

DEPARTMENT OF
MOLECULAR BIOPHYSICS & BIOCHEMISTRY
INFORMATION FOR GRADUATE STUDENTS
YALE UNIVERSITY
2009 - 2010

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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 to conduct 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 booklet will provide students with useful guidelines for the operation 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 are expected to complete all requirements for the Ph.D. degree within six years.

FIRST YEAR

During the first year students take three or four courses each semester and generally rotate through three laboratories. Typically a student selects a research advisor by June 1st, and spends the summer initiating a thesis project and choosing topics for two Qualifying Examination proposals. 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 term) 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 20).

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 term of teaching. The 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 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).

FACULTY ADVISORY COMMITTEE FOR ENTERING STUDENTS

At the start of the first year, each student plans his or her course schedule and first laboratory rotation assignment with a committee of three members of the faculty (including the DGS) and two students.

COURSES

To enable first-year students to become familiar with a variety of research laboratories, all (except M.D./Ph.D. students) take three laboratory rotations (MB&B 650, Introduction to Laboratory Research for First Year Students). We encourage students who remain uncertain about their choice of laboratory for thesis research to take a fourth rotation following the second semester.

All students are required to take, for credit, seven one-term science courses. To obtain the desired breadth and depth of education, students are required to take the four core graduate courses offered by the department: Fall Semester - Macromolecular Structure & Biophysical Analysis (MB&B 720a), Methods & Logic in Molecular Biology (MB&B 730a); Spring Semester - Macromolecular Interactions & Dynamic Properties (MB&B 721b), and Advanced Eukaryotic Molecular Biology (MB&B 743b). In addition, students should take or have previously taken the equivalent of Molecular Genetics of Prokaryotes (MB&B 705a). Students who have not had a course in Physical Chemistry (Thermodynamics) should take CHEM 328a in the fall term. Additional courses, chosen from within MB&B and from other graduate programs, should form a coherent background for the general area in which the student expects to do dissertation research. Finally, all students attend Responsible Conduct of Research (MB&B 676b), which does not fulfill one of the required course credits.

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 if 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 “in order to qualify for the Ph.D. degree, students must have a grade of Honors in at least one year course or two term courses other than those concerned exclusively with dissertation research and preparation.” 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.) 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) 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, is graded satisfactory/unsatisfactory.

Also, the department 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 handbook of the Graduate School of Arts and Sciences for more information.

FELLOWSHIP WRITING WORKSHOP

An important scientific skill is the ability to secure funding for one's research. To assist you in learning about the fellowship application process, MB&B professors Michael Koelle and Tony Koleske will lead a workshop in the early fall for first-year MB&B students. Though these workshops are geared toward applying for graduate fellowships from the National Science Foundation (NSF), the skills developed will be useful for applying for funding from all agencies. The National Science Foundation offers fellowships for graduate students in the sciences. Winning one of these highly prestigious fellowships will not only look great on your resume, it will also give you a higher stipend and free up funds to support other graduate students. Several Yale graduate students win NSF fellowships every year. The workshops will meet twice during the month leading up to the NSF deadline in early November. The first meeting will be a lecture describing the application process. The second meeting will break students into small groups to critique each others' drafts of the opening paragraphs of some of the fellowship application essays.

Participation in the workshop is very strongly recommended.

RESPONSIBLE CONDUCT OF RESEARCH

Education in the ethical and moral dimensions of scientific research is an integral and essential component of the MB&B graduate program and a research career. Specifically, the National Institutes of Health (NIH) has stipulated that:

“all training programs supported by federal funds provide predoctoral and postdoctoral fellows with exposure to information dealing with recommended standards of conduct. Questions ranging from the procedures governing the appropriate use of human subjects, experimental animals, radioisotopes, etc. to issues involving conflicts of interest and commitment and the regulations that every institution must establish to deal with misconduct in science, should be addressed.”

The MB&B faculty have therefore decided:

- 1) to strongly encourage all MB&B graduate students, especially those in the entering class, to attend a series of presentations on the responsible conduct of research sponsored by the Office of the Dean of the Medical School;
- 2) to distribute to all graduate students (as well as to postdoctoral fellows and faculty) two booklets entitled “Guidelines for the Responsible Conduct of Research at Yale University School of Medicine” and “On Being a Scientist” published by the National Academy of Sciences;
- 3) to require that all first year graduate students attend MB&B 676b, Responsible Conduct of Research, at which some of the basic features of life in contemporary research and some of the personal and professional issues that researchers encounter in their work are discussed in a seminar/round table format;
- 4) to require all graduate students to attend the mandatory annual meeting of their research group at which issues relating to the responsible conduct of research are discussed.

