

QBS Rules and Regulations

Overview and Statement of Purpose

QBS Administration

QBS Faculty

- I. Advising and Research Requirements - First Year
 - A. Research Requirements for First Year Graduate Students
 - B. Dissertation Advisor and the Dissertation Committee
 - C. Functions of the Dissertation Committee
- II. Program Requirements for the Ph.D. Degree
 - A. Required Research Rotations
 - B. Course and Graduate Requirements
 - C. QBS Journal Club
 - D. Research in Progress Presentations
 - E. The Qualifying Exam
 - F. Dissertation and Dissertation Defense
 - G. Procedures in Case of Potential Separation from the Program
 - H. QBS Student Grievance Policy
- III. Teaching by Graduate Students
- IV. QBS Graduate Student Advisory Committee Members
- V. Attendance and Vacations
- VI. Internal QBS Master's Program

Overview and Statement of Purpose

The primary goal of the Quantitative Biomedical Sciences (QBS) Graduate Program at Dartmouth is the cross-disciplinary training of students to be highly qualified for productive careers in research and teaching in the quantitative biomedical sciences. Only students who intend to pursue the Ph.D., the Health Data Science Masters, the Epidemiology Masters, or internal M.S. degree full-time are accepted into the program. The program of study begins with necessary prerequisites, a set of required courses, and research rotations. Advanced electives are often taken in later years. Training culminates in the production of a publishable dissertation based on original research in the student's chosen field of investigation. Each student is required to work on the dissertation under the supervision of a faculty advisor; this association will determine, to a large extent, the nature of the student's individual course of study. Students are welcome and in fact are encouraged to devise their own topic. The guidelines that follow have been adopted by the QBS Director, Administration and Program Faculty to ensure that each

student completing the graduate program will have acquired the necessary skills and knowledge to be effective in research and teaching in their chosen discipline within the QBS Program.

QBS Administration

QBS is overseen by the Director(s) of the program and the QBS Advisory Committee. Three director level faculty form the QBS leadership team: Director, Associate Director, and Assistant Director of MS Programs, each position involving a two-year term.

The QBS Director and administrative team oversee the daily activities of the program. The QBS Associate Director is second in command and petitions the Advisory Committee for election to said position. If elected, the Associate Director serves a term of 2 years, after which it is expected that the Associate Director assumes the position of QBS Director. The election of the Associate Director is determined by a majority vote of the Advisory Committee. The Associate Director is essentially director-in-training and serves in a non-direct capacity in the daily administration of the program. Lastly, the Assistant Director of QBS MS Programs, oversees the development and administration of the Health Data Science and Epidemiology Masters Programs.

The Advisory Committee consists of seven members, two from each of the represented disciplines (Bioinformatics, Biostatistics, and Epidemiology) to be appointed with voting privileges by their respective department chairs. The QBS Director is the seventh member serving as the chair of the Advisory Committee, in an officiating, nonvoting role. The QBS Director will cast the deciding vote in cases of a tie or plurality vote. The Associate Director and Assistant Director of QBS MS Programs must each be one of the six voting members of the Advisory Committee. The term for all Advisory Committee Members is a minimum of two years. In the absence of the Director, the Assistant Director will assume authority of the Advisory Committee and programmatic matters as they arise.

Intention to resign from the committee except under unexpected personal or professional circumstances, must be expressed to the committee and department chair at least 2 months in advance such that a suitable replacement can be found. The Advisory Committee meets at least twice per year at approximately 6-month intervals. Decisions regarding major programmatic issues are put to a vote and implemented by the Director, Assistant Director of QBS MS Programs, Program Administration and QBS faculty where appropriate. For routine decisions, the Director and Assistant Director will act in his or her best judgment. The QBS Advisory Committee also serves as members of the PhD or Masters admissions committees with ad hoc members appointed to either when necessary.

Note that in the sections following, the term 'first-year student' is used to describe a student entering the program. Under most circumstances a first-year student may not begin satisfying the requirements

described in this document prior to the fall term of their first year in the program, however this remains an exception for those accepted to the QBS Master's Program (see section V). Also, the word 'faculty' where not specified otherwise, refers to QBS Program faculty.

All students are expected to adhere to the Honor Principle and the Student Code of Conduct as described in the Dartmouth Graduate Student Handbook:

<https://graduate.dartmouth.edu/academics/graduate-school-forms/academic-policies>).

QBS Faculty

Being a member of the QBS faculty carries responsibilities such as attending program seminars, participating in QBS sponsored events, taking QBS students for research rotations, supervising dissertation students, service on program committees, and helping with recruiting interviews during our recruiting season.

- A. **Becoming QBS Faculty:** Members of the Dartmouth community who wish to become QBS faculty must submit their Biosketch/CV as well as a letter of intent to the QBS administration stating why they would like to join and why they would be a good fit for the QBS program. This information is distributed to the QBS Advisory Committee who must provide a majority affirmative vote for this individual to join the QBS program.
- B. **Rotation and Dissertation Students:** QBS faculty join the program with the intent to sponsor rotation and dissertation students. It is recognized that this may be dependent on funding in a given academic year. When taking a rotation student, it should be made clear that the faculty member has the appropriate research grant funds or departmental resources at their disposal to fund the costs of the rotation (e.g., expendable supplies), as well as at least three years of funding to support a student stipend and dissertation research. QBS Administration will solicit information from each faculty member in the program regarding their interests in sponsoring rotation students and be guided by this input when assigning rotations. Faculty should expect the average length of PhD candidacy to be at least 5 years. Should funding hardships be encountered after the 6th year of study be encountered, the situation is to be brought to the attention of the QBS director and Administration to review the situation.
- C. **Committees:** Faculty are expected to serve on QBS qualifier and QBS dissertation committees if their area of expertise is appropriate to do so. QBS faculty may also be approached by the chairs of their respective departments to serve on the QBS Advisory Committee.
- D. **Mandatory Attendances:** QBS faculty are expected to attend:

- I. Their students Research in Progress presentation as well as those of students whose dissertation committee they are serving on.
- II. Their students qualifying defense and oral examination as well as those of students whose qualifying committee they serve on
- III. Diversity and Equity training
- E. Other responsibilities
 - I. Participation in QBS interview weekends: Interviewing students, providing evaluations, and attending social events
 - II. Attending and participating in the QBS retreat and other yearly QBS community seminars, outreach, and social events

I. ADVISING AND RESEARCH REQUIREMENTS - FIRST YEAR

A. Research Requirements for First Year Graduate Students

In August and September preceding the start of the fall term, entering students will have the opportunity to meet individually with the QBS Administration and members of the QBS faculty. The purpose of this initial meeting is to inform the students of program expectations, regulations, and courses, as well as to familiarize students with faculty research to begin the process of selection of laboratories for research rotations, courses, and other programmatic and didactic issues, including pre-tests for entering students. During their first year in the program, first-year graduate students are required to do three research rotations under the supervision of three different program faculty members; each rotation will be of a term's duration (i.e. approximately two and a half to three months, covering the periods Sept-Nov, Dec-Feb, Mar-May). Joint faculty rotations may be arranged with the approval of the QBS Director and QBS Administration. Students are strongly encouraged to read papers by faculty whose research is of particular interest to them and to call or write those faculty members during the summer to discuss the possibility of a rotation. Students can submit up to three choices for research rotation advisors, in rank order of preference to the QBS Administration. Students will then be matched with their research rotation advisor making every effort to give students their first choice. These actions will be performed under the following considerations:

1. Students may perform research rotations only in laboratories of faculty who have made it clear that they have the appropriate research grant funds or departmental resources at their disposal to fund the costs of the rotation (e.g., expendable supplies), as well as at least three years of funding to support a student stipend and dissertation research.
2. Co-Mentorship: Students may perform a research rotation with faculty outside of QBS only in the situation where a co-mentor in QBS is identified for the rotation. Ultimately, this faculty member outside of QBS may be the primary dissertation advisor so long as the co-mentor is still QBS faculty.

3. QBS Administration will solicit information from each faculty member in the program regarding their interests in sponsoring rotation students and be guided by this input when assigning rotations.
4. Realizing that ideas, impressions, attitudes, and expectations change with time, only the first (i.e. the fall term) rotation is to be arranged prior to the beginning of the fall term. The second and third rotations (winter and spring terms) will be arranged during the final week of the preceding term using procedures identical to those employed for the choosing of fall term rotations.

It should be emphasized that neither the student nor the faculty member is to regard any of the three research rotations as permanent. Students are required to perform three such rotations before finally deciding on a dissertation advisor. Students and faculty are not to arrange the choice of their dissertation lab until the last two weeks of the third rotation; the precise time when it is appropriate to discuss permanent arrangements will be announced to students and faculty by QBS Administration. Once the dissertation lab arrangements are made, students and faculty will submit a thesis agreement letter, jointly signed, to the QBS Administration Office of the match. A modified form will be used if the student will be co-mentored by two advisors.

At the end of each rotation, the research sponsor will submit to the QBS Office a grade of Credit (CR) or No Credit (NC) and a written summary of the student's rotation if desired. A grade of NC for the research rotation is given only if there are serious deficiencies in student performance.

Grading System

QBS core and elective courses are graded as HP (High Pass), P (Pass), or LP (Low Pass).

QBS Journal Club, research rotations, supervised teaching, and dissertation research are graded on a CT (Credit), NC (No Credit) scale. All grading should be in accordance with the Guarini School of Graduate and Advanced Studies (<https://graduate.dartmouth.edu/policy/satisfactory-progress>)

Grades of "LP" or "NC" in research rotations, journal club, dissertation research, supervised teaching or in core course work have serious consequences, as follows:

One grade of "LP" or "NC" in any term in any course results in the student immediately being placed on academic probation. Once placed on probation, any one of the following three conditions will be considered by the QBS Advisory Committee should the student not maintain a HP or P in additional coursework:

- a. No action is necessary.
- b. The deficiency must be removed either by repetition of the course, special examination, or other arrangement.
- c. The student is removed from the QBS program.

The following guidelines will be used for arriving at a recommendation (the term "course" includes the outcome obtained in the Qualifying Examination).

1. If a grade of "NC" is earned in any core course in any subsequent term the QBS Administration will recommend option (c).
2. If an additional "LP" is earned in any subsequent course the QBS Administration may recommend options (b) or (c).
3. If more than two "LPs" are earned the QBS Administration may recommend option (c).
4. If a student fails to sufficiently improve his/her performance within one academic year after a performance review recommendation, the QBS Advisory Committee may recommend option (c).

All of the above options will be considered for grades obtained in elective courses at the discretion of the Advisory Committee.

B. Dissertation Advisor and the Dissertation Committee

By the end of the spring term of the first year of graduate study (approximately June 1), each student must have arranged with a member of the QBS faculty to serve as dissertation advisor and research sponsor.

Choice of a dissertation advisor may be delayed by one term under special circumstances in which a student requests from the QBS Administration a fourth research rotation; in this case the fourth research rotation will occur during the summer of the student's first year in the program. Students not able to find a suitable or willing advisor from among QBS program faculty at the end of their research rotations will be separated from the program.

The dissertation advisor plus two other faculty members, chosen by the student in consultation and with agreement of their dissertation advisor, will become the student's Dissertation Committee. The Dissertation Committee is to be formed and approved no later than the end of the spring quarter of the student's second year unless a valid reason for delay is provided to the QBS administration, and the first committee meeting is to be held no later than 3 months after the committee has formed. The student's dissertation advisor will serve as Dissertation Committee Chair. Normally, the Dissertation Committee will be composed only of QBS faculty members. However, where appropriate, one member of the Dissertation Committee may be a non-QBS faculty member. There may be additional members added to the committee as the student's advisor sees fit but at least two members must be QBS faculty. In the case where a student is co-mentored by two QBS faculty, there still must be one additional QBS faculty member on the committee. The committee should be assembled to avoid potential or perceived conflicts of interest between faculty members and between faculty members and the graduate student. Such conflicts would include personal or financial relationships. Final approval by the QBS Director of the composition of the Dissertation Committee is required, as are any subsequent changes in the composition of the committee.

In the event that either the student or the advisor desires to end the student-advisor relationship, then the Dissertation Committee must play an active role, particularly if the decision is not a mutual one between the student and advisor. If the Dissertation Committee is not formed or cannot come to a

conclusion on the matter, the situation should be reviewed by the Advisory Committee. The student and advisory should provide a written statement regarding the discordance. The Advisory committee may recommend the following:

1. Separation from the program
2. The student seeks an alternate advisor if they are near completion of their PhD
3. The student will complete an additional rotation with an advisor who would agree to fund the student and be their mentor for the remainder of their PhD candidacy

C. Functions of the Dissertation Committee

The duties and purpose of the Dissertation Committee are to:

1. Meet with the student at least once yearly, or more frequently as needed to assess progress
2. Attend the student's annual QBS Research in Progress Presentation
3. Review and sign committee meeting progress reports written by the student summarizing their performance in the program. The report form should include an evaluation of the student's progress in developing a dissertation research project and should describe any concerns about the student's trajectory. This will serve as part of the formal record of the student's graduate education.
4. Advise the student of course requirements and select, with the student, an academic program and timetable suitable for the student's chosen interests.
5. Advise the student as to research direction, course selection, TA assignment, etc.
6. Ensure that the student develops the ability to communicate ideas and knowledge to others in seminar-style presentations. This will normally be accomplished through experiences gained in courses, QBS Research in Progress Presentations, lab meetings, etc.
7. Provide advice concerning the time and subject of the Qualifying Examination, following procedures specified by the program if the committee is formed at this time.
8. Mediate disputes between the student and advisor. In the event that either the student or the advisor desires to end the student-advisor relationship, then the Dissertation Committee must play an active role, particularly if the decision is not a mutual one between the student and advisor.

