

DEPARTMENT OF
MOLECULAR BIOPHYSICS & BIOCHEMISTRY
GRADUATE STUDENT HANDBOOK
YALE UNIVERSITY
2019-2020

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CHAPTER 1: MOLECULAR BIOPHYSICS AND BIOCHEMISTRY **GRADUATE CURRICULUM**

Introduction

The graduate program in Molecular Biophysics and Biochemistry is designed to prepare students for careers as independent investigators able to use and develop concepts and techniques in Biochemistry, Molecular Genetics and Structural Biology. We believe that all students should have some knowledge of all three of these fields, even if a student specializes in only one of them. This is because biological problems are now being addressed by this wide spectrum of techniques, and it is important to be able to assess critically the information gained from different approaches. Through graduate courses, research seminars, and extensive laboratory experience, our program is designed to provide students with this broad background. Informal interactions with other graduate students, postdoctoral fellows and faculty also form an important part of graduate education. A major objective of the program is to assist students in conducting independent research for their doctoral dissertation. Thesis research is conducted under the guidance of a member of the faculty, and students are encouraged to develop rigorous and creative approaches to examine significant problems in biology.

This handbook will provide students with useful guidelines for the navigation of the graduate program. What follows is supplementary to the Programs and Policies bulletin of the Graduate School and other official publications of the university.

Anticipated Graduate Student Schedule

Students should aim to complete all requirements for the Ph.D. degree by their fifth year and are expected to do so by the end of year six.

FIRST YEAR

First-year activities are determined by the student's track. Most students who join the MB&B department enter through the Biochemistry, Quantitative Biology, Biophysics and Structural Biology (BQBS) track and should see the BQBS Handbook for first-year requirements. Students joining MB&B typically take three to four courses each semester and rotate through three laboratories. Students select a research advisor by the middle of March and spend the summer initiating a thesis project and choosing an abstract topic for the Qualifying Examination proposal (due at the beginning of the semester in which the Qualifying Examination will be taken). Throughout the period of graduate study, it is expected that students will attend most of the departmental seminars. Some knowledge and understanding of the material presented by seminar speakers will be assumed in the conduct of the Qualifying Examination.

SECOND YEAR

For most students, the Qualifying Examination occurs during the first semester and is usually over by the end of November. However, students who are still taking core courses or who feel that they would benefit from extra time may ask the DGS to allow them to delay the exam until the spring semester. Laboratory research, completion of course work and teaching (one of two required terms) occupy most of the year. By the end of the second year, students must be certified by their research committees to have demonstrated sufficient research potential

to be admitted to candidacy for the Ph.D. degree. The remaining requirements for admission to candidacy are successful completion of all coursework and the Qualifying Examination, the submission of a Provisional Dissertation Prospectus, and remaining in good standing (see page 18). Departmental approval for admission to candidacy is normally obtained at the May faculty meeting. Students must be admitted to candidacy before registering for the fifth term.

THIRD YEAR

Dissertation research and the remaining required term of teaching. The Yale Graduate School residency requirement is fulfilled after three years.

FOURTH YEAR AND BEYOND

Completion of dissertation research. Before the dissertation is filed, the student must submit a final Dissertation Prospectus (see pg. 19 for details) and present a dissertation seminar. A student must have written at least one first-author paper that is submitted, in press, or published by the time of the thesis seminar. Registration past the sixth year requires approval of the Dean (M.D./Ph.D. program included). All students must successfully complete B&BS 503b, RCR Refresher for Senior BBS Students, in the fourth year.

Courses

Satisfying the BQBS requirements automatically also satisfies the MB&B course requirements for the first year. All first-year students (except M.D./Ph.D.) perform three laboratory rotations (MB&B 650 and 651, Lab Rotation for First-Year Students). All students are required to take, for credit, seven one-term science or science writing courses. To obtain the desired breadth and depth of education, students are required to take two courses in molecular biophysics (one of which must be MB&B 720a and some second biophysics course), a quantitative biology course, one course in critical thinking (MB&B 730a), and one course in molecular biology (MB&B 743 is recommended but not required). It is presumed that four of these courses, including one molecular biophysics class, have been taken during the first year of the BQBS training program. The second credit in molecular biophysics and the molecular biology credit may be satisfied by taking appropriate courses from an approved list available each fall (see Appendix A). Additional courses, chosen from within MB&B or from related graduate programs, should form a coherent background for the general area in which the student expects to do dissertation research. All students also attend MB&B 676b, Responsible Conduct of Research. In the fourth year of study, all students must successfully complete B&BS 503b, RCR Refresher for Senior BBS Students. Students who have not had a course in Physical Chemistry (Thermodynamics) should take CHEM 328a in the fall term.

If a student has done graduate work at another university, it is possible that some course credit may be granted. Such credit is normally granted at the end of the first year of residence at Yale provided the student has met the Honors requirement during that period.

Grades

Graduate courses are graded Honors (H), High Pass (HP), Pass (P), and Fail (F). The Graduate School requires that “to meet the minimum...quality requirement for the Ph.D., students must achieve the grade of Honors in at least one full-year course or two full-term

graduate courses taken after matriculation in the Graduate School and during the nine-month academic year.” (Yale University. (2019). *2019-2020 Graduate School for Arts and Sciences Programs and Policies*. Retrieved from <http://catalog.yale.edu/gsas/policies-regulations/degree-requirements/>). In addition to the university requirements, the department requires that a graduate student maintain a minimum average of High Pass (*i.e.*, each term grade of Pass must be balanced by an Honors grade; an F and a HP = 2 P grades; any failed course must be retaken to be used toward the course requirement.). The same criteria will be used in determining eligibility for a master’s degree. An Honors in the full-year rotation course (MB&B 650 & 651) may be counted as one of the two Honors grades required by the Graduate School but will not count towards fulfillment of the Departmental requirement of a High Pass grade average. MB&B 676b, Responsible Conduct of Research and MB&B 675, Seminar for First-Year Students are graded satisfactory/unsatisfactory.

MB&B requires DGS and course instructor approval before students may apply to the Graduate School for permission to be granted a Temporary Incomplete, which extends the grade deadline by a definite period. In special circumstances and with two weeks advance notice, the DGS may petition the Dean of the Graduate School to grant an additional specific extension. Students should refer to the Programs and Policies bulletin of the Graduate School of Arts and Sciences for more information.

Decision Process on Progress of First Year Students

A preliminary review of each first-year student is made by the track co-directors at the end of the first term. At this stage, a student who performs significantly below expectations (including failing a course or falling below a High Pass average) may be placed on academic probation for the second term. The progress of each first-year student is reviewed by the track co-directors and registrar in June. A summary of this discussion may be forwarded to the student’s department. Formal course grades, performance in laboratory, participation in seminars, and other less formal contacts are all considered. Students will have access to the final rotation reports and should be in contact with their departments regarding any additional issues relating to their second year of study.

Formation of Research Committee

At the end of the first year and after a student has joined MB&B, the student, in consultation with the research adviser, will select a research committee of at least three faculty, subject to approval by the DGS. Members of the committee are invited by the student to serve on the committee. Two of the committee members must have appointments in the MB&B department, at least one of whom must have a primary appointment in MB&B. Your advisor, if a member of MB&B, can count toward these requirements. The functions of the research committee are to: provide advice and counsel for the student; provide the student and the DGS with a written evaluation of the student's progress yearly (for second and third year students) or twice yearly (for students in the fourth year and beyond); recommend and/or require additional coursework, if necessary, prior to Admission to Candidacy for the Ph.D.; certify in writing, at the end of the second year, that the student has demonstrated sufficient research potential for Admission to Candidacy for the Ph.D.; approve the final dissertation Prospectus; approve the final draft of the dissertation prior to the dissertation defense; and provisionally approve the

thesis after the dissertation defense, pending full faculty approval. At least one member of the research committee, other than the advisor, usually serves as a member of the student's Qualifying Examination committee and two members of the committee, other than the advisor, serve as departmental readers of the dissertation. Members of the research committee normally remain on the committee for the duration, but new members may be added or other changes made with the approval of the DGS at any time. In addition, students are expected to take the initiative in seeking out advice and information from the entire faculty.