LABORATORY ROTATIONS: INTRODUCTION TO RESEARCH (MB&B 650)

LABORATORY ROTATIONS

The purpose of lab rotations.

Laboratory rotations provide students with a chance to broaden their scientific horizons and to become familiar with the science and the working atmosphere in laboratories they are considering for their thesis research. Each student should rotate in at least one lab that works in an area of molecular biology, biochemistry, biophysics or computational biology substantially different from that in which the student anticipates doing his or her thesis research. Students are strongly encouraged to rotate in at least one laboratory on each side of the campus (Science Hill and the Medical School). A student’s rotation lab is his or her temporary home during the first year. For the first week of the Fall semester, while students are preparing to make their choices, a conference room (310 JWG) will be set aside as a home base.

2009-10 Rotation Schedule.

- 1st Rotation: September 8 (Tues.) - November 6
- 2nd Rotation: November 9 - February 12
- 3rd Rotation: February 15 - April 23

Choosing lab rotations.

During the academic year, students rotate through 3 laboratories for a period of 8-10 weeks. Each student plays an important role in determining his or her rotation assignments, although the final decisions are made by the DGS. In advance of each rotation period, students submit to the DGS a preference list of rotation advisors. Students learn about the labs available to them by looking in the MB&B or BBS brochures and web sites, by talking to more senior students, and by attending the faculty presentations given at the MB&B retreat held each fall. *To ensure that students make informed choices, they are strongly encouraged to meet with individual faculty members to discuss possible rotation projects in advance of submitting their rotation preferences.*

MB&B policy is that no more than one MB&B student may rotate in a given lab at the same time. This encourages students to be more independent and adventurous in their selections. If, for a particular rotation period, students' choices conflict, the DGS will give preference to those students who have talked to the professor about their interests. Every effort will be made to ensure that students are able to obtain their top choice of rotation at some point during the course of the first year.

The first rotation should be in a lab in the MB&B track (see BBS website for a current list). For the second and third rotations, students may choose a lab outside the MB&B track. To do so, the student must first meet with and obtain the consent of the outside advisor before the DGS makes the assignments.

A student who finds early in the rotation that her/his assignment is unsatisfactory, is encouraged to discuss possible remedies with the DGS.

What students should do during lab rotations.

Students are expected to devote about 15 hours per week to their lab rotation. Students should balance their time devoted to rotations and to course work, allowing time for lab work every week but not spending so much time in lab that course work suffers. Students will be given a desk and bench space in their rotation lab, and will determine in discussions with the rotation advisor what to do during the rotation. Typically a more senior student, a postdoctoral fellow, or the professor will supervise the student in carrying out an experiment that will help familiarize the student with the science in the lab. While students should try to achieve results in their project, they should realize that the short period of the rotation often prevents this from being possible, and that obtaining results is not necessary to the success of a rotation. Besides carrying out experiments, rotation students also should familiarize themselves with the intellectual basis of research in the lab by participating in lab meetings/seminars/discussions, and by reading papers related to their rotation work.

Rotation talks.

At the end of each rotation period, each first-year student gives a brief talk on the topic on which he or she did a rotation research project. This helps students crystallize their thoughts about their rotation research, and provides practice and training in the important skill of giving scientific presentations. Because significant results often have not been obtained, the talks

typically focus on the background and experimental approach behind the project. Students should endeavor to give a clear and simple description of their project and its rationale. The talks are usually 10 minutes followed by a 5 minute question period. The DGS arranges two sessions during which the talks are given, and the talks are attended by all the first-year students, their rotation supervisors, and any other interested members of the MB&B department. After the talks, students should arrange to discuss their presentations with their rotation advisor and, if they wish to, with the DGS.

Rotation grades.

The faculty advisor will provide the student and DGS with a written evaluation of the student's performance in each rotation. These evaluations are not based solely on whether the student has achieved significant results in their project, but rather on the student's effort (which is not always the same as time spent in lab!), their manner of working in the lab, their understanding of their project, and on their rotation talk. The DGS will provide a single grade at the end of the spring semester reflecting the student's performance in all of the rotations. This grade will be based on the individual rotation evaluations, the DGS's evaluation of the rotation talks, and, when appropriate, consultation with the rotation supervisors. The rotation grade may be counted toward one of the two Honors grades required by the Graduate School, but rotation grades will not count towards fulfillment of the MB&B requirement of a High Pass grade average.

CHOICE OF DISSERTATION RESEARCH ADVISOR

All students may contact the faculty member of their choice before May 1, but no faculty member may make a definite commitment to be a student's advisor before that date. It is expected that prospective advisors will communicate their decision to the students soon after that date. Students also formally join a department at this time.

