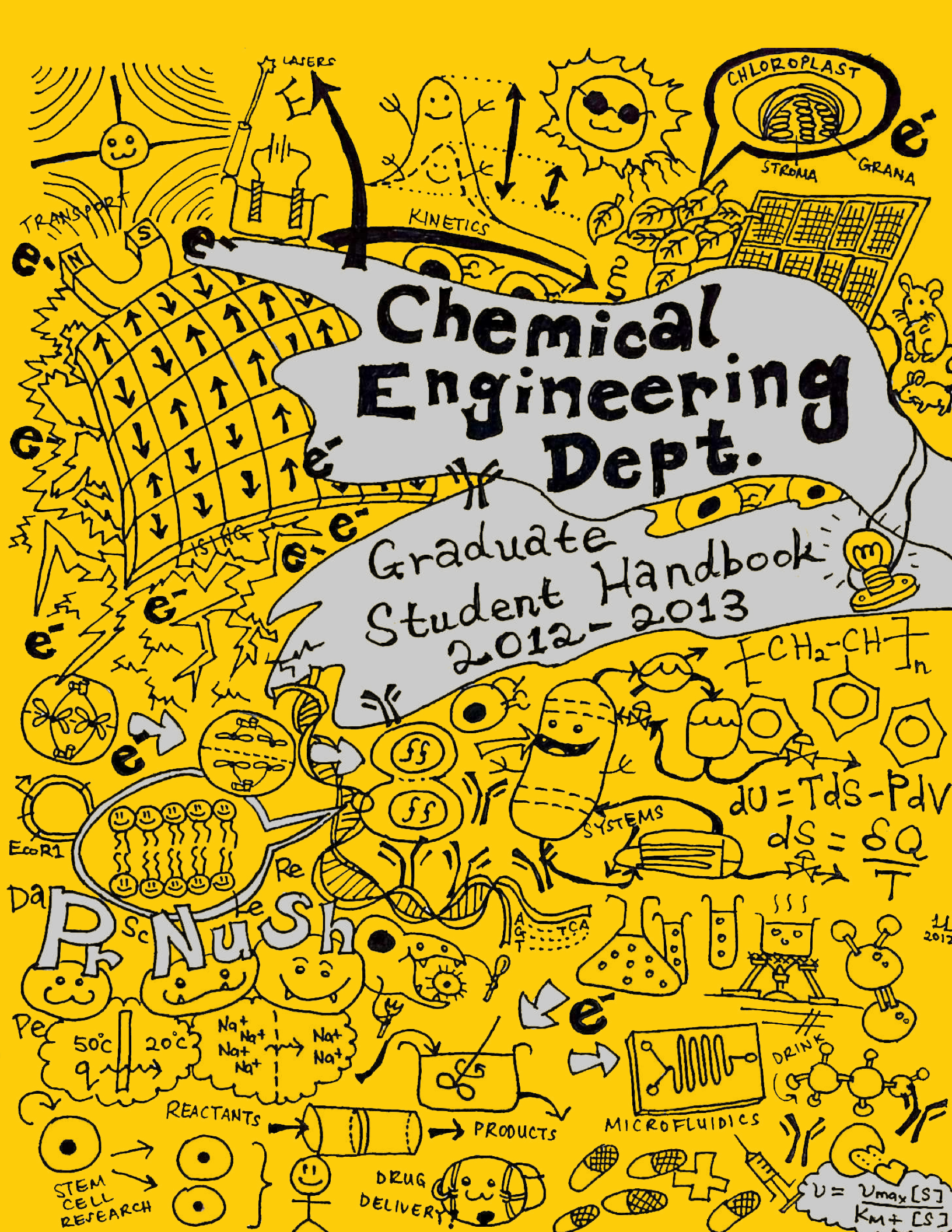
LASERS
CHLOROPLAST
STROMA
GRANA
TRANSPORT
KINETICS
Chemical Engineering Dept.
Graduate Student Handbook 2012-2013
EcoR1
Re
Da
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Nu
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Pe
50°C
20°C
Na+
REACTANTS
PRODUCTS
STEM CELL RESEARCH
DRUG DELIVERY
SYSTEMS
MICROFLUIDICS
DRINK
TCA
dU = TdS - PdV
dS = δQ/T
v = vmax[S] / Km + [S]

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PREFACE

The most important departmental guidelines and policies are presented in this handbook. In addition, the MIT Office of the Dean for Graduate Education's webpage on Graduate Policies and Procedures http://odge.mit.edu/gpp/ and the MIT Bulletin (the course catalog) http://web.mit.edu/catalog/ cover Institute-wide policies, procedures, and regulations.

Professor Patrick S. Doyle, Chairman of the Graduate Committee, Suzanne Maguire, Academic Administrator, and Joel Dashnaw, Graduate Program Coordinator, are valuable sources of information and support for graduate students. If you have special problems or questions at any time during your graduate school experience, we encourage you to contact Suzanne Maguire (room 66-366, (617)253-4577, easterly@mit.edu) or Joel Dashnaw (room 66-366, (617)253-4579, jdashnaw@mit.edu), in the Student Office, or Professor Patrick S. Doyle (room 66-270, (617)253-4534, pdoyle@mit.edu).

Academic policy for graduate students is the responsibility of the Committee for Graduate Students, and students should feel free to consult with its members at any time.

Committee for Graduate Students

Professor Patrick S. Doyle (Chairman)	66-270	(617)-253-4534	pdoyle@mit.edu
Professor Martin Z. Bazant	66-552	(617)-258-7039	bazant@mit.edu
Professor Daniel Blankschtein	66-444	(617)-253-4594	dblank@mit.edu
Professor Richard Braatz	66-372	(617)-253-0171	braatz@mit.edu
Professor Robert E. Cohen	66-554	(617)-253-3777	recohen@mit.edu
Professor T. Alan Hatton	66-309	(617)-253-4588	tahatton@mit.edu
Professor Allan Myerson	66-568	(617)-452-3790	myerson@mit.edu
Professor Bradley D. Olsen	66-556	(617)-715-4548	bdolsen@mit.edu
Professor Kristala J. Prather	66-458	(617)-253-8410	kljp@mit.edu

ADVISORS

For incoming, first-year graduate students, academic advisors are members of the Committee for Graduate Students. Professor Robert Cohen is the academic advisor for students in the PhDCEP program (see page 12). Professor T. Alan Hatton is the academic advisor for students in the Practice School program (see page 34). Professor Robert Cohen is the academic advisor for students in the PPST program (see pages 32).

When a student selects a research topic and begins his/her thesis, the research supervisor becomes the student's academic advisor. In general, students choose research advisors at the end of their first fall semester at MIT. Should the student choose a research advisor from a department other than Chemical Engineering, he/she will also need to choose a co-advisor from the Chemical Engineering faculty. This departmental co-advisor must be prepared to assume sole advisory responsibility if, for some reason, the relationship with the non-departmental research advisor ends. Students are responsible for informing the Student Office of any change in advisor(s).

Prior to Registration Day (fall and spring semesters), the student's subject selection must be made online, and then approved by the advisor (who also approves online). Advisor approval should also be obtained for any subsequent subject add/drop actions during the term (no additional authorization is required).

SUBJECT REQUIREMENTS

The discipline of Chemical Engineering covers many diverse areas, and the Department provides graduate-level subjects to cover those of most relevance. The philosophy of the Department is to encourage students to develop an in-depth understanding of the fundamental concepts of Chemical Engineering while, at the same time, broadening their perspective by sampling other, more specialized subjects.

To this end, we have designated four core subjects in:

1. Chemical Engineering Thermodynamics (10.40)
2. Analysis of Transport Phenomena (10.50)
3. Chemical Reactor Engineering (10.65)
4. Numerical Methods Applied to Chemical Engineering (10.34).

It is expected that graduate students will complete these four core subjects irrespective of their degree objective. In addition, it is expected that graduate students will complete one High-Level (H-Level), graduate subject in Chemical Engineering (Course 10); for a description of the Course 10 H-Level Electives, see the MIT Bulletin http://web.mit.edu/catalog/.

In addition to the four core subjects, the Course 10 graduate H-Level Elective, the Departmental Biology Requirement (see page 26), and the Departmental Minor Requirement (see page 26), a typical PhD/ScD program includes about three to four additional graduate H-Level subjects (see the MIT Bulletin: http://web.mit.edu/catalog/).

No elective course taken to satisfy the MSCEP can be used to satisfy the elective requirement of the PhD/ScD.

PhDCEP students must satisfy the Biology Requirement, but are exempt from the Departmental Minor Requirement.

For students in the PPST program (see pages 32), the PPST core curriculum replaces the four Chemical Engineering core subjects and the Departmental Biology Requirement.

Twenty-four thesis credit units are required for a SM or for a PhD thesis. *Note that thesis units in excess of 24 may not be used to satisfy coursework requirements.*

There is no total credit unit requirement for doctoral students. Students registering for a thesis degree must specify a minimum of one credit unit each semester, but typically, the thesis credit is adjusted to yield a total load of 33 credit units for research assistants and teaching assistants (not including 10.990/10.991/10.992 or other 10.9XX research seminars).

Students interested in a Master's degree in Chemical Engineering are divided into two groups: SM — those who complete a research thesis (see page 33), and MSCEP — those who attend the Practice School (see pages 34).

GRADING POLICY ON SUBJECTS TAKEN TO SATISFY A DEPARTMENTAL REQUIREMENT

Doctoral candidates are expected to receive a grade of "B" or higher in any subject taken to satisfy a Departmental Requirement, including:

- Four Core Subjects: 10.34, 10.40, 10.50, and 10.65
- One H-Level Chemical Engineering (Course 10) Elective
- Minor Requirement
- Biology Requirement
- Systems Engineering: 10.551 (Required for PhDCEP and MSCEP students).

FINANCIAL SUPPORT

Graduate students may provide their own financial support or receive financial assistance in the form of fellowships, research assistantships or teaching assistantships.

- **Fellowships**

  Fellowship funds come from two general sources — outside or inside the Institute. Examples of outside fellowships include: NSF, DOE, Hertz, NIH, EPA, GEM, Kodak, Lucent, NASA, and Whitaker Fellowships. The MIT Graduate Education Office (room 3-138) has a more complete listing of fellowship information. Fellowships from MIT funds are typically limited to first-year graduate students. Funds for such awards are usually provided from gifts from alumni, from unrestricted industrial grants, or from the Provost's Office in the form of Presidential Fellowships. For more information, please visit: the financial aid website http://web.mit.edu/sfs/financial_aid/graduate_financial_aid.html.

  Graduate students who are supported with a Departmental Fellowship have no limitations with regard to credit units that they may take. As a guideline, however, a full course load is considered to be 33 credit units each semester. The recipient of a Departmental Fellowship is under no obligation, either real or implied, to the donor of the fellowship, other than to carry out his/her program of studying and research in a diligent manner.

Recipients of outside fellowships (NSF, DOE, Hertz, Whitaker, etc.) should check with the coordinating official in the MIT Graduate Students Office (room 3-138), to determine any existing obligations regarding their fellowships.

The recipient of a fellowship is allowed two weeks of vacation per calendar year (excluding Institute holidays). Additional vacation time is allowed only with the permission of the research advisor(s).

- **Research Assistants**

  Research assistants (RA's) are supported from research contracts or grants, and are supervised by faculty members of the Department. In this case, the research advisor(s) has a responsibility to the funding organization to conduct research in specified areas.