It is the responsibility of the student to inform the Dissertation Committee about the dates of their QBS Research in Progress Presentations, to schedule meetings with the Dissertation Committee at least once annually, to provide a progress report summarizing progress (template provided by the QBS Administration) and goals for faculty to sign that confirms that the committee has met. The student should come to the meeting with the progress report that outlines their research progress to date, classes completed, papers published or in progress, and a timeline of future plans. Once approved by the Dissertation Committee, this report should be signed by the student and all members of the Dissertation Committee and submitted to the QBS Administration. In the event that the report is not

filed, the stipend increase that is granted to the student upon successful completion of the Qualifying Examination will be withheld after September 30th. In addition, the student will be placed in unsatisfactory standing and the Graduate Studies Office will be notified. The qualifier increase will be restored upon the filing of the report, but the student will forfeit the raise for the months (or parts thereof) during which the report is late. If no report is filed by December 1 of the year it is due, the situation will be reviewed by the QBS Advisory Committee in conjunction with the student's advisor.

If either the advisor or the student wants to end the relationship, then the following must occur:

1. The reasons for the action must be stated in writing and filed with the QBS Administration Office.
2. The Dissertation Committee must be made aware of the issues.
3. The student (or advisor) must be given an opportunity to rectify the problems.
4. The conditions that the student must meet to rectify the problem should be approved by the Dissertation Committee and communicated in writing to the student and to QBS Administration.

II. PROGRAM REQUIREMENTS FOR THE PH.D. DEGREE

For the Ph.D. degree, the student shall show competence in original research and shall prepare a doctoral dissertation containing the results of their independent studies. The dissertation should present a coherent investigation of an original scientific research question at a level of rigor suitable for publication in a peer-reviewed academic journal. It should also include a thorough and critical analysis of the published literature in the field and of the methodological and theoretical background of the work. Before beginning to prepare the dissertation, the student must obtain approval from the Dissertation Committee either signed on their latest dissertation progress report or in a separate signed document stating their approval of the potential timeline to set a defense date. This is to be submitted to QBS Administration. As students begin preparation for the dissertation defense, they must contact the QBS Administration. This is essential to help ensure that the student and program work together to follow all graduate school policies so that the student will be able to graduate on their projected date. Students are advised to visit the Graduate Studies website (<https://graduate.dartmouth.edu/>) for information about dissertation preparation and formatting. Upon completion of an approved dissertation by the dissertation advisor, the dissertation advisor in conjunction with the student will assemble a Dissertation Exam Committee and obtain the approval of the composition of this committee from the Graduate Studies Office. Please review forms and guidelines here:

(<https://graduate.dartmouth.edu/academics/graduate-school-forms/thesis-and-dissertation-forms>). The Dissertation Exam Committee will consist of a minimum of three full-time Dartmouth faculty members of which a minimum of two must be from the QBS Program (in the situation where both the advisor and co-advisor are Dartmouth faculty.) as well as an external member with a faculty-equivalent research appointment outside of Dartmouth. The external member may participate in meetings in person or via

videoconference; however, they must be present in person for the dissertation defense. The Dissertation Exam Committee will usually be the student's Dissertation Committee plus a fourth person who is usually a scientist that is not a member of the Dartmouth College faculty. If one member of the Dissertation Committee is not a QBS faculty member, they can serve on the Dissertation Exam Committee only with the approval of the Graduate Studies Office. It is imperative that the student informs the Graduate Studies Office in sufficient time to allow for approval of the composition of the Dissertation Exam Committee. The student must inform the QBS Administration Office of the composition of the Dissertation Exam Committee and of the expected date of the defense.

A. Required Research Rotations

Each first-year student is required to perform three research rotations in three different laboratories during the first year in the program. The QBS Administration, based on ranked choices submitted by both students and in accordance with faculty, will make rotation assignments. Each rotation will last approximately three months.

B. Course and Graduate Requirements

Every student is required to take Integrative Biomedical Sciences I & II, the seven core courses Foundations of Epidemiology I & II, Foundations of Bioinformatics I & II, Foundations of Biostatistics I & II) and a journal club or approved equivalent (each term for the first 3 years). It is mandatory that in the first year, students take the QBS Journal Club (QBS 270). Students are able to place out of the QBS Math Pre-requisite course via a pre-test administered when students arrive to campus as well as QBS100: Molecular Basis of Human Health via a pre-test of having a graduate level biology course on their transcript. It is mandatory that in the first year, students take the QBS Journal Club (QBS 270). In addition, each student must earn two elective credits approved by the QBS Administration and Director of course level 100 or higher. Students are also required to complete a one-term supervised teaching requirement and an approved ethics course. The course requirements outlined above are considered a minimum for the Ph.D. The Dissertation Committee can recommend that a student take more than the minimum required number of courses in order to provide that student with an academic background appropriate for pursuing research in the student's chosen area of investigation. Students may also petition the QBS Director for credit for courses offered by outside institutions. In all instances where additional courses are suggested, the proper procedure will be for the Dissertation Committee to make a recommendation to the QBS Director, who will have the final authority in this area. Should a student wish to take a course not on the approved QBS course list, they must receive pre-approval from the QBS Director to receive credit.

C. QBS Journal Club

Attendance at QBS Journal Club or equivalent is required during each term the student is enrolled in the QBS Program for the first three years:

1. Students will attend a journal club, where they will participate in discussion and present relative literature. In a student's first year, this journal club is required to be QBS 270.
2. With approval from QBS Administration, QBS 195 Independent Journal Club can substitute for this journal club credit. All Journal Clubs are equivalent to 0.5 Unites

D. Research in Progress Presentations

Students are required to present a research in progress presentation beginning in their 2nd year in the program. On a predetermined day each month, two QBS students will present their current research to faculty and peers. This will begin in the fall term with the most senior QBS students presenting first. Each student's Dissertation Committee is required to attend on the day of the student's presentation. For 2nd year students, if the committee is not formed yet, their advisor must be present, and they may extend the invitation to their Qualifying Examination Committee. In the year that the student expects to defend his/her dissertation and receive their Ph.D., the student must still present a research in progress presentation unless the name of the outside examiner and the defense date have been sent to the QBS Administration Office before August 15. All QBS students are required to attend these presentations and must sign in prior to the RIP. Students may miss two presentations per year, unless a valid reason is provided to the QBS Administration. If a student misses more than two presentation without providing a valid reason, the situation will be reviewed by the Advisory Committee in conjunction with the student's advisor and the student may be placed on academic probation.

