Biomolecular Engineering and Bioinformatics
PhD Program Handbook - 2017-18

The graduate research track in Biomolecular Engineering and Bioinformatics (BMEB) accepts students from molecular biology, biochemistry, computer science, and mathematical backgrounds, and trains them in innovative, multidisciplinary bioinformatics research. The track builds upon UCSC’s renowned bioinformatics program, with particular strengths in comparative and functional genomics, non-coding RNA discovery, protein bioinformatics, and structure prediction. Faculty members from four departments participate in the BMEB research track. Their research groups are internationally recognized for pioneering work on applications of Bayesian statistical methods and hidden Markov models to biological sequence data, the development of widely used computational tools for the analysis and comparison of whole genomes, protein structure and function prediction, and the discovery of non-coding RNA genes. UCSC is the primary release site for the public version of the human genome, the ENCODE project, and a focal point for archaeal, extremophile, and ancient genomics. UCSC is also a major player in technology development in high-throughput and single-molecule sequencing, and integrative investigations of infectious disease and stem cell processes. New BMEB students undertake rigorous core coursework, conduct laboratory rotations, and are exposed to a rich environment of regular seminars and group meetings. Students interact closely with BMEB faculty members while undertaking their dissertation research, and have first-hand access to state-of-the-art computation tools and lab facilities throughout their training, including cluster computing and high-throughput sequencing facilities. Students receive financial support throughout their graduate career, contingent upon remaining in good academic standing.

**Core BMEB Faculty**

Mark Akeson  
**Computational Tools for Angstrom-scale Control and Analysis of DNA and RNA Using Nanoscale Pores**

Angela Brooks  
**Transcriptome Analysis of RNA Splicing and Cancer**

Russ Corbett-Detig  
**Population genomics and genome evolution**

Rebecca Dubois  
**Structure, Function, and Engineering of Virus Proteins**

Camilla Forsberg  
**Hematopoietic stem cells, transcriptional regulation, chromatin, blood cell development, cell surface receptors, genomics**

Ed Green  
**Genome Sequence Assembly and Comparative Genome Analysis**

David Haussler  
**Computational Biology**

Richard Hughey  
**Bioinformatic Tools for Sequence Analysis and Prediction**

Kevin Karplus  
**Protein Structure Prediction and Design**

Jim Kent  
**Computational Genomics**

Daniel H. Kim  
**Epigenetic Reprogramming by Long Noncoding RNA**

Todd Lowe  
**Computational and experimental discovery of non-coding RNAs, microbial genomics, extremophile biology**

Josh Stuart  
**Computational Functional Genomics, with Application to Integrative Analysis of Cancer**

Christopher Vollmers  
**DNA Sequencing Tools for the Analysis of B cells**

**Collaborating Faculty**

Manny Ares  
**Splicing and RNA Processing**

Phil Berman  
**Biotechnology and Infectious Diseases**

Ólöf Einarsdóttir  
**Bioenergetics, Redox Metalloproteins, Electron Transfer, Proton Translocation, Flash-Photolysis, Time-Resolved Spectroscopy**

Lars Fehren-Schmitz  
**Human Palaeogenomics & Molecular Anthropology**

Doug Kellogg  
**Molecular Mechanisms that Coordinate Cell Growth and Cell Division**

Harry Noller  
**Structure and Function of the Ribosome**

Karen Ottemann  
**The Molecular Virulence Factors of Helicobacter pylori**

Nader Pourmand  
**Biosensors, microarray, nanotechnology, pathogens, sequencing, genotyping, DNA fingerprinting**

Jeremy Sanford  
**Post Transcriptional Control of Gene Expression**
Beth Shapiro  Inferring the Evolutionary Dynamics of Species and Populations Using Genome-scale Data Sampled Over Time
Donald Smith  Mechanisms Underlying Responses and Adaptations of Organisms to Toxic Metal Exposures
Fitnat Yildiz  Molecular Mechanisms of Biofilm Formation in Vibrio cholerae
Al Zahler  Exon Recognition and Alternative Splicing

Administrative Structure

Two committees guide the BMEB Track:
Graduate Advising Committee (GAC for Advising)
The Advising Committee is comprised of three program faculty. Responsibilities include student orientation and advising, setting rotation assignments, rotation talk advising and feedback, evaluating and approving oral examination topics, assigning oral examination committees, ensuring thesis committee meetings are held, and allocating University support for continuing students.