  In most cases, an appointment as a RA coincides with the selection of a research topic and a research advisor(s). In other words, the student declares that his/her thesis will be conducted in the area specified in the research project's grant (contract). Such RAs may register for no more than 33 credit units, including thesis, each semester (note that registration in research seminars in the 10.9XX series is not included in this total).

  In a few cases, students may be assigned as a RA to a project where there is an agreement between the student and the research advisor(s) that the work will not be used as part of the thesis. The 33-credit unit maximum noted previously is still in effect. However, no academic credit is given for the research assistant appointment in that case. A typical time commitment to this type of research project would be 20 hours per week.

  In the case of RAs, an arrangement is made with the research advisor(s) to provide project funds for tuition and stipend. The research advisor(s) will notify the Student Office each semester about the funding source, so that appointments can be processed. Although financial support cannot be guaranteed, the Department has traditionally been able to support graduate students making satisfactory progress toward their degree objectives.

A RA is allowed two weeks of vacation per calendar year (excluding Institute holidays). Additional vacation time is allowed only with the permission of the research advisor(s).

- **Teaching Assistants/Instructors G**

  Teaching Assistants (TA's) play a central role in the Department's educational program. Service as a TA, working closely with one or more faculty members in the Department, is an important and beneficial aspect of the graduate school experience. Each TA is assigned to a specific undergraduate or graduate subject. While the exact duties of the TA vary depending on the subject and the teaching methodology of the instructor(s), they generally involve at least some of the following:

  - Developing and grading homework and exam problems.
  - Grading exams and laboratory reports.
  - Holding regular office hours for individual students as well as for group-help sessions.
  - Planning, designing, and supervising laboratory experiments.
  - Proctoring exams.
  - Maintaining a subject website.
  - Preparing electronic and/or hard-copy versions of the subject solution book.

  While the Chemical Engineering Department has eliminated lecturing from the list of responsibilities of Departmental TA's, opportunities exist for students interested in gaining teaching experience to serve as an Instructor G (IG). Students interested in an Instructor G position should first contact the faculty member teaching the class to determine if there is a possibility to serve as an IG. The faculty member should then contact the Executive Officer, Professor William Green, to discuss the appointment. Typically, students who can expect to compete successfully for an appointment as an Instructor G should satisfy the following criteria: (a) exceptional performance in prior service as a TA and (b) interest in an academic career.

  TA assignments are generally made at least one month before the beginning of the Fall and Spring semesters. In some cases, enrollment-driven, last-minute TA assignments are necessary. All doctoral students are expected to volunteer for possible service as a TA at the

time of the presentation of their Thesis Proposal (see pages 16). Two different semesters of availability for the TA pool are selected by the student at that time. The Department then chooses one of these two semesters for the student's TA service. Note that it is the responsibility of the student to coordinate the selection of the two semesters with his/her research advisor(s). The early identification of possible periods of TA service allows for effective planning by students and research advisors of activities related to the thesis project. Students should complete their TA service before the end of their fourth year.

At the conclusion of the TA assignment, a meeting should take place between the TA and the course instructor(s) to evaluate the TA performance in the course. A Departmental TA Evaluation Form (see page 56) should be completed and signed by the course instructor(s) and by the TA at the meeting. The TA should return the completed form, along with the course solution book on CD to the Student Office. Copies of the form, with an accompanying letter from the Graduate Office, will be mailed to the TA, to the course instructor(s), and to the TA research advisor(s) to confirm that the graduate student has successfully completed the TA assignment. A copy of the form will also be kept in the graduate student file in the Student Office for future reference.

TA's are expected to be available from September 1 to January 15 (Fall semester) or January 16 to May 31 (Spring semester). Some lab courses may require students to start a few weeks before the normal TA start date. In such cases their TA appointment will end early as well. In general, a student working as a full TA is expected to devote up to 20 hours per week to TA responsibilities. Some subjects with limited enrollment require only a fractional TA effort, and in those cases, partial TA appointments are made. The number of subject credit units for which a TA may enroll is limited to 33 credit units per semester, in addition to research seminars in the 10.9XX series. No academic credit is given for the TA appointment.

- **Practice School Stations**

  During the semester that students are engaged in project work at the Practice School stations, financial support is normally provided by the host companies by way of a fellowship.

- **Graders**

  A position known as Graduate Grader has been created to assist in the teaching of low enrollment undergraduate and graduate subjects, and to ease the burden on TAs in high enrollment undergraduate and core graduate subjects. These grader positions are advertised to the graduate student body at the beginning of each semester. Students volunteer for these positions, and must be serving as a full-time RA or Fellow during the term of service as a grader. Graduate Graders are involved in grading homework assignments, copying material for class, and preparing project materials. Graduate Graders should not be responsible for any activity involving student contact. Graduate Graders are paid $ 12.75/hour for their services, and can work no more than 10 hours per week. Grader positions are open solely to citizens of the United States.

OFFICE SPACE

First-year students are assigned office space in the second floor of Building 66. These assignments will be made by the Student Office. When a student chooses a research advisor, he/she moves into a laboratory or office space associated with the advisor's research group.

KEYS

First-year students will receive their office assignments during the first few days of the Fall semester. Once students have been assigned a research advisor, they should contact the administrator associated with the research advisor to help them secure an office key. In order to request keys, please follow the steps below:

1. Go to sapweb > building services tab > keys
2. Fill out the form
3. **The profit center for ChemE is 62000**
4. Click submit
5. Your request will come up as a PDF file
6. Save the file
7. Send an email with the PDF file to your advisor's administrative assistant for approval
8. Your advisor's admin will then forward the PDF file to key-request@mit.edu
9. The key office will let you know when the keys are ready for pick-up via email (usually 2-7 days after the key request has been sent)
10. You can then pick up your keys in 7-019

If you have any questions regarding the status of your key request, please call the Key Office at 617-253-4948. Desk keys can be obtained from Alison Martin, the Assistant to the Executive Officer

(room 66-350, (617)253-4562) in ChemE Headquarters, and students should contact her directly to receive their desk keys. Under no circumstances are students to be given keys to faculty suites/offices. When a student vacates his/her office, his/her desk and office space must be emptied. The office key should be returned to his/her advisor's administrator, and the desk key should be returned to Headquarters.

DEPARTMENT COMPUTER SUPPORT

The Chemical Engineering Computer Support Team, Jim Hardsog and Jean Belbin, can be contacted for any computing related issues including: computer viruses, email issues, network access, printing, software applications, toner cartridge replacements, web browser issues, ordering new software and obtaining a new IP Address for a computer or printer. The computer support team is located in room 66-0005 and can be reached by telephone at extension 3-0088 or by email at cheme-computer@mit.edu.

MACHINE SHOP FACILITIES

A Central Machine Shop facility is available on a fee-for-service basis. Requests for shop services can be done either in person or from the web page http://web.mit.edu/cmshop. Email can be sent directly to the Central Machine Shop at cmshop@mit.edu. Email will be answered promptly. Within the Chemical Engineering Department, Mr. Steve Wetzel (room 66-413, (617)258-7166, swetzel@mit.edu) is also available for consultation on machine shop issues.

LABORATORY SAFETY

The importance of laboratory safety cannot be overstated. Specific information on safety-related policies and procedures is available from the Departmental Safety Committee, chaired by Dr. William Dalzell (room 66-450, (617) 253-5273, wdalzell@mit.edu), who is also the Department EHS coordinator and Chemical Hygiene Officer. Another important Departmental resource person for safety-related matters and general issues regarding Departmental space and facilities is Mr. Steve Wetzel (room 66-413, (617) 258-7166, swetzel@mit.edu). Steve Wetzel acts as EHS coordinator for the department when Bill Dalzell is away from MIT. Ms. Susan Leite (room N52-467, (617) 253-5246, smleite@mit.edu), our Environment, Health, and Safety Office (EHS) lead contact, is another valuable resource for safety matters. Ms. Carolyn Stahl (room N52-461, (617) 253-5564) is a valuable resource at the EHS Office for biological safety issues.

Comprehensive information is available on the web from the MIT EHS office http://web.mit.edu/environment/ehs/index.html.

The Department has established policies and procedures to make everyone in the Department aware of his/her responsibilities for safe practices in the laboratory. These are detailed in the Department of Chemical Engineering Chemical Hygiene Plan, available on the department website http://web.mit.edu/cheme/resources/lab/ChemeHygienePlan.pdf. Although the research and other work activities conducted in the department are diverse, the following requirements apply in all cases:

1. We are all responsible for our own safety, as well as for the safety of those who work with and for us.
2. The person running the experiment or utilizing the laboratory space at any given time is responsible for the safe conduct of the experiment, and safe utilization of the laboratory space.
3. A supervisor of someone running an experiment should be satisfied that the person performing the experiment is aware of and follows safe laboratory procedures.

Anyone working in a laboratory must also log into the EHS website http://web.mit.edu/environment/training/ to take the training needs assessment, and then complete the training required before they start working in a laboratory.

William Dalzell will give a presentation on safety-related matters for one hour during the first session of the Departmental Student Seminar Series (10.991/10.992). The safety seminar format varies; it can be a presentation by William Dalzell, Steve Wetzel, other members of the Graduate Student Safety Committee, or an invited lecturer. All graduate students, Post Docs, and UROP students who work in Chemical Engineering laboratories that are covered by the Chemical Hygiene Plan are required to attend these presentations and sign the attendance sheet. Undergraduate students taking undergraduate laboratory courses are not required to attend.

PROFICIENCY IN WRITING

The ability to write clearly and succinctly is an essential skill for a successful career as an engineer. The Department believes that the development of writing skills at an early stage will pay dividends later. Every new Graduate Student is required to the take the Graduate Writing Skills Examination. The Examination consists of two essays of 750-1250 words based on online readings. You will have 72 hours to write the two essays, from 1 pm Friday, August 3rd to 1 pm Monday, August 6th, and submit them online. Based on the examination results, recommendations for remedial work may be made by the MIT Writing Program.

Students are notified by the Student Office whether they:

1. Passed.
2. Performed marginally, and are therefore required to complete one or more workshops in technical writing.
3. Failed. Such students must register for, and complete, one designated writing subject with a grade of A or B. Students will be notified as to which course they must take.

Students with an undergraduate degree from MIT are not required to take the writing examination. For any inquires about the MIT Writing Program, including the results of the writing examination, please contact Suzanne Maguire (easterly@mit.edu) in the Student Office.

SELECTION OF RESEARCH TOPIC/RESEARCH ADVISOR(S)

To aid first-year doctoral students in selecting a research advisor(s), the Department offers a seminar series (10.990) during the Fall semester to inform the students about faculty research interests. Although PPST and MSCEP students are not required to take 10.990, they are encouraged to attend those seminars that are of interest to them. First-year graduate students intending to pursue degrees requiring a doctoral (PhD/ScD or PhDCEP) thesis or a master's thesis are required to attend all the 10.990 faculty presentations.

First-year doctoral students are also required to arrange meetings with at least six faculty members to discuss possible research topics. Those meetings are acknowledged by faculty signatures on a form provided by the Student Office (see page 44). Students are encouraged to be persistent in arranging

the meetings, and not to wait until the Fall semester is almost over to meet with faculty. Each student should select two research projects (1st and 2nd choices) by the end of the Fall semester, and indicate their selection on the form provided by the Student Office. The Department Head will make every effort to grant each student his/her first choice, within funding and space limitations. Students will be notified of their research advisor(s) assignment by mid-January. The Department cannot guarantee that a research advisor will be found for every student. However, efforts will be made by the Department Head and the Graduate Officer to assist any student who has difficulty identifying a research advisor.