Teaching Fellows Assignments

All students are required to teach a total of two terms during their Ph.D. training period. Teaching is an integral part of the graduate program. Normally, one term of teaching is completed in each of the second and third years. Appointment as a teaching assistant accounts for a portion of the normal stipend for the appropriate term.

Teaching assignments for the entire year are made by the DGS during the previous summer and frequently involve one laboratory course and one lecture course. According to university rules, students are not responsible for primary teaching. An average of 10 hours per week is expected; the DGS should be made aware of any circumstances where the student is spending significantly more time in teaching-related duties.

Teaching is a serious responsibility. Attendance at all classes (including appropriate set-up time) and discussion sessions is essential. Just as faculty are required to report to the Provost any absences during a term in which they teach, any absence by a teaching fellow must be reported in advance to the instructor in charge of the course so that alternative arrangements can be made. Especially at the end of the term, when exams must be graded promptly to meet university deadlines, teaching fellows (TFs) must be available. TFs should inform themselves of these deadlines in advance and check with the instructor to ascertain that any travel plans do not interfere with teaching responsibilities. Conversely, the faculty should inform TFs as early as possible as to when their services will be required.

Policies and Code of Practice: MB&B Teaching Fellows Program

The teaching of undergraduates in Yale College is a privilege and responsibility. It is also an activity that varies widely from course to course, from year to year, and from instructor to instructor. The following statement of policies and code of practice is intended, therefore, to specify the general principles that the Department considers good pedagogical practice, so both students and instructors have a clear, broad understanding of what is expected of them.

It is the normal expectation of the MB&B Department that:

1. Teaching Fellows will attend all lectures, laboratories, and assigned discussion sections of courses in which they are assisting. They will also be available for scheduled exams and the period following exams necessary for grading.
2. Teaching Fellows in lecture courses are expected to hold regular meetings with students and to be available for student consultations.

3. Teaching Fellows in laboratory courses are expected to assist in the preparation of laboratory exercises under the guidance and supervision of the instructor and to be available for student consultations.
4. Although teaching is a demanding and time-consuming activity, it is important for both instructors and Teaching Fellows to understand that leading sections and assisting in laboratory courses ought not to prevent a graduate student from making progress with course work and research. All activities for a course ought not to exceed approximately 10 hours per week averaged over the semester (or 20 hours per week for a half-semester laboratory assignment).
5. The duties of a Teaching Fellow do not include the obligation to deliver lectures, but she/he may be given the opportunity to do so. Any lecturing by a Teaching Fellow is voluntary and the instructor supervising the Teaching Fellow should be present to provide feedback after the event. In any case, no Teaching Fellow should deliver more than two lectures in any course.
6. It is the obligation of the instructor, not the Teaching Fellow, to prepare course packets and syllabi and set questions for exams, quizzes, term papers, and essays. Teaching Fellows often participate in drafting these materials, but the primary responsibility rests with the instructor. All class materials should be prepared in time for copying by the Copy Center, not the Teaching Fellow.
7. Instructors should meet with their Teaching Fellows before the start of the course to discuss the role of the Fellows and their teaching responsibilities. Additional meetings should be held on a regular basis to provide guidance, answer questions, and address any problems that may arise.
8. Instructors will provide guidance to Teaching Fellows in the proper marking of all assignments, papers, and exams.
9. If problems arise that cannot be resolved between the instructor and a Teaching Fellow, the DGS and Department Chair have the responsibility of acting as mediators and advocates of the legitimate interests of the Teaching Fellow and the instructor.

MB&B QUALIFYING EXAMINATION GUIDELINES 2019-2020

(Revised – June 2019)

Passing the qualifying examination fulfills one of the requirements for Admission to Candidacy for the PhD.

The qualifying examination is taken in the fall of the second year* and is an oral defense of a research proposal consisting of 1) thesis aims and 2) an extended aim on the same topic. Thus, both portions will be broadly and specifically related to your thesis topic. The extended aim must include experimental approaches beyond those used in the thesis aims, typically beyond those generally employed by the host lab. Thus, a predominantly molecular biological set of thesis aims should be accompanied by biophysical approaches in the extended aim section, and vice versa.

Note that the three-member oral examination committee usually includes at least one of the two non-advisor members of the thesis committee. The composition of your thesis committee must be set by August 1st, 2019 and reported to the Graduate Registrar's office. The requisite form will be sent to you under separate cover.

OUTLINE OF THE QUALIFYING EXAMINATION PROCEDURE

- a) Each student selects one topic of reasonable breadth that will become the basis of study for the written proposal. Approximately one half of the proposal should encompass the thesis project aims. The remainder of the proposal should include the extended aim on the same topic but with experimental approaches and scope beyond those generally pursued by the host lab. One half of the proposal should involve chemical, biophysical or physical biochemical approaches and the other, molecular biology or molecular genetics. **The approaches should be unrelated and provide distinct angles toward solving the proposed biological problem(s).**
- A rule of thumb is that the thesis aims section and the extended aim section should each alone be substantial enough for a PhD thesis. The extended aim should not be merely constructed as an extension/validation of the thesis aims.
 - The two sections should have the scope and depth of investigating related biological topics and answering biological questions as independent studies.
 - The approaches should not overlap between thesis aims and extended aim. One should be more biochemical/molecular genetic while the other should be more biophysical. Pure computationally based proposals can fall into either category depending on the subject matter (for instance, informatics vs molecular dynamics).

To help students determine if the subject matter and approaches of their proposals are sufficiently distinct and broad, students may send brief initial thoughts about their topics to the DGS and/or the Qualifying Exam Committee Coordinator (Joan Steitz) in early August. Although the final determination of whether the topics are satisfactory rests with each student's examination committee, the DGS and the Qualifying Exam Committee Coordinator will alert the student of potentially problematic aspects of the topic or approaches and advise the student on how to address any concerns.

*If you think it is impossible for you to complete the qualifying exam process in Fall 2019, please contact Katie Cox immediately.

By **noon on August 26** each student must submit a titled Abstract of the proposal to the MB&B Graduate Registrar (katie.cox@yale.edu). The Abstract should consist of one or two paragraphs of text--two sets of aims (thesis and extended) should be developed and included, either as two paragraphs or logically connected sections in the same paragraph. Indicate in the abstract what question(s) you will address, the question(s)'s importance, and how you will address it/them. The Abstract should clearly and concisely convey your goals and approaches. Put your name and email address on the Abstract. The Abstract should be single-spaced and written in a normal font (11 pt Arial) with one-half to one-inch margins and should be no more than 30 lines. 5-10 references to key papers in the area should be provided on a separate page (including titles and full author list).