Graduate Admissions Committee (GAC for Admissions)
The Admissions Committee is comprised of three program faculty. Responsibilities include reviewing applications, planning recruiting activities, accepting students and developing offers of support.

Application and Admission to the BMEB PhD Program

Deadlines
The application deadline is in early December for admission to the program in the fall of the following academic year. Application procedures and information are available on the PBSE web page [https://pbse.ucsc.edu/about/application.html](https://pbse.ucsc.edu/about/application.html). The on-line application is available at [https://gradapp.ucsc.edu/start.html](https://gradapp.ucsc.edu/start.html). Application files are reviewed by the Admissions Committee. Late applications are accepted only in exceptional circumstances and subject to available resources. The Admissions Committee will review no applications after April 30 of each academic year.

Admission criteria
The Admissions Committee evaluates candidates based on numerous indicators of potential, which include but are not limited to the following:
- Evidence of research potential and commitment to research in the statement of purpose
- Previous research experience
- Evidence of research potential in letters of recommendation (3 required)
- GRE scores: both general and subject (Biology, Biochemistry, or Chemistry) exams
- GPA
- Grades in relevant undergraduate courses
- Evidence of quantitative and analytical skills
- Evidence of ability to communicate in writing
- Indications of special expertise, experience, or cultural perspectives that the student may contribute to our program
- Performance in interviews

Admission process
After evaluation of each file, the Admissions Committee ranks the applicants. The number of offers made can fluctuate from year to year, depending on the relative strength and size of the applicant pool, and resources available. The BMEB program is committed to supporting all of its graduate students for the five years of a normal degree. The top ranked applicants are invited for a formal interview visit organized by the Admissions Committee and generally held for all PBSE programs simultaneously. Prospective students meet with BMEB faculty and students and faculty and student recruits in other tracks. Feedback from the interview is used to determine offers. The Graduate Division formally notifies prospective students of the offer by March 15. Students are required to accept or decline the offer by April 15.
International students
Because of limited resources to cover out-of-state tuition, which remains in effect for the duration of the degree, relatively few international students are admitted to the program. The University will cover a significant proportion of the out-of-state tuition after a student advances to candidacy. Consequently, students are encouraged to advance after successful completion of the Qualifying Examination, to minimize tuition expenses to themselves and the department.

Getting Started

General advising
In the 1st year, the BMEB Advising Committee and the faculty who supervise rotations are responsible for providing academic and research advice. After students join their thesis lab, the thesis advisor and the student’s thesis committee assumes guidance responsibilities. Students are always welcome to seek additional advice from the Advising Committee, especially concerning procedural issues.

Administrative Support
Administrative support for the BMEB program is provided by the BME Graduate Advisor (currently Tracie Tucker). Many organizational tasks, especially for first-year students, are done in cooperation with the other PBSE tracks.

Email
All BMEB graduate students will be assigned one email account. The @ucsc.edu account will be set up automatically for them by the time they arrive for fall quarter. In addition, all engineering graduate students are required to set up a BSOE account. This account is used to access the SOE computer resources. To apply for your required BSOE account go to new-accounts and follow the instructions there. Indicate Tracie Tucker as your sponsor. In subsequent years, your PI will be your sponsor. Your BSOE account should be activated within three days. The email address for each graduate student is included in a departmental alias, bmegrads@soe.ucsc.edu. The majority of communications with students from the department office will be done through email.

Mailboxes
Currently, the Baskin School of Engineering does not provide mailboxes for graduate students. However, if you have official university business or research related mail (only), the BSOE Graduate Advising Office can accept mail on the student’s behalf, please use mailing address below.

Student Name
UC Santa Cruz
1156 High St., M/S: SOEGRAD
Santa Cruz, CA 95064

Students should use their home address for personal mail, bills, etc.

