

Table of Contents

DIRECTORY

| | |
|--|---|
| Faculty with Primary Appointments in Cellular and Molecular Physiology | 3 |
| Faculty with Secondary Appointments in Cellular & Molecular Physiology | 4 |
| Graduate Students associated with the Department..... | 5 |
| Departmental Offices | 6 |

The Graduate Program - Registration and General Policy

| | |
|--|----|
| Introduction..... | 8 |
| General Information | 8 |
| Foreign Student Registration | 8 |
| In Absentia Registration..... | 9 |
| Leave of Absence | 9 |
| Time off Policy | 9 |
| A. Holidays | 9 |
| B. Vacation | 10 |
| Outside Employment | 10 |
| Withdrawal & Readmission | 10 |
| Tuition..... | 10 |
| Financial Aid | 11 |
| A. Sources of Support | 11 |
| 1) U.S.P.H.S. National Research Service (Institutional) Awards:..... | 11 |
| 2) Individual Fellowships: | 11 |
| 3) Research Assistantships:..... | 12 |
| B. Payment of Stipend:..... | 12 |
| C. Taxation | 12 |
| D. Loans | 12 |
| E. Other Expenses | 12 |

OVERSIGHT

| | |
|-------------------------------------|----|
| A. Policy and Personnel..... | 13 |
| B. Beginning Students | 13 |
| C. Advanced Students | 13 |
| D. Thesis Advisory Committees | 13 |
| E. Evaluation of Progress | 14 |

CURRICULUM REQUIREMENTS AND PROCEDURES

| | |
|------------------------------------|----|
| A. Formal Course Requirement | 15 |
| 1. Mandatory Courses..... | 15 |
| 2. Recommended Courses | 16 |
| 3. Elective Courses | 18 |
| 4. Courses Outside Yale | 18 |
| B. Grades..... | 18 |
| C. Laboratory Rotations | 18 |
| D. Choosing a Thesis Advisor | 19 |
| E. Second Year Activities..... | 19 |
| F. The Qualifying Examination..... | 19 |
| 1. Directed Reading | 19 |

| | |
|---|----|
| 2. Written Research Proposal | 19 |
| 3. Formal Qualifying Examination | 19 |
| Overall Qualifying Exam Timeline | 20 |
| Qualifying Exam Research Proposal – Outline | 20 |
| G. Thesis Advisory Committee | 21 |
| H. Dissertation Prospectus..... | 21 |
| I. Later Years..... | 21 |
| J. Teaching Requirement | 21 |
| K. Admission to Candidacy | 22 |
| L. Dissertation..... | 22 |
| 1. Pre-defense | 22 |
| 2. Defense..... | 23 |
| M. M.D.-Ph.D. Students..... | 24 |
| N. Master’s Degree | 24 |
| O. Publications | 25 |
| P. Residence Requirement and Time Limit..... | 25 |

MISCELLANEOUS INFORMATION

| | |
|---|----|
| A. Calendar Synopsis–Academic year 2008-2009..... | 26 |
| Year 1 | 26 |
| Year 2 | 26 |
| Years 3 and beyond | 26 |
| B. Other Training Activities | 26 |
| C. Lectures, Seminars and Journal Clubs..... | 27 |
| D. Libraries..... | 27 |
| E. Plagiarism..... | 28 |
| F. The McDougal Graduate Student Center | 28 |
| G. Photocopying..... | 28 |
| H. Campus Computing..... | 29 |
| I. Departmental Facilities | 29 |
| J. Graduate Student Senate..... | 29 |
| K. Assembly of Graduate Students..... | 30 |
| L. Grievance Procedures..... | 30 |
| M. Yale Health Plan | 30 |
| N. Dining Facilities | 31 |
| O. Shuttle Buses | 31 |
| P. Night-Time Transportation | 31 |
| Q. Parking | 32 |
| R. Security | 32 |
| S. The I.D. Card..... | 32 |
| T. I.D. Card Access and Keys..... | 32 |
| U. Mail..... | 33 |
| V. Telephones..... | 33 |
| W. Recreational Opportunities | 33 |

Schedule of Academic Dates and Deadlines 2008–2009

| | |
|-------------------------|----|
| Fall Term, 2008..... | 35 |
| Spring Term, 2009 | 37 |

DIRECTORY

Faculty with Primary Appointments in Cellular and Molecular Physiology

| Name | Email | Location | Phone |
|--|--|-----------------|----------|
| Emile L. Boulpaep Director of Graduate Studies Director of Medical Studies | Emile.Boulpaep@yale.edu | SHM B-142 | 785-4055 |
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| Vincent Pieribone | Vincent.Pieribone@yale.edu | 215 JPL | 401-6214 |
| Fred J. Sigworth | Fred.Sigworth@yale.edu | SHM BE-42 | 785-5773 |
| Clifford L. Slayman | Clifford.Slayman@yale.edu | SHM BE-57 | 785-4478 |
| Susumu Tomita | Susumu.Tomita@yale.edu | SHM BE-17/BE-11 | 785-7201 |
| Tong Wang | Tong.Wang@yale.edu | SHM B144A | 785-6435 |
| David Zenisek | David.Zenisek@yale.edu | SHM B-114 | 785-6474 |
| Yufeng Zhou | Yufeng.Zhou@yale.edu | SHM BE-07 | 785-7388 |

Faculty with Secondary Appointments in Cellular & Molecular Physiology

| Name | Email | Location | Phone |
|--|--|----------------------------|--------------|
| Peter S. Aronson Internal Medicine | Peter.Aronson@yale.edu | TAC S-255C | 785-4902 |
| Henry J. Binder Internal Medicine | Henry.Binder@yale.edu | TAC S-227 | 785-4796 |
| Angelique Bordey Neurosurgery | Angelique.Bordey@yale.edu | FMB 422A | 737-2515 |
| Thomas Brown Psychology | Thomas.Brown@yale.edu | DL 332A | 432-7008 |
| Lloyd G. Cantley Internal Medicine | Lloyd.Cantley@yale.edu | TAC S-255A | 785-7110 |
| Marie Egan Pediatrics | Marie.Egan@yale.edu | FMP 506 | 785-2480 |
| Barbara Ehrlich Pharmacology | Barbara.Ehrlich@yale.edu | SHM B-207 | 737-1158 |
| John R. Geibel Surgery | John.Geibel@yale.edu | BML 265 | 737-4152 |
| Leonard K. Kaczmarek Pharmacology | Leonard.Kaczmarek@yale.edu | SHM B316c | 785-4500 |
| Patricia Preisig Internal Medicine | Patricia.Preisig@yale.edu | TAC S363 | 785-7287 |
| George B. Richerson Neurology | George.Richerson@yale.edu | LLCI 712 | 785-4085 |
| Mark Saltzman Biomedical Engineering | Mark.Saltzman@yale.edu | MEC 413 | 432-4262 |
| Joseph Santos-Sacchi Surgery/Otolaryngology | Joseph.Santos-Sacchi@yale.edu | BML 244 | 785-7566 |
| Gerald I. Shulman Internal Medicine | Gerald.Shulman@yale.edu | TAC S-269A | 785-5447 |
| Carolyn W. Slayman Genetics | Carolyn.Slayman@yale.edu | SHM I-202 | 737-1770 |
| Fred S. Wright Internal Medicine | Fred.Wright@med.va.gov | VAMC 5-C365 | 937-3830 |
| Lawrence Young Internal Medicine | Lawrence.Young@yale.edu | TAC S469 | 785-4102 |
| Z. Jimmy Zhou Ophthalmology | Jimmy.Zhou@yale.edu | 300 George St., Suite 8100 | 785-5687 |

Graduate Students associated with the Department

| Name | Program / Department | Lab | Phone |
|-----------------------------|---|---------------------------|----------|
| Vivian Alfonso | Ph.D. Program Physiology & Integrative Medical Biology Track | | |
| Yi Chen | Ph.D. Program Cellular and Molecular Physiology | Sigworth Lab SHM BE 42 | 785-6866 |
| Hyun-Chul (Charles) Choi | Ph.D. Program Cellular and Molecular Physiology | Nitabach Lab SHM BE-29 | 737-2912 |
| Michael Coggins | Ph.D. Program Cellular and Molecular Physiology | Zenisek Lab SHM B-103 | 785-6423 |
| Diego Correa | Ph.D. Program Cellular and Molecular Physiology | Harvard Baron Lab | |
| Rachel Davis | Ph.D. Program Cellular and Molecular Physiology | Tomita Lab SHM BE 17 | 785-7220 |
| Maha Elsayed | Ph.D. Program Cellular and Molecular Physiology | Duman Lab CMHC | 974-7726 |
| Derek Erion | Ph.D. Program Cellular and Molecular Physiology | Shulman Lab TAC S269A | 785-5447 |
| Matthew Fleming | Ph.D. Program Cellular and Molecular Physiology | Kaczmarek lab SHM B309 | 785-4500 |
| Matthew Gillum | Ph.D. Program Cellular and Molecular Physiology | Shulman Lab TAC S269A | 785-5447 |
| Whitney Harris | Ph.D. Program Cellular and Molecular Physiology | Bogan Lab TAC S141 | 785-6319 |
| Melanie Kaelberer | Ph.D. Program Physiology & Integrative Medical Biology Track | | |
| Jennifer Long | Ph.D. Program Cellular and Molecular Physiology | Madri Lab LH 115 | 495-8497 |
| Shelby Montague | Ph.D. Program Cellular and Molecular Physiology | Carlson Lab KBT 1132 | 432-3541 |
| Christoph Straub | Ph.D. Program Cellular and Molecular Physiology | Tomita Lab SHM BE 17 | 785-7220 |
| Vinita Takiar | MD/Ph.D Program Cellular and Molecular Physiology | Caplan Lab SHM B-109 | 785-6833 |
| Dimitrios Tsirigotis | MD/Ph.D Program Cellular and Molecular Physiology | Shulman Lab TAC S269A | 785-5447 |
| Erika Wells | Ph.D. Program Cellular and Molecular Physiology | Caplan Lab SHM B-109 | 785-6833 |