If a student is not able to complete arrangements with a thesis advisor by June 1, he or she may use all or part of the summer as a fourth laboratory rotation, with the understanding that this arrangement need not be permanent. There is no length requirement for a fourth rotation. If a student does not want to remain in this lab, they may leave at any time and join another lab or begin a fifth rotation. However, a final decision on the research advisor must be made before the beginning of the fall term of the second year.

Note that dissertation research is started by mutual agreement between the student and advisor, usually during the summer of the first year. Once thesis work is underway, it sometimes becomes apparent that a change of research problems and/or research advisor would clearly benefit the student. Such changes are an accepted part of the training process and do not reflect adversely on either the student or the research advisor.

If the thesis advisor leaves the university to take up a position at another institution, a graduate student may continue work toward a Yale degree under his or her supervision, provided that the student has passed the Qualifying Exam and met the three year residency requirement.

DECISION PROCESS ON PROGRESS OF FIRST YEAR STUDENTS

The progress of each first-year student is reviewed by the entire departmental faculty in June. A preliminary review of each first year student is made by the DGS 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. At the June faculty meeting, the first year student's progress is reviewed by the entire faculty with special input by faculty with whom the student performed laboratory rotations. Formal course grades, performance in laboratory, participation in seminars, and other less formal contacts are all considered as well. In cases of poor performance a student may be put on probation and asked to meet certain goals in the next year or, in cases of unusually poor performance, may even be asked to leave the program. Students receive a written evaluation of their progress and status from the DGS soon after the June faculty meeting.

FORMATION OF RESEARCH COMMITTEE

At the end of the first year, 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; to 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); to recommend and/or require additional coursework, if necessary, prior to Admission to Candidacy for the Ph.D.; to 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.; to approve the final dissertation Prospectus; to approve the final draft of the dissertation prior to the dissertation defense; and to approve the thesis provisionally 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 ASSIGNMENTS

All students are required to teach a total of two terms during their Ph.D. training period. Teaching is considered to be 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 assistant 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 assistants (TAs) must not be unavailable. TAs 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 TAs 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, in order that both students and instructors will 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 the 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 to 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 by 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, to answer questions, and to address any problems that may have arisen.

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 the Chair have the responsibility of acting as mediators and advocates of the legitimate interests of the Teaching Fellow and the instructor.

QUALIFYING EXAMINATION (Revised - 6/02/09)

The qualifying examination consists of the preparation and defense of two unrelated research proposals: one involving biophysical approaches and the other, molecular biological approaches. One of the two proposals should encompass the thesis. Passing this examination fulfills one of the requirements for Admission to Candidacy.

Students usually complete the qualifying examination in the fall semester of the second year. Students who would benefit from additional time may ask the DGS to allow them to take the exam in the Spring term.

OUTLINE OF THE QUALIFYING EXAMINATION PROCEDURE

- a) Each student selects two topics of reasonable breadth that will become the basis of study for the two written proposals. One topic should encompass the thesis. One topic should involve chemical, biophysical or physical biochemical approaches and the other, molecular biology or molecular genetics. **The topics and approaches should be unrelated and concern distinct biological problems.** 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 are encouraged to send brief initial thoughts about their topics to the DGS and/or the Qualifying Exam Committee Coordinator (Anna Pyle) by August 1. 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 topics or approaches and advise the student on how to address any concerns.

At the start of the semester (**September 2 for the fall term, January 11 for the spring term**) each student should submit titled Abstracts of the two proposals to the MB&B Graduate Registrar. Each Abstract should include one paragraph of text--indicating what question you will address, why that question is important, and how you will address it--and ~5-7 references (including titles) to key papers in the area.

- b) Based on the subject areas and approaches of the proposals, and with a desire to equalize the workload on the faculty, the Qualifying Examination Committee Coordinator (Anna Pyle) 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 (January 20 in the spring term)**, 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 Qualifying Examination Committee Coordinator will also provide committee members with the descriptions of the proposed topics.
- c) Within one week (by **Wednesday September 16 (or January 27 in the spring term)**), the chairperson of each committee, after consulting with the other committee members, will communicate the acceptability of the Abstracts to the student, or arrange a meeting to discuss necessary modifications. The student will supply copies of any modified Abstracts to the members of the committee and to the MB&B Graduate Registrar.
- d) A reading/tutorial period follows in which the student writes the proposals 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 proposals. The student will prepare two written proposals - a thesis proposal and a proposal on the non-thesis topic. The format of the written proposals is described below. This format is based on that of an NIH postdoctoral fellowship 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. Students may seek advice in crystallizing their ideas, addressing general technical questions, and in preparing for the examination. The writing of the proposals, however, must be entirely by the student. Students may show drafts of their proposals 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.