Office supplies
Graduate students should purchase their own office supplies for use in classes. The School of Engineering does not provide those supplies. Students serving as a teaching assistant (TA) for a course may obtain supplies needed to perform their TA duties from BSOE Instructional Support (Engineering 2, Room 298). Such supplies might include overhead transparencies and markers for discussion sections, pens to use in correcting papers, and paper for documentation. After students join their thesis lab, they should consult with the lab P.I. about funding for supplies.

Photocopying
There are photocopiers available on the 2nd and 3rd floors of Engineering 2 for instructional and personal copying. A photo copy card can be checked out from SOE Instructional Support (E2-298), for use by the instructor and the TA(s). After students join their thesis lab, they should consult with the lab P.I. about funding for photocopying. For personal copying, students may purchase copy cards at the Science or McHenry Library.
**TA assignments**
BMEB Graduate Students are generally required to serve as Teaching Assistants for two to three classes during their UCSC Graduate Career. These assignments are usually done within the first two years. Students who are awarded extramural fellowships are often relieved of serving as Teaching Assistants as a condition of their award. Assignments and schedule will be made by the Graduate Advising Committee and the Graduate Director in consultation with students.

The application procedure as well as other TA resources can be found here: [https://ga.soe.ucsc.edu/ta](https://ga.soe.ucsc.edu/ta). Teaching assignments are made by balancing financial needs of students, past performance and assignments, requests of the instructors, and the needs of the department. Every effort is made to accommodate stated preference. Students should feel free to communicate with the Graduate Program Advisor (Tracie Tucker) and the Graduate Director about their teaching preferences. In addition to attending and assisting in lectures, TAs are generally expected to lead discussion sections and to hold weekly office hours. To schedule office hours in one of three locations please see [https://ga.soe.ucsc.edu/ta/office-hours](https://ga.soe.ucsc.edu/ta/office-hours).

**Financial support**
The BMEB program strives to support graduate students for up to 5 years. Support is provided in the form of Graduate Student Researchships (GSRs), Teaching Assistantships (TAs) and a limited number of fellowships. Faculty advisors generally support their students during the summer as GSRs. Continued support is contingent on making academic and research progress.

**Ph.D. Program in the BMEB Track**
Predoctoral fellows in the track in Bioinformatics and Computational Biology must complete rigorous coursework in bioinformatics, chemistry, biology, and statistics. We also require new students to conduct research rotations in both computational and experimental laboratories. BMEB students also have the flexibility to craft their graduate curriculum to suit individual interests, creating a strong foundation for their independent dissertation research. Advanced graduate students work under the direct supervision of one of the affiliated faculty members, while also interacting closely with other faculty members. Training in this interdisciplinary research environment has enabled our students to lead bioinformatics efforts to understand biology and disease, advancing the frontiers of biomedical research, with graduates now in top university faculty positions and leading industrial research laboratories.

**First Year**
- Core bioinformatics series
  - BME 205: Bioinformatics: Models and Algorithms
  - BME 80G: Bioethics
  - BME 230: Computational Genomics
- BME 200: Teaching and Research in Bioinformatics
- BME 280B: Participation in research meetings and seminars
- BME 296: Lab/Research Rotations
- Advanced graduate courses or makeup courses to fill deficits
- Selection of a thesis advisor
- Begin thesis research
- Annual Review at end of year

**Second Year**
- BME 201: Scientific Writing (winter)
- Thesis proposal and qualifying exam (spring)
- Formation of faculty thesis committee for student guidance
- Participation in research thesis meetings and seminars
- Advanced graduate courses

**Third Year**
- Thesis research
- Participation in research meetings and seminars
- Advanced graduate courses (as desired)
- Annual Thesis Committee meeting
Following Year(s)

• Completion of thesis research
• Annual Thesis Committee meetings
• Participation in research meetings and seminars
• Advanced graduate courses (as desired)
• Public presentation of thesis defense

1st-year student Bootcamp and Orientation
Newly admitted students will be notified when Bootcamp and Orientation events will begin in the fall. Typically, this is one to two weeks before the beginning of classes. The BMEB Bootcamp includes ad hoc instruction, training, and a project designed by current BMEB Graduate Students. Additional training and orientation events are organized by the PBSE Program and the Graduate Division. These include biosafety training, computer resource orientation, and an introduction to our science library. A PBSE research conference and welcome dinner at the beginning of the quarter provides a great opportunity to meet faculty and continuing graduate students.