Departmental Offices

SHM Room B-147

| Name | Position | Phone |
|------------------|---------------------------------|--------------|
| Crystal Adamchek | Registrar | 737-2215 |
| Bobbie Barrett | Financial Assistant | 785-4051 |
| Joseph DePonte | Administrator | 785-2395 |
| Renata Musial | Accountant | 785-4053 |
| Patricia Redenti | Coordinator, Grants & Contracts | 785-7376 |
| Leisa Strohmaier | Administrative Associate | 785-4041 |
| Duncan Wong | Systems Programmer | 785-4049 |

| Yale University Graduate School | | |
|--|--|----------|
| Dean Jon Butler | HGS Room 112 | 432-2733 |
| Associate Dean Richard Sleight | HGS Room 132 | 432-2744 |
| Deputy Registrar Grad School of Arts & Sciences Stephen Goot | HGS Room 114 | 436-0492 |
| Registrar's Office Faculty of Arts & Sciences | 246 Church Street, 3 rd Floor (grades; transcripts; forms) | 432-2330 |
| | 320 York Street, Room 113 | 432-2743 |
| Graduate Student Services and Reception Office | HGS Room 140 (general information; dissertation submission) | 432-2770 |
| Financial Aid Office | HGS Room 128 (loan applications; questions concerning fellowships) | 432-2739 |
| Student Financial Services Center | 246 Church Street, 1 st Floor | 432-2700 |
| Program in the Biological and Biomedical Sciences (BBS) Lynn Cooley, Director John Alvaro, Admin Director Bonnie Ellis, Asst Admin Dir | SHM Room I-363 | 785-5067 |
| | SHM Room L-200C | 785-3735 |
| | SHM Room L-203 | 785-5663 |
| | | |
| MD/PhD Program James Jamieson, Director Cheryl DeFilippo, Coordinator Susan Sansone, Registrar | ESH Room 317 / SHM C228 | 785-4317 |
| | ESH Room 319 | 785-4403 |
| | ESH Room 316 | 785-2103 |
| | | 735-4403 |

| Special University Offices | | |
|---|-------------------------|----------|
| Graduate Housing | 420 Temple Street | 432-9756 |
| International Center | 442 Temple Street | 432-6460 |
| Office of International Student & Scholars | 421 Temple Street | 432-2305 |
| Office for Women in Medicine | SHM L-202 | 785-4680 |
| Office of Multicultural Affairs | SHM I-100 | 785-7545 |
| University Police Department | 101 Ashmun Street | 432-4400 |
| MINIBUS (Night Security Transit Service) | (6:00 p.m. - 7:30 a.m.) | 432-6330 |
| Yale University Health Services Emergencies Information & Member Services Student Medicine | | 432-0123 |
| | | 432-0246 |
| | 17 Hillhouse Ave | 432-0312 |

The Graduate Program - Registration and General Policy

Introduction

This handbook is intended to be a source of information for graduate students studying for the Ph.D. degree in the Department of Cellular & Molecular Physiology at Yale. Students and faculty should be able to find answers to questions that they may have from time to time about the Cellular & Molecular Physiology Ph.D. program and its specific policies. The Programs and Policies Bulletin of the Graduate School of Arts and Sciences (<http://www.yale.edu/bulletin/html/grad/introduction.html>), that is updated annually, is the definitive source of information about academic rules and regulations as well as general policies that apply to all graduate programs.

General Information

Graduate School registration online is required of all students, whether in residence, in absentia, or submitting a dissertation. <http://students.yale.edu/oci/> Failure to register makes the student ineligible to use University facilities, including the libraries and the Health Service.

Orientation and Registration check-in for all new students occur between August 25 and August 29, 2008. Online Registration and Course Selection dates for the current academic year are listed in the Graduate School "Programs and Policies" 2008-2009. Fall term Online Course Selection (OCS) ends September 17, 2008. Spring term Online Course Selection (OCS) occurs between January 12 and January 23, 2009. Certain changes can be made after these dates (consult the Departmental Registrar or the Graduate School Registrar for details), but a \$25 fee **will** be charged for each change.

Continuing Students must also register through the Online Course Selection process.

Summer registration is required of all graduate students supported through Yale-administered funds. Continuing students who were registered during the preceding spring term remain registered through August 31.

Foreign Student Registration

Foreign students must check in at the Office of the International Students and Scholars (OISS), 421 Temple Street, (203) 432-2305 before registering at the graduate school. U.S. immigration regulations require that foreign students check in with the OISS when they arrive on campus. Be sure to bring along your passport and immigration documents when you come for the first time. The Office of International Students and Scholars is open from 8:30 am to 5:00 pm, Monday, Wednesday, Thursday and Friday. The office opens at 10:00 am on Tuesday mornings. OISS can also help with visa and language problems and may assist students in other ways to adjust to local conditions. The website is <http://www.oiss.yale.edu/>.

In Absentia Registration

A student, whose curriculum requires full-time study at another institution, or dissertation research on a full-time basis outside the New Haven area can register in absentia, provided he/she receives prior written approval from the Department and the Dean of the Graduate School. Such students will not be enrolled in the Yale Health Plan unless they are paying full tuition, but may enroll themselves (and dependents) at full cost.

Leave of Absence

Students in good standing who wish to interrupt their study temporarily for personal reasons may, with approval of the Department and the Dean, be granted a leave of absence. There are two types of leave, personal and medical. Only students who will not be primarily engaged in degree-related activities during the period of leave are eligible. A one term or one-year leave can be granted to students who have satisfactorily completed one year of study in the Department.

The student should meet first with his/her advisor upon considering taking a Leave of Absence. After consultation with the advisor and the DGS, the student must then submit the appropriate form to the DGS who then forwards it to the Dean. Please note that the forms should be completed before the beginning of the term in which the student requests a Leave of Absence, and leave will not be granted retroactively and normally will not be approved after the tenth day of a term.

The Leave of Absence Form may be found at <http://www.yale.edu/graduateschool/academics/forms/leave.pdf>.

A complete set of Guidelines may be found at <http://www.yale.edu/bulletin/html/grad/policies.html#Leaves>.

Students on leave of absence need not formally apply for readmission before returning to Yale. However, they must notify the registrar in writing of their intention to return. Such notification should be given at least six weeks prior to the end of the approved leave. Students on leave are not enrolled in the Yale Health Plan but may continue membership by paying the full cost.

Time off Policy

A. Holidays

It is the policy of the Department of Cellular & Molecular Physiology to allow all students enrolled in the Graduate Program to take the official Yale holidays as follows for the academic year 2008 - 2009:

| | |
|------------------|---------------------------|
| Labor Day | Monday, September 1, 2008 |
| Thanksgiving Day | Thursday, November 27 |
| Recess Day | Friday, November 28 |
| Recess Day | Wednesday, December 24 |
| Christmas Day | Thursday, December 25 |
| Recess Days | Friday, December 26 |
| | Monday, December 29 |
| | Tuesday, December 30 |
| | Wednesday, December 31 |
| New Year's Day | Thursday, January 1, 2009 |

| | |
|------------------|--------------------|
| ML King Jr Day | Monday, January 19 |
| Good Friday | Friday, April 10 |
| Memorial Day | Monday, May 25 |
| Independence Day | Friday, July 3 |

B. Vacation

The Graduate Program in Cellular and Molecular Physiology promotes the opinion that being a graduate student is a full time job. University policy allows the department to determine vacation policies with certain limitations. It is expected that graduate students in Cellular and Molecular Physiology will have per academic year no more than two weeks of vacation beyond the University holidays. For the purpose of U.S.P.H.S. training grant awards, the period between the spring and fall semesters is specifically considered to be an active time of research and research training and is not considered to be a vacation or holiday.

The granting of a vacation request should take into account the progress of the student towards his/her degree objective. The vacation time taken must be mutually agreeable to the student, the Thesis Advisor and DGS and must not conflict with the laboratory responsibilities or the teaching responsibilities of students.

Outside Employment

Graduate students should recognize that the pursuit of a graduate research degree is a full-time activity that may require significant personal sacrifices for a time but which will hopefully pay off in a more rewarding life's work and greater earning potential. Therefore, students are strongly discouraged from engaging in work outside of the department to supplement their University income. However, occasions do occur in which the question of outside work arises.

Any student wishing to engage in outside work to supplement his or her income is encouraged to discuss this matter earnestly with the advisor as well as the DGS before accepting outside employment. The overriding issue is whether the student is making satisfactory progress towards his/her degree objective, and if the proposed outside work will jeopardize that progress. A student who is working outside the department will be held to the same standards as one who is not.

Withdrawal & Readmission

A student who wishes to terminate his or her Program of study should confer with the DGS and the Associate Dean of the Graduate School regarding withdrawal. A student who has withdrawn from the Graduate School in good standing and who wishes to resume study at a later date must apply for readmission. Neither readmission nor financial aid is guaranteed to a student who withdrew. The deadline for making application for readmission is January 2 of the year in which the student wishes to return to the Graduate School.