- e) By **Friday noon, October 16 (February 26 in the spring term)**, the student should submit hard copies of the two written proposals to each member of the examination committee and to the MB&B Graduate Registrar.
- f) By **Friday noon, October 23 (March 5 in the spring term)**, the chairperson of each examination committee, after consulting with the other committee members, will notify the student that the proposals have been accepted or must be modified. If the proposals were submitted earlier than the October 16 (or February 26) deadline, the committee will make every effort to notify the student prior to October 22 (March 5) regarding the acceptability of the proposals. Members of the examination committee must receive a copy of any modified proposals 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 2 through Friday, November 13 (March 22 through April 2 in the spring term)**. **Examinations will usually be scheduled early in this period.** 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, to members of the committee, to the Graduate Registrar, and to 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 (of part or all of the examination).
- 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, Monday **January 11** (for fall exams) or by **May 28** (for spring exams). 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, together with the Departmental Graduate Registrar.

THE WRITTEN PROPOSALS

The written proposals must have the following:

Title Page (including a Title, your name, the date and time of the exam, and whether this is the thesis or the non-thesis proposal)

Abstract: (1 paragraph, no more than one page)

Specific Aims: (one or two sentences each, no more than one half page total)

Background and Significance: (a general introduction to the area of research including a rationale for the proposal; 1- 3 pages)

Experimental Design and Methods: (details of the experiments and how the data will be interpreted; 6-8 pages)

References: (including titles)

The two proposals should be typed double spaced (i.e., a maximum of a 24 pt. line or three lines per inch). The entire proposal, including any figures and figure legends, but excluding the Title Page and References, should not exceed 10 pages. Use a conventional font no smaller than Times 12 or Arial 11 and margins of at least one half inch on all sides. The proposals 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. Michael Koelle and Tony Koleske will run this year's workshop and will contact you by email to inquire if you wish to participate.

THE ORAL EXAMINATION

The oral examination takes about 2 - 2 1/2 hours. Students may choose to begin with either the thesis proposal or the non-thesis proposal. 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 proposals and proposed methods, both broadly defined.

Students should be prepared to present their proposal in a brief format (10-15 minutes if uninterrupted). To this end, students may use up to five simple transparencies or PowerPoint slides per proposal 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. They should be prepared to answer questions without recourse to additional prepared material. After a short break, the second half of the examination is devoted to the second proposal.

The Committee evaluates the student's performance in oral examination and decides whether the student has passed both halves of the examination, one of them, or neither. Students receiving a qualified 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 agreed to 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, to the other members of the re-examination committee, to the Graduate Registrar, and to the 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.

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. Dated copies of this document are given to each member of the research committee at least one day before the meeting and to the departmental graduate registrar. Students should plan their presentations so that the meeting last no more than one hour, including questions and discussion. The research advisor chairs the research committee and provides a written evaluation of the student's progress to the student and the DGS. Since students must have completed all requirements for admission to candidacy for the Ph.D. by the end of the second year, the evaluation of second year students should include certification by the research committee that the student has demonstrated sufficient research potential for the Ph.D. degree.

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 20). 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. degree may be awarded to a student who is in good standing upon completion of at least two terms of graduate study (granted only to students who are not continuing in the Ph.D. program). Note that a High Pass average is required for obtaining the Master's degree.

M. Phil. degree is awarded automatically to a student who is in good standing on completion of all requirements for the Ph.D., except the dissertation and 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 requirement.

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 at least one day prior to the meeting and to the departmental graduate registrar. Students should plan their presentations so that the meeting last no more than one hour, including questions and discussion. The research advisor chairs the research committee and provides a written evaluation of the student's progress to the student and to the DGS. Students should obtain approval from their research committees before writing their dissertation.

Faculty on leave may not always be available for one or two 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 presentation can be in the form of talks at Yale (including the annual Woods Hole retreat) or at an external scientific meeting. One poster presentation at a scientific meeting (but not at Woods Hole) 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 justification in writing by the DGS. Submission of requests for an extension 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 attempt to summarize the experiments remaining and to estimate the time to degree.

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. 8) 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.

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 1, 2009** (for a December 2009 degree) or by **March 15, 2010** (for a May 2010 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 copies is frequently over two months of full-time work.
2. 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. Consequently, you have the option to publicize the defense (see (4) below) during the three weeks your committee members are reading your draft, or to wait until they approve the draft at the end of the three-week period. The latter option will require that you submit your draft dissertation to the committee members four weeks prior to your anticipated defense date so that notices can be sent out a least one week prior to your seminar (see (4) below).
3. If the outside reader (who cannot be in MB&B) is at Yale or in the vicinity, he/she should be 1) provided with the final draft of the thesis for comment before the seminar; 2) invited to attend the seminar; and 3) asked to approve the thesis and defense immediately after the seminar. Students are encouraged to send the outside reader (regardless of location) the final draft so that suggestions can be incorporated into the finished thesis (see (6) below).
4. 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. In accordance with (2) above, you should let the registrar know

whether to distribute the notices automatically, or to wait for your report that all committee members have given their OK.

