Program Contacts

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Program Advising
The class advisors will lead a week long orientation for incoming students at the end of August. The orientation will include a set of lectures and activities that will introduce students to the many resources at and around Harvard and will answer their questions regarding research, academics and the graduate program. Students will also be paired with a senior graduate student mentor during the orientation. Incoming students will meet with the class advisors individually at the beginning of each semester to plan their initial program of graduate study. Class advisors will be available to meet with students at any time during their graduate career.

Class Advisors

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Laboratory Rotations
Rotations allow students to explore different research areas, identify potential collaborators, and experience the environment in different research groups. The purpose of the rotation is to facilitate the choice of the dissertation laboratory, not to accomplish a research project. Students in the Systems Biology Program are expected to take 2-4 laboratory rotations before selecting a Dissertation Advisor. The program does not set time limits on rotations, but most rotations are expected to be 4-12 weeks long. Rotations with non-training program faculty are permitted but require approval of the program. Students should inform the program coordinator when they begin and complete their rotations.

First year students must choose their dissertation laboratory no later than June 30th.

Teaching
Students are required to act as teaching fellows (TFs) in at least one course. We recommend that students complete this requirement by the end of their second year. Students should inform the program coordinator office as they make plans to fulfill their teaching requirement. TF positions are arranged by each individual department so there are no universal deadlines or contacts. It is usually best to contact the faculty member or preceptor of the course that you are interested in teaching.
Students who wish to perform additional teaching, beyond the required one semester, must receive permission from the program. They will fill out the additional teaching request form. This is to ensure that your teaching aligns with your career and research plans.

Course Requirements
Students are required to take SB212: Communication of Science (fall 2012), SB300: Introduction to Systems Biology (all year), MedSci300: Conduct of Science (fall of the 2nd year) and four science courses chosen in consultation with their class advisors. A current list of courses students commonly take is provided to students at the beginning of the year.

Registration
Students can register from Monday August 18th, 9 a.m. through Tuesday, August 26, 11:59 p.m. at www.my.harvard.edu. They will go to their "my.harvard.edu" portal page and click on the "Campus Resources" tab. Once students complete online registration they are ready to begin using the online course shopping tool. Students will enter their course selection electronically and when they have a full slate of courses they will print up their study card, have it signed by dissertation advisor and submit it to the Program Coordinator on Monday, September 8th by 5pm. (Study Card day is Tuesday, September 9th). First year students should submit their study card to Samantha Reed to be signed.

In order for students to be considered a full time student, they must sign up for 4 half courses each semester.

- Students who are not taking 4 “real” half courses and have not joined a lab should sign up for the rotation course, SB399, catalog # 5863, the appropriate number of times.
- Students who have permanently joined a lab should use SB350, catalog # 8370, (under their PI’s name) the appropriate number of times.

There is no charge for adding or dropping a course during the first three weeks of the term. After the first three weeks there is a $10 fee each time a petition is filed. Add/drop forms can be picked up in the program coordinator’s office (Alpert 536, HMS) or at the registrar’s office (20 Garden St., Cambridge). Oct 20 is the deadline to add courses. October 28 is the deadline to drop a course.

Course Catalog http://www.registrar.fas.harvard.edu/fasro/courses/
Students can visit the FAS Registrar’s Office website to access an online version of the Courses of Instruction Book.

Cross Registration https://crossreg.harvard.edu/OASIS/CrossReg/index.html
Students can cross-register with other Harvard Schools and MIT if there are courses that are of interest to them. Please note that some schools have different registration deadlines.

Quarter and Nanocourses
A quarter course is a half semester course that focuses on a specific topic, usually in the area of expertise of the faculty. The class meets for one 2-hour session per week. Meeting times are usually arranged at the initial session for convenience of faculty and students. Students are required to register for quarter courses on their study cards only when they are scheduled to take the second quarter course.
Nanocourses are short graduate-level courses consisting of two class meetings which cover a specific subject in depth. Six nanocourses are equivalent to one half course. Students register for credit on their study cards in the semester that they plan to complete their sixth nanocourse, or when they plan to complete a combination of 3 nanocourses and one quarter course.