Advising interviews
Students accepted into the Ph.D. program meet individually with members of the Advising Committee during the Fall quarter to review their academic background and plan a curriculum for first year. In addition, students may meet individually with the Advising Committee during Winter and Spring quarters of their 1st year for informal feedback on their progress and to provide feedback to the Advising Committee on the program.

Language requirement
Proficiency in a foreign language is not a requirement for the BMEB Ph.D. program.

Graduate core courses
Students are expected to attend all class meetings and complete all assignments to pass. Grades are A for excellent, B for satisfactory, and C or F for unsatisfactory. The letter grade option is encouraged as students should plan to apply for NSF or other fellowships during their graduate career.

BME 205 Bioinformatics Models and Algorithms
Offered in Fall quarter. Covers bioinformatics models and algorithms: the use of computational techniques to convert the masses of information from biochemical experiments (DNA sequencing, DNA chips, and other high-throughput experimental methods) into useful information. Emphasis is on DNA and protein sequence alignment and analysis.

BME 230 Computational Genomics
Offered in Winter quarter. Genomics databases: analysis of high-throughput genomics datasets; BLAST and related sequence comparison methods; pairwise alignment of biosequences by dynamic programming; statistical methods to discover common motifs in biosequences; multiple alignment and database search using motif models; constructing phylogenetic trees; hidden Markov models for finding genes, etc.; discriminative methods for analysis of bioinformatics data, neural networks, and support vector machines; locating genes and predicting gene function, including introduction to linkage analysis and disease association studies using SNPs; and modeling DNA and RNA structures.

Rotation selection
The purpose of rotations is to provide students with diverse research training in 3 different laboratories, and to allow students and faculty to make appropriate pairings for thesis work. Before the beginning of each rotation period, 1st year students submit to the PBSE graduate coordinator, a ranked list of 3 faculty as rotation choices. Before submitting their choices, students should talk to faculty about potential projects and suitability for rotation in their lab. Rotation assignments are made by the Graduate Director. Students are generally assigned their 1st choice unless there are multiple students who list the same 1st choice. In that case, students are given their 2nd choice.

Faculty are not permitted to make any commitments to students regarding permanent positions in their lab, officially or unofficially, until the 3rd rotation period has ended. Occasionally, a student may not find a suitable laboratory at the end
of 3 rotations. They may select a 4th laboratory for a rotation with the permission of the Advising Committee and the rotation advisor.

**Summer rotations prior to Fall quarter enrollment**
Graduate students may do a Summer rotation if they can find a faculty member who can provide financial support during the summer.

**Rotation talks**
In the final week of the first two rotations, rotating students will give a short rotation talk to the PBSE community. Typically, each talk is 6-8 minutes with an additional 2 minutes for discussion, but times may vary depending on class sizes. During the final week of the third rotation, rotating students will present a poster to the PBSE community.

**Evaluation of rotation performance**
Performance in each rotation is graded as satisfactory/unsatisfactory and summarized in a narrative evaluation by the rotation advisor. Performance is evaluated on the basis of research effort and progress, intellectual mastery of the project, and performance in the talk. Faculty should submit evaluations in a timely manner.

**Faculty responsibility to rotation students**
While rotation students may work closely with one or more members of the laboratory, the primary responsibility for supervision lies with the faculty member. Faculty are encouraged to meet regularly with the rotation student to discuss their progress. Faculty should also attend the rotation talk. If unable to do so, another BMEB faculty member should be asked to attend the talk and provide an evaluation.

**Seminars**
The Biomolecular Engineering & Bioinformatics Department organizes a weekly department seminar. All graduate students should attend the department seminar.

**Failing a course and academic probation**
Students who fail any course, including an undergraduate course or rotation assignment, must meet with the Advising Committee to review their progress. At that time they may be placed on academic probation. If their progress does not improve after an additional quarter, they may be asked to leave the program. All failed courses must be made up at the next available opportunity.

**2nd year advising meeting**
Early in Fall quarter, the Advising Committee meets with 2nd year students to discuss their progress, 2nd year coursework, training in the responsible conduct of research, and preparation for oral exams.