5. 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 bound and 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.
6. The approved thesis, typed in final form, is submitted as follows: a) one unbound and three soft-bound copies are delivered by the student to the Graduate School; b) two hard-bound copies are delivered by the student to one of the MB&B Business Offices or the departmental registrar; and c) a hard- or soft-bound copy is provided to the research advisor. (Minimum number of copies, assuming the student retains one: 8.) Upon filing the thesis at the Graduate School, students may request a statement from the Graduate School registrar certifying that all degree requirements have been fulfilled. This statement enables the student's research advisor to increase the student's stipend to postdoctoral level if the student plans to remain in the laboratory for additional time.
7. 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 form along with a soft-bound copy of the thesis. The three completed readers' reports are returned directly to the Graduate School for consideration by the Degree Committee, which officially approves the award of the degree. The outside reader is selected by the research advisor in consultation with the student. MB&B considers the outside reader to be an important factor in evaluating the Ph.D. thesis. In general, the outside reader will be from outside the university. In special 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. 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 bound and submitted to the graduate school. The official Graduate School protocol for answering readers' objections can be time-consuming and is something to be avoided.

METHODS OF PAYING DISSERTATION COSTS

CHARGES

There are usually three kinds of charges in producing doctoral dissertations: Illustrations, photocopies and binding. All three types of charges are usually made directly to an appropriate account number. Before incurring any of these expenses, the student should get charging instructions from the Business Office (see cost-sharing arrangements below). Usually, the thesis is typed by the student on a word processor but should a student prefer to hire a typist, the cost would be borne by the student subject to such reimbursement as cost-sharing may permit.

COPIES

Usually four copies (one unbound original and one soft-bound copy for each reader) are required by the Graduate School and two (hard-bound) are required for Departmental reference. 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 eight.

COST SHARING

The department will pay a pro-rata share of the total thesis costs for its two copies. 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's grant(s) 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. Once the Business Office is advised of the overall costs and the cost-sharing agreement between the faculty advisor and the student, arrangements will be made to reimburse the latter for whatever funds may be due the student.

WHO TO SEE ABOUT ACADEMIC OR ADMINISTRATIVE ISSUES

QUESTIONS ABOUT YOUR RESEARCH:

Your Rotation Advisor (first year) or your Research Advisor, members of your research committee, and the DGS.

GENERAL ACADEMIC QUESTIONS:

The Director of Graduate Studies (Mark Solomon, C-123 SHM, 737-2702) or the departmental registrar (Nessie Stewart, 301 JWG, 432-5662). M.D./Ph.D. students should see the Director of the MD/PhD Program, Dr. James Jamieson (317 ESH, 785-4313) or his assistant, Cheryl DeFilippo (310 ESH, 785-2103).

SPECIFIC GRADUATE SCHOOL PROBLEMS:

If you feel your problem cannot be or has not been satisfactorily addressed by the DGS, contact:

Associate Dean Richard Sleight/Assistant Dean Robert Harper-Mangels, 132 Hall of Graduate Studies, 432-2744.

Graduate Education Committee: Members of the Graduate Education Committee (Mark Solomon, Mark Hochstrasser, Tony Koleske, Anna Pyle and Lynne Regan) 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 work of all members of the 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 304 JWG and Room C-106 SHM. Questions about irregularities in stipend checks and fellowship allowances may be directed to the Departmental Registrar (301 JWG, 432-5662) or the Financial Aid Office (129 HGS, 432-2899).

MISCELLANEOUS INFORMATION

REGISTRATION

First through fourth-year students must register with the Graduate School in September for the Fall Term, in January for the Spring Term and in May for summer residency. Note that the residency requirement is three years and the tuition requirement is four years. Students beyond the fourth year merely submit an annual continuous registration form for the academic year. Registration beyond the sixth year requires approval of the Dean (see departmental registrar). ID stickers are available from the Departmental Registrar's Office (301 JWG) for the Fall and Spring Term. Photo ID validation for the Summer Session is done at the Graduate School Registrar's Office, 11 SSS.

ANNUAL RETREAT

Every year, a weekend, typically in 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.

It is particularly important for first-year students to attend. This year, the retreat will run from Friday September 25 - Sunday, September 27, 2009 and will be held at Jiminy Peak in the Berkshires of Massachusetts.