E. The Qualifying Examination

Each student enrolled in the Ph.D. program must pass a qualifying examination in order to be formally advanced to candidacy for the Ph.D. degree. This exam has two components: a written research proposal and an oral exam that uses the written proposal as its focus. Specific deadlines pertaining to the exam will be communicated to the students during the summer of the student's first year and they will be provided with a document to provide to their committee that outlines committee responsibilities. The Qualifying Examination topic will be based on the students proposed dissertation project or an approved topic of their choice. The Qualifying Examination Committee will be composed of three faculty members who serve as the examining and voting members of the committee. At least two members of the Qualifying Examination Committee must be members of the QBS Program faculty. The student and dissertation advisor will jointly choose two members of the examination committee. They should be chosen for their expertise in the areas of the written proposal and for their willingness to interact with the student in defining the topic and specific aims for the written proposal.

- a. The Qualifying Examination Committee should be assembled to avoid potential or perceived conflicts of interest between all parties. This committee is not the student's Dissertation Committee, but if suitable, all members would be allowed to be on the student's Dissertation Committee. Such conflicts would include personal or financial relationships. As the aims evolve, it may become clear that faculty members who agreed to be members of the Qualifying Examination Committee early during the process are not the best ones to serve on the committee. In these cases, the student, advisor, and Qualifying Examination Committee members should decide on a replacement. If it is found that a committee member is consistently unresponsive during entirety of the qualifying process, causing a delay in the timeline, the student is to bring this matter up with their advisor and the QBS Curriculum Director to resolve the issue. One member of the Qualifying Examination Committee may be a faculty member who is not a member of the QBS Program. The student's dissertation advisor will not serve as a member of the Qualifying Examination Committee but the advisor's approval of the topic, specific aims, and the final written proposal are required. The advisor is also required to attend the oral examination. The QBS Curriculum Director will attend qualifier exams upon request or to advise the committee should the majority of committee members be unfamiliar with the QBS qualifier process. This is to ensure fairness and consistency. In cases when the Curriculum Director cannot attend, another member of the Advisory Committee will attend.
- b. The student, advisor, and first two Qualifying Examination Committee members will agree upon one of the committee members to serve as chair (in cases where a non-QBS faculty member is serving on the Qualifying Examination Committee, that person may not serve as Chair). The student is responsible for meeting all deadlines and for setting a time and place for the oral examination. The chair is responsible for the conduct of the examination and for the preparation of any required correspondence, compiling the critique of the written proposal, communicating major concerns to the QBS Director and Curriculum Director. The committee chair should be the main contact point for the student, however they may seek guidance and input from individual members.
- c. The student should develop specific aims for the research proposal. The student is encouraged to interact with his/her advisor and the two Qualifying Examination Committee members already selected in developing and focusing the specific aims. However, the student should be aware that the development of the scientific focus of the proposal is the responsibility of the student. The student should submit the proposal title and specific aims to the advisor and Qualifying Examination Committee members. The specific aims should contain an introductory paragraph (approximately 0.5 pages) that places the actual experimental aims in context. In addition to stating the actual aims of the proposed studies, this section should also describe briefly the experimental approaches to be used. With the approval of the Qualifying Examination Committee, the specific aims may be

modified, as the written proposal is prepared. In its final form, the specific aims will be the first part of the written proposal.

- d. The third committee member will be chosen after the advisor and the two committee members have approved the topic and specific aims. The advisor and Qualifying Examination Committee members should confer and select a third member of the committee. The committee will communicate their choice to the student who will then contact this third member inviting them to join the committee and provide them with the guidelines of committee responsibilities, the qualifier timeline, and their specific aims. After the 3rd member is chosen, students are required to submit the names of the entire committee to the QBS Director and Curriculum Director for approval. This is designed to (a) provide additional expertise useful for evaluating the studies proposed; [only after the specific aims are developed and the probable approaches outlined is it clear what additional expertise would help in evaluating the proposal]; (b) provide new faculty with an early opportunity to participate in the Qualifying Examination process; (c) ensure that at least one member of the Qualifying Examination Committee has extensive experience with the QBS Qualifying Exam.
- e. During the period of topic selection and development of specific aims, students are expected to maintain full-time involvement in coursework, teaching, and normal laboratory activities.
- f. In all cases and no later than a defined date in December of the student's second year in the QBS Program, the topic and specific aims must be approved by the advisor and the two Qualifying Examination Committee members chosen by the advisor and student. The committee member names, abstract title and specific aims should be submitted to the QBS Administration Office by a defined date in December. The aims will be reviewed by the students Qualifying Examination Committee, and revision suggestions will be presented to the student. Revised aims are due on a defined date in January.
- g. The following are the criteria for evaluation and approval of the specific aims:
 - i. Is studying and writing about the topic of the proposal likely to be a sound educational experience for the student? Ideally, the Qualifying Examination should enhance knowledge and understanding in fields related to the student's Ph.D. dissertation project.
 - ii. Do the aims address important questions in the field? Ideally the aims should be "hypothesis driven" rather than merely descriptive.
 - iii. Are the proposed methods reasonable and feasible using current technology? If not, has the student proposed new approaches that have a reasonable probability of succeeding?
 - iv. Can the proposed experiments be completed within the timeframe of a student's Ph.D. candidacy?

- v. Is the style and level of detail of the specific aims appropriate for a grant application?

The Written Research Proposal

Qualifying Examination Timeline:

Mid December	Submit First Draft of Aims
Early January	Committee Provides Aims Revisions
Mid-January	Submit Final Revision of Aims
Mid-February	Submit First Draft of Written Proposal
Mid-March	Committee Returns Revision Comments
Early April	Submit Final Revision of Written Proposal
Early April	Committee Approval or Failure of Final Proposal
Early May	Oral Defense

- a. Preparation of the written proposal. The written portion of the Qualifying Examination is a research proposal written by the student. Once the student's topic and specific aims have been approved, the student will have four weeks to complete the written proposal. The proposal should be written entirely by the student. The written proposal must be approved by the advisor before it may be submitted. The advisor should not approve the proposal if it is difficult to understand due to the writing style, grammatical errors, or a failure to provide sufficient background or experimental detail. The advisor should ensure that the proposal conforms to the length requirements (not more than 7 pages plus references) and that the references include all needed information (including titles). Scientific evaluation of the written proposal is the responsibility of the Qualifying Examination Committee, not the advisor. The written proposal must be submitted to the Qualifying Examination Committee no later than a defined date in February of the second year of graduate work. Furthermore, the entire qualifying examination should be completed as close to May 1 as committee availability allows, and no later than August 1 of the student's second year of graduate work. If the exam is not completed by this time, the student will not be permitted to enroll for the following fall term as a Ph.D. student. During the time when the written proposal is being prepared, students are expected to discuss their research schedule with their advisor since it is understood that writing the qualifying exam will take a considerable amount of time and effort. Students are expected to maintain their coursework and other activities during this time. Note that in writing the proposal, the student may not copy from grant applications or journal articles. This constitutes plagiarism and is grounds for dismissal from the program.
- b. Written Qualifying Exam Format and Organization

General Format:

- i. The entire research proposal is limited to seven pages and adhere to NIH Fellowship (F) format (<http://grants.nih.gov/grants/how-to-apply-application-guide/format-and-write/format-attachments.htm>). The 7-page limit does not include the reference list. The

7-page limit does, however, include all figures and tables. No materials may be included in any appendix. Proposals exceeding this page limit will be returned to the student without review.