For SM degree candidates, the selection of a research advisor may be made at any time with the joint agreement of the student and a faculty member. PPST students should contact their program advisor for information on the research advisor selection process.

Occasionally, a research project does not proceed according to the expectations of the student, the research advisor(s), or both. Early recognition of the possibility of switching topics and/or research advisor(s) is an important factor in successfully managing this process. Any student contemplating a change of research advisor(s) should contact the Graduate Officer, Professor Patrick S. Doyle, for consultation and assistance. If a change in research advisor(s) has been made, the student should notify the Student Office of this change in writing.

THE DOCTORAL PROGRAMS (PhD/ScD and PhDCEP)

There are two distinct programs (PhD/ScD and PhDCEP) leading to the doctoral degree in the Chemical Engineering Department. The PhD/ScD program emphasizes the research experience while the PhDCEP program provides a blend of engineering science and business/management education along with a research experience. Although the same Qualifying Examination is used to screen students for doctoral candidacy in the two programs, transfer from one program to the other is not automatic and is strongly discouraged. In the rare event that an enrolled student wishes to enter a doctoral program different from the one to which he/she was originally admitted, the student must re-apply to the Chemical Engineering Graduate Admissions Committee. Applications to the PhDCEP Program are reviewed by both the Chemical Engineering Graduate Admissions Committee and the corresponding admissions body at the Sloan School of Management.

*Note that there is no difference between the PhD and the ScD degrees, except for the designation on the diploma and the color of the hood at Commencement (see pages 28).

The key requirements leading to a doctoral degree in Chemical Engineering are discussed below.

Qualifying Examination

Early in his/her program each doctoral candidate must pass the Written Qualifying Examination, which consists of a set of questions that cover core undergraduate and/or graduate chemical engineering material. This examination is given twice each year, in January and May. It is normally taken in January of the first year. Requests to take the Written Qualifying Examination are made by completing a form available in the Student Office. For the 2012-2013 Academic Year, the key dates are:

- December 1, 2012 (Request Form due to the Student Office for January exam).
- January 10, 2013 (Written Qualifying Examination).
- April 1, 2013 (Request Form due to the Student Office for May exam).
- May 23, 2013 (Written Qualifying Examination).

The exam consists of three open-book questions that are focused on thermodynamics, transport, and kinetics. Graduate material on thermodynamics and transport may be included, at the level of the corresponding core subjects offered in the Fall term (10.40 and 10.50). Otherwise, the material is typical of that covered in undergraduate programs in chemical engineering. The time allowed per question is one to two hours, the precise schedule being announced at least one week before the exam. The results of Written Qualifying Examination are evaluated by the faculty, along with the student's performance in MIT subjects and other academic records, to determine whether or not he/she is prepared to be a doctoral candidate. If the performance on the Written Qualifying Examination per se is unsatisfactory, the student will be so informed and he/she may request to take it a second time.

There is an Institute requirement that MIT doctoral programs have both written and oral qualifying (or general) examinations. In Chemical Engineering the written requirement is satisfied by the Written Qualifying Examination described above; the oral requirement is met by presenting a satisfactory thesis proposal at the first meeting of the candidate's Thesis Committee (see page 14). If the performance on the oral requirement per se is unsatisfactory in the judgment of the Thesis Committee, the student will be so informed and he/she may request to present it a second time.

For students in PPST, the Department allows the PPST Qualifying Examination to be administered in lieu of the Chemical Engineering Qualifying Examination.

Students who have passed the Qualifying Examination may petition to defer the start of their research and temporarily withdraw from MIT. All temporary leaves must be approved by the Department through the Graduate Officer and the Chairman of the Graduate Admissions Committee. When a petition is approved, a letter recognizing this approval, signed by the Chairman of the Graduate Admissions Committee, is given to the student. The letter states that the student will be readmitted to the Department, and will not be required to retake the Qualifying Examination, if he/she returns to the Department within five years of passing the Qualifying Examination. A copy of this letter is kept in the graduate student file in the Student Office for future reference.

Thesis Committee

As soon as practical, but no later than eleven months after choosing a research advisor(s), each doctoral student should select a Thesis Committee in consultation with their research advisor(s). The Thesis Committee must have two or more members in addition to the research advisor(s). At least two members of the Thesis Committee must be faculty members in Chemical Engineering. At least one committee member must be a Chemical Engineering faculty member who is not the research advisor. The research advisor will serve as the Thesis Committee Chairperson. For students in the

PPST program, the research advisor need not be a Chemical Engineering faculty member, but must be a PPST faculty or affiliate.

The Thesis Committee is responsible for providing advice on the doctoral student's academic and research programs, and for monitoring the quality and the progress of the research carried out by the student. A Thesis Proposal is to be presented to the Thesis Committee by the doctoral student. Oral and written progress reports are to be presented at least once a year in the PhD/ScD program, and more frequently in the PhDCEP program (see section on Progress Reports on page 17). It is the responsibility of the student to ensure that meetings with the Thesis Committee are scheduled in a timely manner. It is also the responsibility of the student to reserve a room for the Thesis Committee meetings. To reserve a room and an LCD or Overhead Projector (if needed), go to the conference room scheduler on the Department's website http://chemedev.mit.edu/che_room_res.nsf, and follow the necessary steps to check the availability of conference rooms and projectors in building 66, as well as to reserve a room. The student will then receive a confirmation email letting him/her know that the room and the projector have been reserved. Reporting Forms for the Thesis Proposal Presentation as well as for the Thesis Committee Progress Reports Thesis Committee Progress Reports are available online.

The interaction of the doctoral student with his/her Thesis Committee is a very effective means for the student to obtain general advice and detailed technical consultation. The Thesis Committee members serve as a group of expert consultants in the research areas relevant to the student's doctoral thesis, and are chosen by the student, in consultation with the research advisor(s), to complement the background and expertise of the research advisor(s). Doctoral students are encouraged to have frequent one-on-one interactions with Thesis Committee members. In addition, doctoral students are encouraged to add new members to their Thesis Committee as needed during the course of their thesis project. When there is mutual agreement between the doctoral student and a Thesis Committee member that continued service on the Thesis Committee is not warranted, a member of the Thesis Committee may be excused. However, the requirements on the composition of the Thesis Committee, as indicated on page 14, must be satisfied at all times.

- **Thesis Proposal**

The Department requires doctoral students to submit a written Thesis Proposal within eleven months after they have passed the written portion of the Qualifying Examination. The Thesis Proposal must be presented orally to the Thesis Committee within that same time frame. The purpose of the oral presentation is to obtain feedback early on in the course of the thesis project from the combined expertise and experience of the Thesis Committee members. It also satisfies the Oral component of the Qualifying Examination. Failure to complete the Thesis Proposal and the oral presentation within the above-mentioned deadlines will constitute unsatisfactory progress toward the doctoral degree, and can result in denial of future registration. There is also a financial penalty for failure to complete the Thesis Proposal Requirement in a timely manner.

Scheduling of meetings with faculty can be a difficult problem at certain times during the academic year. It is strongly recommended that students do not leave the oral presentation of the Thesis Proposal to the very end of the 11-month period following the written portion of the Qualifying Examination. It is the student's responsibility to schedule a room and any audio/visual equipment that he/she may need for his/her oral presentation. The procedure to reserve a room and an LCD or Overhead Projector is discussed on page 15. It is also the responsibility of the student to provide the research advisor(s) with a Report of Thesis Proposal Presentation Form (page 47) which is available online (http://web.mit.edu/cheme/resources/gradstudents/index.html). Reserving the room and getting the various Thesis Committee Reporting Forms are also the student's responsibility for all subsequent Thesis Committee Meetings following the Oral Presentation of the Thesis Proposal.

Although the format of each Thesis Proposal is a matter to be worked out between the student and his/her research advisor(s), the following outline may serve as a useful guideline:

1. **Cover Page**
    - Provides a title, name(s) of research advisor(s) and members of the Thesis Committee, and date of submission. The mailing addresses, email addresses and telephone numbers of members of the Thesis Committee outside the Department should also be provided. The Student Office will send letters to

these members to express the Department's appreciation for their service on the Thesis Committee.

2. **Specific Aims**
   - Clearly states the thesis objectives (not to exceed one page).
3. **Background**
   - Presents a rationale for conducting the proposed research studies.
   - Reviews briefly the previous research that is relevant to the proposed studies.
4. **Research Plan**
   - Discusses the planned research with particular emphasis on expected difficulties and challenges.
   - Presents preliminary results, if available.
   - Indicates how the proposed experimental and/or theoretical results will serve to meet the proposed objectives.
5. **Safety**
   - Discusses any safety-related issues. These include personal and environmental safety, as well as waste-disposal procedures.
6. **Time Schedule**
   - Delineates the expected time schedule.
7. **Literature Citations**
8. **Appendices (optional)**
   - Expands the literature review if necessary or desired. Provides experimental details or more complete theoretical derivations, as appropriate.

Thesis Proposals, including literature citations, figures, and tables, should not exceed 25 pages, using at least an 11-point font and one-inch margins. Brevity and clarity of presentation will be appreciated by the Thesis Committee. The Thesis Proposal is a statement of the intended plans for the research program. It is not meant to be a document containing a significant volume of research already completed by the student. Copies of the Thesis Proposal should be given to each member of the student's Thesis Committee at least one week before the oral Thesis Proposal presentation. A hard copy of the final thesis proposal will need to be turned in with the form and meeting summary comments to the Student Office following the completion of the meeting.

- **Report of Regular Thesis Committee Meeting, Report of Plan-to-Finish Thesis Committee Meeting, and Report of Final Thesis Committee Meeting**

  In the PhD/ScD program, Written and Oral Progress Reports should be presented to the Thesis Committee at least once every 12 months. The PhDCEP program requires one Thesis Committee Meeting each in the Fall and Spring semesters of the second and the third years of the program. These types of committee meetings should not be scheduled in December or in

May, because of the large numbers of proposal presentations and final defenses that occur in those months. In addition, for both the PhD/ScD and the PhDCEP programs, frequent one-on-one interactions with the student's Thesis Committee members are expected and encouraged.

For a Written Progress Report to be most useful, in addition to summarizing the progress made by the student since the last Thesis Committee Meeting, it should clearly state the problems and challenges encountered by the student in his/her research, including unsuccessful attempts made to resolve them and a discussion of future approaches to be pursued. The Written Progress Report should be as concise as possible. Students are also encouraged to append copies of the slides to be used during the oral presentation at the Thesis Committee Meeting. When appropriate, supporting data and completed manuscripts may also be appended to the Written Progress Report.

Written Progress Reports, including all appended materials, should be given to each Thesis Committee member at least one week prior to the Thesis Committee Meeting. This will enable each Thesis Committee member to be better prepared for the meeting.