**Preliminary Qualifying Exam Guidelines (PQE)**

**Part 1 of the PQE**
Part 1 of the PQE must be completed no later than June 1st of the first year.

This exam is intended to be a creative exercise in biological theory, computation or informatics. Students will formulate a question related to any problem in biology (on any scale) and develop a simple set of equations and/or a computational or bio-informatic analysis designed to address the question in a quantitative way.

This exam is intended to catalyze a period of exploration and creativity as well as exploration of an area of biology that is new to the student. Students are encouraged to discuss possible questions and models with each other and with faculty in preparing for the exam, but the final project should be their own work. The project should not be based directly on work from a rotation or a course.

Students will prepare a short written summary and an oral presentation on their project. The written summary should be no more than 4 pages.

- Background
- Question
- Approach
- Results/Conclusion
- Future Directions
- What I learned

Students should also think about whether the results are or are not consistent with the literature and think about some experiments or other approaches to test their project.

The proposal should be submitted to the committee members and Samantha Reed 1 week prior to the oral defense. In the oral exam students will present the results of their analysis. If students choose to use PowerPoint, the number of slides is limited to 10.

The presentation will be made to 3 Program faculty members, with one of them being a Co-director. The examination committee will ask questions about the project itself and about background information associated with the project.

The committee may also ask explore the student’s general knowledge beyond that of the project. It is expected that students will be familiar with the content covered in *Essential Cell Biology* by Bruce Alberts et al. These general questions will help the faculty committee assess if the student
is adequately prepared to undertake a PhD project. Gaps in general knowledge not associated with the project will not affect the outcome of the exam (pass/fail) but may result in the student being assigned additional reading or coursework.

Possible outcomes:

Students pass and move into their dissertation research.

Serious flaws are found in the proposal. Students will be asked to correct flaws or submit a new problem and solution and defend it no later than August 31. Failure to do so will result in the student not being allowed to register for the second year of graduate school. In some rare cases, students may be counseled to consider leaving the program.

Important gaps are found in the student’s education. In this case the committee may assign additional reading or coursework, in consultation with the student’s advisor. This will not affect passing or retaking the exam.

The PQE Part 2
Exam must be held no later than March 31st of the student’s second year.

Assembling the Committee
Subject to program approval, any three Systems Biology Program faculty may be on the PQE Part 2 committee (excluding the Dissertation Advisor). Members of the PQE committee may also be appointed to the student’s DAC, however they are not required to be. A Program Co-director will attend every exam to ensure uniformity.

The student should email the Systems Biology Coordinator with their proposed committee members and a brief abstract summarizing their PQE topic in December. Once the program has approved the committee members, the student should invite the faculty. Students should notify the program coordinator when the faculty members have agreed to be on the committee. The coordinator will then schedule the exam.

Advisor Role
The advisor should view the process of preparing for the exam as a training opportunity and should guide their students in planning the dissertation project and in writing the proposal. However, the advisor must not write any part of the proposal, and the ideas in the proposal must be the student’s. The Program expects that preparation for the PQE Part 2 will be an iterative process in which the student expresses their ideas to the advisor, either verbally or in writing, and receives constructive criticism and feedback, leading to another cycle of creative thought, literature review, and discussion with the advisor.

Prior to the exam, the Advisor will be invited to speak briefly with the chair of the committee.
**Written Proposal**

Students will prepare and defend an original research proposal derived from the student’s proposed dissertation research. The proposal should define the important questions to be addressed, provide adequate background and describe some details of experiments, computation and/or theoretical work to be undertaken. Examples of successful proposals will be provided to students. The proposal should be designed so that the work can realistically be completed in approximately four years. It is appreciated that research directions may change during the course of the dissertation research.

Students are strongly encouraged to discuss their proposal and practice their oral presentation with faculty, postdocs and students in preparing for the exam.

The final written proposal should be submitted to the student’s Committee and the Systems Biology Coordinator by 5pm one week prior to the oral defense. The overall length of the proposal, not including figures and references, should not exceed ten pages.

