

**University of California, Merced**

**Graduate Program in  
Quantitative and Systems Biology**

**Policies and Procedures**

**Effective Academic Year 2011-2012**

## **I. SCOPE OF RESEARCH**

QSB faculty research covers a wide range of biological subdisciplines, some of which are often housed in clearly defined, separate departments at traditional campuses. The QSB program at UC Merced was founded without departments and institutional boundaries, allowing for the development of a unique graduate group in which cell biologists, bioengineers, evolutionary biologists and ecologists can interact easily and regularly, fostering new ideas and exciting research collaborations. Faculty in QSB share the common interest of applying or developing quantitative methods to better understand biological systems. Moreover, QSB aims to link the biological subdisciplines by training our students in quantitative approaches that can be applied to biological systems at different scales and through the promotion of multidisciplinary collaborations.

## **II. GRADUATE ADMISSIONS**

All persons seeking admission to graduate standing must submit a formal application for admission to the UCM Graduate Division. Applications are reviewed by the QSB Recruitment and Admissions Committee, which makes recommendations on admission to Graduate Studies; the Dean of Graduate Studies makes final decisions on admission.

### **II. A. APPLICATION DEADLINES FOR ADMISSION**

The deadline for receipt of applications is January 15. Normally applications will be accepted for Fall semester only, enrollment in other semesters will be considered on an individual basis, with applications due no later than seven months prior to the beginning of the semester when the student would like to begin graduate studies. Applicants are encouraged to contact individual faculty members to discuss their research interests before applying for graduate study.

### **II.B. MATERIALS TO BE SUBMITTED**

The complete official application form;

The application fee;

All official university/college/junior college transcripts;

An official Graduate Record Exam (GRE) score report. Only the general tests are required;

Three letters of recommendation from instructors or supervisors who can comment on the applicant's scholarly ability and promise as a researcher;

Official score reports from the Test of English as a Foreign Language (TOEFL) and the Test of Spoken English (TSE) if the applicant's native language or language of instruction is other than English.

### **II.C. ADMISSION CRITERIA**

The minimum requirement for graduate admission to UCM is a bachelor's degree with an undergraduate grade point average no lower than 3.0 on a 4.0 scale. This minimum will be waived only under circumstances where the applicant has demonstrated strong academic skills subsequent to their undergraduate studies. Performance on the GRE, accomplishments in undergraduate research, and letters of recommendation are also important determinants of an applicant's potential for success in graduate education and will be evaluated by the admissions committee. Foreign students from non-English speaking countries are required to attain a minimum score of 580 on the TOEFL exam (paper version) or 230 (computer-based version), as well as a score of at least 45 on the TSE. Each academically qualified student will also have a telephone or in-person interview with one or more QSB faculty members. Finally, the match of the candidate's skills and interests to QSB research programs will be considered.<sup>1</sup>

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<sup>1</sup> Applicants are encouraged to contact individual faculty members to discuss their research interests before submitting a full application.

### **III. GENERAL REQUIREMENTS FOR ADVANCED DEGREES**

#### **III.A. RESIDENCY**

In accordance with SR 682 and 686, the minimum residency requirement for any advanced degree is two semesters. The minimum residency requirement for the Ph.D. degree is four semesters. Before advancement to candidacy Ph.D. students must be registered in regular University courses as a full-time student for at least two semesters. M.S. students must be registered as a full-time student for at least one semester before advancement to candidacy. M.S. students must be in residency for at least one semester after advancement to candidacy before conferral of the degree. For the purposes of determining residency, only the Fall and Spring semester will be counted; however, the summer semester may be counted in evaluating students on academic probation. Residency is established by satisfactory completion of at least 12 units of graduate coursework (including research) per term. Ordinarily, a graduate student shall not receive credit for more than 12 units of graduate courses in any semester. The QSB graduate Program only accepts full time students. Exceptions will only be granted for students in the non-thesis Masters Degree program (Section V.B.) with the permission of the graduate Program Chair, in consultation with the Executive Committee.