- b) Based on the subject areas and approaches of the proposal, and with a desire to equalize the workload on the faculty, the Qualifying Examination Committee Coordinator (Joan Steitz) will select the three members of the Student's Examination Committee and will designate one of these members to chair the committee. Every effort will be made to ensure that the Committee includes at least one member of the Student's Research Committee (other than the research advisor). The research advisor cannot be part of the committee and cannot be present at the examination. By **September 9**, the Qualifying Examination Committee Coordinator will tell the student who the committee members will be and the proposed date for which the examination has been scheduled. The MB&B Registrar will provide committee members with a copy of the Abstract.
- c) Within one week (by **Monday, September 16**), the chairperson of each committee, after consulting with the other committee members, will communicate the acceptability of the Abstract to the student or arrange a meeting to discuss necessary modifications. The student will supply copies of a required modified Abstract to the members of the committee and to the MB&B Graduate Registrar if required.
- d) A reading/tutorial period follows in which the student writes the proposal and prepares for the oral examination. No laboratory research is expected from the student during this time. Students should arrange individual meetings with the members of the Qualifying Examination Committee to discuss the proposal. Students may seek advice from anyone (including their advisor) in developing their ideas into a concrete proposal, addressing general technical questions, and in preparing for the examination. The writing of the proposal, however, must be entirely by the student. Students may show drafts of their proposal to anyone they wish (including faculty). Feedback should be given **VERBALLY** concerning **BROAD SCIENTIFIC** aspects of the presentation (such as "this won't work," "unclear," or "flesh this out"). The student remains fully responsible for the actual writing, including grammar, spelling, sentence structure, etc. **Be sure that you put quotation marks around any text you take from anyone else's work, whether from an online source or a formal publication. Failure to do so may result in charges of plagiarism, a very serious offense. Please speak with the DGS or another faculty member if you are unclear on the meaning of plagiarism.**

Note that the format of the written proposal is described below (pg 4). This format is based on that of an NIH R01 application, and thus this writing exercise is designed to introduce students to the process of grant writing that must be mastered in order to succeed in science.

- e) By **Friday noon, October 18**, the student must submit an electronic copy (PDF) of the proposal to each member of the examination committee and to the MB&B Graduate Registrar. If a committee member requires a hard copy, they must inform the student.
- f) By **Friday noon, October 25**, the chairperson of each examination committee, after consulting with the other committee members, will notify the student and the registrar whether the proposal has been accepted or requires revision. If the proposal was submitted on or before the deadline, the committee will make every effort to notify the student within one week of submission regarding the acceptability of the proposal. Members of the examination committee must receive a copy of any modified proposal at least 24 hours prior to the scheduled examination or the examination may be postponed.
- g) Examinations (except for those that have been postponed for cause) are scheduled during the period from **Monday, November 4th through Friday, November 15**. Immediately after the examination, the student will be informed of the committee's decision and a written statement of this decision will be submitted by the chairperson within 24 hours to the student, student's advisor, members of the committee, Graduate Registrar, and the Director of Graduate Studies. Outcomes of the qualifying exams include Unconditional Pass, Conditional Pass (requiring supplemental work such as additional written work, an oral presentation, coursework, or other efforts that the committee feels will remedy a deficiency in the student's preparation or allow the student to demonstrate competence in that area), and Failure.
- h) All qualifying examinations, supplementary work, and other requirements other than additional coursework must be completed prior to the start of registration for the Spring Term, Wednesday, **January 8**. Re-examinations (see below) should normally be held within three months of the original examination, following a schedule set by the examination committee and as agreed to by the DGS.
- i) Administration and scheduling for the qualifying examination will be handled by the Departmental Qualifying Examination Coordinator (Joan Steitz), together with the Departmental Graduate Registrar.

THE WRITTEN PROPOSAL

This should be in NIH R01 style. All margins should be at least 0.5 inch, font must be 11 point Arial, single-spaced. All figures should be included in the body of the proposal. Both thesis aims and extended aim should be integrated into a single proposal with the following sections and total page limits:

- Title Page (including a Title, your name, the date and time of the exam)
- Abstract: (no more than 30 lines)
- Specific Aims: (about half a page; the aims should be chosen for both the thesis component and the extended goals; a short description of each aim should be given)

The following should comprise no more than 12 pages:

- Background and Significance: (a general introduction to the area of research including a rationale for the proposal; 1- 3 pages)
- Innovation (what is new and innovative about the proposal) (0.5-1 page)
- Research Design and Methods: (Preliminary Data if relevant; Rationale and details of the experiments and how the data will be interpreted; potential pitfalls and how they will be addressed; it may be desirable to clearly separate the sections of thesis aims and extended goals; 6-10 pages)

Not included in the page limit:

- References: (including titles and full author list)

The proposal must be organized as outlined above, written in acceptable English and presented in reasonable form and appearance. Your proposal will be judged on the clarity and precision of your writing as well as on its scientific content.

An optional writing workshop in which MB&B faculty discuss the art of writing scientific proposals will be offered to help students prepare for the Qualifying Exam. The first meeting of the workshop will be in September at a time and place to be announced.

THE ORAL EXAMINATION

The oral examination takes about 2 - 2 1/2 hours. Students should be familiar with the material presented in their chosen courses and with **topics covered in departmental seminars**. Students should also have considerable up-to-date knowledge of the literature concerning the proposal and proposed methods, both broadly defined. **Both the main aims and the extended aim will be covered during the examination.**

Students must present their proposal in a brief format (less than 30 minutes if uninterrupted). To this end, students may use up to five simple PowerPoint slides to present material that would be difficult to present using the board. Slides may not be used to present outlines, schemes, chemical structures, etc., with which the student should be familiar and that can be drawn on the board. Students should be prepared to answer questions without recourse to additional prepared material. A short break will take place either between thesis aims and extended aim, or at any

other appropriate point. The Committee evaluates the student's performance and decides whether the student has passed the examination. Students receiving a conditional pass will be required to complete additional work such as a supplemental report, course work, presentation to his or her lab, or other assignments designed by the committee to remedy any deficiencies demonstrated during the exam. The student will be clearly informed of the committee's decision at the conclusion of the examination. The chairperson will send the student, other committee members, the Graduate Registrar, and the Director of Graduate Studies a written statement of the decision.

RE-EXAMINATIONS

In the event of an unsatisfactory performance on the oral qualifying examination, a student who has achieved a High Pass average in course work will have the right to re-examination. The original examining committee will decide whether the form of a re-examination will be oral, written, or a combination of the two. Re-examinations should normally be held within three months of the original examination, following a schedule set by the examination committee and as approved by the DGS.

To avoid double jeopardy and to remedy any perceived weaknesses in the original examination committee, the re-examination committee will consist of four faculty: the two non-chair members of the original committee, and two new members, one chosen by the student and the other (who will function as the new chairperson) chosen by the Director of Graduate Studies.

Students who are re-examined will be informed of the decision of the re-examination committee immediately after an oral re-examination or no more than two business days following submission of a written re-examination. Within one business day of informing the student, the chairperson will submit a written statement of the decision of the re-examination committee to the student, student's advisor, other members of the re-examination committee, Graduate Registrar, and Director of Graduate Studies.

In the event of an unsatisfactory performance on the re-examination, the student's status in the graduate program will be considered by the Faculty as a whole or by the Executive Committee of the Faculty.

CHAPTER 3: DISSERTATION RESEARCH

Research Committee Meetings, Second Year

Progress of second and third year students is monitored, at least annually, by the research committee, usually early in May. For each research committee meeting, the student prepares a brief research summary (usually 1 to 2 double-spaced pages) describing the goals of the thesis project(s), progress to date, and possible future directions and provides copies at least three days before the meeting to the committee members and departmental graduate registrar. In addition, students should prepare an updated CV to be submitted with the research summary which should include presentations, poster sessions, publications, and teaching experience. Students should practice their formal presentation to ensure that it takes no longer than ~20 minutes. The entire meeting, including discussion, should last no more than one hour.