**Training in the responsible conduct of research**
NIH recommends two Responsible Conduct of Research (RCR) training experiences in Ph.D. programs. The first RCR training experience in our program is our Research and Teaching course (BME 200), taken by graduate students during their 1st year. The course includes readings about and discussion of keeping accurate and durable records; forms and consequences of fraud, plagiarism, and other forms of academic misconduct; honest reporting of data; writing and reviewing grants; authorship; conflict of interest; working with collaborators; and humane and appropriate use of animals in research.

The second RCR training experience is generally the Ethics course requirement.

**Selection of original research proposal topics for the oral examination**
A qualifying examination committee is then formed in the second year, which consists of the adviser and three additional members, and which is approved by the graduate director and the campus graduate dean. At least two of the four must be members of the Department of Biomolecular Engineering. The student must submit a written dissertation proposal (thesis proposal) to all members of the committee and the graduate program adviser one month in advance of
the examination. Typically, this proposal is drafted during Winter of the second year in BME201 Scientific Writing. The dissertation proposal is publicly and formally presented in an oral qualifying examination given by the qualifying committee.

Avoidance of apparent conflict of interest
Formal evaluation of a student may lead to an apparent conflict of interest for a faculty member. Such situations can include, but are not limited to, serving on an oral or thesis committee for the student of a spouse or significant other. In such situations where an apparent conflict of interest could occur, the faculty should recuse him/herself. They may, however, serve as an ad hoc advisory member of such thesis committees, but will not participate in the formal evaluation process. Informal situations are not subject to apparent conflict of interest considerations.

Plagiarism - definition, guidelines, and consequences
The UCSC Code of Student Conduct states: "Plagiarism is defined as the use of intellectual material produced by another person without acknowledging its source. This includes, but is not limited to: 1) copying from the writings or works of another into one's academic assignment without attribution, or submitting such works as if it were one's own; 2) using the views, opinions, or insights of another without acknowledgement; or 3) paraphrasing the characteristic or original phraseology, metaphor, or other literary device of another without proper attribution." In assignments for class and when writing research articles and grants, students must express ideas in their own words and must give credit to the sources of the ideas. When cases of plagiarism are discovered, the disciplinary actions are severe. After a first incident of plagiarism, the instructor will generally assign a 0 on the assignment that contained a plagiarized portion or portions, and the Department Chair and the Graduate Dean will be notified of the incident. After a second incident of plagiarism, the program will recommend to the Department Chair and the Graduate Dean that the student be expelled from our graduate program.

Progress Toward a Thesis
Selection of the thesis committee
After successful completion of the qualifying exam, the student should immediately assemble their thesis committee in consultation with their thesis advisor. The committee comprises the advisor plus two BME faculty members. A majority of the members must be members of the UCSC Academic Senate. While outside members specializing in the thesis research are permitted, they are not mandatory. Outside members must be tenured members of an academic institution. The student must meet with their thesis committee at least once per year until completion of the Ph.D. degree. The committee will provide continuing guidance throughout the development of the thesis, will provide ongoing assessment of the student's progress, and will evaluate the completed dissertation.

Graduate student academic progress reports
The Graduate Division requires an annual report of progress for every PhD student. At the end of each academic year, the BMEB advising committee will meet to evaluate the academic progress of each student and set out requirements due in the coming year. A summary of this evaluation will be sent to each student and will include a statement of any deficiencies in meeting requirements.

Target time and normative time
The target time for the Ph.D. is 5 years. The normative time for the Ph.D. degree within the University of California is 6 years. Students who fail to complete their thesis within this time must request an extension from the Graduate Division. The form for requesting an extension is available in the BSOE Graduate Advising Office. This petition must include a detailed timetable for completion and must be signed by the student, faculty advisor and graduate director prior to submission to the Graduate Dean. If the Ph.D. degree is not awarded within 7 years from the date of advancement to candidacy, the student’s candidacy shall lapse and the student will be required to pass a new oral qualifying exam prior to submitting the dissertation or undergo such other formal review as the student’s department shall direct, and the result of this examination or review shall be transmitted in writing to the Graduate Council (Academic Senate Regulation 18.6).