Tuition

Tuition and Continuing Registration Fees are normally covered by sources of financial aid, as described below. For each Ph.D. student full tuition is charged for four years (eight semesters), except in the case of students who complete all degree requirements (including submission of the dissertation) in less than four continuous years from the date of matriculation in the Ph.D. Program. In such cases, full tuition is charged only through the term in which the dissertation is submitted.

Once the tuition requirement has been met, the student is expected to continue registering until the dissertation is submitted or the terminal date is passed. A continuous registration fee is charged for each term after the tuition requirement has been met.

Students who are considering a leave of absence or registration in absentia should consult the Graduate School to determine how this would affect tuition charges.

Financial Aid

The Department of Cellular and Molecular Physiology attempts to ensure that all its registered Ph.D. students receive adequate financial aid. Because aid levels are budgeted annually, no particular level can be guaranteed for aid in subsequent years. Our expectation, however, is to maintain support at least at the level of the current year.

A. Sources of Support

All students receive support for full tuition and a stipend for 12 months. The stipend for the year 2008-2009 is \$29,000.00.

Sources of outside support frequently utilized by students in the biological and biomedical sciences are listed below:

1) U.S.P.H.S. National Research Service (Institutional) Awards:

These awards (which are also called Traineeships) come from funds provided to Yale by the National Institute of Health, and typically pays \$18,538 toward your tuition of \$31,500. Institutional funds cover the shortfall of tuition. The National Institutes of Health awards pay \$20,772 toward the stipend of \$29,000. The stipend shortfall is covered for the first year by the BBS and later by institutional funds. The department's National Institute of Health institutional training grant normally provides support for the first two years only.

2) Individual Fellowships:

Numerous fellowships, administered by federal or private sources, are available to graduate students in the Biological Sciences. <http://bin.yale.edu/%7Eetb6/fdb-index.html> The Department strongly encourages students to seek external fellowships, as a mechanism for enlarging and strengthening the Graduate Program. Students who obtain external fellowships receive a larger total stipend.

The most popular and attractive fellowships in recent years have been those awarded by the National Science Foundation <http://bin.yale.edu/~etb6/fdb/fellowships/1081049966-17924-71.html> and the National Institutes of Health <http://bin.yale.edu/~etb6/fdb/fellowships/1081049966-17924-70.html>

Individual U.S.P.H.S. National Research Service Awards may provide support to a student for a maximum of four years. Acceptance of these awards obligates the student within two years after completion of doctoral training either (a) to engage in biomedical or behavioral research or teaching in academic, governmental, or private (including industrial) facilities, for a period equal to the period of support, or (b) if suitable teaching or research jobs are not available, to engage in a health-related activity or alternative service, appropriate to the student's education or training, for a period equal to the period of support. Failure to comply with these provisions obligates the student to pay back the sum received for

training.

Application materials for these two Programs are available on the appropriate website.

3) Research Assistantships:

Research grants and contracts awarded by outside agencies to support the research projects of individual faculty members may contain funds for Research Assistantships that can be held by graduate students. This is the usual way by which a Thesis Advisor supports a student, starting in the third year. Research Assistantships are appropriate only for students who are fully engaged in dissertation research.

B. Payment of Stipend:

Checks for U.S.P.H.S. Traineeships and for University Fellowships are paid in equal biweekly installments at the **beginning** of each two-week period and cover the calendar year.

Checks for salaried positions, such as Research Assistantships, are paid at the **end** of the two-week period. Therefore, any student who is transferred from a fellowship to an assistantship will have a one-time *one-month gap* between checks.

C. Taxation

The University does not withhold federal or State of Connecticut income taxes from U.S.P.H.S. Traineeships and University Fellowships. Students are responsible for reporting to the IRS and the State of Connecticut Department of Revenue Services any stipend income that is properly taxable. Students who are not subject to withholding may be required to file quarterly estimates tax payments with the Internal Revenue Service and the State of Connecticut. Failure to file may result in interest and penalty assessments.

When a student is going off a training grant or a University Fellowship to become a Research Assistant, he/she should be certain to file a W-4 form either at the Department Business Office or at the Payroll office, to ensure that the proper amount of Federal and State withholding is taken out of his/her paycheck.

D. Loans

For information on the various types of graduate student loans, consult the Financial Aid Office (HGS; 432-2739). This Office can provide short-term loans during temporary financial crises (for example, if a stipend check is delayed or if a student transfers from a fellowship to an assistantship). The Office also has up-to-date information on federally sponsored student loan plans. For more information, see the website at <http://www.yale.edu/graduateschool/financial/index.html>.

E. Other Expenses

First and second year students in the Department of Cellular & Molecular Physiology receive a maximum of \$300 per year towards the expense of travel to scientific meetings. See the departmental Registrar for proper procedure. Unspent travel allowance of the first year may not be carried over to the second year.

OVERSIGHT

A. *Policy and Personnel*

Educational policy for the Graduate Program in Cellular and Molecular Physiology is made and periodically reviewed by the Graduate Education Committee of the Department and the whole faculty of the Department. Functioning of the Program is supervised by the Director of Graduate Studies (DGS), Emile Boulpaep (B-142 SHM, 785-4055), with the advice and assistance of the Committee on Graduate Education, which consists of:

| | |
|---|-------------|
| Michael Caplan, Interim Chair | (B-116 SHM) |
| Michael Nitabach | (BE-29 SHM) |
| Fred J. Sigworth | (BE-31 SHM) |
| Clifford Slayman | (BE-59 SHM) |
| David Zenisek | (B-114 SHM) |
| Emile L. Boulpaep, Director of Graduate Studies | (B-142 SHM) |

Finances are handled by Joseph DePonte and Bobbie Barrett (B-147 SHM); day-to-day operation of the Program is administered by the Registrar, Crystal Adamchek (B-147 SHM, 737-2215).

B. *Beginning Students*

Each first-year student will be matched with an advisor who is a member of the Physiology and Integrative Medical Biology Track. This faculty member has the responsibility to advise the student who has not yet begun thesis research. Students should discuss their curriculum needs, prospective courses, and relationships to Graduate School, Department, and Track requirements with their individual advisor and the DGS before submitting their Fall and Spring Course Selection online. Students should also feel free to consult with any member of the Committee on Graduate Education about academic and administrative matters, or other problems that may arise.

C. *Advanced Students*

For students who have begun thesis research and have completed the qualifying examination, their Thesis Advisor serves as primary advisor, assisted by the Thesis Advisory Committee. The student must meet with the Thesis Advisory Committee at least semi-annually, unless circumstances dictate more frequent meetings. To facilitate helpful communication between the student and his/her Committee, the departmental Registrar will assist in scheduling the semi-annual meetings.

D. *Thesis Advisory Committees*

The Thesis Advisory Committee has primary responsibility for objectively advising the student on the quality and direction of his/her thesis research, as well as for providing assistance with specific problems.

The Thesis Advisory Committee plays a number of roles:

(1) To provide a source of scientific expertise. A major role of the Thesis Advisory Committee is to provide advice to the student from a variety of perspectives beyond those available in the advisor's laboratory.

(2) To advise students and inform advisors as to general thesis directions. It is not unusual, for instance, for the Committee to recommend a more focused

and less ambitious project than that which is outlined.

(3) To determine when the student is ready to present a prospectus, or to defend the thesis. The section "Dissertation" (on page 22) specifically addresses the latter point.

(4) To provide a critical practice-presentation audience in front of which a student can hone presentation skills.

(5) To evaluate the progress of the thesis, and to provide feedback to the Graduate Education Committee on a semi-annual basis.

Thesis Advisory Committees should consist of 3 (or 4) faculty members; the advisor is not a member of the committee. If the advisor *is not* a primary faculty appointee in the C&M Physiology department, at least one member of the Thesis Advisory Committee must be a primary faculty appointee in the C&M Physiology department. If the advisor *is* a primary faculty appointee in the C&M Physiology department, at least one member of the Thesis Advisory Committee must be a faculty member of the C&M Physiology department.

Each Thesis Advisory Committee should have a chairperson, selected from one of the C&M Physiology faculty members. This person will oversee the conduct of the semi-annual meeting, and provide written feedback to the departmental Registrar for the student's file.

E. Evaluation of Progress

The Department encourages students to maintain frequent informal discussions with the DGS and other members of the Graduate Education Committee, with course instructors, and with their Thesis Advisor and members of their Thesis Advisory Committee. Such informal discussions are an important mechanism to give students an accurate, continuing sense of their progress. In addition, the Graduate School requires the Department to evaluate progress formally at the end of every academic year. For first and second year students, evaluation is based primarily on performance in courses, laboratory rotations, the qualifying examination, and the prospectus. The DGS prepares a summary evaluation and annual meetings with the DGS are scheduled in the spring to discuss progress. At any time that serious deficiencies are discovered, the DGS will provide the student with a written report describing the deficiencies and suggesting possible remedies.

In later years the Thesis Advisor and Thesis Advisory Committee report to the Graduate Education Committee on progress of the student's thesis research (e.g., written report by the Committee Chairperson). Students admitted to candidacy must submit online in May a self-assessment through the annual Dissertation Progress Report (DPR). Students file the Dissertation Progress Report by logging in to the Dissertation Progress Report tool <http://www.yale.edu/sis/dpr/> using their NetID. Subsequently, the Thesis Advisor attaches his/her comments to the Dissertation Progress Report and answers a number of questions regarding the student's progress. Finally, the DGS attaches his comments to the Dissertation Progress Report.

CURRICULUM REQUIREMENTS AND PROCEDURES

A. **Formal Course Requirement**

The first one and one-half to two years of graduate study are normally spent in formal course work, independent reading, and exploratory research rotations, all of which should lay a foundation for the dissertation. The student should consult with the DGS, individual advisors, and members of the Graduate Education Committee to design a suitable Program of courses.