The Thesis Committee Meetings should not exceed 90 minutes, with about half devoted to the student's presentation and half to discussion. Following the Thesis Committee Meeting, in consultation with the research advisor(s), the student should prepare a detailed summary of the Thesis Committee's evaluation of his/her research to date, as well as indicate any real or potential problems identified. This summary should be typed and attached to the Report of Thesis Committee Form. The student should also append the Written Progress Report to this Form. The Form should be signed by the student, the research advisor(s) and each Thesis Committee member. The completed Form, including all appended materials, should then be given by the student to the Student Office within one week following the Thesis Committee Meeting. The student, the research advisor(s), and other members of the Thesis Committee, will receive a copy of this Form, including summary and meeting notes, for future reference via email. A copy of the form will also be kept in the graduate student file in the Student Office for future reference.

In the PhD/ScD program, the Department requires at least one Thesis Committee Meeting in each 12-month period following the presentation of the Thesis Proposal, and more frequent meetings are encouraged whenever significant feedback from the Thesis Committee is required. An approximate timeline for completion of the doctoral program, showing the various thesis committee meetings, is presented on page 25.

- **Regular Thesis Committee Meeting**

  The first thesis committee meeting following the Thesis Proposal Presentation, referred to as a Regular Thesis Committee Meeting, should be scheduled by the student within 12 months of the Thesis Proposal Presentation Meeting (see page 48). A second Regular Thesis Committee Meeting, to be held within 12 months of the first, may be needed before the Plan-to-Finish Thesis Committee meeting.

- **Plan-to-Finish Thesis Committee Meeting**

  The Plan-to-Finish Thesis Committee Meeting should be scheduled by the student when completion of the research is anticipated within about 12 months (see page 50). At the Plan-to-Finish Thesis Committee Meeting the Thesis Committee should evaluate a Written Plan-to-Finish Report prepared by the student. The Written Plan-to-Finish Report should be a concise summary reevaluating the research plan proposed by the student in the original Thesis Proposal, including discussing and justifying any needed modifications to the original research plan. The report should also discuss the remaining tasks (experiments, theoretical derivations, simulations, analysis, literature review, and writing) that are needed to bring the doctoral thesis project to a successful completion. A realistic time line for the completion of these tasks should also be included. The written Plan-to-Finish Report should not constrain the intellectual inquiry of students and research advisor(s). On the contrary, it is subject to revision if significant opportunities or setbacks arise in the course of the remaining thesis research. The Written Plan-to-Finish Report should be given to each Thesis Committee member at least 1 week prior to the meeting.

- **Final Thesis Committee Meeting**

  Within 12 months of the Plan-to-Finish Thesis Committee Meeting, the student should schedule the Final Thesis Committee Meeting (see page 52). For this meeting,

the student should prepare a Written Final Progress Report, summarizing the main results obtained in the doctoral research, and justifying why these results are sufficient for completion of the doctoral thesis. This document should be given to each Thesis Committee member at least one week prior to the meeting. At the Final Thesis Committee Meeting, the Thesis Committee should agree that the work carried out by the student, as reflected in the Written Final Progress Report and in the student's Oral Presentation, constitutes a high-quality research study and is suitable for presentation to the faculty in the Final Thesis Defense (see page 21). Please note that in the semester during which the student plans to defend his/her thesis, he/she should only register for 10.THG.

For those students who have not had a Thesis Committee Meeting in 12 months, a Form recording the date of the last Thesis Committee Meeting (see page 58) will be emailed to them. The Form will indicate that the student should have a Thesis Committee Meeting within three months following Registration Day. The Form will also indicate that failure to comply with this requirement will constitute Unsatisfactory Progress toward the doctoral degree, and may result in denial of future Registration. The Form should be signed by the student and by the research advisor(s) to indicate that this important requirement is clearly understood. The completed form should then be submitted to the Graduate Officer for approval as part of the Registration Process. The Form, approved by the Graduate Officer, will be kept in the graduate student file in the Student Office for future reference.

In the PhDCEP program, the Thesis Committee evaluates the merits of the research on an ongoing basis, similar to the PhD/ScD program. In addition, there is special significance to the PhDCEP Plan-to-Finish Meeting, which is held prior to the end of the Fall semester of year 3 of the program. Based on the written Plan-to-Finish Report and the discussions at the Plan-to-Finish Meeting, one of the following four outcomes is possible:

(a) Progress is satisfactory, and the student is on track for successful completion of the research project prior to the end of the third calendar year.

(b) The research progress of the student is satisfactory, and the scope of the project is well suited for completion in the foreseeable future, but not by the end of the third calendar year.

(c) The student's progress is satisfactory, but the scope of the research project is not well suited for completion in a clearly defined time frame. The larger scope of the research subject relative to that originally envisioned makes it more suitable for the PhD/ScD program that has no specific time limit on the research phase.

(d) The research progress is unsatisfactory, and its successful completion by the student is not expected on any time scale.

The Chemical Engineering faculty anticipates that outcome (a) will continue to be the predominant one for the PhDCEP candidates. In scenario (b), the Thesis Committee and the research advisor(s) are empowered to recommend to the Chemical Engineering Department Graduate Officer a time extension of up to one year; approval is expected under normal circumstances. Scenario (c) requires decisions on the part of the student. If the student wishes to enter the PhD/ScD program in the Chemical Engineering Department, a formal application to the Department's Graduate Admissions Committee will be required. This application would normally be submitted by the end of IAP of the academic year in progress. Endorsement of the student's research work and a petition by the research advisor(s) and the Thesis Committee will be essential in such cases. The Department anticipates that outcome (d) will be a rare event. Students viewed by the Thesis Committee as making unsatisfactory progress with no likely improvement will be denied further registration and will leave MIT with the MSCEP degree.

- **Final Thesis Defense**

  Following the satisfactory completion of the Final Thesis Committee Meeting, doctoral students can begin the Thesis Defense process. Thesis Packets, available online http://web.mit.edu/cheme/resources/gradstudents/index.html, describe in detail the procedures for preparing and submitting a Master's Thesis or a Doctoral Thesis. The steps below pertain specifically to the Doctoral Thesis Defense:

1. Students should fill out the Thesis Scheduling From and have it signed by their research advisor(s). This form should be brought to the Student Office **before** distributing the thesis draft and review forms to your committee members.
2. An Application for Advanced Degree must be filled out online via WebSIS http://student.mit.edu/ by the date indicated on the MIT Academic Calendar, depending on which term (Fall, Spring, IAP, or Summer) the student plans to defend.
3. Four weeks prior to the oral thesis defense, the student should give a copy of his/her final thesis document to: the research advisor(s), every Thesis Committee member, and an electronic copy to the Student Office. Prior to giving this form and Thesis for review to your Thesis committee Members, please discuss with them a suitable date and time for your thesis defense. The Thesis Committee members will have two weeks to review, comment upon, and possibly suggest changes to the thesis document.
4. During the two-week thesis review period described in step 3, the student should coordinate a tentative date and time for the Final Thesis Defense with his/her research advisor(s) and Thesis Committee members. The normal expectation is that all Thesis Committee Members will be present at the defense, and every effort should be made to choose a date that makes this possible. After the date, time, and room for the Final Thesis Defense have been arranged, the student must send confirmation emails to the research advisor(s), to every Thesis Committee member, and to Joel Dashnaw (jdashnaw@mit.edu). This will ensure that the Student Office, the research advisor(s), and the Thesis Committee members are all aware that the Final Thesis Defense is taking place.
5. Two weeks before the oral thesis defense, the student should give the following materials to the Student Office:
    a. Thesis Defense Review Form. There should be one Form from each research advisor and each Thesis Committee member.
    b. An email attachment of the Technical Summary in PDF format. The Technical Summary is a text-only document no longer than two pages (12 point font, 1 inch margins, single-spaced). It should describe the scope and the significance of the entire doctoral thesis. The primary audience is the Chemical Engineering

Department faculty, who will be interested in a concise description of the thesis research and its most significant findings.

5. Upon receipt of the technical summary, the Student Office will distribute it to the entire faculty in the department, along with an announcement designed to generate faculty attendance at the Final Thesis Defense. All Thesis Committee Members are expected to be present.
6. The student should plan to speak for no more than 30-40 minutes. A thesis presider (from the MIT Chemical Engineering faculty) will be appointed by the Student Office to introduce the research advisor(s), who subsequently will introduce the candidate. The thesis presider will also be in charge of the open and closed question-and-answer sessions which follow the candidate's presentation, culminating in the final deliberations by the faculty. The thesis presentation and first question-and-answer session are open to the public, but will be followed by a second session involving only the candidate, Thesis Committee Members, and other MIT faculty.
7. Once the thesis defense is successfully completed, the student has <u>two days</u> to assemble the final version of the thesis document. The student should turn in to the Student Office <u>two</u> final copies of the thesis, and <u>at least two</u> title pages (on archival bond) signed by the research advisor(s). The final version must be printed on archival bond paper. The Final Thesis will then be distributed* as follows:

    1. First Copy - MIT Archives
    2. Second Copy - Engineering Library

*In the case of PhDCEP candidates, the final thesis will not be distributed for approval and signature until the end of the final year of the program, so that the 10.IPG Integrative Complete Project Paper can be included as a capstone chapter in the thesis document.

The Student will also need to hand in the following to the Student Office (found within the Thesis Packet on our website.):

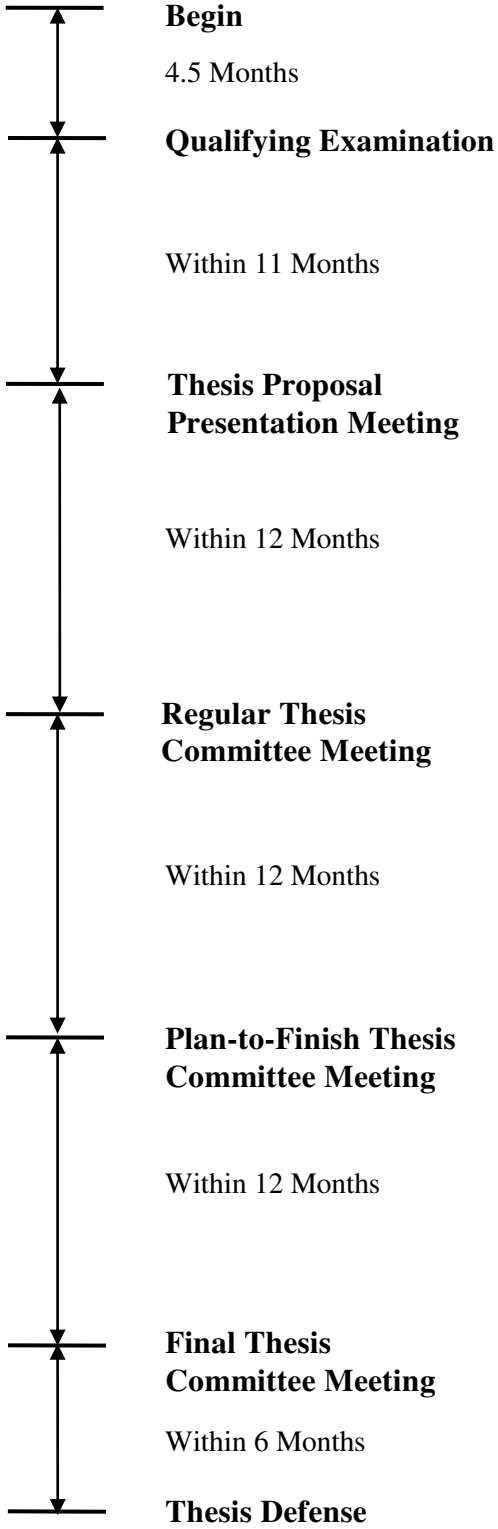
- One extra copy of the Thesis Abstract.
- One extra copy of the Thesis Title Page.
- Chemical Engineering Department Departure Form.
- Forwarding Address Form.
- University Microfilms Form (UMI).
- Recruiting Questionnaire (Optional).