#### **III.B. SCHOLARSHIP**

Graduate students must maintain at least a 3.0 grade-point average to be considered in good academic standing or to be awarded an academic graduate degree. A student whose cumulative graduate grade-point average falls below 3.0, or who is judged not to be making satisfactory progress toward the degree by his or her graduate advisor or faculty committee, will be placed on academic probation. The student will then be allowed a maximum of one semester to make up the deficiencies and be returned to good academic standing (beyond the semester they go on probation). Otherwise, the student will be dismissed from the graduate program.<sup>2</sup>

Specific scholarship requirements are as follows:

1. Only courses in the 100 and 200 series in which the student receives grades of at least “B-“ or “S” may be counted in satisfaction of the requirements for advanced degrees. A course in which a student receives a “C” or “D” or lower cannot be used to satisfy the unit requirement for the degree but will count in determining the grade point average.
2. Candidates must maintain an average of at least three grade points per unit in all upper division and graduate courses elected during their residence as graduate students at the University of California. Students must maintain an average grade point of 3.0 for advancement to candidacy and conferral of the degree.

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<sup>2</sup> The QSB Graduate Group is very demanding in the level of scholarship and research, so additional obligations (compensated or not) may slow academic progress below what is considered satisfactory by this graduate program. Therefore, before accepting obligations in addition to their graduate thesis research, TA, or GSR appointment, graduate students are strongly urged to consult with their research advisor and thesis advisory committee; if these consultations do not reach a satisfactory conclusion, the QSB graduate group chair should be consulted.

Graduate students should be aware that B- grades may cause them to be in violation of the requirements established by GRC for academic satisfactory progress or eligibility for graduate student employment. Additional information is contained in the UCM Graduate Advisor’s Handbook.

3. Courses graded “S/U” will not be counted in determining grade point averages.
4. Students must make satisfactory progress on their programs of study as determined by their graduate research advisor.

In the event that the advisor feels that a student is not making adequate progress in their research or is encountering other serious difficulties in their graduate studies, the advisor will notify the student in writing describing this concern and spelling out specific actions and timelines for improvement. If the progress continues to be inadequate, the advisor will arrange a meeting with the QSB Executive Committee to review the case and recommend future action. The outcome of this meeting will be either a memo to the student requesting additional corrective action or a recommendation that the student be dismissed from the QSB graduate Program. The student will be notified in writing of this decision. In the event of dismissal, the student’s advisor and the QSB Chair will write a memo the Graduate Dean describing the reasons for the dismissal.<sup>3</sup>

### **III.C. FACULTY COMMITTEES FOR ADVANCED DEGREES**

All students in the QSB Graduate Program must have a graduate research advisor and committee. The student’s graduate research advisor (see section IV.C.), normally in consultation with the student, the Graduate Program and other faculty, recommends appointment of faculty members to advise on and supervise the student’s dissertation research, serve on examination committees, and review and pass upon the merits of the doctoral dissertation. Final approval of the membership on these committees rests with the Dean of Graduate Studies.

Advanced degree committees in the Quantitative and Systems Biology Program typically consist of three members, although additional committee members are permitted if warranted by the student’s research project. One is the student’s graduate research advisor and the two or more others are usually UC Merced faculty members in the Program (one of whom is appointed as Committee Chair). Under some circumstances other members of the committee members can be drawn from UC Merced faculty members from outside the Program or regular or adjunct faculty member from any UC campus or an individual from outside the University of California who has special expertise and qualifications. In this case, the graduate research advisor should submit a brief statement indicating the appointee’s affiliation and title and how the prospective appointee has special expertise or qualifications that are not represented on the campus. In addition to the justification letter from the graduate advisor, a curriculum vita and a letter from the proposed appointee indicating a willingness to serve must be submitted to the Chair of the Quantitative and Systems Biology graduate program for review and approval by the Membership Committee and appointment as an Affiliate Member.