In the first year, each student of the Physiology and Integrative Medical Biology Track will be matched with an advisor who is a member of the Physiology and Integrative Medical Biology Track. This faculty member has the responsibility to advise the student who has not yet begun thesis research. The student is expected to design a suitable Program of courses in consultation with the advisor and the DGS.

Students in the Cellular and Molecular Physiology Graduate Program are **required to take at least six graduate-level courses**, taken in the first year and a half to two years, form a coherent background for the expected area of dissertation research. Three courses are **mandatory**, two other advanced courses are **recommended**, and one is **elective**.

All course selections are made online by the student at the following website:
<http://students.yale.edu/oci/search.jsp>

The Director of Graduate Studies provides online approval of the course selections made on-line by the students.

1. **Mandatory Courses**

The mandatory course work will be taken by all students in the Cellular and Molecular Physiology Graduate Program allowing them to acquire a broad knowledge of interrelated physiological and pathophysiological mechanisms at diverse levels of understanding: whole-organism, system, organ, tissue, cell, subcellular components and molecules.

C&MP 520a: Current Perspectives in Physiology

C&MP 550a: Physiological Systems

C&MP 560b: Cell and Molecular Physiology: Molecular Machines
in Human Disease

<http://info.med.yale.edu/cmphysiol/education/graduate/trackcurriculum.htm>

Students with extensive prior training in systems physiology may be exempted from C&MP 550a in consultation with the Director of Graduate Studies. If a student exempts C&MP 550a, then three courses instead of two must be selected from the recommended courses listed below.

In addition, all graduate students should take:

MB&B 676b/CBIO 676b Responsible Conduct of Research.

This course does not count toward the six-course requirement.

2. Recommended Courses

At least two courses should be selected from the recommended courses listed below. Consult the Online Course Information at <http://students.yale.edu/oci/search.jsp> or the 2007-2008 Yale Bulletin at <http://www.yale.edu/bulletin/html/grad/departments.html> on Programs and Policies of the Graduate School for exact descriptions, course numbers and meeting times.

| | |
|------------------|--|
| BENG 351a | Biomedical Engineering I |
| BENG 355a | Biomedical Engineering Lab |
| BENG 410a | Physical and Chemical Basis of Bioimaging and Biosensing |
| BENG 434 | Biomaterials |
| BENG 445 | Biomedical Image Processing |
| C&MP 710b | Electron Cryo-Microscopy for Protein Structure Determination |
| CBIO 601a | The Molecular and Cellular Basis of Human Disease |
| CBIO 602a & 603a | Molecular Cell Biology and Seminar Molecular Cell Biology |
| CBIO 604 | Systems Cell Biology |
| CBIO 606 | Advanced Seminar Course |
| ENAS 505a | Advanced Engineering Mathematics |
| ENAS 510a | Physical & Chemical Basis of Biosensing |
| ENAS 534a | Biomaterials |
| ENAS 551a | Biomedical Engineering I |
| ENAS 554b | Biochemical Engineering: Biotechnology |
| ENAS 575a | Computational Vision & Biological Perception |
| ENAS 580a | Seminars in Biomedical Engineering |
| ENAS 812b | Molecular Transport & Intervention in the Brain |
| ENAS 821b | Physics of Medical Imaging |
| ENAS 825 | Physics of MRS in Vivo |
| ENAS 836 | Biophotonics & Optical Microscopy |
| ENAS 910a | Adaptive Control & Neural Networks |
| ENAS 913a | Advanced Topics in Medical Imaging and Computer Vision |
| GENE 625a | Basic Concepts of Genetic Analysis |
| GENE 645a | Statistical Methods in Human Genetics |
| GENE 703 | Mouse in Biomedical Research |
| GENE 705a | Molecular Genetics of Prokaryotes |
| GENE 743b | Advanced Eukaryotic Molecular Biology |
| GENE 749a | Medical Impact of Basic Science |
| GENE 777b | Mechanisms of Development |
| GENE 840a & 840b | Medical Genetics Clinical Rotation |
| IBIO 530a | Biology of the Immune System |
| IBIO 531b | Advanced Immunology |
| IBIO 539b | Advanced Immunology Seminar |
| IMED 630a | Practical & Ethical Issues in Clinical Investigation |
| MBIO 685b | Molecular Mechanisms of Microbial Pathogenesis |
| MB&B 420a | Macromolecular Structure |
| MB&B 425a | Basic Concepts of Genetic Analysis |
| MB&B 449a | Medical Impact of Basic Science |
| MB&B 523a | Biological Physics |
| MB&B 600a & 601b | Principles of Biochemistry I & II |
| MB&B 602a | Molecular Cell Biology |
| MB&B 625a | Basic Concepts of Genetic Analysis |
| MB&B 630b | Biochemical and Biophysical Approaches in Molecular and Cellular Biology |
| MB&B 705a | Molecular Genetics of Prokaryotes |
| MB&B 720a | Macromolecular Structure and Biophysical Analysis |
| MB&B 721b | Macromolecular Interactions and Dynamic Properties |

| | |
|------------|--|
| MB&B 743b | Advanced Eukaryotic Molecular Biology |
| MB&B 749a | Medical Impact of Basic Science |
| MB&B 750a2 | Biological Membranes |
| MB&B 752a | Genomics and Bioinformatics |
| MB&B 760b3 | Principles of Macromolecular Crystallography |
| MB&B 765b | Enzyme Mechanisms |
| MB&B 800a | Advanced Topics Molecular Medicine |
| MCDB 500a | Biochemistry |
| MCDB 505a | Molecular Genetics of Prokaryotes |
| MCDB 530a | Biology of the Immune System |
| MCDB 555a | Molecular Basis of Development |
| MCDB 570b | Biotechnology |
| MCDB 600 | Advanced Biological Techniques / Principles of Biochemistry I |
| MCDB 602a | Molecular Cell Biology |
| MCDB 625a | Basic Concepts of Genetic Analysis |
| MCDB 630 | Biochemical & Biophysical Approaches to Biology |
| MCDB 670b | Advanced Seminar in Biochemistry and Genetics |
| MCDB 720a | Neurobiology |
| MCDB 743b | Advanced Eukaryotic Molecular Biology |
| MCDB 752a | Genomics and Bioinformatics |
| NBIO 500b | Structural and Functional Organization of the Human Nervous System |
| NBIO 501a | Principles of Neuroscience |
| NBIO 507b | Cellular and Molecular Mechanisms of Neurological Disease |
| NBIO 509b | Synaptic Organization of the Nervous System |
| NBIO 510a | Introduction to Methods in Cellular & Molecular Neurobiology |
| NBIO 511a | Introduction to Techniques Used in Electrophysiological Analysis at the Cellular Level |
| NBIO 570 | Cellular & Network Dynamics of Sensory & Motor Functions |
| NBIO 610b | Fundamentals in Neurophysiology |
| NBIO 720a | Neurobiology |
| NSCI 501a | Principles of Neuroscience |
| NSCI 507b | Cellular and Molecular Mechanisms of Neurological Disease |
| NSCI 510b | Structural and Functional Organization of the Human Nervous System |
| NSCI 514b | Neurodevelopment & Neuropsychiatric Disorders |
| NSCI 539b | Synaptic Organization of the Nervous System |
| NSCI 540a | Introduction to Statistics |
| NSCI 580a | The MAP Kinase Pathway and Cognitive Disorders |
| NSCI 585a | Stem and Progenitor Cells in the Adult Nervous System |
| NSCI 600a | Experimental Methods in Neuroscience |
| NSCI 720a | Neurobiology |
| PATH 600a | Pathological basis of Human Disease |
| PATH 618b | Clinical and Pathological Correlates in Renal Disease |
| PATH 650b | Cellular and Molecular Biology of Cancer |
| PATH 670b | Biological Mechanisms of Reaction to Injury |
| PATH 680 | Seminar in Pharmacology & Molecular Medicine |
| PATH 690a | Molecular Mechanisms of Disease |
| PHAR 504a | Pharmacology I: Maintaining and Restoring Homeostasis |
| PHAR 504b | Pharmacology II: Interfering Selectively |
| PHAR 508b | Neuropharmacology |

3. Elective Courses

One course is fully elective and is chosen in consultation with the student's advisor. The elective course can be any course in the graduate school or may be an additional selection among the list of recommended courses.

4. Courses Outside Yale

Students may find it useful to take courses and/or workshops outside Yale University, for example at the Marine Biological Laboratory, Woods Hole, Massachusetts, or at Cold Spring Harbor, New York. These would normally occur during the summer term, and students contemplating such courses should apply for the announced scholarships and fellowships. Ordinarily, outside courses cannot *per se* satisfy Department or Graduate School requirements, but they can be a very important part of the individual student's training.

B. Grades

Course grades for regular term courses in the Graduate School are recorded as Honors, High Pass, Pass, and Fail; and for research or seminar courses, as Satisfactory or Unsatisfactory. The minimum requirement of the Graduate School for course performance is a grade of **Honors** in two regular term courses, which *must* be met by the end of the 2nd year (see Graduate School *Programs and Policies*). Tutorials, informal seminars, research courses, and term courses having fewer than 3 credit hours cannot be used to fulfill the Honors requirement.

C. Laboratory Rotations

Each student will complete laboratory rotations in three different laboratories during the first year. Eventually a fourth rotation would be possible during July and August at the end of the first year providing consultation and approval by the DGS. The rotations should be chosen to include and surround the subject area in which each student expects to do his/her dissertation research. Rotation laboratories may be anywhere in the BBS. However, at least one rotation should be in the laboratory of a C&MP faculty member.