SEMINARS

Participation in the seminars and colloquia held throughout the University is an important part of every student's education. In addition to the weekly departmental seminar, there are seminars in many related departments. All students are expected to attend the majority of departmental seminars. (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

The Departmental 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.

The total vacation time that a student may take is negotiable with the thesis adviser, but in general it is expected that the student would take no more than two weeks vacation beyond the stated University holidays and the Christmas Eve to New Year's Day break. In no case may vacations conflict with any academic or teaching obligations (see Teaching Assignments, p. 12). Note that research labs operate throughout the year, often with little regard for University holidays and breaks. Students should transition from a "school" schedule to a full-time and self-motivated research schedule as early as possible.

TRAVEL

Limited funds, provided either by the student's training grant or by department sources, are available to reimburse expenses incurred by the student in attending scientific meetings or courses. The form required for requesting such support is available from the departmental graduate registrar and from both business offices and requires the approval of the student's research advisor and the DGS. Students supported by outside fellowships that include research allowances apply directly to the MB&B Business Offices for travel reimbursement (or advances) and do not use the student travel funds. Research grants awarded to the student's advisor will usually cover the remainder of such costs.

UNIVERSITY LIBRARIES

Libraries of particular interest to the sciences include:

Kline Science Library:

Location: Concourse floor of Kline Biology Tower. Hours: Mon.-Thurs. 8:30 a.m. – 7:45 pm. Fri. 8:30 a.m.- 4:45 pm, Sat. 10:00 a.m. – 4:45 p.m.; Sun. 1 p.m. – 7:45 pm.

Medical Library:

Location: Sterling Hall of Medicine. Hours: Mon. - Thurs. 8:00 a.m. - midnight; Fri. 8:00 a.m.- 10:00 p.m., Sat. 10:00 a.m. - 10:00 p.m.; Sun. 9:30 a.m. - midnight.

Chemistry Library:

Location: Sterling Chemistry Laboratory (SCL). Hours: Mon. - Fri. 9:30 a.m. - 5:00 p.m.

Engineering and Applied Science Library:

Location: Becton E&AS Center. Hours: Mon. – Thurs. 8:30 a.m. – 9:45 p.m., Fri. 8:30 a.m. - 4:45 p.m.; Sat. 1:00 a.m. - 4:45 p.m.; Sun. 1:30 p.m. – 9:45 p.m..

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. Information and schedules are available at <http://www.yale.edu/parkingandtransit/shuttle/index.htm> and at the Parking and Transit Services Office, 155 Whitney Avenue. Yale ID required to ride the Yale Shuttles.

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 <http://www.yale.edu/transportationoptions/shuttle/dayshuttle.html>.

Night Shuttle/Mini-Bus

Operates from 6:00 p.m. to 1:00 a.m. seven evenings a week. The Night Shuttle is an on-call service after 1:00 a.m. (432-6330). 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. If you require an escort to the nearest pick-up point, the Escort Service is available 24 hours/day, 7 days/week. The number to call is 432-9255, or 785-5555. For complete information on the Night Shuttle go to: <http://www.yale.edu/transportationoptions/shuttle/nightshuttle.html>.

KEY AND CARD ACCESS

The Business Offices (304 JWG 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.

PONY MAIL AND FAX

Bulk mail can be sent and received the same day throughout the Department using PONY mail, which is picked up from a designated red bag in each business office (304 JWG and C-106 SHM). Two FAX machines available for general Departmental use are in 304 JWG (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) 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 representatives for 2009-10 are Brannon McCullough and Dan Spakowicz. For more information on the GSA, visit the web site at <http://gsa.yale.edu/>.

The **McDougal Graduate Student Center, Hall of Graduate Studies (HGS)**, 320 York Street 432-8273, mcdougal.center@yale.edu, www.yale.edu/mcdougal). At Yale, there is no general campus center, student union, or student center for the entire University community. For graduate students, much of student life is based in their respective departments and schools, and dormitories or apartment complexes. The McDougal Center is a place where graduate students from across the campus regularly meet and share interests.

Mission - A generous gift from Mr. Alfred McDougal, a Yale alumnus, and his wife, Ms. Nancy Lauter, enabled Yale in 1997 to create the McDougal Graduate Student Center. The McDougal Center warmly welcomes the fellows, faculty, staff, alumni/ae of the Graduate School, and members of the larger Yale community. Its web site (<http://www.yale.edu/mcdougal>) provides all kinds of information relating to graduate student life. The Center provides members of the graduate student community with a place of their own on campus.