- **Scheduling of Thesis Defense**

  The official deadlines that apply to Chemical Engineering students in the PhD/ScD program for each of the three Institute-wide degree lists compiled during the year are set by the Registrar's Office, and are published in the Institute calendar each year http://web.mit.edu/registrar/www/calendar.html. In certain cases, the Student Office may be able to grant extensions beyond these official dates, but such extensions cannot be guaranteed. Students who miss the official Institute deadlines may be required to register for the next term in order to defend their thesis. Some tuition costs may be incurred as a result.

  For students in the PhDCEP program whose Sloan School component will begin in the Fall, the complete research component of the thesis must be turned in to the Student Office and distributed to all the Thesis Committee members by August 15. The two-week reading period, therefore, must be completed by September 1, and the student and the Thesis Committee members must schedule the date of the thesis defense before September 15. The Sloan School component of the PhDCEP program will begin that semester, concurrent with the Thesis Defense in Chemical Engineering.

Sample Timeline for Completion of Doctoral Program



- **Biology Requirement**

The purpose of the Departmental Biology Requirement is to ensure that doctoral students are familiar with the molecular and cellular basis of biological processes, which are becoming increasingly important to the Chemical Engineering discipline. In essence, it requires that a doctoral student take at least one subject which addresses the molecular and cellular basis of how biological systems operate. The Biology Requirement can be satisfied via two options: (a) taking MIT's introductory undergraduate biology course (7.012/7.013/7.014), or (b) petitioning to satisfy the requirement by virtue of having already taken an equivalent course(s) at his/her undergraduate institution prior to admission to MIT. If a student follows option (b), he/she should provide detailed written information about the relationship of the material covered in the course(s) that he/she has taken and the material covered in 7.01X http://web.mit.edu/7.01x/. The syllabi of the courses and a copy of the undergraduate transcript should be included as documentation.

Students should request the Graduate Officer's approval to satisfy the Biology Requirement as soon as possible after completing the Qualifying Examination. Students can request this approval by completing the Biology Requirement Form which is available online http://web.mit.edu/cheme/resources/gradstudents/index.html (see page 54).

Note that a grade of B or higher must be received in every course listed to satisfy the Biology Requirement taken either prior to coming to MIT or at MIT.

Minor Requirement

The purpose of the Departmental Minor Requirement is to broaden the education of doctoral students by exposing them to modes of thought or problem solving in another field. For those in the traditional PhD/ScD program, this is done via concentrated study of some other discipline or body of knowledge outside Chemical Engineering, consisting of at least three subjects and 24 total credit units. The Minor field may be technical (e.g., a science or another engineering discipline) or non-technical (e.g., management or a language), but must have a coherent theme. The subjects chosen should pass at least one of the following tests of coherence: (1) they are offered by the same department; (2) although perhaps not in the same

department, they are part of a conceivable major; (3) research in all three could be published in the same specialty journal. Criterion (2) applies most to disciplines that span multiple departments, such as biology, chemistry, and mathematics. In general, subjects with 10.xxx numbers cannot be used to fulfill the minor requirement. However, because the number given to a subject does not always reflect its disciplinary content, certain exceptions may be possible. If a 10.xxx subject is a core component of a degree program outside Chemical Engineering, or if it has little or no involvement of Chemical Engineering faculty and little or no chemical engineering science content, it might be acceptable. How advanced a subject needs to be to fulfill the minor requirement depends on how close the minor is to Chemical Engineering. To avoid misunderstandings, students should seek approval of their Minor Program before taking any of the proposed subjects. This can be done by completing the Proposal for Doctoral Minor form, which is available in the Student Office or online at http://web.mit.edu/cheme/resources/gradstudents/index.html (see page 55). Questions about proposed minors may be directed to the Graduate Officer, and approved minors can be revised at any time, subject to the approval of the Graduate Officer.

The sequence of subjects in the Sloan School taken by PhDCEP students satisfies the Departmental Minor Requirement, and no formal petition for approval is required. Students in the PPST program must take three subjects in Chemical Engineering, in addition to those which are part of the PPST core curriculum, in order to satisfy the Minor Requirement. Two of these three subjects must be from the Chemical Engineering Core Curriculum (10.34, 10.40, 10.50, and 10.65).

Note that a grade of B or higher must be received in every course taken to satisfy the Minor Requirement.

- **Teaching Requirement**

  It is the Department's policy that every doctoral student is required to serve as a Teaching Assistant (TA) for one term. Two possible semesters of availability for the TA draft are identified by the student at the time of the Thesis Proposal Presentation Meeting, by completing the appropriate section in the Report of Thesis Proposal Presentation Meeting

Form. Both the student and the research advisor(s) must sign this section of the Form. Students should complete their TA service to the Department by the end of their fourth year.

- **Doctoral Degrees**

  Students in the PhDCEP program receive the PhD degree. Other doctoral students are given the choice of receiving a Doctor of Philosophy (PhD) degree or a Doctor of Science (ScD) degree. There is no difference between the PhD and the ScD degrees, except for the designation on the diploma and the color of the hood at Commencement. The lining of the hood carries the school's colors - red and gray. The velvet edging on the hood is blue for a Doctor of Philosophy (PhD) and gold for a Doctor of Science (ScD).

- **Doctoral Seminar (PhD/ScD and PhDCEP Programs)**

  Two subjects (10.991–Fall semester and 10.992–Spring semester) have been designated as doctoral seminars. All students in the PhD/ScD and the PhDCEP programs must register for these subjects after their first Fall semester at MIT. Students planning to defend their thesis in a specific semester should not register for 10.991 or 10.992 in that semester. The doctoral seminars are held on Monday afternoons from 3:00 - 4:00 p.m. (in room 66-110). Typically, on a given Monday afternoon, two third-year doctoral students will present on their research. Both sets of seminars provide an excellent opportunity for students to broaden their perspective in many areas of Chemical Engineering research.

  Regarding attendance: All doctoral students are expected to regularly attend the Friday afternoon Departmental seminars (3:00 – 4:00 p.m. in room 66-110) delivered by visitors to the Department. Attendance is taken at the Monday seminars (via seminar evaluation forms). Attendance is based on the number of individual presentations attended. For example, if at a Monday seminar there are two presentations, then a student who attended both presentations, and filled out and submitted two evaluation forms, would receive credit for two attendances. Attendance credit will not be given for a student's own presentation. Doctoral students who do not attend at least 50% of the total seminar presentations will receive an F.

  Professor Klavs F. Jensen, Head of the Department, is in charge of the 10.991/10.992 doctoral seminars, with the seminar scheduling done by the Student Office. All doctoral students are

required to give a Departmental seminar (PPST students are exempt from giving seminars in the Chemical Engineering Department). Students should plan to give their doctoral seminar two years after they pass the Qualifying Examination. Students who attend the Practice School will be given extra time to prepare for their seminar. PhDCEP seminar speakers should plan to give their presentation in the Spring term of their third year at MIT. At that time, they should be close to completing the research phase of the PhDCEP program, and therefore the seminar will be a good way for the PhDCEP students to demonstrate the achievement of at least one publishable paper from their period of research in the department Seminar speakers must prepare a summary of their talk one week prior to the seminar. A copy of this summary (1-2 pages), should be emailed (in PDF format) to Joel Dashnaw (jdashnaw@mit.edu) in the Student Office one week before your presentation. The Student Office will email the summaries to everyone in the department prior to the Monday seminar. Seminar speakers should plan to speak for no more than 20 minutes to allow sufficient time (10 minutes) for questions. For PPST students, the subject 10.960 satisfies the seminar requirement in the Fall and Spring semesters.

- **Non-Resident Doctoral Thesis Registration - Institute Regulations**

  Nonresident status is intended for doctoral students who have completed all requirements other than the thesis. Thesis research is ordinarily carried out while the student is in residence at the Institute. However, on some occasions, it may be essential or desirable that the student be absent from the campus during a portion of his or her thesis research or writing. Permission to become a nonresident doctoral candidate must be obtained from the Dean for Graduate Education (Christine Ortiz, room 3-133, (617)253-1957) at least one month prior to Registration Day of the term during which the student wishes to register in this category (a fee will be assessed for late requests).

  A student who is permitted to undertake nonresident thesis research must register as a nonresident doctoral candidate and pay a substantially reduced tuition. For the first three regular academic terms, tuition is approximately 5 percent of regular full tuition. Thereafter, it is charged at approximately 15 percent. The Schedule of Fees sets forth the specific tuition charges.

Nonresident students have limited access to the facilities and academic life of the Institute. However, they are permitted access to the libraries and athletic facilities and have the same student health privileges and options as resident students upon payment of the appropriate fees. For the first three semesters of nonresident status, a student may receive fellowship support from MIT for an amount up to 5 percent of tuition per semester. After the third semester, nonresident students can no longer receive fellowship support from MIT. Eligibility for federal loans and sponsored billing remain unaffected for the length of nonresident tenure.

Prior to submission, the request form must be approved by the student's thesis supervisor and by the departmental graduate officer from the student's department of registration. Justification for the nonresident status must be set forth in the proposal. This may include: field work or data collection; use of special or unique facilities at other laboratories; the need to accompany a thesis supervisor who transfers to another institution prior to completion of thesis research; simultaneous employment unrelated to the Institute and also unrelated to the thesis research. Arrangements must be described through which the thesis research will be supervised by a member of the faculty or a senior staff member approved by the department.

Prior to seeking approval, the student must have completed the general qualifying examinations and must have been in residence as a regular graduate student for a period of at least four regular terms (periods of residence at other educational institutions, as a special student or during the summer session at MIT may not be counted in meeting this requirement). The student must also have submitted a thesis proposal that indicates approval by the supervisor and the appropriate departmental committee. A summary of the proposal must be included with the request for nonresident status submitted to the Dean for Graduate Education.

Nonresident doctoral candidates are not eligible to reside in student housing or to be graduate resident tutors. Upon approval for nonresident status, students must terminate their current license agreements (with adherence to current poilicies) and forfeit their continuing housing status, if applicable. Students granted this status may subsequently

request to be put on a waiting list and, when space is available, may be assigned housing on a semester-by-semester basis.

Should space become available after all other fully registered students have requested and have been granted an assignment on campus, Housing will then offer the nonresident candidate an available space. Students on the waiting list will be offered a space in the order of date applied. Housing will try to allow students already in graduate housing who move to nonresident status and who receive an offer from the waiting list to stay in their current location, but this is not guaranteed.

Students cannot accept employment as academic, administrative, or research staff, or as hourly employees at MIT, Lincoln Laboratory, or the Charles Stark Draper Laboratory while registered as nonresident graduate students. Initial approval for nonresident status is granted for two successive regular terms in the same academic year. Registration as a nonresident doctoral candidate is not required during the summer session unless the student is returning to resident status to complete degree requirements and submit a thesis. Continuation for two additional periods of two regular terms each may be granted by the Dean for Graduate Education if the student's progress is satisfactory and if the thesis supervisor and the department so recommend. Generally, a maximum of six regular terms in nonresident status will be permitted. Longer periods will need written endorsement from the department of registration. Following completion of the nonresident period, the student must return to resident status for completion and presentation of the doctoral thesis. If the thesis is completed during the first term of resident status (including summer session), tuition will be prorated on a weekly basis subject to a minimum charge of one half the tuition for a regular term.