All members of the committee must be in attendance for Ph.D. qualifying examinations and thesis defense. If a committee member’s absence from campus for an extended period of time makes scheduling of examinations unreasonably difficult, the student may request that the committee be reconstituted. Reconstitution of the committee may also be justified by a substantial change in the student’s thesis topic or may be required by the departure of a committee member from the university. When membership changes must be made, the graduate advisor in consultation with the student should recommend a new committee member, giving the reason for the change. The change must be approved by the Chair of the Quantitative and

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<sup>3</sup> If a graduate student is having difficulties in their graduate studies that they cannot resolve with the assistance of their graduate advisor, they may bring this up with the other members of their graduate committee or the QSB Chair who will work to resolve the issues with the advisor. Any formal grievance processes will be handled by the Graduate Division.

Systems Biology graduate program with consultation from the Executive Committee if requested.<sup>4</sup>

## **IV. DOCTORAL DEGREE**

### **IV.A. SIGNIFICANCE**

The Doctor of Philosophy degree is granted to students who demonstrate a thorough knowledge of a broad field of learning and have given evidence of distinguished accomplishment in that field. The degree also signifies that the recipient has critical ability and powers of imaginative synthesis as demonstrated by a doctoral dissertation containing an original contribution to knowledge in his or her chosen field of study.

### **IV.B. REQUIREMENTS**

The Quantitative and Systems Biology graduate program has established the following requirements for the Ph.D. degree. Students must:

- Complete at least four semesters of full-time academic residence (12 units minimum) at UC Merced;
- Earn a passing grade in at least three graduate courses of at least three units (exclusive of research) and other coursework as described (see section IV.D);
- Complete all graduate courses with an S or a letter grade of at least B-;
- Maintain an overall GPA of 3.0, and semester GPAs not below 3.0 for two consecutive semesters.
- Serve as a Teaching Assistant for at least one semester;
- Pass a qualifying exam that includes both a written and oral component (see sections IV.E and IV.F.)
- Present an open technical seminar at least twice while in residence; (see section IV.H)
- Prepare at least one manuscript deemed by the student's faculty committee to be of sufficient quality and importance to be appropriate for publication in peer-reviewed literature (see section IV.I.);
- Present and successfully defend a doctoral dissertation containing an original contribution to knowledge in the field. (see section IV.J.)

### **IV.C. SELECTION OF A GRADUATE RESEARCH ADVISOR**

The heart of the Quantitative and Systems Biology Ph.D. program is the completion of a piece of original scientific research leading to the preparation and defense of a Ph.D. thesis.<sup>5</sup> Selection of a graduate research advisor must be approved by the Graduate Program and must occur before the student's faculty committee can be constituted. The student and the graduate research advisor together will develop a research topic, and research will normally occupy a majority of the student's time after the first year of residence. Interdisciplinary projects are highly encouraged, as are research collaborations with faculty or senior scientists outside UC Merced. However, the graduate research advisor must be a member of the Quantitative and Systems Biology Program. Students will be assigned an initial advisor when they first enroll, unless the student has already chosen an advisor.

### **IV.D. COURSEWORK REQUIREMENTS**

All Ph.D. students in the Quantitative and Systems Biology Program are required to take:

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<sup>4</sup> Additional regulations regarding faculty committees are contained in the UCM Graduate Advisor's Handbook chapter VII. Standards and Requirements For Graduate Degree Programs.

<sup>5</sup> To this end, each student should discuss research interests and possible Ph.D. projects with all of the faculty in the program as early as possible, and select a graduate research advisor early during the first year of study.

A. Core Course Requirements:

- 1) a graduate-level Quantitative Biology (QB) course (3 – 5 units)
- 2) a graduate-level Systems Biology (SB) course (3 – 5 units)
- 3) one other 3-5 unit graduate level QSB course (numbered 200-299).