The purpose of the laboratory rotation is to provide an informed choice of advisor and dissertation research and also to create natural alternatives in case the initial choice proves unworkable. In addition, the rotations can broaden the student's background of practical experience and research insights.

Rotations run in 3 month intervals.

| Rotations | Dates | Presentation |
|-----------|--------------------------------------|--|
| First | October 1, 2008 to December 31, 2008 | January 12, 2009 |
| Second | January 5, 2009 to March 31, 2009 | April 6, 2009 |
| Third | April 1, 2009 to June 30, 2009 | First Research In Progress – Fall 2009 |

At the end of each rotation the first-year students shall describe their progress at a "Research in Progress" session and discuss their data with other students, and with interested faculty. At the end of each rotation the head of the laboratory shall provide a written evaluation to the DGS and the student.

D. *Choosing a Thesis Advisor*

Students normally select a laboratory for dissertation research from one of their rotation labs. The student must fill out a Thesis Advisor Selection Form (available from your departmental Registrar) for signature by the Thesis Advisor and the DGS no later than July 1 of the first year. Students are expected to begin in the laboratory of the selected Thesis Advisor no later than July 1. In the case of a 4th rotation, the student should start his/her research in the chosen laboratory no later than August 15 of the first year. The Thesis Advisor provides mentoring, guidance and intellectual support, meeting with the student as often as possible. The advisor will provide substantial input to the aims and experimental approaches for the project.

E. *Second Year Activities*

Course work may continue in the third semester, and possibly into the fourth semester. In the third semester, students will review their overall educational plans and decide on the areas for directed reading in preparation for the Qualifying Examination. Ideally, the qualifying examination may be taken in the third semester but must be taken before the end of the fourth term.

F. *The Qualifying Examination*

C&M Physiology graduate students must complete the qualifying examination by the end of the fourth term, but in no case will the deadline be extended beyond the 5th term of study. The purpose of this examination is to ensure breadth and depth of a student's preparedness to pursue thesis research. The examination consists of three parts; a directed reading period, written research proposal, and formal examination. In consultation with the Director of Graduate Studies, the student selects two "reading faculty" members and one "writing faculty" whose own expertise is relevant to the anticipated thesis topic. At least one of these faculty members should be a primary faculty member of the C&M Physiology department.

1. *Directed Reading*

With each of the two "reading faculty" the student undertakes a directed reading period in a selected area of physiology. The readings should challenge the student to broaden and deepen comprehension of fields related to the chosen research area. At the conclusion of each reading period the student prepares written answers to examination questions submitted by the "reading faculty" member.

2. *Written Research Proposal*

The student prepares a research proposal (following the Qualifying Exam Prospectus Outline guidelines found on page 20 of this handbook) in collaboration with the "writing faculty" member. The role of this faculty member is to provide the student with guidance in effectively organizing and expressing the background, aims and methodology of a research proposal. The written proposal provides the focus for a formal examination.

3. *Formal Qualifying Examination*

The Thesis Advisor and both reading and writing faculty members should attend the formal Qualifying Exam.

A public presentation of the proposal by the student is followed by an oral examination session by the Qualifying Examination Committee consisting of the "reading" and "writing" faculty members plus at least one additional C&M Physiology faculty member. At least one member of the examining

committee should be a member of the departmental Graduate Education Committee, most often the Director of Graduate Studies. The student is expected to demonstrate a comprehensive understanding of the scientific context and experimental strategy of the proposal and topics covered in the reading periods. Questioning during the examinations should extend beyond the limits of the proposal as necessary to determine the strengths and potential deficiencies of the student's preparation.

After the student's public presentation of the proposal and questioning, the usual procedure is for the Qualifying Examination Committee to meet without the student to discuss the proposal and assess the student's overall performance. When the student returns, the Qualifying Examination Committee reports its evaluation and transmits specific advice, feedback and recommendations.

Overall Qualifying Exam Timeline

The Qualifying Examination must be completed by the end of the fourth term, May 31. Extensions must have prior approval of the DGS. A timeline for the exam is as follows:

- Choose reading and writing faculty and designated chairperson for thesis advisory committee
- No later than the beginning of fourth term: meet with advisor and DGS to discuss the exam
- No later than the beginning of fourth term: meet with "reading faculty"
- Write proposal in collaboration with the "writing faculty"
- Hand in proposal to Committee Members, Advisor, DGS and Graduate Program Registrar
- No later than the end of fourth term (May 31) --- oral examination

Qualifying Exam Research Proposal – Outline

Title Page (includes committee members & roles)

Introduction // Project Summary

- A. Specific Aims (State the specific purpose of the research proposal and the hypotheses to be tested)
1., 2., 3.
- B. Background and Significance (Sketch briefly the background to the proposal. State concisely the importance of the research described in the proposal by relating the specific aims to broad, long-term objectives)
1., 2., 3.
- C. Preliminary Results
1., 2., 3.
- D. Experimental Plan
1., 2., 3.
 - a. Research Design and Methods
 - b. Possible Outcomes
 - c. Limitations and Alternatives
- E. Future Directions
- F. References

G. Thesis Advisory Committee

It is anticipated that, following their participation in the qualifying examination, the “reading” and “writing” faculty may continue as the student’s Thesis Advisory Committee. At least one of these faculty members should be a *primary* faculty member of the C&M Physiology department.

H. Dissertation Prospectus

Yale Graduate School requires all students to submit a written outline of proposed thesis work. (Guidelines for this are contained in the Graduate School Programs and Policies. A copy of which can be found online at <http://www.yale.edu/graduateschool/academics/forms/dissbook.pdf> . For the Program in Cellular and Molecular Physiology, a written synopsis of the thesis proposal as formulated and approved at the time of the qualifying examination, is usually submitted to the Graduate School as the student’s Dissertation Prospectus.

I. Later Years

From the third year onward, students will spend most of their time on the dissertation research, but should continue to take advantage of relevant advanced courses and seminars as they are offered. A meeting with the members of the student’s Thesis Advisory Committee will be held each semester.

The first meeting of the Thesis Advisory Committee will occur at least by the fall semester of the third year (i.e., before December 31). Prior to the first meeting, the student should prepare an outline of the proposed research, along with background and references. The outline should be distributed to the Committee members before the meeting as the basis for a brief oral presentation to, and discussion with, the Thesis Advisory Committee. Subsequent Thesis Advisory Committee meetings should occur twice a year at six month intervals (i.e., before June 30 and December 31).

The format of the semi-annual meetings will be as follows:

- (1) Project presentation and discussion (about 45 minutes). The advisor is invited to attend but is expected to refrain from joining the discussion. An important aspect of these presentations is that the student develop skills of “thinking on his/her feet” and demonstrate an ability to develop a project with a degree of independence. (*Advisors who cannot refrain from joining this discussion should absent themselves from the project presentation. Chairpersons are requested to intercede in this regard if necessary.*)
- (2) Discussion with the student, advisor absent (5-15 minutes).
- (3) Discussion with the advisor, student absent (5-15 minutes).

The Registrar will provide to the committee chairperson a Thesis Advisory Committee Meeting Report form before each meeting. The chairperson will complete the report, detailing an evaluation of the student’s progress thus far, and return the signed form to the Registrar who procures the DGS signature and will retain the form in the student’s file.

J. Teaching Requirement

Teaching experience is an important part of graduate training in Cellular and Molecular Physiology. Students are expected to assist in teaching two course-semester and at least at the level of Teaching Fellow II. The list of available teaching fellowship positions in graduate and undergraduate-level courses is updated every year by the BBS. First-year students are not allowed to teach. The

BBS and the Department of Cellular & Molecular Physiology requires that **each** student take the "Teaching At Yale Day" seminar – offered this year on September 2, 2008 – before fulfilling their Teaching Requirements. A good resource for teaching guidelines can be found in the Becoming Teachers Handbook online at <http://www.yale.edu/graduateschool/teaching/handbook.html>.

K. Admission to Candidacy

The Graduate Education Committee will admit a student to candidacy when all the following pre-dissertation requirements have been fulfilled:

- Course Requirement
- Honors Requirement
- Qualifying Examination
- Dissertation Prospectus
- Teaching Requirement
- Satisfactory Thesis Advisory Committee Reports

Students admitted to candidacy must submit online in May, a self-assessment through the annual Dissertation Progress Report (DPR)

<http://www.yale.edu/sis/dpr/>.

L. Dissertation

During the last 9-12 months of thesis research, the student should maintain especially close communication with his/her advisor and Thesis Advisory Committee, in order to set out the content and composition of the thesis efficiently.

At least two months before he/she intends to petition the Graduate School for the Ph.D. degree, the candidate should inform the DGS, who then asks the Thesis Advisory Committee to provide a list of readers, including the outside reader, whom the DGS will officially invite. The dissertation will be judged by a committee of at least three readers, usually the members of the Thesis Advisory Committee (but **not** the Thesis Advisor), and subsequently by one reader from outside Yale University.

The dissertation must describe original research making significant new contributions to knowledge. Its form and content should be of the quality expected of papers submitted to major scientific journals. The Graduate School should be consulted for detailed instructions on the format of the dissertation. The dissertation office puts out a handbook with detailed format description (including forms) that is available from your Departmental Registrar.

1. Pre-defense

Prior to defending the thesis, the student will supply copies of the thesis to the Thesis Advisory Committee, and hold a pre-defense oral presentation before the Thesis Advisory Committee and the primary faculty members of Cellular and Molecular Physiology. A complete draft of the thesis will be provided to Committee members at least **two to three** weeks before the pre-defense, and two extra copies will be made available to interested faculty through the Departmental Registrar; a copy will also be sent to the outside reader at this stage. This meeting includes a full "practice-run" of the defense presentation. It is intended to iron out rough spots, and to identify important problems in the presentational aspects of the thesis.