- ii. A font size of 11 point or larger is acceptable. Use of smaller font sizes will result in return of the proposal to the student without review. Recommended fonts: Arial, Garamond, Georgia, Helvetica, Palatino Linotype, Times Roman Numeral, and Verdana. There may be no more than 15 characters/inch.
- iii. The proposal should be single-spaced. There may be no more than 6 lines of type per vertical inch.
- iv. Provide at least one-half inch margins (top, bottom, left, and right) for all pages
- v. All pages should be numbered. The first should be numbered as page 1 and should include the abstract and specific aims.
- vi. A reference list should be included after the research description section. There is no length limit for the reference list. Citations in the reference list should be complete and contain all authors' names (if fewer than 10 authors and the first 10 authors if more than 10 authors), full title, year of publication, journal, journal volume, and page numbers. The format of the reference list in NIH format could serve as a model, but a specific format is not required. Students are urged to cite original references rather than review articles.
- vii. Citations in the text of the proposal can either be numbered (e.g. as in a *Nature* paper) or use the author/year format (e.g. as in a *Cell* or *Genes & Development* paper). Please see (<http://www.ncbi.nlm.nih.gov/books/NBK7256/>) for guidance.
- viii. Inclusion of relevant figures and tables is encouraged. The figures and tables can be either embedded in the text or placed together preceding the references. In either case, the research description section must not exceed 7 pages including all figures/tables.
- ix. In addition to distributing a paper copy of the written proposal to each Qualifying Examination Committee member, the student should send committee members an electronic copy.
- x. The Chair of the Qualifying Examination Committee should examine the proposal for compliance with format requirements as soon as possible after receiving it. Proposals, which do not adhere to all format specifications, will be returned to the student without evaluation. The Chair should provide written guidelines to the student describing why the proposal is being returned. The Chair should also inform the student about the amount of time available for bringing the proposal into compliance with the format requirements. It is anticipated that most modifications needed to bring the proposal into compliance can be completed in less than a week. This does not constitute the one permitted revision of the written proposal.

Organization:

The research description should contain the following subsections:

- xi. **Specific Aims.** An introductory paragraph should introduce the topic and provide a very brief background sufficient to place the actual specific aims in context. The specific aims should be listed and the proposed experimental approaches briefly described. Suggested length: up to 1 page.
- xii. **Significance (background).** This section should provide the reviewers/committee members with essential background information to allow them to understand the proposed experiments. This section is not a broad review of the field; instead it should be focused on providing information that will enhance the understanding of the proposed experiments.
- xiii. **Approach.** This section should describe the proposed experiments, specifically the rationale, the methods to be used, and the likely outcomes and interpretations of the experiments. The experimental plan should be divided into sections that correspond to the specific aims. Students should keep in mind that applications for support from an F31 grant should propose a body of work that can be completed by a single person in a 2-3 year period. In general, the written proposal should provide experimental detail sufficient for the Qualifying Examination Committee members to understand the experimental approaches planned and possible limitations or concerns with using the planned approaches. The proposal should not contain excessive details of standard techniques and approaches. However, some experimental detail may be appropriate when the techniques and experimental approaches to be employed are novel or not widely used. Students should consult the Qualifying Examination Committee Chair if they have questions about how much experimental detail to include. This section may also contain a "Preliminary Results" section since the topic may be based on dissertation research.
- xiv. **A timetable** outlining what work will be done in each year of the grant.

Suggested length: 6 pages for significance, innovation, approach, and timeline. The members of the Qualifying Examination Committee will have up to four weeks to evaluate the written proposal (hopefully it will be shorter) and communicate their decision and critique via the committee chair to the student, which should be completed no later than a defined date in March. The Qualifying Examination Committee may either approve the proposal or may return the proposal to the student for revision. Revising grant applications is a common part of grant-funded research. The Qualifying Examination Committee should request a revision of the written proposal if the proposal contains significant flaws or if the committee believes that a substantially stronger proposal would result from revision. If the Qualifying Examination Committee requests revision of the written proposal, a written critique of the

proposal should be prepared by the Chair by combining the concerns and suggestions from individual committee members. These comments should be organized into “required revisions” that must be incorporated into the proposal and “general comments” that do not need to be incorporated, but may be grounds for questioning during the oral examination. Members of the Qualifying Examination Committee should NOT communicate written critiques directly to the student. The Chair of the committee will merge the individual critiques into one, provide committee members with the opportunity to read and comment upon the written critique, revise the critique, and forward the final critique to the student and advisor. The written critique should provide feedback to the student on specific areas where the proposal needs improvement. The student is advised to discuss with the Qualifying Examination Committee Chair how to address the concerns raised in the written critique. If the Qualifying Examination Committee feels that the written proposal is acceptable such that it does not need major revisions, individual committee members may communicate minor concerns to the student orally and may prepare a written critique if they so choose.

Evaluation of the written proposal.

The criteria for evaluating the proposal are the following:

- a. Does the proposal follow the stated guidelines for length and format? If not, the proposal should be returned to the student without review.
- b. Does the Introduction/Background section provide sufficient detail to understand and evaluate the proposed experiments?
- c. Is the rationale for each experiment clearly described?
- d. Is sufficient (but not excessive) detail on methodology provided?
- e. Are potential outcomes and interpretations of possible outcomes described?
- f. Have alternative approaches been considered if the method of choice does not work?
- g. Is the grant written in a style appropriate for a research grant?
- h. Is the timetable for the work provided by the student realistic?

Revision of the written proposal.

The amount of time available to the student for preparing and submitting a revised written proposal will be determined by the Qualifying Examination Committee, based on the amount of revision needed. This may be as short as three days if only minor revisions are required, and as long as three weeks if major revision is needed. The student is to prepare, in addition to their revised proposal, a 1-page response to the critique the Chair has sent them. Only one revision of the written proposal will be permitted. The revised proposal, approved by the advisor, should be submitted to the Qualifying Examination Committee. Prior to the oral examination, the Chair of the Qualifying Examination Committee should consult with the other committee members to determine whether there remain substantial deficiencies in the written proposal. If it is decided that these deficiencies can be addressed during the oral exam, the chair should inform the student in writing

before the date of the oral examination and state briefly what the deficiencies are. No less than one week prior to the oral examination, each Qualifying Examination Committee member is required to submit 3-5 questions that may be asked during the oral exam to the Qualifying Examination Committee Chair. These questions will be circulated to the committee by the Chair no less than one week prior to the oral exam.

Alternatively, if the deficiencies are such that they would have returned the revised written report if it were the first submission, they may choose to fail the written examination. Approval or failure of the final written exam should be communicated to the student no later than 1 week after submission. If failure occurs, the QBS Advisory Committee will convene with members of the Qualifying Examination Committee to determine the next step. The student may be allowed to repeat the qualifier process a second and final time or may be dismissed from the program if warranted based on the student's cumulative body of work.