B. Other Requirements: In addition, students must take 1 unit of QSB 294 Responsible Conduct of Research, 2 units of QSB 291 Seminar during first year of residence, and are expected to take QSB 292 Group Meeting, QSB 293 QSB Journal Club and QSB 295 Thesis Research.

Examples of currently offered or proposed courses that may be taken to fulfill the core course requirements are:

1. Quantitative Biology (QB). One course should be selected from following: QSB 280 Mathematical Biology (3 units); QSB 281 Computational Biology (3 units); QSB 282 Bioinformatics (5 units).
2. Systems Biology (SB). One course should be selected from following: QSB 215 Principles of Biological Techniques (3 units); QSB 290 Current Topics in Quantitative and Systems Biology (3 units); QSB 297 Systems Biology (3 units).
3. One other QSB course: This requirement can be met by any other 3 – 5 unit QSB course numbered 200-299 (excluding 295 Graduate Research). QSB298 and 299 can be used to fulfill this requirement if no other available course meets student's needs. A course from another graduate program at UC Merced may be substituted by petition to the EPC.

Other courses may be added to these lists as fulfilling the QB or SB requirements, by the EPC in consultation with the faculty.

Graduate students who transfer into our program having taken courses in other graduate programs may make a single petition to EPC on entrance to QSB for fungible equivalence of courses taken. They should be prepared to demonstrate having obtained a suitable grade (see below) in a class of equivalent semester-hours or greater, and syllabus content comparable to that of a requirement being matched.

All requirements for formal course work beyond the minimum are flexible and are determined by the individual student's background and research topic in consultation with the student's graduate research advisor.<sup>6</sup>

**Sample Plan for First Year PhD students in QSB (Cell Fate Decision Emphasis)**

<b>Fall 2010</b>	<b>Units</b>	<b>Spring 2011</b>	<b>Units</b>
QSB 280, 281 or 282	3-5 units	QSB 290 or QSB 297	3
QSB 291	1	QSB/Graduate Emphasis <sup>7</sup>	3 - 5
QSB 292	1	QSB 291	1
QSB 293	1	QSB 292	1
QSB 294	1	QSB 293	1
QSB 295	3-5 units	QSB 295	3
Total	12	Total	12

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<sup>6</sup> First-year Ph.D. students intending to apply for pre-doctoral fellowships should consult with their advisors regarding whether to take courses for a letter grade. Section III.B. Scholarship contains additional information.

<sup>7</sup> Graduate Emphasis might be QSB 200, QSB 212, QSB 250, QSB 252, QSB 298 or 299

### Sample Plan for First Year PhD students in QSB (Ecology and Evolution Emphasis)

Fall 2010	Units	Spring 2011	Units
QSB 280, 281 or 282	3-5 units	QSB 290 or QSB 297	3
QSB 291	1	QSB/Graduate Emphasis <sup>8</sup>	3 - 5
QSB 292	1	QSB 291	1
QSB 293	1	QSB 292	1
QSB 294	1	QSB 293	1
QSB 295	3-5 units	QSB 295	3
Total	12	Total	12

#### **IV.E. RESEARCH PROPOSAL**

One month before the scheduled qualifying exam, the student will provide to the degree committee a written document that describes his or her research topic, summarizes progress to date, and outlines what he or she proposes to do, why it is relevant, and what will be learned. The format of the research proposal will be determined by the student in consultation with their adviser and committee; however the proposal must follow the format of a research proposal to a major funding agency in the student's area of research. The committee will review this document prior to the exam and determine if the student has outlined a project that is appropriate for a Ph.D. If not, the student is given a month to rewrite the research plan. Once the research plan is approved the student may take the oral portion of the Qualifying Examination.