At the conclusion of the pre-defense meeting, the Thesis Advisory Committee will decide whether the thesis is ready to be formally defended, with anticipated revision if necessary. If so, the defense date can then be

announced.

Individual Thesis Advisory Committee members will note any problems identified at this meeting (briefly) on paper. The outside reader may have communicated suggestions as well. The student should make requested revisions in the thesis, to be completed preferably by the time of the defense.

2. Defense

The actual defense date should be tentatively scheduled well in advance and tentative arrangements made with the outside reader (by the DGS). Announcements of the defense date will not be made, and the plane flight for the reader will not be guaranteed, until the Thesis Advisory Committee has given the go-ahead at the conclusion of the pre-defense. This places a practical *minimum* of two weeks between the pre-defense Committee meeting and the formal oral defense.

The oral defense is an open, public presentation before the readers, the faculty of the Department, other students, and interested guests. Following the usual period of general questioning, the other students and guests are asked to leave, and discussion continues among the student, the readers, and the Department faculty. When that discussion is finished, the student is asked to leave. The faculty then deliberates and votes whether to accept the thesis (with or without specific alterations), or to remand it to the student for further work. That judgment is based on the quality of the oral presentation, the student's ability to defend his/her arguments, and the readers' verbal evaluation of the written thesis.

When the vote is to accept the thesis, the student formally petitions the Graduate School for the Ph.D. degree. The Petition includes:

- (a) Payment of a small fee;
- (b) One unbound copy of the completed thesis (now containing all changes requested by the readers and faculty) on acid-free paper – this copy the Graduate School will have bound for the library copy;
- (c) If necessary final-version softbound copies, which the Graduate School will send to the Readers, along with the formal Reader's Report. This Petition must be submitted by **October 1, 2008** (for a December 2008 award of degree), or **March 16, 2009** (for a May 2009 award).

Meanwhile, the list of names and addresses of the readers will be sent to the Graduate School Registrar by the DGS. The Graduate School solicits a Reader's Report from each reader, on the basis of the final version of the thesis. The Readers return copies of these reports to the Graduate School Registrar, who forwards a copy of the reports to the DGS, who then certifies the Department's approval of the Ph.D. award.

Before departing, the student should provide three unbound copies of the completed thesis to the Department Registrar (on acid-free paper), who will have them hardbound. One each hardbound copy is for the student, the Thesis Advisor, and the Department.

M. M.D.-Ph.D. Students

Questions concerning the M.D.-Ph.D. Program should be taken to the director of that Program, James Jamieson (214 ESH, 785-4403). Special curriculum needs of individual students may also be discussed with the DGS/DMS Emile L. Boulpaep (B-142 SHM, 785-4055).

Specific Requirements for M.D.- Ph.D. students:

- a. Students must take at least three graduate-level courses for a grade in addition to the courses that are already part of the Yale Medical School M.D Program.
- b. One C&MP course is required: preferably C&MP 560b, Cellular and Molecular Physiology: Molecular Machines in Human Disease. In addition, M.D.-Ph.D. students in Cellular and Molecular Physiology must take two recommended graduate-level courses outside the regular medical school curriculum, subject to approval by the DGS.
- c. Two grades of Honors. Graduate courses that are part of the Yale Medical School M.D Program and taken for a grade may be counted towards the Honors fulfillment.
- d. Two rotations in two different laboratories over one summer. Each rotation should last five weeks.
- e. One semester of teaching at least at the level of Teaching Fellow II.

General Requirements for M.D.- Ph.D. students:

Policies with regard to Thesis Advisor, Qualifying Examination, Thesis Advisory Committee, Dissertation Prospectus, Admission to Candidacy, Dissertation pre-defense and defense are the same as described above for Ph.D students.

N. Master's Degree

Although the Department does not admit students for terminal master's degrees, the rules of the Graduate School provide for optional awarding of a Master degree during the progress of graduate study.

A student leaving the Ph.D. Program after one year of residence in good standing, and having successfully passed at least four semester courses, including two Honors grades, and three successful laboratory rotations, may elect to receive a terminal Master of Science (M.S.) degree upon withdrawal from the Departmental Program.

Any student who has fulfilled all the requirements for the Ph.D. except the prospectus, teaching requirements, and dissertation may elect to receive the Master of Philosophy (M.Phil.) degree, normally at the end of the second year. Once the Ph.D. has been awarded, the M.Phil. is of little significance. However, if for personal reasons any eligible student wishes to obtain the M.Phil. degree, he/she may download the application online at <http://www.yale.edu/graduateschool/academics/forms/degreePetition.pdf> or see the department Registrar (SHM B147).

O. *Publications*

The Graduate School requires that subsequent publication of thesis results as papers should include a statement to the effect that the paper(s) is(are) based upon "a dissertation submitted to fulfill in part the requirements for the degree of Doctor of Philosophy in Yale University".

Training grants also require the following statement to be included in publications: "This investigation was supported by National Research Service Award no. _____, from the National Institute of _____.

Other grants, which the student has received (e.g., NSF, American Heart Association), and supporting faculty research grants, should be similarly acknowledged. The departmental Business Office can supply the explicit grant information.

P. *Residence Requirement and Time Limit*

Students are required by the Graduate School to be in residence in the New Haven area for a minimum of three academic years. However, all Ph.D. candidates are charged four years of full tuition. Six years is normally sufficient for completion of the Ph.D., and this is the normal maximum period of enrollment. Both the Department and the Associate Dean must approve an exception to the residence requirement. The maximum time may, if the Associate Dean gives approval, also be extended by special petition, but only if the student is making good progress and if all requirements for the Ph.D. (including submission of the Prospectus) have been fulfilled, except for completion of research and submission of the thesis.

MISCELLANEOUS INFORMATION

A. *Calendar Synopsis—Academic year 2008-2009*

Year 1

| | |
|----------------|---|
| August 28 | Graduate School Matriculation Ceremony |
| August 29 | Orientation and Registration in the Department |
| September 3 | Fall term classes begin |
| November 21-30 | Fall recess – No classes |
| December 19 | Fall term ends |
| January 12 | Spring term classes begin |
| January 12 | Spring term Registration begins |
| March 6-22 | Spring recess – No classes |
| May 12 | Spring term ends |
| By July 1 | First year students choose advisor & department |

Year 2

Additional courses

Choose reading and writing faculty for qualifying examination

Prepare for qualifying examination

Take qualifying examination by May 31

Continue research

Meet with Thesis Advisory Committee at 6 month intervals following Qualifying Examination date (before June 30 and before December 31)

Years 3 and beyond

Fall and Spring Meet with Thesis Advisory Committee

(These meetings should be scheduled automatically (before June 30 and before December 31))

B. *Other Training Activities*

All students are expected to participate in the following training activities for the entire time they are in the Program, whether as first year students in the Physiology and Integrative Medical Biology Track or in following years as students in the Cellular and Molecular Physiology Graduate Program.

- “Research in Progress Reports” on Mondays twice monthly.
<http://www.info.med.yale.edu/cmphysiol/education/graduate/requiredactivities.htm>
- Weekly “Seminar in Cellular and Molecular Physiology” on Thursdays

- Journal Club and laboratory meetings of the laboratories in which they are rotating or doing research
- Annual Retreat in Cellular and Molecular Physiology
- A course on ethics in research: e.g. MB&B 676b/CBIO 676b Responsible Conduct of Research

C. **Lectures, Seminars and Journal Clubs**

In addition to their formal courses and seminars, most graduate students will find on the Yale campus a large number of relevant research seminars, journal clubs, retreats, and symposia. Students should form the habit of watching the following:

C&M Physiology Departmental website <http://www.info.med.yale.edu/cmphysiol>

YSM Event Calendar <http://info.med.yale.edu/calendar/>

The Yale Weekly Bulletin & Calendar <http://www.yale.edu/opa/yb&c/index.html>

Departmental bulletin board (located on the first floor B wing of SHM) where all seminar announcements received in the Department Office are posted.

The Department itself sponsors several events. Students are expected to attend departmental seminars, Research in Progress, and at least one journal club on a regular basis.

- 1) **Departmental Seminar:** This is held weekly: Thursday at 4:00 p.m., in the Cellular and Molecular Physiology Seminar Room (B-145 SHM), and is usually given by a visiting scientist. The choice of topics and speakers is determined by general interest; students are invited to make suggestions.
- 2) **Research in Progress:** Alternate Mondays at noon in the Cellular and Molecular Physiology Seminar Room (B-145 SHM). Two presentations, 30 minutes each, by students or postdoctoral fellows or associates.
- 3) **Departmental Retreat:** This is a very popular meeting held off-campus. It consists of lectures, posters, much informal discussion, and good food and drinks. The purpose is to bring the department together for in-depth discussions of research going on in the Department. This year's retreat will be held at the Water's Edge Resort & Spa (located in Westbrook) on November 1, 2008. All students are expected to attend.

Also, three other significant annual scientific events are sponsored by the Department:

- 4) **Louis H. Nahum Lecture:** Named in memory of a former member of the department, this is a lecture in the general area of cardiovascular physiology.
- 5) **Peter F. Curran Lecture:** Named in memory of a distinguished biophysicist, this is a lecture in the area of membrane transport processes.
- 6) **Robert Berliner Lecture:** Named in memory of a distinguished member of the department and former Dean of the School of Medicine, this is a lecture on renal physiology.