As the meeting begins, the PI should leave the room to give the student time to speak with the other committee members in private. During this time, the student is free to discuss any issues regarding the lab or PI, which he or she wishes to keep confidential. Next, the student should leave the room so that the PI has time to meet with the other committee members in private. During this time, the PI is free to discuss any issues regarding the student and his or her progress in the lab. The chair of the committee (usually the student's PI) is responsible for completing the meeting evaluation form with the input of the other committee members and provides a written evaluation of the student's progress to the student, the committee members, and the DGS. The evaluation of second year students should include a discussion of whether the student has demonstrated sufficient research potential for the Ph.D. degree. If so, the committee may recommend the student for advancement to candidacy. Alternatively, the committee may postpone the advancement to candidacy decision to the next committee meeting.

Admission To Candidacy For The Ph.D. Degree, End Of Second Year

Students must complete all requirements for admission to candidacy for the Ph.D. degree before registration for the fifth term (beginning of third year) unless the faculty vote to extend this time into the third year. Students qualify for Admission to Candidacy upon passing the Qualifying Examination; fulfilling all course requirements of the Graduate School, department and research committee; submitting a provisional Dissertation Prospectus; and demonstrating sufficient research potential to the research committee and the faculty as a whole. The student must also be in good standing (see page 18). The recommendation that the student has demonstrated sufficient research potential for Admission to Candidacy is included in the written evaluation of the research committee at the end of the second year. Admission to candidacy is voted on during the annual faculty review of all students past the first year in May, after the Spring research committee meetings.

Provisional Dissertation Prospectus, End Of Second Year

Before registering for the fifth term (beginning of third year), all students must file with the Graduate School registrar a provisional title for the dissertation and a summary, prepared by the student, of the expected nature and scope of the dissertation. This summary is normally one or two double-spaced, typewritten pages in length with only the most essential references. The

research summary prepared for the spring research committee meeting is usually submitted as a Prospectus. The Prospectus must be approved by the research advisor and certified by the DGS. The student first sends the Prospectus to the departmental registrar noting that the approval of the research advisor has been obtained. The DGS then forwards the Prospectus to the Graduate School with the required departmental certification form. A final Prospectus is submitted before the dissertation is filed (see below).

Master's Degrees

M.S.: Students are not admitted for the M.S. degree. It may only be awarded to a student in the Ph.D. program who is in good standing upon completion of at least two terms of graduate study and who will not continue in the Ph.D. program. A student must receive grades of Pass or higher in at least five courses approved by the DGS as counting toward a graduate degree, exclusive of seminars or research. Students must have taken at least ten courses. A typical schedule would consist of six traditional courses, MB&B 650 and 651, and one term each of MB&B 675a and 676b. A student must also meet the Graduate School's Honors requirement for the Ph.D. program and maintain a High Pass average. Students who are eligible for or who have already received the M.Phil. will not be awarded the M.S.

M. Phil.: The M. Phil. degree is awarded automatically to a student who is in good standing upon completion of all requirements for the Ph.D. other than the dissertation and the completion of the teaching requirement, and after admission to candidacy.

Students should not petition for a degree until the semester following completion of the degree requirements.

Third Year And Beyond: Research Committee Meetings And Decision Process On Progress

Third year students meet once with their research committees, usually April 15 - May 10. Progress of students in years four and beyond is monitored twice yearly by the research committee, once in November and once in the spring. For each research committee meeting, the student prepares a brief research summary (usually 1 to 2 double-spaced pages) describing the goals of the thesis project(s), progress to date, and possible future directions. Dated copies of this document are given to each member of the research committee and departmental graduate registrar at least three days prior to the meeting. In addition, students should prepare an updated CV to be submitted with the research summary which should include presentations, poster sessions, publications, and teaching experience. Students should practice their formal presentation to ensure that it takes no longer than ~20 minutes. The entire meeting, including discussion, should last no more than one hour.

As the meeting begins, the PI should leave the room to give the student time to speak with the other committee members in private. During this time, the student is free to discuss any issues regarding the lab or PI, which he or she wishes to keep confidential. Next, the student should leave the room so that the PI has time to meet with the other committee members in private. During this time, the PI is free to discuss any issues regarding the student and his or her progress in the lab. The chair of the committee (usually the student's PI) is responsible for

completing the meeting evaluation form with the input of the other committee members and provides a written evaluation of the student's progress to the student, the committee members, and the DGS.

Faculty on leave may not always be available for research committee meetings. Some faculty continue to serve on research committees whereas others bow out for the duration of their leaves, often meeting in one-on-one settings with the students. In such cases, students may add temporary members to their research committees so that they continue to receive broad advice on their research.

Students in years three and beyond are required to give at least one public presentation per year. Such presentations are an important aspect of graduate training. These presentations can be in the form of talks at Yale (including the annual MB&B retreat) or at an external scientific meeting. One poster presentation at a scientific meeting (but not at MB&B retreat) may be substituted for one talk.

The annual faculty review of all students past the first year occurs in May after the Spring research committee meetings. Following the May faculty meeting, the DGS provides students with a written evaluation of their status and progress. For fifth and sixth year students, the written evaluation will include a reminder that extensions beyond six years require justification and approval from the Dean.

The Graduate School allows six years for completion and submission of the Ph.D. thesis; extensions beyond six years require approval by the Graduate School after recommendation by the full faculty and justification in writing by the DGS. Any student who thinks they may need more than six years is required to give an oral presentation of their progress and remaining work to the Graduate Education Committee (GEC) in the spring of their sixth year. The GEC will present their recommendations to the faculty at its June meeting. The DGS will inform the student shortly after this meeting whether the faculty support the request. Formal submission of requests for an extension to the Grad School should be made at the end of the spring term, if possible, but no later than early August. To facilitate timely completion of the Ph.D. degree, the report of the committee chair (sent to the student and DGS) should summarize the remaining experiments and estimate the time to degree.

Finishing Graduate School In Five Years Or Less

Many factors contribute to how long you'll be in graduate school. Some of these are under your control and some are not. Even some that aren't (such as a stubborn project) can be addressed (by knowing when it's time to switch projects). The faculty are committed to helping you finish as expeditiously as possible. Our goal is to have you complete your thesis in under five years without sacrificing the quality of your thesis or your training. This time frame is good for your career whether you do a postdoc or pursue a non-bench activity.

A key factor in finishing expeditiously is the determination to do so. Tell yourself that you want to be done in under five years. (Why do you think store items are priced at \$4.95 rather than \$5.00?) Don't let yourself (and your project) coast without evaluating where you are relative to your goals. Think about what you want to do after grad school (the online MyIDP survey can help) and take concrete steps toward that goal throughout Grad School. These steps can include attending the annual BBS Career Fair, joining online discussion groups dedicated to particular careers, thinking about potential areas for your postdoc years before it's time to send out letters, and networking by establishing contacts in your future field. Keep on track by giving

yourself periodic (monthly? quarterly?) tasks to do or topics to investigate. Nothing slows us all down more than not having long-term plans.

Yes, “working harder” will probably get you done sooner, but for any degree of hard working, working more efficiently can have a huge effect. For instance, if you’re distracted the equivalent of one day a week (day dreaming in lab, web browsing, chatting, unmotivated—all understandable in moderation), that’ll add up to about an extra year in grad school. Conversely, you can finish a year early (or accomplish more) if a little extra planning can save you just one experiment-day per week (by having all the samples in the best order on the gel, by including that one extra control, by anticipating a potentially odd outcome, by making sure your technique is optimal, by coming in for thirty minutes one evening to set up an experiment to keep you busy the next day, etc.). Strive to be the person whose every experiment works!