Facilities - The facilities of the McDougal Center enhance student life in many ways. The magnificently restored Common Room has been transformed into a lounge with comfortable furnishings, Internet ports, newspapers and magazines, and a student-run cafe serving coffee and light food throughout the day. In an adjacent wing on the first floor of HGS the Center has a large multi-purpose Program Room (HGS 119) with a stage, seating for up to 100, and advanced video and sound projection equipment. The Program Room provides space for lectures, conferences, performances, film series, workshops and other events by and for students. The Center also has smaller conference and meeting rooms. Graduate student groups and departments may request to reserve space by contacting the center office at 432-8273, stopping by HGS 123, or filling out a request online at <http://www.yale.edu/graduateschool/mcdougal/meeting.html>. There is a public computer cluster supported by ACS, a public copy machine, a public phone, bulletin boards and information kiosks as well. The lower floor also offers offices for the Assembly of Graduate Students, graduate student organizations, rooms for Teaching Fellows to meet with students, lockers for graduate student use, and vending machines. The McDougal Center is open days, evenings, and weekends.

Student Life Programs - Lisa Brandes, Director, 123 HGS, 42-8273. The Center offers a variety of activities open to the G&P community. These include weekly movies on the Really Big Screen, coffeehouse musical evenings, happy hours, poetry readings, student research presentations, health and wellness workshops, teas with campus and community figures, and service opportunities such as blood drives. It hosts activities organized by student groups and departments, including cultural festivals, movies, lectures, receptions, and conferences. Activities are publicized in campus publications, in McDougal Notes calendar, on the web site, and via E-mail lists.

Graduate Career Services (GCS) - Gene Policelli, Director, 123 HGS, 432-8896, <http://www.yale.edu/graduateschool/careers/index.html>. Graduate Career Services was established to guide and educate graduate students about academic and non-academic career opportunities and job search strategies. The office offers programs such as professional career development workshops, seminars, resume/CV reviews, individual counseling, on campus interviews, dossier service, and current job listings.

The Office of Teacher Preparation - Bill Rando, Director, 123 HGS, 432-8896. Dr. Rando directs the teacher preparation program within the McDougal Graduate Student Center, and also works with faculty and graduate students to enhance teacher preparation programs in departments. He advises the Working At Teaching program. The mission of Working At Teaching (WAT) (www.yale.edu/wat) is to help improve the teaching skills of Yale graduate students and to contribute to their professional development as teachers. WAT offers excellent peer-led training workshops for teaching assistants each semester, promotes dialogue in the Yale community about all aspects of pedagogy through forums and lectures, and supports teaching assistants by publishing a handbook, maintaining a resource office, and conducting classroom visitations. WAT is sponsored by the Graduate School and is housed in the McDougal Center. While most of the students who participate in WAT programs come from the Graduate School, other G&P students who teach take part in its activities.

McDougal Graduate Student Center Resource Library

The Resource Library is a non-circulating self-service reference library located in Room 120A McDougal Center HGS, and is open Monday-Friday from 9am-5pm. The collection includes focused books for PhDs under five main categories: **Careers, Fellowships, Teaching, Writing and Graduate Student Life/Academic Life**. Materials can be checked out for closed reserve for 3 hours in the McDougal Center. Users can make copies on the ITS student copier in the McDougal Computer Cluster in the basement.

Alternative Careers in Biosciences (ACB) is a seminar series, the goal of which is to provide resources for graduate students and postdoctoral fellows who may be interested in pursuing careers that differ from the traditional routes of academic or industrial research. The topics of previous years' seminars have included scientific publishing, science policy, high school science curriculum development, and consulting.

There are many other formal student organizations at Yale, covering a broad spectrum of interests and activities, including an active intramural sports league.

SCHEDULE OF ACADEMIC DATES AND DEADLINES 2009–2010

Fall Term, 2009

Monday, August 24	New student orientation week begins.
Wednesday, August 26	SPEAK Test for new international students in Ph.D. programs.
Thursday, August 27	Matriculation ceremony.
Friday, August 28	Fall-term On Line Course Selection (OCS) begins. Orientation in departments for all new students begins. SPEAK Alternative Test for new international students in Ph.D. programs.
Tuesday, September 1	Registration for returning students begins. Orientation for all new Teaching Fellows.
Wednesday, September 2	Fall-term classes begin, 8.20 a.m.
Friday, September 4	Final day to pick up registration materials from academic departments.
Monday, September 7	Labor Day. Administrative offices closed.
Friday, September 11	Final day to apply for a fall-term <i>personal leave of absence</i> . The entire fall-term tuition charge or continuous registration fee (CRF) will be canceled for students who withdraw from the Graduate School on or before this date or who are granted a <i>leave of absence</i> effective on or before this date.
Wednesday, September 16	Fall-term On Line Course Selection (OCS) ends. Final day for registration. <i>A fee of \$25 is assessed for course schedules accepted after this date.</i>
Friday, September 25	One-half of the fall-term full-tuition charge will be canceled for students who withdraw from the Graduate School on or before this date or who are granted a <i>medical leave of absence</i> effective on or before this date (<i>The CRF is not prorated.</i>)