Registration must be continuous. If a student is withdrawn and then readmitted to resident status to submit a thesis and receive the doctoral degree that same term, tuition will be 1.5 times the full tuition for a regular term.

Special action by the Dean for Graduate Education is not required for thesis research in the cooperative, internship, and practice school programs in several departments of the School

of Engineering. The tuition charges for these programs are set forth in the Schedule of Fees.

- **Tuition Charges for Doctoral Theses (2012-2013)**

  Tuition charges for continuing resident student registration will be in accordance with the regular tuition and minimum fee schedule as indicated in the MIT Catalogue or on the website http://web.mit.edu/registrar/reg/costs/graduate/thesisrules.html.

  If a student defends his/her doctoral thesis before the last day of classes, the tuition will be prorated according to the Registrar's Tuition Table to the day of the oral thesis defense. Students should consult the MIT Academic Calendar for the various deadlines for doctoral theses submission http://web.mit.edu/registrar/www/calendar.html.

PROGRAM IN POLYMER SCIENCE AND TECHNOLOGY (PPST)

This section is intended to summarize the expectations of the Department of Chemical Engineering for students in PPST who intend to receive a PhD/ScD degree in Chemical Engineering. Except where noted, such students are expected to adhere to the policies and procedures described in this Handbook. Questions should be directed to the Student Office (room 66-366, (617)253-4577), or to the PPST Office http://web.mit.edu/ppst/ (room 3-435, (617)253-0949). The following guidelines apply:

1. The PPST core curriculum replaces the four core subjects (10.34, 10.40, 10.50, and 10.65) and the Biology Requirement of the Department of Chemical Engineering.
2. Students in PPST must take three subjects in Chemical Engineering, in addition to those that are part of the PPST core curriculum, in order to satisfy the Minor Requirement. Two of these three subjects must be from the Chemical Engineering core curriculum (10.34, 10.40, 10.50, or 10.65). Note that a grade of B or higher must be received in every course taken to satisfy the Minor requirement.
3. 10.960 satisfies the seminar requirement each Fall and Spring semesters for PPST students. During their first Fall semester at MIT, PPST students are strongly encouraged to attend 10.990 seminars delivered by PPST faculty and affiliates.
4. First-year students are required to meet with at least five faculty or affiliates of PPST to discuss possible research topics. Each faculty should sign a form provided by the PPST office. The selection of a research advisor(s) should be made in

consultation with the Director of PPST, Professor Robert E. Cohen (room 66-554, (617)253-3777, recohen@mit.edu), typically by the end of the first Fall semester.

5. The Thesis Committee should consist of two or more members, in addition to the research advisor. At least two of these must be faculty members in Chemical Engineering. The research advisor serves as the Thesis Committee Chairperson. The research advisor need not be a faculty member in Chemical Engineering, but in this case a pro-forma ChemE co-research advisor is required.

6. PPST students admitted by the Department of Chemical Engineering are required to serve as a Teaching Assistants (TA) for one term in the Department, normally in a 10-XXX subject. Two possible semesters of availability for the TA draft are identified by the student at the time of the Thesis Proposal Presentation Meeting, by completing the appropriate section in the Report of Thesis Proposal Presentation Meeting Form (see page 46). Both the student and the research advisor(s) must sign this section of the Form.

7. The Qualifying Examination administered by the PPST faculty replaces the Chemical Engineering Qualifying Examination. The PPST Qualifying Examination is offered once a year, at the end of the Spring semester. Requests to take the PPST Qualifying Examination should be made in writing to the PPST Director by April 15. The written portion of the PPST Qualifying Examination consists of five or six one-hour questions split into two sessions, with a break in between. The oral portion of the PPST Qualifying Examination involves responding to two or three questions posed by the PPST faculty in a single 45minute session. The PPST Qualifying Examination covers material presented in the first two semesters of the PPST core curriculum, as well as general knowledge of an introductory nature in the area of polymer science and engineering.

MASTER'S DEGREE WITH THESIS

The general requirements described in the MIT Graduate School Manual are applicable http://odge.mit.edu/gpp/degrees/masters/master-of-science/. Students must complete at least 66 subject units, of which 42 units must be graduate H-level (higher level) subjects. The four core graduate subjects (10.34, 10.40, 10.50, and 10.65, see page 2) are required for the SM degree. Units which have been used to satisfy other master's level program degree requirements (e.g., MSCEP, see

page 34) cannot be used to satisfy the 66 units required for the SM degree. 24 units of thesis should be taken, and this is in addition to the 66 units just mentioned. Thesis units in excess of 24 may not be used to satisfy subject requirements. The SM Thesis must be approved by two readers, the research advisor and one additional Chemical Engineering faculty member.

MASTER'S DEGREE IN CHEMICAL ENGINEERING PRACTICE (MSCEP)

The Chemical Engineering Department at MIT offers a unique graduate program that combines coursework with problem solving in an industrial setting. Students normally spend two semesters (not necessarily consecutively) in the Chemical Engineering Department at MIT to satisfy subject requirements, and one semester at two industrial field stations engaged in project work which is accepted in lieu of an SM thesis. Students pursuing the Practice School option are generally divided into three categories: (1) Master's only candidates, (2) doctoral candidates, and (3) MIT SB graduates pursuing a Master of Science in Chemical Engineering Practice (MSCEP). Over the past decade, approximately 60 percent of the departmental doctoral students have selected the Practice School program as an interim degree en route to their PhD/ScD.

Matriculated graduate students in the Department can apply to the School of Chemical Engineering Practice by completing a Practice School application and arranging an interview with the Practice School Director, Professor T. Alan Hatton after entering the Department. Typically, students entering in the Fall semester complete their application by December 1 for placement in the following Summer, Fall, and Spring sessions. Practice School applications can be completed on-line.

Requirements for a Master's Degree in Chemical Engineering Practice (MSCEP)

The Practice School station assignments are offered 3 times per year, during the Fall, Spring, and Summer terms, and the distribution of subject and project requirements depends on the semester of attendance at the Practice School Station. Those students attending either the Fall or the Spring sessions complete four 12-unit projects, while students attending the stations during the shorter Summer session (13-week program vs. 16-week program) complete only three projects, and make up the remaining credit units by doing additional coursework. Each Practice School project is rated as two 0-6-0 subjects, grades being given independently for technical performance and for non-technical aspects of the project execution. Proficiency in certain core areas of Chemical

Engineering is required for the MSCEP degree. All students are required to take one subject in each of the following areas:

Required Subjects	**Suggested Courses**	**Units**
Thermodynamics	10.40	4-0-8
Heat and Mass Transfer	10.50	4-0-8
Reaction Engineering	10.65	3-0-6
Systems Engineering	10.551	3-0-6
Applied Mathematics	10.34	3-0-6
Applied Process Chemistry	10.25, 10.520, 10.541, 10.521, 10.544, 10.569, 10.572, 10.652J, 10.675J (others are also allowed with consent of the Practice School Director)	3-0-6 or more
Undergraduate Process Design	Course from Undergraduate Institution, OR 10.390, 10.490, 10.491 at MIT	No units credited toward MSCEP Degree
	Total Course Units Required	63+ units

For students attending in the Fall and Spring semesters, additional credit requirements include:

Practice School Projects	10.80 through 10.87	48 units
	Total Units for MSCEP Degree	111+ units

For Summer session students, the credit requirements include:

Elective	Consent of Practice SchoolDirector	3-0-6 or more
Practice School Projects	10.80 through 10.85	36 units
	Total Units for MSCEP Degree	108+units

Graduate level subjects taken outside the Department may be accepted in lieu of the above subject requirements with the consent of the instructor teaching the appropriate subject, and of the Practice School Director. In such cases, credit unit requirements must be satisfied with other graduate level technical subjects approved by the Practice School Director.

Arrangements while at Practice School

Financial support for students enrolled in the Practice School program is available. Funding from a group of Sponsoring Companies and from a Practice School Alumni/ae Endowment Fund is used to support students while in residence at MIT, normally limited to one semester of support for each student. In addition, Practice School students may be supported by teaching assistantships, research assistantships, or external fellowships. Students at the stations receive funding with full tuition and with stipends equivalent to what would be granted at MIT, with funding from the host companies, the Practice School Endowment, or external fellowships.

Housing is provided by the host company for single and married students during the period of assignment to the Practice School Station sites.

JOINT MASTER'S DEGREES

This degree is intended for graduate students who seek academic recognition in two professional fields, which, although distinct, have a substantial interdisciplinary connection.

For the Chemical Engineering portion, the student must satisfy the same subject requirements as for any SM degree offered by the Department. A total of at least 132 subject units in both Departments is an Institute requirement http://odge.mit.edu/gpp/degrees/masters/simultaneous-registration-for-two-masters-degrees/. This total does not include thesis units. If the student is attending Practice School, units in excess of 36 may be used to satisfy the Chemical Engineering subject requirements.

A joint SM program is not one which is to be declared near graduation. As described in the MIT Graduate School Manual:

> Participation in a dual degree program is limited to students who are already registered in one Department and who meet the admissions criteria in the second Department. At least two regular terms prior to completion of the program, the student must submit to each Department a statement of educational objectives along with a detailed program plan that includes a description of the proposed thesis topic. The total program must meet with the approval of each Department and a petition approved by the Dean of the Graduate School describing the program must be filed with the Registrar. The thesis research shall be done under the supervision of an approved member of one of the two participating Departments with the other Department providing a thesis reader. The research must be done on campus. The thesis must be of superior quality. The single

thesis cannot be used to satisfy the requirements of any additional graduate degree programs.

If the Practice School is to be used to meet the thesis requirement, this choice must be approved by the other participating Department.

SPECIAL GRADUATE STUDENTS

A Special Graduate Student in Chemical Engineering is one whose intended program of study is essentially graduate in nature, but who is not a candidate for a degree. Application for this status is made to the Departmental Admissions Committee. Admission is valid only for one term; readmission must be sought each term. Other information relating to filing dates, fees, and academic performance can be found in the MIT Graduate School Manual, at the Office of the Dean for Graduate Education website: http://odge.mit.edu/gpp/registration/status/special-student/.

CONSULTATION OR OUTSIDE JOBS

The financial aid provided to the Department for fellowships, research, or teaching assistantships usually carries a restriction that the student should devote full-time effort to the activities for which he/she is receiving support. Students receiving support from the Department should therefore consult with their research advisor(s) and ask the Chemical Engineering Graduate Officer before undertaking any compensated outside activity, and obtain an approval form from the Dean for Graduate Education, Christine Ortiz (room 3-138, (617)253-4860, cortiz@mit.edu).

UNSATISFACTORY PROGRESS

Students judged to be making unsatisfactory progress toward their degree objective will be so notified in writing by the research advisor(s), the Graduate Officer, or the Dean for Graduate Education, Christine Ortiz (room 3-138, (617)253-4860, cortiz@mit.edu). If sufficient improvement is not made by the end of the following semester, future registration may be denied.