Scheduling the oral examination.

Once the first submission of the written proposal has been approved or the second has been submitted, the student should schedule the oral examination and reserve a room with a wipeboard for the oral, which should take place by May 1, or as soon thereafter as faculty schedules permit. If possible, a room and time should be scheduled a month in advance. A room for the oral qualifier examination should be reserved for at least 4 hours although most oral examinations are completed in two hours or less.

The Oral Examination

- a. Format for the oral examination. The student should prepare a brief presentation (no more than 10 minutes) of the background to the proposal, the aims and hypotheses to be tested. The student should consult the Chair of the Qualifying Examination Committee for advice on preparation of the brief introductory presentation. The student may use not more than **two** overheads or slides and should provide copies of these to the Qualifying Examination Committee members in advance of the oral examination. Suggestions for the content of these slides may include an outline of their aims or research strategy or important graphs or figures that they may wish to address. **Students are not permitted to use additional slides for clarification.**
- b. Guidelines to assist students in preparing for the oral examination:
 - i. The student should be familiar with the theoretical and factual background relevant to their proposal. All members of the Qualifying Examination Committee may ask some of the questions that the Chair has circulated but are also free to ask questions broadly related to the proposal and to areas that constitute the background for the proposal. The student should be able to place the topic of their proposal in the context of the broad field of integrative biomedical sciences. If the student has been informed by the Qualifying Examination Committee that a revised written proposal still has substantial deficiencies, the student should be prepared to address these during the oral examination.

- ii. Students should be conversant with the literature in the field(s) covered by their proposal, including those papers that deal with matters of general significance as well as those that relate directly to the proposed research. The Qualifying Examination Committee will expect the student to have an appreciation of the development of ideas (historical perspective) in this field and the potential role of current ideas in guiding the field in the future.
 - iii. Students should be able to consider and generate alternative approaches and should be prepared to interpret hypothetical outcomes proposed by examiners.
 - iv. Students should be thoroughly familiar with the technical aspects of their proposal. They should have a solid understanding of the approaches or techniques they propose to use. They should be aware of the advantages and limitations of these techniques. They should be prepared to defend why they have chosen a particular technique or approach rather than alternative ones that might be available.
 - v. The Qualifying Examination Committee may also test the following aspects of the student's background and ability:
 - Is the student able to critically evaluate original scientific articles?
 - Has the student designed experiments that address the specific aims and which have the potential to add new and useful information to the field of investigation?
- c. The following describes the areas that will be evaluated during the oral examination.
- i. Introduction/Background:
 - Background knowledge in area of exam
 - Familiarity with literature
 - Historical perspective
 - General knowledge of the basics of integrative biomedical sciences, as covered in the core competency course
 - Ability to evaluate the literature critically
 - ii. Specific Aims:
 - Are the proposed experiments appropriate to answer the proposed question?
 - Does the student have a theoretical and technical understanding of the approaches proposed?
 - Will the results be interpretable?
 - Will the results add new and useful information to the field of investigation?
 - iii. General:
 - Can the student answer questions that require the inclusion of new/additional information?
 - Can the student incorporate information into a working model?

Can the student propose alternative approaches in cases where the proposed approaches do not provide the information needed?

iv. Evaluation of the Qualifying Examination:

Following the oral examination, Qualifying Examination Committee members evaluate the student's overall performance, considering both written and oral portions of the examination. The committee should attempt to reach a consensus on the outcome of the exam, but if this is not possible, the three committee members will vote and the vote of the majority will determine the outcome of the examination. The only possible outcomes for the Qualifying Exam are Pass, Conditional Pass, or Fail. Conditional Passes (passes with conditions to remedy deficiencies) are permitted only after the first attempt at the oral exam. The student will be informed about whether or not they have passed the exam at this time; the Chair of the Qualifying Examination Committee will summarize the strengths and weaknesses of the oral exam. In cases where the student fails the exam, the Chair will prepare a consensus written summary clearly enumerating the reasons for the failure. If the student passes the oral exam, no detailed written summary of the exam is required. If the student receives a Conditional Pass, the Qualifying Examination Committee may ask them to remedy deficiencies in a written document up to 5 pages or to re-defend a specific topic of their oral exam. In both instances, this must be accomplished no later than 1 month after the oral exam. Should the student fail after an attempt to remedy their Conditional Pass, this is considered a "first" failed attempt and the student will be given a chance to redefend in no later than 1 month. Following the oral examination, the student and Qualifying Examination Committee Chair should sign the Qualifying Examination Report and the student must submit it, along with their written proposal, to the QBS Curriculum Director. For Conditional Passes, this is signed when they have addressed their deficiencies as recommended by the Qualifying Examination Committee.

v. Repeating the oral Qualifying Examination:

In the event that the student fails the oral examination or their subsequent Conditional Pass, the student will have one opportunity to repeat the oral examination. The second administration of the oral must occur not later than one month after the first oral examination. In the event that the examination is not repeated within the one-month time period, or if a second failure occurs, the student will not be advanced to candidacy for the Ph.D. degree and normally will be unable to remain in the Ph.D. program. However, the situation will be reviewed by the QBS Advisory committee in which the student and advisor may provide a written statement in regards to extenuating circumstances that may have warranted a fail. Recognizing extenuating circumstances, the Advisory Committee may

allow the student to re-do their examination and determine the appropriate time-line in which to do so. Otherwise, if it is determined appropriate upon review by the QBS Advisory Committee in consultation with the Qualifying Examination Committee, the student may opt to leave with a masters in the program if the appropriate coursework is completed. The final determination for this will be subject to review by the QBS Advisory Committee.

After passing the oral Qualifying Examination:

Once a student has passed the Qualifying Examination and advanced to candidacy, the student will continue to be graded on research performance in the laboratory by their advisor at the end of each term, on a Credit (CT) or No Credit (NC) scale. If the advisor feels a grade of "NC" is warranted, the advisor must present the details of the student's performance to the student's Dissertation Committee at a meeting called especially for this purpose. A grade of "NC" for graduate research can only be assigned with the agreement of the Dissertation Committee. Grades of "NC" for graduate research received after a student has been promoted to candidacy will be treated the same as similar grades received for research rotations or course work. A grade of "NC" for research will result in the student being put on probation and may result in dismissal from the program if this causes any of the provisions previously listed (in Section I.A.) to be met.