D. **Libraries**

The main libraries around the Yale campus, which are of interest to students and faculty in Biological Sciences, are:

- 1) Medical Library (Sterling Hall of Medicine). Hours: Monday-Thursday, 8:00 am to midnight; Friday, 8:00 am to 10:00 pm; Saturday, 8:00 am to 8:00 pm; Sunday, 11:00 am to midnight (785-5354)

- 2) Kline Science Library (C floor of Kline Biology Tower). Hours: Monday - Thursday, 8:30 am to midnight; Friday - Saturday, 8:30 am to 10:00 pm; Sunday, 11:00 am to midnight (432-3439)

Both of these libraries are tied to Interlibrary Loan and can obtain volumes (or photocopies) of individual articles from other Libraries throughout the United States. Rarely used books from the Yale Libraries--including very old journal volumes, certain foreign-language journals, etc.--are stored in the Seeley Mudd Library (38 Mansfield St., in front of Ingalls Rink; 432-3203). They can be retrieved by courier on request to the other libraries but are accessed much more quickly in person. [Photocopying at Mudd Library is by coin-operated machine or by Sterling Library keycard.]

E. *Plagiarism*

The department of Cellular & Molecular Physiology upholds the University's policy on plagiarism which can be found on the graduate school's website at http://www.yale.edu/graduateschool/academics/integrity_plagiarism.html. Additionally, the BBS provides a booklet entitled "Sources Their Use and Acknowledgement" from Dartmouth College (1998), Hanover, New Hampshire. This booklet can also be found on the Dartmouth College website at <http://www.dartmouth.edu/~sources/contents.html>.

F. *The McDougal Graduate Student Center*

<http://www.yale.edu/graduateschool/mcdougal/>

The McDougal Center is a gathering place where graduate students, postdoctoral fellows, faculty and staff from across the campus regularly meet and share interests. It offers services, Programs, information resources and an informal place to relax or study. Its web site 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.

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 with a stage, seating for up to 100, and advanced video and sound projection equipment. The Program Room (119 HGS) 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 office at 432-BLUE (123 HGS) or filling out a request on line.

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.

G. *Photocopying*

First year students can obtain a copycard keyed for the Medical Library photocopiers from the track registrar. Photocopying done by rotation students

related to research in an advisor's laboratory is paid by research funds of the advisor.

All campus libraries now have photocopying machines for use on either a cash or charge basis. For charging, everyone is required to have a valid Yale I.D. card and either a valid departmental account number or a local key-card. Different key-cards are used at each library. Students should use the charge account number on their stockroom charge card, which can be obtained from Bobbie Barrett (B-147 SHM). For non-library materials, a more convenient copier is available in the business office for members of the department. An access code number is needed for the copier in the business office.

The Libraries will also copy documents for you on request, but cost and time rise quickly in elaborate jobs. Be sure to inquire about this point before submitting a request for photocopying to one of the Libraries.

Bulk copying can be done by the Copy Center, which is located at SHM IE-96. For printing and copying jobs, documents saved as PDF files can be submitted on a Windows formatted disk. Alternatively, files can be printed directly by the Copy Center machines over the Yale network.

H. Campus Computing

Information Technology Services (ITS) <http://www.yale.edu/its> is located at 175 Whitney Avenue (432-9000). It includes computing, telecommunications, audiovisual, printing, and copying services. ITS operates campus computer clusters, provides Computing Assistants in clusters and residences and offers training courses and computer classrooms. The ITS website (listed above) provides information on all of its services.

I. Departmental Facilities

DEPARTMENTAL NETWORK SERVICES

Local network hardware support and e-mail services are coordinated by Henrik Abildgaard in the departmental shop, SHM BE-43. For students working in primary C&MP laboratories (BE and first-floor B wing of SHM) Henrik arranges network connections and support.

WORKSTATIONS

The Department of Cellular & Molecular Physiology has provided a graduate student lounge, located in B-120A SHM, with 2 PC's and 1 MAC. These computer workstations are available *only* for departmental graduate students. A sign on and password are needed and may be obtained through your departmental Registrar.

J. Graduate Student Senate

Each graduate department in the University may appoint one student to the Graduate Professional Student Senate (GPSS). This body discusses University-wide aspects of graduate and professional student affairs and makes recommendations to the deans of the graduate and professional schools, as well as the offices of the President, Secretary and Provost of the University, the Association of Yale Alumni, and the Yale Corporation. Through the GPSS, students may hold positions on various university committees, including the committee for investor responsibility and the committee on racial and ethnic harassment. The GPSS also runs the Graduate Professional Student Center at Yale (GPSCY), and is responsible for all social and educational Programming offered at the GPSCY.

The Senate meets twice monthly in the GPSCY (204 York St., 432-2638), and its

agenda may be obtained from the Recording Secretary. For further information, see the GPSS web page at <http://www.yale.edu/gpss> .

K. *Assembly of Graduate Students*

The Assembly of Graduate Students is a policy organization of Yale students in the Graduate School of Arts and Sciences. The purpose of the Assembly is to assure that graduate students can be represented and can participate more effectively in Graduate School policymaking about matters relevant to their education and their lives as students.

It provides a mechanism for communication and deliberation of students with each other and between Yale graduate students, faculty, undergraduates, administrators and other members of the university community. Formal authority of the Assembly includes appointing graduate students to the various committees of the graduate school and meeting regularly with the Dean and others on a wide range of issues.

Each department or degree-granting Program in the Graduate School is guaranteed a minimum of one representative. The C&MP student representative for 2008-2009 is **Jennifer Long**. The Assembly meets at least once a month during the academic year. For additional information as well as current topics under consideration by the Assembly, visit their web site at <http://www.yale.edu/assembly>.

L. *Grievance Procedures*

Situations can arise in which a student disagrees strongly with a decision made about him/her, or where he/she feels wrongly treated by someone within the University. Several courses of action are open. Advice or assistance may be asked of the student's Advisor, the Committee on Graduate Education, the DGS, or the Department Chairman. Alternatively, if the matter is one that should not be raised within the Department, other University agencies can help. The Dean of the Graduate School (112 HGS, 432-2733) is one. Another is the Deputy Provost (137 HGS, 432-4448), who is especially concerned with problems relating to equal rights for minorities and for women.

Within the School of Medicine, the latter concerns are also specifically addressed by the Ombudsperson and Director of the Office for Women in Medicine (L-202 SHM, 737-4100).

For more information, please see the *Graduate School Bulletin, Programs and Policies* or go to <http://www.yale.edu/graduateschool/academics/grievances.html>

M. *Yale Health Plan*

The Yale Health Plan is a prepaid comprehensive health care Program located at the University Health Services Center, 17 Hillhouse Avenue. All Yale graduate students enrolled at least half-time are automatically members of the YHP and are eligible for ambulatory care services and use of the infirmary at no additional charge.

Yale requires that students have hospitalization coverage as well. Students who do not have hospitalization from another source must purchase Yale Health Plan hospitalization coverage. For the current fiscal year, this coverage costs \$1,166 which is included as part of the regular financial aid.

For a separate monthly fee, students may purchase a supplemental Major Medical policy to extend the basic benefits. Major Medical coverage must be renewed each year.

Students may enroll their spouses and dependents under age 19 by filing an application with the YHP. A fee is applied through the Bursar's Office. Only those spouses and dependents specifically enrolled are eligible to receive YHP benefits and service.

Members of the Yale Health Plan use the University Health Services for both routine and emergency outpatient care. The YHP encourages its members to select a personal physician from its full-time primary care medical staff. Appointments are scheduled weekdays between 8:30 am and 5 pm. Emergency care is available 24 hours a day at 17 Hillhouse Ave. on a walk-in basis (432-0123).

In addition to primary care and emergency care, a full range of specialty services are available, including Allergy, Dermatology, EN&T, General Surgery, Mental Hygiene, Obstetrics and Gynecology, Ophthalmology, Orthopedics, Optometry, and Urology.

For students entering Yale University, membership begins on the day of registration. Prior to registration, a complete medical examination form and health report must be submitted to the YHP. If these forms are not completed, the service will be provided and a \$25 charge will be billed.

Further information about the Yale Health Plan may be obtained from Health Plan Member Services (information), 17 Hillhouse Avenue (432-0246) or at <http://www.yale.edu/uhs/>.

N. Dining Facilities

Several University dining facilities (hours of operation can be found at: <http://www.yale.edu/dining/options/hours.html#jump26>) are maintained for the convenience of students, faculty, and staff. In the Medical School area, these include:

- 1) Marigolds, (785-4685) located in the Edward S. Harkness Dormitory and Apartments (367 Cedar Street, adjacent to SHM). Marigolds is a contemporary eatery, which offers traditional as well as upscale cuisine. It is open 7:30 am to 7:00 pm on Monday through Friday.
- 2) The cafeteria and deli in Yale-New Haven Hospital are open for breakfast, lunch, and dinner seven days a week. A valid Yale I.D. enables you to receive a "staff discount" at the cashiers.

3)

O. Shuttle Buses

The Yale Shuttle Bus is a cross-campus service operated by the University for those who need to move between the Medical School, the Central Campus, and the Science Area. The Shuttle is free with a University I.D. card. The Daytime Shuttle operates from 7:20 a.m. to 6:00 p.m. Monday through Friday. It does not run on weekends or employee holidays, with the exception of Good Friday. The bus loops around the campus along four different set routes. Schedules and routes are subject to change and are posted on the web at <http://www.yale.edu/parkingandtransit/shuttle/>

P. Night-Time Transportation

The Yale University Parking Service operates free evening transportation service. The Nighttime Shuttle runs 7 nights a week, 359 days a year (every night of the

year except Thanksgiving, Christmas Eve, Christmas night, New Year's Eve, New Year's night, and July 4th). Between 6 pm and 7:30 am 359 days a year, any person with a valid Yale ID card can obtain free transportation on the Yale Nighttime Shuttle from Yale buildings to residences, from residences to Yale buildings within the service boundaries. This is NOT a residence to residence service.