#### **IV.F. PH.D. QUALIFYING EXAMINATION**

All students in the Quantitative and Systems Biology Ph.D. program are required to pass a qualifying examination, which consists of a written proposal and an oral examination, before advancement to candidacy for the Ph.D. degree. Students are expected to take and pass the qualifying examination during their second year of graduate study unless they successfully petition the Graduate Program Chair to take it at a specific later date. Students entering the Ph.D. program with a M.S. degree may request to take their qualifying exam during their first year, provided their graduate research committee approves. The examination committee is the same as the student's faculty committee except that the graduate research advisor is usually replaced by another member of the Program, selected by the Chair of the Graduate Program in consultation with other members, if necessary to maintain a minimum examining committee size of three. The graduate research advisor is encouraged to be available for private consultation with the examination committee at the beginning and/or end of the examination, but may not be present during other times such as student examination and committee deliberation. The members of each student's examination committee will select one member to chair the examination committee. The dates for the examination are arranged between the student, their graduate research advisor, and the examination committee chair.

The qualifying exam may be taken only after the student's written research proposal has been approved by the student's committee (Section IV.E.). The exam will focus on the student's research proposal, but may cover any related field of science, and will typically last three hours. The committee conducts the examination, and immediately thereafter submits the results of the examination to Graduate Studies. Possible outcomes are:

1. Pass (conditions may not be appended to a pass decision)
2. Re-Take, with an option to retake the examination within a specified time period, or to satisfy specific other requirements
3. Fail

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<sup>8</sup> Graduate Emphasis might be QSB 247, QSB 248, QSB 244, QSB 253, QSB 252 or QSB298 or 299



The committee members should include in their evaluations of the student such factors as relevant portions of the previous academic record, performance on the examination, and an overall evaluation of the student's performance and potential for scholarly research as indicated during the examination. The committee should strive to reach a unanimous decision. If a unanimous decision is reached, the committee shall inform the student of its decision in one of the forms listed above. If the decision is "Re-Take" or "Fail", the chairperson of the committee must include in a report a specific statement, which may include a minority report, explaining its decision and must inform the student of its decision. In the case of a "Re-Take" decision, the committee must include in its report a further statement of its terms and inform the student of those terms. In those cases when it is not possible for the members to resolve their differences, the student should be informed of the nature of those differences and each member should submit a detailed assessment of the student's performance to the Chair of the Graduate Program. The Chair, in consultation with other members of the Graduate Program, will use these individual reports to adjudicate the result.

Upon recommendation of the examination committee, a student who has not passed the examination may repeat the qualifying examination after a preparation time of no more than six months. The examination must be held by the same committee except that members may be replaced, with the approval of the graduate advisor, for cause such as extended absence from the campus. Failure to pass the examination on the second attempt means that the student is subject to disqualification from further study for the doctoral degree. After a second examination, a vote of NOT PASS is unacceptable; only PASS or FAIL is recognized by the Dean of Graduate Studies.

#### **IV.G. ADVANCEMENT TO CANDIDACY**

Upon successful completion of the examinations and approval of a research plan, the student is given an application for advancement to candidacy by the examining committee chair. When it is filled out and signed by the graduate research, the student pays a candidacy fee and submits the form to Graduate Studies. Upon advancement to candidacy for the degree, the faculty committee is then charged to guide the student in research and in the preparation of the dissertation.

#### **IV.H. SEMINARS**

All students in the Quantitative and Systems Biology Program are required to present an open technical seminar at least twice during their residence in the Graduate Program. The topic of the seminar may be the student's own research or it may be any other topic that falls within the areas of study spanned by the program, broadly defined. The seminar may be presented as part of a regular seminar series or, if necessary, as a special seminar. The open presentation given as part of the Ph.D. defense may be counted as one of the required seminars.

#### **IV.I. PUBLICATION REQUIREMENT**

The final confirmation of the quality of a Ph.D. dissertation is the ability to publish the research results in a peer-reviewed journal. The research field may influence the timing and work required to publish research results, making it difficult to define the number of publications required for each dissertation. For this reason, whether a student has made sufficient progress for the Ph.D. ultimately will be determined by the student's advisor and faculty committee. However, it is expected that the research project should be sufficiently complete to support publication of at least one full manuscript. The student's faculty committee may determine if having simply submitted a manuscript is sufficient to warrant completion of the Ph.D. requirements, although in most cases, acceptance of the manuscript by the journal will be expected (i.e. manuscript "in press" or "in print").<sup>9</sup> The process of writing the manuscript will be undertaken with the assistance and guidance of the student's research adviser. Manuscripts should be presented to the graduate committee for examination and approval at the time of the student's dissertation defense.