The general format for the written proposal is:

- An abstract summarizing the questions, aims and significance of the proposed research
- A section on relevant background
- The specific aims of the research proposal
- A brief description of how the research aims will be accomplished, and what the anticipated outcomes are – both positive and negative.

Diagrams and figures can be included in the body of the proposal for clarity; these items will not be counted against the proposal’s length limit.

**Oral Exam**

Students should not supply food or drinks for their committee. The format of the oral portion will be:

- The exam is organized around the presentation of the proposal in the form of a “chalk talk.” PowerPoint presentations are NOT allowed.
- During the presentation and after it, faculty members will ask questions regarding the proposed research. Faculty may also probe the student’s general knowledge, beyond the specifics of the proposal.
- The oral exam is expected to last no longer than two hours.

**Outcomes**

The faculty committee will convene to evaluate the student’s performance on the exam. The evaluation will take into consideration both the written and the oral parts of the exam. The outcome of the examination will be communicated to the student by the examining faculty within a week of the end of the exam (often on the same day as the exam).

The faculty will consider whether or not the student successfully justified the proposed research, the significance of the research, and will evaluate the degree of independent thinking that went
into the proposal, the clarity of the writing, and the student’s breadth of knowledge relevant to the proposed research.

There are several possible outcomes:

- The student will receive a pass and continue with the proposed research.

- The faculty may find problems with the proposed research and/or the presentation (either written or oral). The student may then be asked to prepare and defend a new proposal. The student must retake the exam no later than the end of June.

- If the problems with the proposal and/or presentation are serious, the faculty may conclude that the student is best served by leaving the Program to pursue other interests. In such cases, the student will be asked to leave the program at the end of the semester.

**The Next Step**
After passing the PQE, the student will assemble a Dissertation Advisory Committee (DAC). The initial meeting of the DAC should take place within 6 months of approval of the student’s PQE proposal.
Dissertation Advisory Committee (DAC)
After passing the PQE, a DAC of at least three faculty members and the student’s Dissertation Advisor(s) must be appointed 4 months after their PQE exam and a meeting scheduled for 6 months after their PQE exam. This will allow students to take maximal advantage of their committee’s expertise. At least one committee member should be from the Program in Systems Biology. Other members may be from outside the Program and, if they choose, one member may be from outside Harvard.

The Committee must meet with the student at least once a year through G5 and every six months thereafter, until Ph.D. dissertation writing is underway. However, students are encouraged to consider more frequent meetings (every 6 months is ideal). The Chair of the DAC is responsible for the preparation of the DAC Report, which should be signed by all committee members at the conclusion of each meeting and submitted to the Systems Biology Coordinator. Students will be allowed to register for the upcoming year only if their Dissertation Advisory Committees have met and filed a formal report (see the attached form) within the past twelve months.

Role of the DAC
The role of the DAC is to assist the student in defining the dissertation project, review scientific progress, offer critical evaluation, suggesting extension or modification of objectives, arbitrate differences of opinion between the student and the advisor if they arise, and decide when the work accomplished constitutes a dissertation. Our hope is that the committee will help students in the early stages to get their research off to a good start, and that they will be a resource for students at any point during their graduate career.

At the start of the meeting, the student will be asked to leave the room for a few minutes. This gives the committee an opportunity to speak with the Dissertation Advisor but this should not be considered evaluative. Similarly, the Dissertation Advisor will also be asked to leave the room so that the student can voice any issues that they might feel more comfortable discussing only with the committee.

Procedures for Setting up DAC meetings
Students should contact the Systems Biology Coordinator, who will assist them in scheduling all meetings and who should receive a copy of all information that is given by the student to his or her DAC committee prior to the meeting.

Summary of Progress and DAC Report Policy
Students are to submit a brief summary of progress (five or fewer pages not including images and references) to their Dissertation Advisory Committee and Systems Biology Coordinator at least one week before the meeting and be prepared to give a twenty minute presentation. The student is also responsible for bringing a copy of the DAC report to each meeting. This report is to be filled out by the Chair of the committee and returned to the Systems Biology Coordinator immediately following the completion of the meeting.