COMPLETION OF STUDIES

Each student, upon completion of his/her graduate program, must submit the following materials to the Student Office (found within the Thesis Packet on our website.):

1. Forwarding Address Form.
2. Departmental Departure Form - This form requires various approvals, including those of the student's research advisor(s) and the Facilities Manager, Steve Wetzel (room 66-413, (617)258-7166, swetzel@mit.edu), to ensure that the laboratory and/or office space is neat and clean, and that no unapproved chemical samples are left behind. In addition, all office and lab keys must be returned to the Administrative Assistant associated with the student's research advisor, and the desk key must be returned to the Assistant to the Executive Officer (room 66-350, (617)253-4562), prior to leaving the Institute.
3. Recruiting Questionnaire. This is optional, but is very useful to the Student Office in collecting data about what Chemical Engineering students do after graduating from MIT.

In addition, each student submitting a thesis for the master's or doctoral degree must turn in the following materials to the Student Office:

1. Two copies of the thesis (on archival bond paper).
2. One extra copy of the Thesis Abstract.
3. One extra copy of the Title page.
4. University Microfilms Form (UMI)

The thesis must be signed by the student, and his/her research advisor(s), prior to being submitted to the Student Office. The title pages and one copy of the thesis will then be delivered by the Student Office to the Graduate Officer for final approval and signature. The two copies of the doctoral thesis, along with all other forms, must be turned in to the Student Office within two days following the Final Thesis Defense. The master's thesis (with the accompanying forms) must be turned in to the Student Office on or before the last day of classes.

GENERAL MIT POLICIES

- **Affirmative Action/Equal Opportunity in Education**

  The Massachusetts Institute of Technology is committed to the principle of equal opportunity in education and employment. The Institute does not discriminate against individuals on the basis of race, color, sex, sexual orientation, gender identity, religion, disability, age, genetic information, veteran status, ancestry, or national or ethnic origin in the administration of its educational policies, admissions policies, employment policies, scholarship and loan programs, and other Institute administered programs and activities, but may favor US citizens or residents in admissions and financial aid.

  The Vice President for Human Resources is designated as the Institute's Equal Opportunity Officer and Title IX Coordinator. Inquiries concerning the Institute's policies, compliance with applicable laws, statutes, and regulations (such as Title VI, Title IX, and Section 504), and complaints may be directed to Alison Alden, Vice President for Human Resources, Room E19-215, 617-253-6512, or to the Manager of Staff Diversity and Inclusion, Room E19-215, 617-452-4516. Inquiries about the laws and about compliance may also be directed to the Assistant Secretary for Civil Rights, US Department of Education.

  *The ROTC programs at MIT are operated under Department of Defense (DOD) policies and regulations, and do not comply fully with MIT's policy of nondiscrimination with regard to sexual orientation. MIT continues to advocate for a change in DOD policies and regulations concerning sexual orientation, and will replace scholarships of students who lose ROTC financial aid because of these DOD policies and regulations.

- **MIT Policy on Harassment**

  Harassment of any kind is not acceptable behavior at MIT; it is inconsistent with the commitment to excellence that characterizes MIT's activities. MIT is committed to creating an environment in which every individual can work, study, and live without being harassed. Harassment may therefore lead to sanctions up to and including termination of employment or student status.

  Harassment is any conduct, verbal or physical, on or off campus, that has the intent or effect of unreasonably interfering with an individual or group's educational or work performance at MIT or that creates an intimidating, hostile, or offensive educational, work, or living

environment. Some kinds of harassment are prohibited by civil laws or by MIT policies on conflict of interest and nondiscrimination.

Harassment on the basis of race, color, sex, disability, religion, national origin, sexual orientation, gender identity, veteran's status, or age includes harassment of an individual in terms of a stereotyped group characteristic, or because of that person's identification with a particular group.

Sexual harassment may take many forms. Sexual assault and requests for sexual favors that affect educational or employment decisions constitute sexual harassment. However, sexual harassment may also consist of unwanted physical contact, requests for sexual favors, visual displays of degrading sexual images, sexually suggestive conduct, or offensive remarks of a sexual nature.

The Institute is committed under this policy to stopping harassment and associated retaliatory behavior. All MIT supervisors have a responsibility to act to stop harassment in the areas under their supervision.

Any member of the MIT community who feels harassed is encouraged to seek assistance and resolution of the complaint. MIT provides a variety of avenues by which an individual who feels harassed may proceed, so that each person may choose an avenue appropriate to his or her particular situation. Institute procedures are intended to protect the rights of both complainant and respondent, to protect privacy, and to prevent supervisory reprisal.

General complaint procedures are described in Section 9.6 Complaint and Grievance Procedures as well as the Guidelines for Raising Complaints about Harassment.

- **Complaint and Grievance Procedures for Students at MIT**

  Students who believe they have been treated improperly, for any reason, are encouraged to raise their concerns. Students who have difficulty in their living groups should raise these problems within the living group and with graduate residents and housemasters, as appropriate. Concerns related to the broader Institute community, including but not confined

to academic or work situations, should be raised directly with professors, instructors, departmental advisors and immediate supervisors, Campus Police or other Institute officials, as appropriate to the nature of these problems.

In the Department of Chemical Engineering, students may wish to contact one of the following people to discuss issues of harassment, complaints, or other concerns:

- Professor Klavs F. Jensen, Department Head, Room 66-342, (617)253-4589, kfjensen@mit.edu
- Professor Patrick S. Doyle, Chairman, Committee for Graduate Students, Room 66-270, (617)253-4534, pdoyle@mit.edu
- Ms. Suzanne Maguire, Academic Administrator, Room 66-366, (617)253-4577, easterly@mit.edu
- Ms. Esther Estwick, Personnel Administrator, Room 8-331, 253-4563, estherg@mit.edu

A concern may also be raised at any time with any of the following MIT personnel:

- Ms. Mary Rowe, Special Assistant to the President and Ombudsperson, Room 10-213, (617)253-5921, mrowe@mit.edu.
- Ms. Toni Robinson, Ombudsperson, Room 10-213, (617)253-5921, trobins@mit.edu
- Ms. Alison Alden, Vice President for Human Resources, Room E19-215, (617)253-6512, aalden@mit.edu

If the complaint is against another student and cannot be resolved otherwise, the Office of the Dean for Student Life may assist (Room 4-110, (617)253-4052), or the case may be referred to the Committee on Discipline. For further information on the Committee on Discipline, please refer to the MIT Bulletin. (Detailed procedures of the Committee on Discipline are stated in Committee on Discipline Rules and Regulations, which is available from the Office of the Dean for Student Life http://web.mit.edu/committees/cod/.

It is the Institute's policy that individuals will not be reprimanded, or discriminated against, for initiating an inquiry or a complaint. It is also the Institute's policy to recognize and respect the rights of any individual against whom a complaint has been brought.

The procedures that are in here are intended to resolve issues within the Institute, and follow the guidelines explained in the MIT Policies and Procedures Guide, March, 1990, or on the website http://web.mit.edu/policies/. They are not ordinarily available to deal with the substance of a complaint that has been formally taken outside the Institute.

Normally, while a complaint is being pursued internally, a complainant is expected to represent himself or herself directly; individuals are free to obtain the support and assistance of a co-worker or fellow student or any other MIT associate in presenting their concerns. "MIT associate" is a person who is currently a member of the MIT community, mainly a student, faculty member, staff member, or other employee, but not a member of the complainant's immediate family (parent, sibling, spouse, or child) so that issues of familial loyalty do not cloud the resolution of the complaint.

Once a complaint is presented or an inquiry has begun, a determined effort should be made at each step, either to resolve the problem, or to refer it to the next step, within one week. Throughout the entire complaint process, the complainant should be assured that the information provided will be kept confidential, insofar as the individual wishes it, or until such time as the individual agrees that a third party, or parties, must be informed to facilitate action. This assurance of confidentiality may be qualified: for example, by the duty placed by law on persons receiving complaints of particular types.

- **Academic Honesty**

  MIT assumes that all students come to the Institute for a serious purpose and expect them to be responsible individuals who demand of themselves high standards of honesty and personal conduct. Cheating, plagiarism, unauthorized collaboration, and other forms of academic dishonesty are considered serious offenses for which disciplinary penalties can be imposed.

  Some academic offenses by students may be handled directly between a faculty member and the student, possibly with the assistance of the Department Head. More information on academic honesty can be found on the MIT website at: http://web.mit.edu/policies/10.0.html or at http://web.mit.edu/academicintegrity/.

IMPORTANT

DEPARTMENTAL FORMS

CHEMICAL ENGINEERING DEPARTMENT
GRADUATE STUDENT PLANS FOR FALL 2012

Directions: All graduate students should submit this form to the Student Office (66-366) by **Wednesday, December 12, 2012**. **This form will not be accepted without all of the required Faculty Signatures.**

STUDENT NAME:_____

I. As part of the Research Advisor selection process, I have discussed possible research projects with the following six Chemical Engineering faculty:

Faculty Name (Please Print)	**Date**	**Faculty Signature**
1. _____	_____	_____
2. _____	_____	_____
3. _____	_____	_____
4. _____	_____	_____
5. _____	_____	_____
6. _____	_____	_____

II. My ultimate degree objective is (check boxes and answer questions):

☐ **(PhD/ScD)/PhDCEP**

1. **FIRST PROJECT CHOICE**

Advisor Name:_____

Project

Title:_____

Advisor Agreement: I hereby agree that if **(Student Name)**

_____is assigned to me as one of the two doctoral students allowed by the Department, I will accept him/her as a doctoral student in my research group **(Advisor Signature, on or after December 1, 2012)** _____.

Over→

2. SECOND PROJECT CHOICE

Advisor Name:_____

Project

Title:_____

☐ **SM**

1. FIRST PROJECT CHOICE

Advisor Name:_____

Project

Title:_____

2. SECOND PROJECT CHOICE

Advisor Name:_____

Project

Title:_____

☐ **MSCEP**

I plan to attend Practice School in **(indicate which term)** _____.

(If you are planning to attend in Spring 2013 or Summer 2013, your decision is needed by Friday, October 19, 2012.)

REPORT OF THESIS PROPOSAL PRESENTATION MEETING

(To be Completed by the Student and the Thesis Supervisor(s))

Student Name: _____

Date of Meeting: _____

Thesis Supervisor(s): _____ Present Absent

_____ Present Absent

Thesis Committee Members*: _____ Present Absent

_____ Present Absent

_____ Present Absent

_____ Present Absent

*** If a Thesis Committee Member is from outside the Chemical Engineering Department, please include his/her address, email address, and phone number.**

Thesis Title: _____

_____

_____

Is the Research Plan described in the Thesis Proposal satisfactory? ___Yes ___No

Were safety considerations adequately addressed at this meeting? ___Yes ___No

The Thesis Committee has reviewed the academic plan of this student with respect to remaining coursework needed for Departmental Requirements and as a supplement to research, and has made the following recommendations.

(Over, Please)

- **Please *attach a typed summary* of the comments and recommendations made by the Thesis Committee.**

- **Please *attach a copy* of your Thesis Proposal.**

Student Signature: _____

Thesis Supervisor(s) Signature(s): _____

_____

We concur with the overall evaluation reported above (satisfactory or unsatisfactory).

_____, **Thesis Committee Member**

_____, **Thesis Committee Member**

_____, **Thesis Committee Member**

_____, **Thesis Committee Member**

CAREER GOALS:

Industry_____ Academia:_____

Other: _____

Departmental TA Duties:

The candidate has agreed to be available for Departmental TA duties during the two terms indicated below. The terms chosen should not be later then the end of the candidate's fourth year. The Thesis Committee endorses the student's TA plan.