Preparation of the thesis
When the student’s advisor and thesis committee have agreed that the research is ready to be submitted, the student may proceed with “writing up” according to the guidelines prescribed by the University Library and the Graduate Division. The dissertation is of critical importance, because it reflects the candidate’s ability to do independent research at a high level of scholarship and creativity. The dissertation should make clear that the candidate is familiar with and able to criticize and evaluate previous work done in his or her specialty field, and that the candidate has made a significant contribution to knowledge, at least part of which is of a quality and quantity worthy of at least 2 publications. The outline of the thesis should be approved by the thesis committee prior to preparation of the thesis. The thesis should be provided to the committee no less than one month prior to the thesis defense date. The thesis defense should comprise an open seminar. After the seminar, the thesis committee will meet with the student to discuss any changes to the thesis required for completion. Upon submission of the final thesis, the committee will sign the cover page and grant the Ph.D. Formal award of the Ph.D. is made by the Graduate Division. Summer thesis defenses are discouraged, since many faculty are absent and no formal seminar series is in place during the summer.

**Other BMEB/BSOE Program Policies**

BSOE and Graduate Division forms are available from [https://ga.soe.ucsc.edu/current/forms](https://ga.soe.ucsc.edu/current/forms). All forms, applications, etc. in connection with the Graduate Division must be routed through the BMEB Graduate Program Advisor (Tracie Tucker). UCSC-wide policies and procedures for Graduate Students are further explained in the [UCSC Graduate Student Handbook](https://ga.soe.ucsc.edu/current/forms).

**Completion of previous degrees**

1. No student may enroll as a graduate student at UCSC until a bachelor’s degree has been completed.
2. Newly accepted students who are currently completing another graduate degree normally will not be permitted to enroll in the BMEB Graduate Program until the previous degree has been completed (or abandoned).

**Leaves of absence**

1. Students are expected to engage in their graduate student activities continuously (including the summer) from the time of admission until completion of the Ph.D. thesis. Any leave of absence must be authorized in advance.
2. Approval for a leave of absence will be recommended to the Graduate Dean only under unusual or exceptional circumstances. Requests for leave must be submitted in writing to the Advising Committee and must include justifications and the consent of the student’s advisor or the Advising Committee, whichever applies to the individual student.
3. Time spent on leave continues to count toward all departmental and university time requirements, including, but not limited to, passing the qualifying exam, the three-year limit after advancement to candidacy, and the six-year limit on normative time for completion of graduate work at UCSC.
4. Making use of an approved leave of absence will not jeopardize maintaining the satisfactory academic progress that must be reported annually to the Graduate Dean.
5. If a leave of absence is granted, it is the responsibility of the student to be familiar with all relevant departmental and university regulations, and to file any necessary paperwork both with the BSOE Graduate Advising Office and the Graduate Division. Please consult with the BMEB Graduate Program Advisor (Tracie Tucker).
6. International students have additional responsibilities to meet restrictions imposed by their visas, and must also have approval from International Services (visa@ucsc.edu).
7. Re-admission to the program after a leave is contingent upon satisfying any conditions set by the department or the Graduate Dean.

**Normal course loads**

1. BMEB graduate students are expected to work full-time towards their degrees and, therefore, students should enroll for 15 units of credit each quarter.
2. Once formal upper-division and graduate courses recommended by the student’s advisory committee have been completed, it is expected that the student will normally enroll in 15 units of BME 297, Independent Study, each quarter (unless taking a 5 unit graduate elective) plus 2 units of BME 280 if this is offered by the thesis advisor. Advanced students will enroll in BME 299, Thesis Research.
3. Lighter or heavier loads must be approved in advance by the Advising Committee.
Ph.D. thesis defense
The BMEB Graduate Program requires a formal thesis defense before awarding the Ph.D. degree. This requirement must be satisfied before the thesis committee signs the cover page and other forms indicating that the thesis has been accepted. The defense takes place after all members of the committee have approved the written thesis. The defense must be a public seminar, attended by a majority of the candidate’s thesis committee, in which the candidate formally presents the substance of the thesis. After the seminar, the public must have sufficient opportunity to question the candidate. The thesis committee may then meet in private with the candidate for further questions, before determining whether the candidate’s thesis is accepted or rejected, or whether any problems need to be resolved. If both the thesis and the defense are acceptable, the cover page and necessary forms will be signed by the committee members, and all departmental requirements pertaining to the Ph.D. thesis defense will have been satisfied.