The presentation can include the student’s overall goals, progress that has been made (show data) and plans going forward. The student should also discuss any other plans for the coming year such as teaching, meeting, courses, etc with the committee so all can get some sense of how time will be spent during the coming year.
Dissertation Preparation and Defense

Preparation for the Dissertation Defense:
The Dissertation Advisory Committee, in consultation with the Dissertation Advisor, determines when it is time for a student to stop laboratory work and begin to write their dissertation. Once a student has been given permission to write their dissertation, they must contact the Program Coordinator to schedule an appointment to discuss requirements, dates and receive their dissertation information packet.

The FAS registrar specifies deadlines by which the dissertation must be submitted and the dissertation examination passed to receive the Ph.D. diploma in November, March, or May of each academic year. A dissertation information packet is available in the Program Office specifying the steps to be taken when the student is ready to apply for the Ph.D. degree and the various forms that need to be submitted. The information packet will be thoroughly reviewed with the student by the program coordinator. The first step is completion of the “application for degree” form. The deadline for submitting this form can be more than three months before the student expects to receive the degree.

Examiners:
The Dissertation Examining Committee evaluates a student’s dissertation defense. The student and the student’s dissertation advisor must select at least four examining committee members: an examination chair and three examiners. The Program Director must approve the members of the examining committee.
- The chairperson of the DAC should preferably chair the examination. The examination committee chair is the only member of the DAC permitted to serve on the examination committee.
- The student may choose to have one faculty member from outside of Harvard, but it is not required.
- The examining committee must have 2 Harvard Faculty and at least one must be a member of the Systems Biology Program.
- All proposed examiners must be the rank of assistant professor or higher.
- The dissertation advisor is not eligible to be an examiner or the chair, but usually attends the exam ex officio.

If an alternate examiner is requested either by the student, dissertation advisor or the program, then the alternate must receive a copy of the dissertation and be available on the date of the defense.

The student is expected to give a seminar of approximately one-hour as part of the examination, on the day of the examination, prior to a defense of the dissertation with the examination committee.
Events

All Systems Biology students and faculty are invited to attend two half-day symposiums where second year students will give talks on their proposed dissertation project. Each student speaker will be assigned two faculty coaches who will help them to develop their talks and give feedback.

Systems Biology Program Retreat: November 14-15, 2014
All current Systems Biology students and faculty are invited to attend the Systems Biology Program Retreat. The purpose of the retreat is to bring our community together to learn about current research in systems biology. Advanced students will present their research to date orally or through a poster. The schedule for the weekend will also include faculty talks, a poster session, and social gatherings.

Other Seminars of Interest

Bauer Forum talks are informal scientific seminars designed to foster communication and collaboration among people with an active interest in genomics and systems biology. The talks are held on Wednesdays at 4:00pm in Northwest Lab, Room 425, 52 Oxford Street.

MCB Events Calendar - http://www.mcb.harvard.edu/NewsEvents/Calendar/index.asp
Many talks are listed on the MCB events calendar. Students may be particularly interested in the Thursday Noon Seminars that are held in the Northwest Building
http://sysbio.harvard.edu/csb/news/lectures.html

Theory Lunch Talks - http://vcp.med.harvard.edu/tl-schedule.html
Theory Lunch is held on Fridays at noon, in Alpert 563 (HMS). A catered lunch is provided and is followed by a "chalk" talk (whiteboard only, no slideware). The talks can be on any biological subject that might be of interest to theoretically minded people, including, but not limited to, on-going work, off-the-wall ideas, a recent paper, an interesting proposal, etc, with vigorous but friendly audience participation.

Pizza Talks - http://sysbio.med.harvard.edu/sbpizzataalk.html
SB Tuesday Pizza Talks are a way for Systems Biology Department Post Docs & Graduate Students to present their work and receive feedback in a casual setting. Senior systems biology grad students often volunteer to speak.