All Ph.D. students, whether they are planning careers in academia or beyond the professoriate, are required to complete an Individual Development Plan (IDP) from the second year of their program and beyond with the support of their faculty mentors. This will be discussed annually at each student's thesis committee meeting. An IDP is a personalized tool that students can use to establish and prioritize professional goals and construct an actionable strategy to achieve them. By providing a structured framework for identifying gaps in professional skills, assessing potential career options, clarifying expectations, and creating realistic goals and timelines, IDPs can be highly effective in facilitating communications between graduate students and faculty and raising student productivity. [MyIDP](#), [ImaginePhD](#), and [ChemIDP](#) are free online IDPs that offer a wealth of resources for self-assessment, career education, and goal-setting.

The following are steps you can take and landmarks that if achieved will keep you on track to finishing your PhD in under five years. These are goals and recommendations, not requirements.

Year 1: Complete as much of your required coursework as you can. Once you join a lab, immerse yourself in your research topic. Your project should be yours, not an assignment from on high.

Year 2: Qualifying in the fall rather than the spring will help you transition earlier from “school” mode to full-time research mode. You should begin owning your project and setting its direction.

Year 3: By the end of this year you should have the core results of your first paper and be able to list the key remaining experiments. If you don’t have a central finding for a paper, you and your advisor should discuss whether it’s time for a change in project. You may feel that it’s too early to have that discussion, but, in hindsight, almost all of us feel that we’ve more often stayed with a dead-end project too long rather than dumped an ultimately productive one too early.

Year 4: Aim to write your first paper by the end of year 4. Even if the experiments aren’t all done, lay out the figures you have (and write their legends), create mockups of the data you don’t have, write the Introduction and much of the results. And most important, come up with a title and write an Abstract. This exercise will focus your efforts as you complete the project.

Year 5: Finish up, submit any additional papers, line up your next position.... Finishing in five years is set up by what happens in the first four years.

Unsatisfactory Performance By Students After Admission to Candidacy

Students who have passed all academic requirements other than writing the thesis will be recommended for admission to candidacy only after the research committee certifies that the student is making adequate progress in the laboratory (usually by the end of the second year). In those cases where a student who has been admitted to candidacy is no longer continuing to make good progress in the judgment of the advisor, the advisor will notify the student of the problem and convene a meeting of the research committee with the student to recommend a course of action. The responsibility of the research committee will be to seek ways to help the student. Both the student and the DGS will be notified in writing regarding the decision of the research committee. Normally, the committee will request that specified experiments be attempted within a given period of time, not exceeding six months. At the end of one or more such probationary periods, the research committee will determine whether the student has made satisfactory progress and should be allowed to continue in the advisor's laboratory. In unusual cases the committee may recommend that the student not be allowed to continue in the MB&B graduate program. The possibility of such a recommendation will have been made clear to the student at a previous research committee meeting so that the student has ample warning of their probationary status. The recommendation will be forwarded to the DGS.

Good Standing

Students will be considered to be in good standing for the M. Phil and PhD degrees if they meet the following milestones:

- 1) Maintaining a High Pass average (see p. 8) (evaluated at the end of each term), unless waived by the faculty at the time of admission to candidacy.
- 2) Satisfying the two Honors requirement (see p. 7) by the end of the first year.
- 3) Satisfactory completion of the Qualifying Exam and admission to candidacy by the end of the second year.
- 4) Teaching requirements are on schedule (one course in year two and one course in year three), unless postponed by the DGS.
- 5) Satisfactory research progress as documented by annual or semi-annual research committee meetings (see above).
- 6) No unresolved issues of plagiarism or other scientific misconduct.

For the MS degree, students must satisfy (1), (2) and (6). Students not in good standing will be considered on probation until the situation is resolved.

The Ph.D. Degree: Requirements in Addition to the Dissertation

- 1) A student must have written at least one first-author paper based on his/her thesis research that is submitted, in press, or published by the time of the thesis seminar.

- 2) A student must be considered by the department to be in good standing in order to be awarded the Ph.D. degree.

CHAPTER 4: PREPARING THE DISSERTATION

(see Appendix B for Dissertation workflow)

Final Dissertation Prospectus

The provisional dissertation Prospectus, submitted before registration for the fifth term (beginning of third year), often will not adequately reflect the actual course of thesis work. Therefore, just prior to writing the thesis, the student should prepare a final Prospectus of 1-2 pages. The final Prospectus should be given to the DGS who will forward it to the Graduate School. Please note that the dissertation must be filed with the exact title provided on the last Dissertation Prospectus submitted.

Preparation, Defense and Submission of the Dissertation

1. Detailed instructions on the format of the dissertation should be obtained from the Graduate School registrar prior to writing the dissertation. Filing a Petition for the Degree is mandatory; forms are available from the Graduate School registrar. Dissertations should be submitted to the graduate school by **October 2** (for a December degree) or by **March 16** (for a May degree). Note that the actual writing of a dissertation often takes much longer than expected. Even after all laboratory work is complete, the time to write and produce the final copy is frequently over two months of full-time work.
2. In writing your thesis, it is appropriate to use “I” to refer to work that you did. In chapters reporting work done collaboratively, include a statement at the beginning of the chapter indicating what work (which figures, for instance) is yours and what was done by others. Include a citation if the work in a chapter has been published. In your References section, list all authors unless the number is very large (greater than, say, 50), in which case list the first 49 and the last (or last several) authors.
3. You may schedule a tentative defense date at any time. Final drafts of all chapters of the thesis must be submitted to the members of the research committee at least three weeks prior to the date of the dissertation seminar, so that any major alterations can be completed before the seminar. (Shorter times are acceptable as long as they are agreed to by all members of the thesis committee well in advance. Committee members have no obligation to consider times less than three weeks.) Though unusual, committee members may raise major objections that require the postponement of the defense. If the outside reader (see below) is in the vicinity, he/she should be invited to attend the seminar.
4. MB&B considers the outside reader to be an important factor in evaluating the Ph.D. thesis. The outside reader is an expert in the field who can evaluate the thesis. They will typically hold a rank equivalent to Assistant Professor or higher. **The outside reader is selected by the research advisor in consultation with the student and subject to approval by the DGS.** The outside reader must be from outside the university with no Yale appointment in the previous two years. In exceptional cases, an outside reader may be from within the university but may not hold an appointment (whether primary or joint) in the department or be a member of the thesis committee. The final decision regarding the choice of outside reader rests with the DGS, who should be consulted early on if there is any question about the suitability of a particular reader. The outside reader should be

provided with the final draft of the thesis for comment before the seminar. Students are encouraged to send the outside reader (regardless of location) the final draft at the same time that it is given to committee members so that suggestions can be incorporated into the finished thesis (see (6) below).

5. A dissertation seminar notice must be distributed to all members of the department at least one week in advance. Notices will be prepared and distributed by the departmental graduate registrar.
6. Each student must give an oral presentation of the work accomplished in his or her thesis. The presentation to the department (with the research committee in attendance) must be given before the final thesis is submitted to the Graduate School. Immediately following the dissertation seminar, the research committee members provisionally approve the thesis, pending full faculty approval. If faculty members do not submit written objections to the DGS within one business day, the faculty will be considered to have approved the thesis and the thesis can be filed at the Graduate School. Students should allow sufficient time to incorporate reader comments before the deadline for filing the thesis at the Graduate School.

Submission

Dissertations must be submitted to the Graduate School by October 2 for degrees to be considered at the fall meeting of the Degree Committee and by March 16 for consideration at the spring meeting of the Degree Committee. These deadlines have been established to allow sufficient time for readers to make careful evaluations and for departments to review those evaluations and make their recommendations to the Graduate School. No extensions of these deadlines will be granted.

A dissertation submission checklist with links to relevant policies, formatting guidelines, and forms is available online at https://registrar.yale.edu/sites/default/files/dissertation_checklist_and_phd_petition_master_0.pdf

The Graduate School requires submission of one unbound printed original of your dissertation (no softbound copies required for Readers). Submit to Dissertation Office (246 Church Street, 3rd Floor) along with all required forms and fees (see checklist).