#### **IV.J. DISSERTATION AND FINAL EXAMINATION**

The Ph.D. dissertation must be creative and independent work that can stand the test of peer review. The expectation is that the material will serve as the basis for publication(s) in a peer-reviewed journal. The work must be the student's, and it must be original and defensible. The student is encouraged to discuss with members of the faculty committee both the substance and the preparation of the dissertation well in advance of the planned defense date. Detailed instructions on the form of the dissertation and abstract may be obtained from the Graduate Division.

The student must provide a copy of the dissertation to each member of the faculty committee and allow each committee member at least four weeks to read and comment on it. If one or more committee members believe that there are significant errors or shortcomings in the dissertation or that the scope or nature of the work are not adequate, the student must address these shortcomings before scheduling a defense. Once the committee members are in agreement that the dissertation is ready to be defended, the final examination date may be scheduled by the student in consultation with the committee.

The Ph.D. final examination consists of an open seminar on the dissertation work followed by a closed examination by the faculty committee. During the examination, the student is expected to explain the significance of the dissertation research, justify the methods employed, and defend the conclusions reached. At the conclusion of the examination, the committee shall vote on whether both the written dissertation and the student's performance on the exam are of satisfactory quality to earn a University of California Ph.D. degree. A simple majority is required for a pass. Members of the committee may vote to make passing the exam contingent on corrections and/or revisions to the dissertation. In this case, the committee will select one member, normally the graduate research advisor, who will be responsible for approving the final version of the dissertation that is submitted to Graduate Studies. All members of the degree committee must sign the final dissertation.<sup>10</sup>

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<sup>9</sup> The publication requirement is intended to encourage the student to view submission of manuscripts as the ultimate goal of any research project, and to teach the student how to organize research projects and write scientific manuscripts.

<sup>10</sup> The Graduate Division will require the *Report on Final Examination for the Ph.D. Degree* form, and the student will have to submit their dissertation to the Graduate Division along with ProQuest.

## **V. MASTER'S DEGREE**

### **V.A. SIGNIFICANCE**

Students may be admitted to the graduate program in Quantitative and Systems Biology to work towards a Masters Degree (M.S.). Additionally, a Ph.D. student who has been in residence for at least two semesters, is in good academic standing, and has completed at least three of the core courses may petition the Admissions Committee to pursue a terminal M.S. degree. The recipient of a M.S. degree is understood to possess knowledge of a broad field of learning that extends well beyond that attained at the undergraduate level, but is not necessarily expected to have made a significant original contribution to knowledge in that field.

### **V.B. REQUIREMENTS**

The Quantitative and Systems Biology Program has established the following requirements for the M.S. degree. Each M.S. student has a committee with at least three members (see description for Doctoral committees above), and students writing a master's thesis have a graduate research advisor. Two different tracks are recognized:

#### **TRACK I (Thesis-Based)**

- Complete at least two semesters of full-time academic residence (12 units minimum) at UC Merced;
- Complete at least two of the Program's graduate courses worth at least 3 units, and other coursework as described below, with an S or a letter grade of at least B-; one from among QSB 280, 281, 282 satisfying the quantitative biology requirement, and the other chosen from among QSB 215, 290, or 297 satisfying the systems biology requirement. Other courses may be substituted by petition to EPC.
- Complete at least 24 units of upper-division and graduate coursework with a cumulative grade-point average of at least 3.0, and a semester GPA not below 3.0 for two consecutive semesters. At least 18 units must be graduate-level coursework.
- Prepare an acceptable thesis describing original research in the field and successfully defend thesis to thesis committee.