There are two ways to use the Nighttime Shuttle.

- 1) Go to one of the stops listed on the schedule and wait for the next Shuttle. A bus passes each stop every 15 minutes.
- 2) 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 – call 432-9255. Be prepared to show your Yale I.D. For more information, check their website at http://www.yale.edu/minibus/gen_info.htm

In addition, the University Police provide transportation 24 hours a day for medical emergencies to the University Health Services.

Q. *Parking*

Parking permits are available for a fee to Yale students. For information on submitting an application for a permit go to the Parking Services website at <http://www.yale.edu/parkingandtransit/parking/forms.htm> Available parking space is limited. All assignments are made on a first-come, first served basis. Contact the Parking office at 203-432-9790 for a parking application.

R. *Security*

All members of the Yale community are alerted to the fact that Yale is not immune to crime, property loss, or even personal injury. Individuals are urged to walk in groups, or request to be escorted by the Student Patrol Service, which has been set up by the University Police to provide for safety on the streets and in the parking lots. These patrolmen are easily identified by their orange vests and police radios. Night-time transportation is available for students working late in the evenings (see above).

S. *The I.D. Card*

During initial registration, incoming students receive an I.D. card with their registration packets. Other students who need I.D. cards (in the case of lost or stolen cards) should report to the Medical School I.D. Center SHM CE-1A (785-5555) <http://www.yale.edu/sfas/idcard/index.html#features>.

T. *I.D. Card Access and Keys*

Numerous entrances to Medical School facilities are controlled by card readers. The doors are opened by swiping an authorized I.D. card through the card readers. The proper access authorizations are Programmed at the time the I.D. card is issued. The Department of Cellular and Molecular Physiology provides I.D. card access to the student office and tea room in the Department. Students on lab rotations or advanced students may require keys for off-hour access to particular laboratories. The Department Registrar and Business Office can arrange for keys to be issued.

U. Mail

Mail is distributed to mail boxes in the business office. Each student has a named mail slot.

V. Telephones

Telephone communication at Yale presently operates on two separate exchanges: one for the Medical School-Hospital area and one for the rest of the campus. Calls within the Medical School-Hospital area and the rest of the campus are made by dialing the last 5 digits. Calls made outside the campus require 9, then the 7-digit number. You should consult the campus directory for dialing long distance.

W. Recreational Opportunities

A wide variety of recreational opportunities are available at Yale and in the New Haven area.

- 1) *University Athletic Facilities* are available for standard fees. They include:
 - a) Payne Whitney Gymnasium (70 Tower Parkway; 432-1444) for sports, dance, exercise, and swimming.
 - b) Ingalls Skating Rink (73 Sachem Street; 432-4771) for ice-skating sessions between mid-October and April.
 - c) The Yale Golf Course (Ray Road; 432-0895)
 - d) Cullman Tennis Courts (for indoor tennis, late October through late April) and outdoor courts (Derby Avenue; 432-0693).
 - e) The McNay Family Sailing Center (Short Beach, Branford; 488-9330 – formerly known as the Yale Sailing Center), which has 420's for use and offers sailing lessons.
- 2) *At the Medical School*, the Department has softball and basketball teams that participate in a very informal University league.
- 3) *Musical Opportunities* include:
 - a) The Yale Symphony orchestra, made up of students from all levels within the University, and the Philharmonic Orchestra, made up of School of Music students. Most concerts are at Woolsey Hall (College & Grove St.). Tickets are \$2 for Yale students (call 562-5666 for tickets)
 - b) A variety of singing groups (for information, call the Music Department at 432-2985).
 - c) Yale School of Music sponsors frequent recitals, which are listed in the Weekly Bulletin & Calendar. Admission is often free.
 - d) New Haven Symphony and the Woolsey Hall Concert Series. Tickets are available singly or in series at the New Haven Symphony – Administrative Offices, 70 Audubon 3rd floor (865-0831)
 - e) Music on the Green concerts in Summer begin at 6:00pm and are over by 7:30pm. Admission is free. Friday – movies, Saturday – concerts.

4) *Theatrical Productions* are presented during the year by

- a) The Yale Repertory Theatre
Chapel & York Street, 432-1234
- b) The Long Wharf Theatre Company
222 Sergeant Drive, 787-4282
- c) The Yale Cabaret
217 Park Street, 432-1566
- d) The Shubert Theater Box Office
247 College Street, 562-5666
- e) The Palace Theater
206 College Street, 789-2120

5) *University Museums*, worth many visits:

- a) The Peabody Museum of Natural History
Sachem Street & Whitney Avenue 432-5050
Free Admission with Yale I.D.
Hours: Mon-Sat 10-5, Sun 12-5.

This museum contains extensive research collections in geology, anthropology, and ornithology. Displays include minerals; birds of Connecticut; fossil plants, fish, birds, reptiles, and mammals; and especially the great dinosaurs. For students coming to Yale from great distances, this museum provides an excellent study of the natural history of New England.

- b) The Yale Art Gallery
1111 Chapel Street 432-0600
Free admission
Hours: Tue-Sat 10-5, Thurs 10-8, Sun 1-6.

The Gallery includes wonderful collections of 17th, 18th, and 19th century paintings and furnishings. It also offers free Sunday concerts, films, and lectures.

- c) The British Art Center
1080 Chapel Street 432-2800
Free admission
Hours: Tues-Sat 12-5, Sun 12-5.

This center contains a collection of British paintings, drawings, prints, rare books, and sculpture assembled over the past 35 years by Paul Mellon. It also offers a gift shop and free Saturday films.

Schedule of Academic Dates and Deadlines 2008–2009

Fall Term, 2008

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| Monday, August 25 | New student orientation week begins. |
| Wednesday, August 27 | SPEAK Test for new international students in Ph.D. Programs. |
| Thursday, August 28 | Matriculation ceremony. |
| Friday, August 29 | 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. |
| Monday, September 1 | Labor Day. Administrative offices closed. |
| Tuesday, September 2 | Registration for returning students begins. Orientation for all new Teaching Fellows. |
| Wednesday, September 3 | Fall-term classes begin, 8.30 a.m. |
| Friday, September 5 | Final day to pick up registration materials from academic departments. |
| Friday, September 12 | 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 17 | Fall-term On Line Course Selection (OCS) ends. Final day for registration. A fee of \$25 is assessed for course schedules accepted after this date. |
| Friday, September 26 | 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>) |
| Wednesday, October 1 | Final date for the faculty to submit grades to replace Temporary Incompletes (TI's) awarded during the 2007-2008 academic year. Due date for dissertations to be considered by the Degree Committees for award of the Ph.D. in December. Final day to file petitions for degrees to be awarded in December. |
| Friday, October 24 | Midterm. Final day to add a fall-term course. 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> |

Teaching appointments will not appear on the transcripts of students who withdraw from the assignment on or before this date.

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| Friday, October 31 | Final day to change enrollment in a fall-term course from Credit to Audit <i>or</i> from Audit to Credit. Final day to withdraw from a fall-term course. |
| Monday, November 3 | Readers' Reports are due for dissertations to be considered by the Degree Committees for award of the Ph.D. in December. |
| Friday, November 7 | Departmental recommendations are due for candidates for December degrees. Final day to withdraw a degree petition for degrees to be awarded in December. |
| Thursday, November 13 | SPEAK Test for international students in Ph.D. Programs. |
| Friday, November 21 | Fall recess begins, 5:20 p.m. |
| Monday, December 1 | Classes resume, 8:30 a.m. |
| Friday, December 5 | Classes end, 5:20 p.m. |
| Friday, December 19 | Fall term ends; winter recess begins. |

Spring Term, 2009

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| Wednesday, January 7 | Final grades for fall-term courses due. |
| Thursday, January 8 | SPEAK Alternative Test for new international students in Ph.D. Programs. |
| Monday, January 12 | Registration and spring ID validation begins. Spring-term classes begin, 8:30 a.m. |
| Friday, January 16 | Friday classes do not meet. Monday classes meet instead. |
| Monday, January 19 | Martin Luther King Jr. Day. Administrative offices closed. Classes do not meet. |
| Friday, January 23 | 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 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 6 | 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 6 | Midterm. Spring recess begins, 5:20 p.m. Final day to add a spring-term course. 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 16 | 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 23 | Classes resume, 8:30 a.m. |
| Monday, March 30 | 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 10 | Good Friday. Administrative offices closed |
| Monday, April 13 | Readers' Reports are due for dissertations to be considered by the Degree Committees for award of the Ph.D. in May. |

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| Thursday, April 16 | SPEAK Test for international students in Ph.D. Programs. |
| Wednesday, April 22 | Departmental recommendations are due for candidates for May degrees. |
| Friday, April 24 | Final day to withdraw a degree petition for degrees to be awarded in May. |
| Monday, April 27 | Classes end, 5:20 p.m. Monday classes do not meet. Friday classes meet instead. |
| Friday, May 1 | Final day to submit Dissertation Progress Reports and petitions for extended registration. |
| Tuesday, May 12 | Spring term ends. |
| Friday, May 15 | 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 24 | Graduate School Convocation. |
| Monday, May 25 | University Commencement. |
| Monday, June 1 | Final grades for spring-term courses and full-year courses are due. |
| Friday, June 5 | SPEAK Alternative Test for new international students in Ph.D. Programs. |