MB&B requires an electronic copy (pdf) which the MB&B Graduate Registrar will provide to all Readers. Follow steps and instructions below:

Immediately after you submit thesis to Graduate School Dissertation Office provide the MB&B Registrar with electronic copy (pdf) of thesis.

- The thesis file should be saved as a PDF using the “reduced file size PDF” setting.
- The file should be named with your last name, first name, middle initial and your department with space in between each, and the month and year of the degree.

Example: Smith, Jon A. – MB&B Dept., Dec 2017

If after March 16 you make changes to the paper version of the dissertation in response to Reader comments, you should supply a note or email to the DGS stating that the changes from the PDF version were minor or editorial and not substantive to the dissertation. **NOTE:** You should still provide your readers with a draft version well ahead of the March 16 deadline so that

their comments can be incorporated into the pdf version sent to the Registrar and the paper version you submit to the Graduate School by March 16.

After the thesis is filed, the Graduate School will send each of the three readers (two non-advisor members of the research committee plus the outside reader) the necessary Readers' Report online evaluation form. The three completed readers' reports are submitted directly to the Graduate School for consideration by the Degree Committee, which officially approves the award of the degree. Because the Degree Committee may require that errors cited in readers' reports be corrected or rebutted before the degree is awarded, students are strongly encouraged to provide the outside reader with the last **draft** of the thesis, so that corrections may be incorporated into the final copy before the thesis is submitted to the graduate school. The official Graduate School protocol for answering readers' objections can be time-consuming and is something to be avoided.

After all Readers have submitted reports indicating that the thesis is acceptable, students may request a statement from the Graduate School certifying that all degree requirements have been fulfilled and that the formal diploma will be awarded in May/December. Institutions and companies that require students to have received their PhD prior to starting employment typically accept this statement in lieu of the diploma, which is often received months later.

Dissertation Costs

COPIES

One unbound original is required by the Graduate School and one (hard-bound) copy is required for Departmental reference (this copy can be provided after readers reports are submitted). Usually, the student will want a copy; also, a hard-bound or (final) soft-bound copy must be provided to the advisor. Thus, the minimum number of copies needed is ~four.

COST SHARING

The department will pay a pro-rata share of the total thesis costs for its one hard-bound copy. Since the length of theses and grant resources available to help defray theses vary with circumstances, the faculty advisor and the student must decide between them the proportionate share each will pay of the costs that the Department's pro-rata share will not cover. Under normal circumstances the faculty advisor will assume most of these residual costs. However, the student should expect to pay a pro-rata share for his/her own copy if he or she retains one. Students should contact the department registrar regarding reimbursement.

CHAPTER 5: ADDITIONAL YALE STUDENT RESOURCES

Who To See About Academic Or Administrative Issues

SPECIFIC GRADUATE SCHOOL PROBLEMS:

You can find general information on Yale graduate programs and policies at the following link: <https://gsas.yale.edu/academics/programs-policies>. If you feel your question is not answered or that your problem cannot be or has not been satisfactorily addressed by the track co-directors, you may choose to contact:

Associate Dean Richard Sleight, 1 Hillhouse Ave, 432-2744.

Graduate Education Committee (MB&B): Members of the 2019-20 Graduate Education Committee (Mark Hochstrasser, Karla Neugebauer, Charles Sindelar, Mark Solomon, Yong Xiong) welcome questions, comments, or suggestions from graduate students on any matter pertaining to the graduate program.

DEPARTMENTAL BUSINESS OFFICE

Two business offices exist and support the BQBS graduate program and the MB&B department. They maintain grant and personnel records, arrange for the purchase of supplies and services, secure the assistance of Physical Plant and Housekeeping personnel, act as general information centers with regard to University policy and procedure, give employment information and assistance to non-faculty employees, assist in the preparation of departmental budgets and grant applications, and arrange for clerical service. Do not hesitate to ask for information or assistance from either one: Room 1214 KBT and Room C-106 SHM. Questions about irregularities in stipend checks and fellowship allowances may be directed to the Departmental Registrar (336 BASS, 432-5662) or the Financial Aid Office (129 HGS, 432-2899, gradfinaid@yale.edu).

Miscellaneous Information

REGISTRATION

All students must register online with the Graduate School in September for the Fall Term and in January for the Spring term of each academic year.

ANNUAL RETREAT

In MB&B, a weekend, typically in mid-September or early October, is reserved for a retreat for all academic members of the department and is designed to encourage communication in a relaxed, congenial environment. Students will find the sessions beneficial and enjoyable. First-year BQBS students are encouraged to attend, although attendance at the retreat of any department is optional. The 2019 MB&B Retreat is scheduled for September 20 and 21, 2019 at Woods Hole, MA.

SEMINARS

Participation in the seminars and colloquia held throughout the University is an important part of every student's education. Many departments have weekly seminar series. All students are expected to attend seminars regularly. (First year students should note that some knowledge and understanding of the material presented by seminar speakers will be assumed in the conduct

of the Qualifying Examination.) Also very important are research group meetings, for which both attendance and active participation is expected of all individuals in the research group.

VACATION AND LEAVE

The course of study and graduate student stipend are based on a 12-month commitment. It is expected that students will take no more than two weeks of vacation, in addition to University holidays each year. Note that breaks in course work (Fall or Spring break, Christmas/New Year's, beyond the official university holiday days, summers) are not holidays for graduate students. The total vacation time that a student may take is negotiable with the thesis adviser. Unscheduled absences or excessive vacation time may result in a stipend reduction and/or possible suspension from the Program. In the event that the student needs to take a leave of absence, a personal leave of absence form must be filled out. In no case may vacations conflict with any academic or teaching obligations. (Form: https://registrar.yale.edu/sites/default/files/change_of_status_form_master.pdf.)

The policy regarding student vacations conforms to the stipulations of the federal training grants that provide support for most first through third year students. The excerpt below appears in an announcement of regulations contained in the application material for NIH National Research Service Award Institutional Grants (*i.e.* training grants), dated May 16, 1997: "In general, trainees may receive stipends during periods of vacation and holidays observed by individuals in comparable training positions at the grantee institution. For the purpose of these awards, however, the period between the spring and fall semesters is considered to be an active time of research and research training and is not considered to be a vacation or holiday."

TRAVEL

Limited travel funds are available for MB&B students who are not supported by training grants or outside fellowships. These funds should support attendance of scientific meetings or courses. The form required for requesting such support is available from the departmental graduate registrar and requires the approval of the student's research advisor and the DGS. Students supported by outside fellowships that include research allowances must use those funds and do not use the student travel funds. Research grants awarded to the student's advisor will usually cover the remainder of such costs. Please contact the DGS registrar (katie.cox@yale.edu) for more information.

UNIVERSITY LIBRARIES

For all Yale main library buildings and hours* go to: <http://web.library.yale.edu/buildings>
Libraries of particular interest to the sciences include:

- Center for Science and Social Science Information (CSSSI): 219 Prospect Street, Concourse Level, Kline Biology Tower, New Haven, CT <http://csssi.yale.edu/>
- Medical Library:
Location: Sterling Hall of Medicine, 333 Cedar Street. <http://library.medicine.yale.edu/>

*Confirm all library hours online.

BUS SERVICE (all free with Yale ID)

Yale Shuttles

The Daytime Campus Shuttles operates from 7:20 AM to 6:00 pm Monday through Friday. See <https://to.yale.edu> and the Parking and Transit Services Office, 155 Whitney Avenue for information and schedules. Yale ID required to ride the Yale Shuttles. [View the Yale Shuttle buses in real-time.](#)

Science Hill ↔ School of Medicine (Blue Shuttle route)

Fast transportation (Blue Shuttle route) between Science Hill and the School of Medicine is available weekdays. Bus leaves every 10 minutes. For other cross campus routes and Union Station route, see <https://to.yale.edu>.