Thursday, October 1	<p>Final date for the faculty to submit grades to replace Temporary Incompletes (TI's) awarded during the 2008-2009 academic year.</p> <p>Due date for dissertations to be considered by the Degree Committees for award of the Ph.D. in December.</p> <p>Final day to file petitions for degrees to be awarded in December.</p>
Friday, October 23	<p>Midterm.</p> <p>One-quarter of the fall-term full-tuition charge will be canceled for students who withdraw from the Graduate School on or before this date or who are granted a <i>medical leave of absence</i> effective on or before this date. <i>The CRF is not prorated.</i></p> <p>Teaching appointments will not appear on the transcripts of students who withdraw from the assignment on or before this date.</p>
Friday, October 30	<p>Final day to change enrollment in a fall-term course from Credit to Audit <i>or</i> from Audit to Credit.</p> <p>Final day to withdraw from a fall-term course.</p>
Monday, November 2	<p>Readers' Reports are due for dissertations to be considered by the Degree Committees for award of the Ph.D. in December.</p>
Friday, November 6	<p>Departmental recommendations are due for candidates for December degrees.</p> <p>Final day to withdraw a degree petition for degrees to be awarded in December.</p>
Thursday, November 12	<p>SPEAK Test for international students in Ph.D. programs.</p>
Friday, November 20	<p>Fall recess begins, 5:20 p.m.</p>
Monday, November 30	<p>Classes resume, 8:20 a.m.</p>
Friday, December 11	<p>Classes end, 5:20 p.m.</p>
Saturday, December 19	<p>Fall term ends; winter recess begins.</p>

Spring Term, 2010

Wednesday, January 6	Final grades for fall-term courses due.
Thursday, January 7	SPEAK Alternative Test for new international students in Ph.D. programs.
Monday, January 11	Registration and spring ID validation begins. Spring-term classes begin, 8:20 a.m.
Friday, January 15	Friday classes do not meet. Monday classes meet instead.
Monday, January 18	Martin Luther King Jr. Day. Administrative offices closed. Classes do not meet.
Wednesday, January 20	Final day to apply for a spring-term <i>personal leave of absence</i> . The entire spring-term tuition charge or CRF will be canceled for students who withdraw from the Graduate School on or before this date or who are granted a <i>leave of absence</i> effective on or before this date
Friday, January 22	Registration and spring ID validation end. Spring-term On Line Course Selection (OCS) ends. Final day for registration. <i>A fee of \$25 is assessed for forms accepted after this date.</i>
Friday, February 5	One-half of the spring-term full-tuition charges will be canceled for students who withdraw from the Graduate School on or before this date or who are granted a <i>medical leave of absence</i> effective on or before this date. <i>The CRF is not prorated.</i>
Friday, March 5	Midterm. Spring recess begins, 5:20 p.m. One-quarter of the spring-term full-tuition charge will be canceled for students who withdraw from the Graduate School on or before this date or who are granted a <i>medical leave of absence</i> effective on or before this date. <i>The CRF is not prorated.</i> Teaching appointments will not appear on the transcripts of students who withdraw from the assignment on or before this date.

Monday, March 15	Due date for dissertations to be considered by the Degree Committees for award of the Ph.D. in May. Final day to file petitions for degrees to be awarded in May.
Monday, March 22	Classes resume, 8:20 a.m.
Monday, March 29	Final day to change enrollment in a spring-term course from Credit to Audit <i>or</i> from Audit to Credit. Final day to withdraw from a spring-term course.
Friday, April 2	Good Friday. Administrative offices closed
Monday, April 12	Readers' Reports are due for dissertations to be considered by the Degree Committees for award of the Ph.D. in May.
Thursday, April 15	SPEAK Test for international students in Ph.D. programs.
Wednesday, April 21	Departmental recommendations are due for candidates for May degrees.
Friday, April 23	Final day to withdraw a degree petition for degrees to be awarded in May.
Monday, April 26	Monday classes do not meet. Friday classes meet instead.
Friday, April 30	Final day to submit Dissertation Progress Reports and petitions for extended registration.
Monday, May 3	Classes end, 5:20 p.m.
Tuesday, May 11	Spring term ends.
Friday, May 14	Final grades for spring-term courses are due for candidates for terminal M.A. and M.S. degrees to be awarded at Commencement.
Sunday, May 23	Graduate School Convocation.
Monday, May 24	University Commencement.
Tuesday, June 1	Final grades for spring-term courses and full-year courses are due.
Friday, June 4	SPEAK Alternative Test for new international students in Ph.D. programs.