1._____ 2._____

_____ _____

Student Signature **Thesis Supervisor(s) Signature(s)**

Please return this form (*including attached materials*) to the Student Office, 66-366. The Student Office will maintain a copy of this form in the student's file. A copy of this form (*including attached summary and statement*) will be mailed to the student, the Thesis Supervisor(s), and the other members of the Thesis Committee.

REPORT OF REGULAR THESIS COMMITTEE MEETING

(To be Completed by the Student and the Thesis Supervisor(s))

Student Name: _____

Date of Meeting: _____

Thesis Supervisor(s): _____ Present Absent

_____ Present Absent

Thesis Committee Members*: _____ Present Absent

_____ Present Absent

_____ Present Absent

_____ Present Absent

*** If a Thesis Committee Member is from outside the Chemical Engineering Department, please include his/her address, email address, and phone number.**

Thesis Title: _____

_____

_____

Is the Regular Thesis Committee Meeting Progress Report satisfactory? ___Yes ___No

Were safety considerations adequately addressed at this meeting? ___Yes ___No

(Over, Please)

- **Please *attach a typed summary* of the comments and recommendations made by the Thesis committee.**

- **Please *attach a copy* of the written Regular Thesis Committee Meeting Progress Report that you submitted to your Thesis Committee prior to this meeting**.

Attendance at Scientific Conferences:

Since my last Thesis Committee Meeting, I have attended the following Scientific Conferences:

_____

_____

_____

_____

Student Signature: _____

Thesis Supervisor(s) Signature(s): _____

_____

We concur with the overall evaluation reported above (satisfactory or unsatisfactory).

_____, **Thesis Committee Member**

_____, **Thesis Committee Member**

_____, **Thesis Committee Member**

_____, **Thesis Committee Member**

Please return this form (*including attached materials*) to the Student Office, 66-366. The Student Office will maintain a copy of this form in the student's file. A copy of this form (*including attached summary and statement*) will be mailed to the student, the Thesis Supervisor(s), and the other members of the Thesis Committee

REPORT OF PLAN-TO-FINISH THESIS COMMITTEE MEETING

(To be Completed by the Student and the Thesis Supervisor(s))

Student Name: _____

Date of Meeting: _____

Thesis Supervisor(s): _____ Present Absent

_____ Present Absent

Thesis Committee Members*: _____ Present Absent

_____ Present Absent

_____ Present Absent

_____ Present Absent

*** If a Thesis Committee Member is from outside the Chemical Engineering Department, please include his/her address, email address, and phone number.**

Thesis Title: _____

_____

_____

Is the Plan-To-Finish Thesis Committee Meeting Report satisfactory? ___Yes ___No

Were safety considerations adequately addressed at this meeting? ___Yes ___No

(Over, Please)

- **Please *attach a brief statement* summarizing discussions during the meeting about your career goals and expectations after completing your PhD**

- **Please *attach a typed summary* of the comments and recommendations made by the Thesis Committee.**

- **Please *attach a copy* of the written Plan-to-Finish Thesis Committee Report that you submitted to your Thesis Committee prior to this meeting. The report should *describe the remaining research tasks to complete your PhD Thesis, including an estimated time to complete these tasks* and *an estimated date of graduation, as well as a list of manuscripts submitted, or to be submitted, for publication.***

Attendance at Scientific Conferences:

Since my last Thesis Committee Meeting, I have attended the following Scientific Conferences:

_____

_____

_____

_____

Student Signature: _____

Thesis Supervisor(s) Signature(s): _____

_____

We concur with the overall evaluation reported above (satisfactory or unsatisfactory).

_____, **Thesis Committee Member**

_____, **Thesis Committee Member**

_____, **Thesis Committee Member**

_____, **Thesis Committee Member**

Please return this form (*including attached materials*) to the Student Office, 66-366. The Student Office will maintain a copy of this form in the student's file. A copy of this form (*including attached summary and statement*) will be mailed to the student, the Thesis Supervisor(s), and the other members of the Thesis Committee.

REPORT OF FINAL THESIS COMMITTEE MEETING

(To be Completed by the Student and the Thesis Supervisors(s))

Student Name: _____

Date of Meeting: _____

Thesis Supervisor(s): _____ Present Absent

_____ Present Absent

Thesis Committee Members*: _____ Present Absent

_____ Present Absent

_____ Present Absent

_____ Present Absent

*** If a Thesis Committee Member is from outside the Chemical Engineering Department, please include his/her address, email address, and phone number.**

Thesis Title: _____

_____

_____

Is the Final Thesis Committee Meeting Report satisfactory? ___Yes ___No

Were safety considerations adequately addressed at this meeting? ___Yes ___No

(Over, Please)

- **Please *attach a brief statement* summarizing discussions during the meeting about your career goals and expectations after graduation.**

- **Please *attach a typed summary* of the comments and recommendations made by the Thesis Committee.**

- **Please *attach a copy* of the written Final Thesis Committee Meeting Report that you submitted to your Thesis Committee prior to this meeting. The report should *include a detailed outline of the research tasks that need to be completed to finish your PhD Thesis, including a date of graduation, as well as a list of manuscripts submitted, or to be submitted, for publication.***

Attendance at Scientific Conferences:

Since my last Thesis Committee Meeting, I have attended the following Scientific Conferences:

_____

_____

_____

_____

Student Signature: _____

Thesis Supervisor(s) Signature(s): _____

_____

We concur with the overall evaluation reported above (satisfactory or unsatisfactory).

_____, **Thesis Committee Member**

_____, **Thesis Committee Member**

_____, **Thesis Committee Member**

_____, **Thesis Committee Member**

Please return this form (*including attached materials*) to the Student Office, 66-366. The Student Office will maintain a copy of this form in the student's file. A copy of this form (*including attached summary and statement*) will be mailed to the student, the Thesis Supervisor(s), and the other members of the Thesis Committee.

REQUEST FOR BIOLOGY REQUIREMENT EXEMPTION

Student Name: _____

I petition to be exempt from taking 7.01x (x=1,2,3) because I have taken an equivalent course(s) at _____**(institution)** prior to enrollment at MIT. ***Please attach a transcript copy and a syllabus of the course(s) that you have taken, and explain the relationship of the material covered to that in 7.01x; for a detailed syllabus of 7.01x, see http://mit.edu/7.01x/).**

In addition, please provide the following information:

	Course Title	**Textbook**	**Units/Grade**
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____

Student Signature: _____ **Date:** _____

Thesis Supervisor(s)

Name (printed):_____**Signature:** _____ **Date:** _____

Name (printed):_____**Signature:** _____ **Date:** _____

PLEASE RETURN THIS FORM AND RELATED DOCUMENTATION TO THE STUDENT OFFICE, 66-366. THE STUDENT OFFICE WILL SEEK APPROVAL OF THE COMMITTEE FOR GRADUATE STUDENTS. IF APPROVED, A COPY OF THIS FORM WILL BE MAILED TO THE STUDENT AND THE THESIS SUPERVISOR(S).

APPROVAL OF COMMITTEE FOR GRADUATE STUDENTS

SIGNATURE: _____ **DATE:** _____

REQUEST FOR APPROVAL OF DEPARTMENTAL MINOR

Student Name: _____

Title of Minor: _____

Date: _____

	Subject Number	Subject Title[1]	Units	Level[2]
1.	_____	_____	____	____
2.	_____	_____	____	____
3.	_____	_____	____	____

[1] If the three subjects are not all offered by the same department, please attach an explanation of how they constitute a coherent theme.

[2]Please note whether the subject is U (Undergraduate Level) G (Graduate Level), or H (Graduate Higher-Level).

Student Signature: _____ **Date:** _____

Thesis Supervisor(s) Signature(s): _____ **Date:** _____

_____ **Date:** _____

PLEASE RETURN THIS FORM TO THE STUDENT OFFICE, 66-366. THE STUDENT OFFICE WILL SEEK APPROVAL OF THE COMMITTEE FOR GRADUATE STUDENTS. IF APPROVED, A COPY OF THIS FORM WILL BE MAILED TO THE STUDENT AND THE THESIS SUPERVISOR(S), INDICATING THE APPROVAL.

APPROVAL OF COMMITTEE FOR GRADUATE STUDENTS

SIGNATURE: _____ **DATE:** _____

TEACHING ASSISTANT (TA) EVALUATION FORM

- **It is the responsibility of the TA to arrange an evaluation meeting with the course instructor(s) upon completion of the TA assignment.**

- **It is also the responsibility of the TA to return this form to the Student Office (66-366) (with a copy of the solution CD*) following the evaluation meeting. The Student Office will keep a copy of the form in the student's file. In addition, copies will be mailed to the TA, to the course instructor(s), and to the TA's research advisor(s). *The Student Office needs only one solution CD per course, so please coordinate this with fellow TAs.**

TA Name: _____

Instructor Name(s): _____

_____

Date of Evaluation: _____

Course Number: _____

Semester/Year: _____

Research Advisor Names(s) _____

_____

Evaluation of the TA Performance

(Faculty, please circle the appropriate category)

1. Technical knowledge of the course material:

Excellent Very Good Good Average Poor N/A

2. Performance during office hours and review sessions:

Excellent Very Good Good Average Poor N/A

3. Ability to develop new homework and exam problems:

Excellent Very Good Good Average Poor N/A

4. Ability to grade homework and exam problems accurately and in a timely manner:

Excellent Very Good Good Average Poor N/A

5. Availability to students:

Excellent Very Good Good Average Poor N/A

6. Management of the course logistics, including:

- **Preparation of solutions to homework and exam problems.**
- **Photocopying of course materials.**
- **Maintenance of the course Web site.**
- **Preparation of electronic and/or hard-copy versions of the course solution book.**

Excellent Very Good Good Average Poor N/A

7. Ability to communicate student concerns to the instructor(s):

Excellent Very Good Good Average Poor N/A

8. Planning, designing, and supervising of laboratory experiments (for TAs in laboratory courses):

Excellent Very Good Good Average Poor N/A

9. Communication and personal skills when interacting with students:

Excellent Very Good Good Average Poor N/A

10. Overall TA performance:

Excellent Very Good Good Average Poor N/A

If the instructor(s) have additional comments and recommendations, please attach them.

TA Signature: _____

Instructor Signature(s): _____

_____

RECORD OF THESIS COMMITEE MEETINGS
September, 2012

Name Jones, Rocky

As a Departmental rule, every graduate student in the PhD program should have a Thesis Committee Meeting at least once every 12 months following the Thesis Proposal Presentation (for additional information about Thesis Committee Meetings, please consult the 2011-2012 Chemical Engineering Graduate Student Handbook).

Your Student Office record indicates (see below) that you have not had a Thesis Committee Meeting during the last 12 months. In view of that, you should schedule a meeting within the next 3 months . Failure to do so will constitute Unsatisfactory Progress toward the doctoral degree, and may result in denial of future registration.

On Registration Day, please submit this form, signed by you and by your research advisor(s), to the Graduate Officer. This is your acknowledgment that you need to convene your thesis committee soon (within the next 3 months).

Research Advisor(s)

J. Willard Gibbs

Thesis Information

Title Reevaluation of the Gibbs Phase Rule

Thesis Proposal Completed 3/27/2010

Committee Dates	**Thesis Committee Members**
2/15/2011	Ludwig Boltzmann
3/27/2010	Nicholas Sardi Carnot

Student Signature _____ **Research Advisor(s)** _____

_____

_____