Night Shuttle/Mini-Bus

Operates from 6:00 p.m. to 6:00 a.m. seven nights a week. The Night Shuttle is an on-call service after 1:00 a.m. (432-6330) within campus boundaries. There are two ways to use the Night Shuttle: **Scheduled route pick-up stops:** Go to one of the stops listed on the schedule and wait for the next Shuttle. A bus passes each stop every 15 minutes. **Off Route Pick-Ups:** If you cannot safely go to one of the listed stops, call 432-6330. The dispatcher will radio one of the buses to go off route and pick you up.

Nighttime Safe Rides & Walking Escort Service:

Between the hours of 6:00 p.m. and 6:00 a.m., seven days a week, Yale students, faculty, and staff can call **203-432-6330 or 203-432-WALK** to request a University Security safe ride within campus boundaries. A University shuttle or Security Vehicle will be dispatched to your location and will drop you to your final on-campus destination. It is advisable to request the service at least 15 minutes prior to the intended departure time and even earlier during high-demand hours such as late nights or weekends. If you cannot safely go to one of the listed stops, call 432-6330 or 203-432-WALK. For complete information on the Night Shuttle see <https://to.yale.edu>.

KEY AND CARD ACCESS

The MB&B Business Offices (1214 KBT and C-106 SHM) issue all Departmental keys. For graduate students, this includes:

- lab keys as requested by faculty advisor
- Departmental machine shops keys, as requested by advisor

All MB&B graduate student I.D. cards are automatically coded for access to the Bass Center for Molecular and Structural Biology, the Sterling Hall of Medicine, and the Boyer Center for Molecular Medicine. Students working in other departments should see their business office for keys and card access.

PONY MAIL AND FAX

Same-day mail delivery between Science Hill and the Medical School is available using PONY mail, which is picked up from a designated red bag in each MB&B business office (1214 KBT and C-106 SHM). Two FAX machines available for general Departmental use are in 1214 KBT (432-5175) and C-106 SHM (785-6404). Many other machines are located in faculty offices.

Graduate School Organizations

The Graduate and Professional Student Center at Yale (GPSCY) located at 204 York Street provides a central meeting place for graduate and professional students, faculty, and alumni. Open only to members and their guests, the GPSCY operates a full service bar with reduced prices; sponsors receptions, dances, and parties; and hosts conferences, rehearsals, and exhibitions. The GPSCY is overseen by the Graduate-Professional Student Senate (GPSS), a university-wide organization of graduate and professional students.

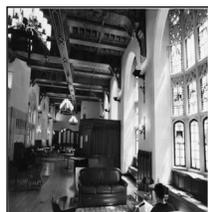
The Graduate Student Assembly (GSA) is a student-run democratic organization, made up of representatives from each department in the biological and physical sciences, social sciences, and humanities. Its goal is to represent the interests of all Yale graduate students and to bring students' concerns to bear on Graduate School policy decisions. MB&B's current representatives are Meaghan Sullivan and Josh Zimmer. For more information on the GSA, visit the web site at <http://gsa.yale.edu/>.

The McDougal Graduate Student Center

<https://gsas.yale.edu/life-yale/mcdougal-graduate-student-center-space-collaborating-programs>

The McDougal Graduate Student Center is located at 135 Prospect Street and is open Mondays through Thursdays from 9:00 am through 10:00 pm, Fridays from 9:00 am through 8:00 pm and on weekends from 12:00 pm through 6:00 pm during the academic term. You can contact the McDougal Graduate Student Center office at (203) 432-BLUE or at mcdougal.center@yale.edu.

See the GSAS Events calendar: <http://gsas.yale.edu/events>



Graduate Student Life

<https://gsas.yale.edu/life-yale/mcdougal-graduate-student-life-office>

This office oversees student life programs and directs the facilities of the Center. It works with McDougal Graduate Student Life Fellows to create an array of programs and activities open to all graduate students and their family members. Student life programs include cultural festivals; holiday celebrations; monthly First Friday at Five happy hours; arts outings; concerts and musical events; sports and recreational events; public service and volunteer opportunities; spiritual life and wellness programs; and activities for various student populations, including international students, GLBTQ students, and student families.

The Office of Graduate Student Life advises and supports graduate student interdepartmental groups, and often coordinates events and publicity with them. Limited financial support for interdepartmental, professional development, or cultural groups is available upon request. For group listings and policies, please see the "Student Organizations" page: <http://gsas.yale.edu/life-yale/graduate-student-organizations>.

Lisa Brandes, Assistant Dean and Director of the Office of Graduate Student Life, is available to discuss specific concerns about all areas of graduate student life with individual students, faculty or departmental groups. This office provides a liaison for graduate students to other services at Yale, including graduate housing; parking; security; health; childcare; work life; the chaplaincy, as well as athletics, and is a liaison to various New Haven resources. The

assistant dean also administers the Graduate Affiliate Program in the Yale residential college, which allows a limited number of graduate & professional students to have a role in the residential college system. All new and continuing students will be invited to apply to be affiliates once each year. For further information on these resources, contact Lisa Brandes at (203) 432-BLUE [2583].

Office of Career Strategy

For students interested in exploring diverse career paths, the Office of Career Strategy provides resources and services to help students clarify career aspirations, identify employment opportunities, and obtain advice for every stage of the non-academic job search process. Students may make one-on-one appointments with an experienced adviser, attend skill-building workshops, network with alumni and employers, and take advantage of extensive online resources at ocs.yale.edu.

The Yale Poorvu Center for Teaching and Learning (CTL) <http://ctl.yale.edu>

a. Graduate and Postdoctoral Teaching Development

<https://poorvucenter.yale.edu/graduate-students/about-teaching-development-graduate-and-professional-school-students>

The Yale Poorvu Center for Teaching and Learning (CTL) supports graduate students, postdocs, and professional school students in their teaching development, from first-time teachers to seasoned instructors refining their practice. Located in Sterling Library, the Graduate Teaching Program of the CTL provides a space for instructors to reflect on their teaching, get feedback, and experiment with new ways to reach students.

Teaching at Yale Day: orientation to teaching in Yale College, required for all first-time TFs. The date for 2019-2020 is Monday, August 26th.

b. The Graduate Writing Lab (GWL)

<http://ctl.yale.edu/writing/graduate>

The GWL helps graduate students become confident and prolific academic writers. The GWL team provides individual and group support to graduate students at all stages of their academic career. The lab helps students with written and oral projects related to their academic work including written coursework, fellowships, grant applications, conference papers, dissertation prospectuses, chapters, and papers for publication. The GWL team believes that all writers benefit from sharing work in a collaborative and supportive environment and encourages students to visit the lab at various stages of their research and study.

The GWL offers free assistance to graduate students through the following programs:

- ***Individual Consultations for Written and Oral Communication*** take place at the Center for Teaching and Learning (CTL), Medical Library, and Center for Science and Social Science during the academic year. During these sessions, trained writing consultants provide feedback and comments to the students' written and oral work. Students can schedule these consultations through the [online scheduling system](#) on the GWL website.
- ***PitchVantage Studio for Public Speaking*** is located on the mezzanine floor of the CTL in room M104C. In that studio, graduate students can improve public speaking skills by practicing their oral speeches, presentations, and lectures with PitchVantage software.

This software focuses on different aspects of public presentation, from pacing and pausing to pitch and tone, and evaluates performance in real time. The scheduling for PitchVantage sessions is similar to scheduling writing consultations [on the GWL website](#).

