation Safety Committee, and the Diving Control Board. **NB**: Transfer of certain hazardous chemicals and reagents between the Manoa campus and satellite research facilities (such as CRCH, Kewalo Marine Lab, and all hospitals) using a private vehicle may be illegal. Transfer of potentially infective materials (i.e. vertebrate blood or tissues) on passenger aircraft such as inter-island air flights as carry-on baggage is also illegal.

5. **Graduate Assistantships and Other Types of Support**

**Teaching assistantships**: Teaching assistantships are available from academic departments and programs engaged in undergraduate education and affiliated with this graduate program (Biology, Chemistry, Genetics and Molecular Biology, Zoology, Botany, and Microbiology) for students who have a minimum 3.0 GPA and who are not in the first year of their PhD program. Assistantships carry a stipend that is paid on a 12-month basis for 12 months of service, or may be only for a single semester. Tuition is waived. Graduate assistants are expected to spend half-time (not more than 20 hours/week) working for the department or program of instruction, usually configured as 12 hrs/week in undergraduate instruction and 8 hrs/wk in associated duties. Teaching assistantships are normally approved by the instructor of record, and applicants must have a background appropriate to the course that they are applying to student teach in.

1. **Course load**: All graduate assistants must carry a minimum of 6 credit hours, but may carry a maximum of 9 credit hours each semester. Audit hours do not count towards the minimum. The 6 credit hours may be at any level, (400-800). Graduate assistants taking only Dissertation 800 for less than 6 credits may be certified by the Graduate Division as carrying a full load. To be eligible for such certification, receipt of Student Progress Form II verifying that the dissertation proposal has been approved must be recorded in the Graduate Division.
2. Foreign teaching assistantships: The English Language Institute has developed a course that provides practice for foreign teaching assistants in speaking in classroom situations with an emphasis on oral skills, ESL 111. Practicum for Foreign Teaching Assistants.

Research Assistantships: Research assistantships frequently are available to qualified students in connection with funded research projects. Such assistantships are rarely available until after faculty have had the opportunity to assess the student’s research potential. The stipend may be more than that of a teaching assistantship.

NSF and Howard Hughes Foundation pre-doctoral fellowships: These foundations make a number of awards each year to hundreds of highly qualified graduate students who are either entering a new graduate program with an undergraduate degree or are currently in a graduate program but have not completed 30 credit hours of work. (typically, a first year student who gets a bright idea after participating in a research rotation but wants to work on a project not currently funded in that faculty member’s lab). The fellowships give a stipend for three years, along with education costs to cover tuition and health care, and a modest annual research budget for supplies. Application details can be found on the CMB web page. The student can use them at any institution with any qualified faculty member. Students write a short research proposal, submit supporting letters from faculty who know their potential and can address their ability to perform independent research. The applicant should have competitive GRE scores (>90th percentile) in order to have a reasonable chance of success in these programs.

ARCS fellowships: Colleges with faculty participating in the CMB program award research fellowships to outstanding graduate students on an annual basis. The student, must be a US citizen, and is nominated by their advisor. After screening by a committee, one student is selected to represent that academic unit for the university, and receives a cash award of $5000. Students will be interviewed by a faculty committee, and a single student is chosen as ARCS scholar of the year.

Cancer Research Center of Hawaii travel award: Students in our program who will be presenting either a paper or a poster on their thesis/dissertation project at a national or international research meeting can apply for a travel award, generously supplied by the Cancer Center. These awards are a maximum of $1250, and applicants must submit a copy of the abstract, the acceptance letter, a letter of recommendation from their advisor, and a cover letter stating why travel to this meeting will help them achieve their professional goals. A short report about the meeting should also be turned in after completion of travel.

Graduate Division teaching awards: In recognition that student teaching is a valuable and important skill, the Dean of the Graduate Division makes an annual award for the best Graduate Assistant contributing to the UH learning community. TA’s are nominated by students and faculty, and nominations are screened by a committee. The winner is honored with an award of $1000 and recognition of meritorious teaching at the annual fall convocation.
**Scholarships and small research grants:** see the CMB web page for announcements throughout the year about deadlines for Bank of Hawaii grants, American Heart Association fellowships, Sigma Xi grants in aid of research, AAUW, Kamehameha Schools/Bishop Estate, Soroptimists, etc. Some research societies also make best student paper awards for publication of a student’s thesis work when submitted to their journals. Your advisor is probably the best source of information about special programs and supplements available in a particular discipline.

**Tuition waivers:** Tuition waivers are included in each teaching assistantship contract. In addition, the Departments of Cell and Molecular Biology and Zoology receive several tuition waivers made available by the State each year, and students should ask department chairs individually about these opportunities.

**Additional employment:** It is expected that the combined responsibilities of graduate student and assistant will occupy all the time available to a student during the academic year. University policy on outside (off-campus) or overload (on-campus) employment by a graduate assistant in addition to the assistantship limits such employment to eight hours per week.

**Health insurance:** Graduate assistants may enroll in the State Health Fund medical insurance program if appointed at 0.5 FTE (full time equivalent) for a period of at least three months. There are several plans to choose from, both single and family, with the cost shared in part by the State. Alternatively, assistants may enroll in one of the student health plans, either single or family.