#### **TRACK II (Course-Based)**

- Complete at least two semesters of full-time academic residence (12 units minimum) at UC Merced;
- Complete at least three of the Program's graduate courses worth at least 3 units, and other coursework as described below, with an S or a letter grade of at least B-; one chosen from among QSB 280, 281, 282 satisfying the quantitative biology requirement and the other chosen from among QSB 215, 290, 297 satisfying the systems biology requirement. Other courses may be substituted by petition to EPC.
- Complete at least 32 units of upper-division and graduate course work with a cumulative grade-point average of at least 3.0, and a semester GPA not below 3.0 for two consecutive semesters. At least 24 units must be graduate level, and no more than 4 units may be Graduate Research QSB 295 or equivalent.
- Pass a comprehensive qualifying examination with both a written and oral component administered by the faculty committee. This examination will test the student's understanding of the main concepts in the field at the graduate level.

In addition, both M.S. program tracks require QSB 294. As with the Ph.D. students, M.S. students are recommended to take research units (QSB 295), journal clubs (QSB293), and group meetings (QSB292) to help fulfill their unit requirements. Section III.B. Scholarship contains additional information.

## **VI. TIME TO DEGREE AND ANNUAL EVALUATION OF GRADUATE STUDENT PROGRESS**

The Quantitative and Systems Biology Graduate Program places a nominal time limit of two years from entrance to completion of the M.S. and five years for completion of the Ph.D. Extensions beyond these limits can be permitted by the Chair of the Quantitative and Systems Biology Graduate Program in consultation with the Executive Committee.

In order to ensure satisfactory progress toward the degree, each student must meet with his or her faculty committee for an annual review of progress at a mutually agreeable time prior to the first day of each Fall semester. (For Ph.D. students these meetings occur each year after advancing to candidacy.) At least two members of the committee must be present. The committee will review the student's progress toward the degree during the past year and develop a time table, mutually agreeable among student, graduate research advisor, and faculty committee, for completion of the remaining requirements. The annual report of the committee will become part of the student's record. Annual student evaluation forms can be found on the QSB website.

Should the committee conclude that the student is not making satisfactory progress toward the degree, the student may be placed on academic probation as described under "Scholarship" above (Section III.B.)

## VII. TEACHING AND RESEARCH ASSISTANTSHIPS AND STIPENDS

Graduate students in the Quantitative and Systems Biology Program are normally offered stipend support in the form of either Teaching Assistant positions (TAs) or Graduate Student Researcher positions (GSRs). Students in their first semester of residence usually serve as TAs for appropriate courses in the schools of Natural Sciences or Engineering. After the first semester, support may be offered through either funding as a TA or as a GSR in the graduate research advisor's laboratory.<sup>11</sup> TA stipends are set by the schools while GSR stipends are determined by the Graduate Program. Graduate students with external fellowships are still required to satisfy the one semester teaching requirement and will be paid by the school for teaching.

All students in good academic standing are eligible to receive financial support (\$24,000 for a 12-month GSR appointment in 2011-2012) in the form of an academic appointment as described in the graduate advisor's handbook, which includes fees and non-resident supplemental tuition if applicable (except that graduate students must pay campus fees out-of-pocket – \$566 in 2011-2012), and graduate student health insurance, subject to available funding. Current salaries for 12-month GSR appointments and campus fees can be found on the QSB and UCM websites.

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<sup>11</sup> Students in their first semester of residence usually serve as TAs for appropriate courses in the schools of Natural Sciences or Engineering. It is important to note that the TA and GSR appointment is independent of the time a graduate student spends working on his/her thesis project. A GSR appointment dictates the amount of time a graduate student is paid to work on a specific project (the subject matter of which is determined by the goals of the project funded by a university or non-university entity). The project that is providing the GSR stipend may or may not be related to his/her thesis project. In all situations, the graduate student is required to make adequate scholarly progress on his/her thesis project (see QSB Policies and Procedures, Section VI).