- **Academic Writing Workshops and Seminars** are offered regularly through the academic year. These programs address critical skills graduate students need to succeed as writers, researchers, communicators, and professionals that are not usually addressed through coursework and traditional academic training. Students register for programs through the GWL website or through the weekly electronic newsletter sent to all GSAS students.
- **Writing Retreats and Study Halls** are a powerful tool for collaborative writing. These groups help students combat the isolation that is common in the later stages of their doctoral work. They also provide space and structured time to GSAS students to accomplish their dissertation-related projects in a distraction-free environment.
- **Peer-review Groups** help students discuss their work under the guidance of trained writing consultants. Groups generally have 5-7 members so that everyone receives individual attention. At each weekly meeting, two or three members present written work for detailed feedback.

The GWL team works with faculty members and students of different academic programs to design and organize workshops tuned to their needs. The GWL issues a weekly newsletter circulated among GSAS students, department DGSs, and registrars by email. For more information, contact Elena Kallestinova, Assistant Dean and Director, at elena.kallestinova@yale.edu or visit the program website at <http://ctl.yale.edu/writing/graduate>.

Office of International Students and Scholars (OISS) <http://oiss.yale.edu/>

OISS is Yale's representative for immigration concerns for all foreign nationals who are or will be studying or working at Yale. This office also offers many programs for international students, including English conversation groups for students and their spouses, cultural understanding workshops and celebrations, academic success skills programs, bus trips, and a host family program. OISS supports various nationality clubs where students can meet others at Yale from their home country for friendship and support. OISS works closely with many Yale offices that assist graduate students, especially the Office of Career Strategy and Graduate Student Life, on programs and publicity. OISS is housed in the International Center at Yale, 421 Temple Street, which provides a comfortable space for international community gatherings. You can reach OISS at (203) 432-2305.

Office for Graduate Student Development and Diversity (OGSDD)

<http://gsas.yale.edu/diversity>

The Office for Graduate Student Development and Diversity works to expand the diversity within the student body and to enhance awareness of diversity issues within the academic community. The Office focuses and coordinates efforts to recruit and retain students from all backgrounds and experiences at the Yale Graduate School of Arts and Sciences. Michelle Nearon, Associate Dean for Graduate Student Development and Diversity, and Denzil Streete, Assistant Director of Diversity, work collaboratively with departments and programs to support the needs of students as they pursue graduate study. Associate Dean Nearon and Assistant Director, Denzil Streete, advise prospective and current graduate students and serve as the Graduate School's Title IX Coordinators. The Summer Undergraduate Research Fellowship

(SURF) Program, the Post-Baccalaureate Research Education Programs (ESI PREP and NIH PREP), Diversity Recruitment Days, Diversity Preview Days, Diversity Orientation Day, and the Transitions: First Year Experience Program fall under the purview of the OGSDD. Graduate Student Diversity Fellows are appointed annually to assist the Office in the development and implementation of a wide array of programs and initiatives to cultivate awareness, appreciation, and knowledge of self and others. Through mentoring, the Peer-to-Peer Advising Program, and the Social Justice Discussion Seminars, topics such as discrimination, bias, imposter syndrome, and stereotypes are discussed to promote constructive dialogue among students, faculty, and staff. If you have any questions, please contact Michelle Nearon, Associate Dean for Graduate Student Development and Diversity, directly via email at michelle.nearon@yale.edu or (203) 436-1301.

Exchange Scholar Program and Other Exchanges

Graduate School participates in an official exchange with eleven other “Ivy Plus” institutions. Please see <http://gsas.yale.edu/academics/academic-exchanges> for details. Additionally, departments may maintain exchanges with particular institutions, usually abroad. The Graduate School must approve these programs. For more information about the Graduate School’s international exchanges, please see the listing in the [P&P](#).

Conference Travel Funds

Attending and presenting at academic conferences is an important part of the professional and research development of our students. In addition to any conference funds that may be administered through department and degree programs, the Graduate Student Assembly administers the GSAS Conference Travel Fellowship. GSA students may apply for limited, supplementary funds to support travel to professional conferences. Encourage your students to apply as needed: <http://gsa.yale.edu/ctf>.

Schedule of Academic Dates and Deadlines

Please see the calendar of important dates at this link: https://gsas.yale.edu/sites/default/files/calendar-files/2019-20_academic_calendar_0.pdf.

Appendix A

Courses to fulfill areas of MB&B curriculum

Molecular Biophysics

CHEM 556 – Biochemical Rates and Mechanisms

MB&B/CB&B/PHYS 523/ENAS 541 – Biological Physics

MB&B/PHAR 529 – Structural Biology and Drug Discovery

MB&B/CB&B/INP/MCDB/PHYS 562/AMTH 765/ENAS 561 – Modeling Biological Systems II

MB&B/MCDB 630 – Biochemical and Biophysical Approaches in Molecular and Cellular Biology

MB&B 635/ENAS 518 – Quantitative Approaches in Biophysics and Biochemistry

MB&B/C&MP 710 – Electron Cryo-Microscopy for Protein Structure Determination

PHAR 530 – Targeted Use of Structural Biology in Drug Discovery

Molecular Biology

CBIO 606 – Advanced Topics in Cell Biology

MB&B 600 – Principles of Biochemistry I

MB&B 601 – Principles of Biochemistry II

MB&B/CBIO/MCDB 602 – Molecular Cell Biology

MB&B/GENE/MBIO 734 – Molecular Biology of Animal Viruses

MB&B/GENE/MCDB 743 – Advanced Eukaryotic Molecular Biology

Either Biophysics or Biology

C&MP/ENAS/MCDB/PHAR 550 – Physiological Systems

MB&B/MCDB 591/ENAS/PHYS 991 – Integrated Workshop

MB&B/GENE/MCDB 625 – Basic Concepts of Genetic Analysis

MB&B/CB&B/CPSC/MCDB 752 – Biomedical Data Science: Mining and Modeling

MB&B 753 – Biomedical Data Science: Mining

MB&B 754 – Biomedical Data Science: Modeling

MB&B Dissertation Procedural Workflow

Dissertations officially due for May 2020 awarding to the Registrar's office (see this [link](#) for all required documentation) on **March 16th**.

Steps to dissertation submission:

- 1) Receive approval to begin writing from thesis committee. That means that this thesis committee meeting is your last meeting.
- 2) Set the defense date with your thesis committee members. Your thesis committee must attend your defense, as they provide conditional approval for your thesis.
- 3) In consultation with advisor, choose at least two internal (one must be from your thesis committee) and one external reader
 - a. Students contact readers to receive their consent to serve
 - b. Your PI does NOT serve as a reader.
 - c. The external reader does not need to attend your defense. (They will be invited but their presence is not required).
 - d. You will need to fill out the following survey link as soon as you establish both a defense date and reader list to provide the Graduate Registrar with all necessary information: https://yalesurvey.ca1.qualtrics.com/jfe/form/SV_81VHmHLdQRkUbOJ. (This will activate the Graduate Registrar to prepare and distribute the flyer, provide refreshments, and help schedule a room if needed.)
- 4) You are required to provide a final draft of your thesis to your committee **3 weeks** before your defense. This is done so that any comments they provide can be incorporated BEFORE you officially submit to the graduate school. This review does not count as the official review for graduation.
- 5) Immediately following the defense, the thesis committee will quickly meet to reach consensus on whether the thesis is preliminarily acceptable.
- 6) Submit final thesis in hard copy to the Graduate School by the published deadline for graduation during that term, e.g. for Spring 2020, the deadline is March 16th. You will also need to provide an electronic copy (PDF) to the MB&B Graduate Registrar for distribution to your readers. The Graduate Registrar will complete the online notification of readers form (ONOR).