- vi. Expectations for Dissertation Research Work during Qualifying Exam:
Prior to submission of the topic and specific aims, students are expected to maintain full (i.e. 100%) presence in the lab, teaching, and coursework. It is not acceptable, for example, to disappear from the lab for weeks or months for the purpose of generating the aims for the Qualifying Examination. Students are encouraged to begin the discussions and background reading needed to select a topic early in their second year of study. Once the topic and aims are approved, students have 4 weeks to prepare and submit the written proposal. Prior to writing their proposal, students are expected to discuss their research schedule with their advisor since it is understood that writing the Qualifying Examination will take a considerable amount of time and effort. During the weeks prior to the oral exam, the expectation for lab presence is reduced. During this time, students should maintain some presence in the lab and must continue to fulfill coursework and teaching obligations.
 - vii. Timeline for Completion: A defined date of Mid December of the second year of graduate studies is the latest possible date for submission to the QBS Administration Office of the approved topic and specific aims, and the names of two faculty who have agreed to serve on the Qualifying Examination Committee.
- d. Students should anticipate that several weeks are required to do the background reading needed to select a topic and to formulate specific aims. It is strongly recommended that students

begin this process well before the defined date in December and should consider initiating this process during the summer between the first and second years of graduate study. The third Qualifying Examination Committee member may be selected after the first two committee members are chosen, and the topic and specific aims are approved. Students must submit to the QBS Administration Office the name of the third committee member no later than the date of submission of the written proposal. Qualifying Examinations should be scheduled and finished ideally by May 1 and no later than August 1. The entire process may be completed sooner than the designated dates, and this is strongly encouraged. Departures from the time line for the Qualifying Examination specified here require the prior approval of the QBS Director.

F. Dissertation and Dissertation Defense

For the Ph.D. degree, the student shall show competence in original research and shall prepare a doctoral dissertation containing the results of their independent studies. The dissertation should present a coherent investigation of an original scientific research question at a level of rigor suitable for publication in a peer-reviewed academic journal. It should also include a thorough and critical analysis of the published literature in the field and of the methodological and theoretical background of the work. Before beginning to prepare the dissertation, the student must obtain approval from the Dissertation Committee either stated on their latest signed dissertation progress report or in a separate signed document stating their approval of the potential timeline to set a defense date. This is to be submitted to the QBS Administration. As students begin preparation for the dissertation defense, they must contact the QBS Administration Office. This is essential to help ensure that the student and program work together to follow all graduate school policies so that the student will be able to graduate on their projected date. The Dissertation Committee will be formed after the student's dissertation advisor has approved the dissertation topic. The Dissertation Exam Committee must consist of at least three faculty members from the QBS Program and/or Dartmouth (at least 2 must be QBS faculty and 3 in the case where both Advisor and Co-Advisor are QBS Faculty) and a fourth person from outside of Dartmouth that may be selected when the student has approval to set a thesis defense date. It is imperative that the student informs the Graduate Studies Office in sufficient time to allow for approval of the composition of the Dissertation Exam Committee.

(https://graduate.dartmouth.edu/sites/graduate_studies.prod/files/graduate_studies/wysiwyg/phd-examination-committee-guarini.pdf) The student must inform the QBS Administration Office of the composition of the Dissertation Exam Committee and of the expected date of the defense.

Students must give each member of the Dissertation Exam Committee a copy of the dissertation at least two weeks before the date scheduled for the defense. Students planning to participate in the formal DMS or Dartmouth College June graduation exercises should be aware that both the Graduate Studies Office and the programs set deadlines regarding the submission, examination, and approval of theses.

Typically, these deadlines occur during the month of May. It is each student's responsibility to meet these deadlines in order to participate in commencement. Students must contact the QBS Administration Office with the date, such that they can aid in organizing the time and location of their dissertation defense seminar for distribution of public seminar notices and events surrounding their defense. If any member of the Dissertation Exam Committee finds that the submitted dissertation is inadequate, that member must immediately communicate their concerns to the dissertation advisor and the other members of the Dissertation Exam Committee, which may cancel the dissertation defense as late as 48 hours before the scheduled time of the defense. Concerns from the outside examiner must be communicated up to 72 hours prior to the scheduled defense to allow the committee time to meet the 48-hour deadline.

Following a publicly announced and delivered seminar on the dissertation material, the doctoral candidate will defend the dissertation before the Dissertation Exam Committee. The dissertation advisor is responsible for promptly notifying the QBS Administration Office of the outcome of the defense. Should this committee find the dissertation itself or the student's understanding of the dissertation subject area insufficient for the conferral of the Ph.D. degree, the student shall be informed of the deficiencies and the areas that require modification. The dissertation may be revised, and the dissertation defense may be repeated once, and insofar as possible, the composition of the Dissertation Exam Committee shall remain unchanged. The Dissertation Exam Committee will determine an appropriate deadline for the revised dissertation to be submitted. If a student fails to satisfy the concerns of the Dissertation Exam Committee after a second attempt, the student will be immediately separated from the program.

The student dissertation can be approved provisionally, pending corrections and minor modifications recommended by the Dissertation Exam Committee. Normally, the student's advisor will monitor these changes and upon satisfactory completion of them, permit the student to submit the finalized dissertation to the Graduate Studies Office.

G. Procedures in the Case of Potential Separation from the Program

In the event that a student faces potential separation from the program due to course grades or other reasons, or is denied advancement to candidacy due to the failure at two attempts of the Qualifying Examination or other reason, the QBS Advisory Committee will be convened to review the student's overall record and the pending separation prior to final action. The Advisory Committee will meet in conjunction with the student's dissertation advisor, and as deemed appropriate for the situation, the student's Dissertation Committee (if one has been formed), the Qualifying Examination Committee (if the Qualifying Examination has been attempted), or Dissertation Exam Committee (if a dissertation has been submitted and the dissertation and the dissertation defense attempted). The QBS Director will serve as chair of the meeting unless the Director is the student's dissertation advisor. In such case, a

senior member of the QBS Advisory Committee will serve as chair. Faculty members who feel they might have a conflict of interest that would compromise their ability to make a fair and impartial decision should remove themselves from associated meetings. The Advisory Committee will function as a democratic committee with a single vote for each faculty member present and the final decision will be arrived at by a majority vote.

The overall performance of the student will be reviewed with respect to whether the student is qualified for a productive scientific, or related, career and as to their potential capacity for achieving Ph.D. level of scientific development within a reasonable timeframe. They will also consider any extenuating circumstances brought to their attention by the student, mentor, or other informed party that may have contributed to the poor performance. Information about extenuating circumstances should be brought to the attention of the QBS Advisory Committee in a document prepared by the student, mentor or other informed party. In extraordinary instances, the Advisory Committee may recommend an alternative course of action to that which would normally be stipulated by the QBS rules and regulations for the particular circumstances that prompted the review process. Such a recommendation requires a 2/3 majority vote of the Advisory Committee.