Expected timetable for the Ph.D. degree
The BMEB Ph.D. was conceived as a five-year program. Under normal circumstances, students should plan to follow this timetable:
1. Enter at the beginning of the Fall quarter.
2. Complete all required coursework in the first two years.
3. Take qualifying examination and advance to candidacy by the end of Spring quarter of the second year.
4. Complete research and finish writing thesis by end of the fifth year. Deviations from this pattern require good justification. Deviations must be approved by the student's advisory committee and by the Advising Committee. Approval is not automatic and should be sought as soon as the need is anticipated.

Leaves and qualifying examinations
1. Students must obtain written permission first from their advisor, then from the department graduate director for all leaves.
2. Students not registered or not on leave for any given quarter must turn in the required paperwork the following quarter (summer excepted) or they will be dismissed from the program.
3. Students who formally withdraw from the program without the successful completion of either a thesis or the qualifying examination must submit formal notification to the Advising Committee and BMEB Program Advisor.
4. Students must take the qualifying examination before the beginning of Fall quarter of their third year or they will not be allowed to register for courses or serve as a TA or RA. The Graduate Division will be notified, and course enrollment will be denied. Any exceptions to this policy must be made in writing by the student's faculty sponsor committee member) prior to the beginning of the Fall quarter.
5. If explicitly invited to do so by the examination committee, students who fail the qualifying examination have one quarter to produce a Master’s Capstone Project (on current research) or retake the examination. Such cannot extend past the Fall quarter of the third year in residence without written permission from the Advising Committee.

Checklist for Graduation
1. Complete and file application for degree form for the quarter of graduation: http://graddiv.ucsc.edu/student_affairs/forms.php
2. Schedule dissertation seminar with the BMEB Graduate Program Advisor (Tracie Tucker).
3. At least three (3) months before graduation, meet with thesis committee to determine thesis content and format.
4. At least one (1) month before thesis defense, give all committee members a copy of thesis for review.
5. Two (2) weeks before thesis defense, meet with thesis committee again for final feedback.

Appendix: UCSC APPEALING ACADEMIC JUDGMENTS
Revisions approved by Graduate Council on April 24, 2008 and effective July 1, 2008
Students have the right to appeal various institutional judgments concerning their academic standing at UC Santa Cruz including dismissal from graduate standing, placement on probationary status, narrative evaluation or grade notation, and their academic progress. This appeal procedure applies only to current graduate students at UC Santa Cruz and is not available to appeal denial of admission or readmission to any program. The scope of this procedure is limited to the matters listed above, and excludes complaints regarding student employment as a Teaching Assistant, student
discipline, auxiliary student services (such as housing, child care, etc.), and sexual harassment, which are covered by
other policies and procedures. There are four levels of complaint resolution available to graduate students at UC Santa
Cruz: Instructor appeal, Departmental appeal, Graduate Dean appeal, and Graduate Council appeal. The procedure for
appeals is detailed in Section IX:D.3 of the UCSC Graduate Student Handbook.

Throughout all stages of the appeal process, both parties are strongly encouraged to seek informal resolution.
The Dean of the Division of Graduate Studies may be consulted for informal resolution at any stage of the process. In
addition graduate students may contact the Office of the Ombudsman for assistance with informal complaint resolution.
Working toward informal resolution does not preclude continuation of a formal appeal. However, unless a request for
extension of a deadline is granted as provided below, informal resolution efforts shall not serve in any way to stay or
extend an applicable filing deadline.

Requests for Extension of Filing Deadlines
Except as otherwise provided in this policy, any party may for good cause seek an extension of a deadline by filing a
request with the Dean of the Division of Graduate Studies. Such request must be submitted in writing prior to the
deadline for which an extension is sought, and must explain the reason(s) why an extension is necessary. The decision to
grant or deny a request is within the discretion of the Dean and shall be final and binding.