H. QBS Student Grievance Policy

The process for guiding graduate student progress in QBS, while primarily designed to oversee scientific progress and direction, is also intended to guard against biased treatment of any individual. We have also established a grievance process consisting of multiple stages, to ensure that student grievances will be investigated fully and fairly, treated confidentially and decided in a timely manner. With an effective oversight/grievance committee structure, few grievances or disputes will reach the stage where they require formal resolution. However, when resolution is not feasible or successful, the graduate office is the next place to turn. A grievance may be handled as appropriate in the following stages:

1. When possible, speak directly to the person who bears responsibility for the complaint or who is the alleged cause of the complaint.
2. Speak to the research advisor and/or members of the Dissertation Committee.
3. Speak to the QBS Director.
4. If a satisfactory resolution cannot be reached within the department or program, the aggrieved student may request a meeting with the Dean of Graduate Studies to discuss the issue.
5. If the Dean, working together with the aggrieved student and appropriate faculty member(s), or representatives of the QBS Program is unable to reach a satisfactory resolution, the student can request in writing a formal hearing and ruling by the Dean of Graduate Studies and the Committee on Student Grievances. Formal hearings are conducted as described in the Graduate Handbook (see sections titled "Committee on Student Grievances" and "Formal Hearing" under Academic and Conduct Regulations).

Please note that allegations of scientific misconduct, violations of the academic honor principle, and certain issues of professional and personal conduct (sexual harassment, discrimination, and others described in the graduate handbook under code of conduct - non-academic regulations) must be reported to and handled by the Graduate Office.

III. TEACHING BY GRADUATE STUDENTS

An essential element of graduate education at Dartmouth is the experience gained in teaching. Therefore, at least one term of teaching is required of all Ph.D. students.

In the student's second or third year of study, they will TA one of the QBS courses or electives. **Under no circumstances may students opt out of this requirement.** Students will be asked to rank their top 3 choices of courses to TA, and after consulting with faculty, students will be assigned to TA a course by the QBS Administration. To be eligible to TA a class, a student must have completed that course and received a grade of "CT", "HP", or "P", or have taken a similar course that provides them with sufficient background to TA the course. Students will register to TA (QBS196) as they would a normal course prior to the term in which they were assigned to TA. Subsequent responsibility for detailing TA teaching obligations (including examination and report grading, preparation of materials and discussion responsibilities, etc.) rests with the instructor(s) or directors in charge of the course. A grade of "CT" or "NC" will be assigned at the end of the course for the TA. Generally TA responsibilities include:

1. Holding Regular and Consistent Office Hours (Please attempt to poll students for availability)
2. Grading Exams and/or Homework, course material preparation, and leading discussions as specified by Faculty
3. Attending all class sessions
4. Timely responses and availability to student
5. Teamwork: essential element as most courses will have two TAs
6. Weekly commitment to a course is 10-12hrs per week.

It is not expected to lecture or prepare lectures for instructor unless mutually agreed upon. It is expected that Faculty will provide solutions for homework and exams to assist with grading.

Opportunities can be made for students wishing to participate in more than one term of teaching. However, this requires that adequate teaching positions are available to accommodate the interested student(s) and that their advisor agrees, in which case final approval of the arrangement by the QBS Director is required.

If applicable, teaching assistants are expected to begin their duties no more than one week prior to the start of a course, and they need to be available until the final grades are submitted, normally 1 week after the exam period. If, because of illness or some other legitimate reason, teaching assistants are unable to meet their teaching obligations, they should inform the appropriate faculty member so that adequate replacements can be found.

IV. QBS GRADUATE STUDENT REPRESENTATIVES AND ADVISORY COMMITTEE MEMBERS

Each Year, 3 QBS students in their 2nd year or above will be chosen to perform as part of the QBS Advisory committee and hold other responsibilities in the program. These students will have voting rights on non-student specific issues and attend all Advisory Committee meetings unless otherwise directed. They will participate in the admissions process by being assigned MS & PhD Applications to review as well as serve as main participants in the MS Interview Process and acceptance day as well as the PhD Interview. They are required to attend Diversity and Equity Training or other important training sessions. Student representatives are expected to attend all student related academic and social events and to help in the planning of main program events such as the QBS retreat, orientation, and the end of year enrichment trip. It is mandatory that these students attend at least two on-campus or off campus recruiting events.

V. ATTENDANCE AND VACATIONS

During any year in which they receive compensation from Dartmouth, regardless of the source of those funds, graduate students are committed by the terms of their agreement to be in residence for a period of twelve months commencing one week before fall term registration. Vacation time should not exceed a total of one month per year, excluding designated holidays, and the time(s) should be mutually agreeable to the student and the dissertation advisor. During the summer(s) students are expected to perform their dissertation research and enroll in required courses as course availability and time permit. For any expected absences of greater than one month per year and for students who are primary caregivers for a child, rules and regulations adhere to those outlined by Dartmouth Graduate Studies in the Graduate Student Handbook. Medical Leave and Part-time status situations will be reviewed by the QBS Administration and QBS Director in conjunction with the Graduate Studies Office.

Due to the length of time an International Student may spend acquiring their Ph.D., including the attainment of prior degrees, it is to be expected that most International Students will need to renew their Student visa at some point during their studies. International students are required to report the expiry date of their visa to program administrators during their first quarter in the program. Program administration will inform the student's advisor at the time when the visa has only 12-months left before it expires that the student shall be allowed to visit their home country or take other necessary action to renew their visa if it is their wish to do so. If the student lets their visa expire then they must give their advisor at least a 12-month window during which time a mutually agreed-upon is to be found for them to renew their visa.

VI. INTERNAL QBS MASTER'S PROGRAM

The internal M.S. degree option is initially offered to 1.) Ph.D. students at Dartmouth who are enrolled in a program separate from QBS who have permission from their advisor and 2.) QBS Ph.D. students in good standing who do not successfully advance to Ph.D. candidacy.

The M.S. degree can be earned in as little as 5 consecutive quarters if the program is started in the spring quarter and should take no more than 15 consecutive quarters. Interested students will need to submit to the QBS Director and Administration a signed letter of approval from their advisor indicating they acknowledge the course load and grant permission to pursue the Master's degree. Applications are submitted online through the Dartmouth application system, however students are not required to resubmit transcripts from other institutes or test scores. Students must apply to the M.S. according to the QBS application cycle deadline.

The full QBS Ph.D. curriculum is in place, and all of the courses have been taught for at least six years. Therefore, it is a natural extension to offer this same curriculum to the M.S. students. We recommend that the following curriculum be pursued to obtain the coursework-based M.S. degree (8 total courses):

Degree Requirements

Students applying to the QBS Master's program may begin to fulfill degree requirements prior to being accepted and will also receive credit for any required course that they have received a Pass or higher in. They must notify the QBS Administration, their program, and advisor that they intend to pursue the internal M.S. should they wish to take more than 3 QBS courses. QBS 110 cannot be taken until the student is accepted to the internal M.S. degree.

The requirements for the internal M.S. degree, as described above, in Quantitative Biomedical Sciences are as follows:

Satisfactory completion of two terms of integrative biomedical science (Integrative Biomedical Sciences I and II; QBS 110, 111), two terms of bioinformatics (Foundations of Bioinformatics I and II; QBS 146, 175), two terms of biostatistics (Foundations of Biostatistics I and II; QBS 120, 121), and two terms of epidemiology (Foundations of Epidemiology I and II; QBS 130, 131).

All grading policies are as described in Section I.A.