Chemical Engineering Department

2016-2017

Graduate Student Handbook

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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 (ODGE) webpage on Graduate Policies and Procedures http://odge.mit.edu/gpp/, and the MIT Bulletin (aka course catalog) http://web.mit.edu/catalog/, cover Institute-wide policies, procedures, and regulations.

Graduate Committee Chair Daniel Blankschtein, the Academic Administrator, and the Academic Services Coordinators 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 The Academic Administrator (room 66-366, (617) 253-4577), Sydney (room 66-366, (617) 253-9695, sydneyg@mit.edu), or Ekaterina (room 66-366, (617) 253-4579) in the Student Office, or Prof. Blankschtein (room 66-442B, (617) 253-4594, dblank@mit.edu).

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

Graduate Committee

Prof. Daniel Blankschtein (Chair)	66-442B	(617)253-4594	dblank@mit.edu
Prof. Richard Braatz	E19-551	(617)253-3112	braatz@mit.edu
Prof. T. Alan Hatton	66-370A	(617)253-4588	tahatton@mit.edu
Prof. Heather Kulik	66-464	(617)253-4584	hjkulik@mit.edu
Prof. Allan S. Myerson	E19-502D	(617)452-3790	myerson@mit.edu
Prof. Yuriy Román	66-558b	(617)253-7090	yroman@mit.edu
Prof. Hadley Sikes	E19-502C	(617)253-5224	sikes@mit.edu
Prof. Michael S. Strano	66-566	(617)324-4323	strano@mit.edu
Prof. James Swan	66-554	(617)324-7359	jswan@mit.edu
Prof. William Tisdale	66-458A	(617)253-4975	tisdale@mit.edu

ADVISORS

For incoming first-year graduate students, academic advisors are members of the Graduate Committee. Prof. Daniel Blankschtein is the academic advisor for students in the PhDCEP program (see page 16) and for students in the PPSM program (see page 38). Prof. T. Alan Hatton manages the Practice School and is the academic advisor for MSCEP students (see page 41). Prof. Paul Barton is the academic advisor for students in the CSE PhD program (see page 39).

Students join a research group at the end of their first fall semester in the Department, at which point their research supervisor becomes the student's academic advisor. Should the student choose a research advisor from another department, they will also need a co-advisor from the Chemical Engineering faculty who is prepared to assume sole advisory responsibility if, for some reason, the relationship with the research advisor ends. Students are responsible for informing the Student Office in writing of any change in advisor(s).

Prior to Registration Day (both fall and spring semesters), pre-registration subject selection must be made online, and then approved by the advisor, online. Advisor approval should be obtained for any subsequent add or drop of subjects during the term (no additional authorization is required).

SUBJECT REQUIREMENTS

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 perspectives by sampling other more specialized subjects.

PhD/ScD students must complete:

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).
5. Introduction to Chemical Engineering Research (10.990)
6. One graduate subject in Chemical Engineering (Course 10); for a description of the Course 10 Electives, see http://web.mit.edu/catalog/.
7. Departmental Biology Requirement (see page 31).
8. Departmental Minor Requirement (see page 31)

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

PPSM students must complete:

1. The PPSM core curriculum.
2. One graduate subject in Chemical Engineering (Course 10); for a description of the Course 10 Electives, see http://web.mit.edu/catalog/.
3. Departmental Minor Requirement (see page 31).

CSE PhD students must complete:

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).
5. Introduction to Chemical Engineering Research (10.990).
6. One graduate subject in Chemical Engineering (Course 10); for a description of the Course 10 Electives, see http://web.mit.edu/catalog/.
7. Departmental Biology Requirement (see page 31).
8. Four graduate-level subjects from the Center for Computational Engineering (CCE) approved list of computational science and engineering subjects (http://cce.mit.edu/cse).

PhDCEP students must complete:

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).
5. Introduction to Chemical Engineering Research (10.990).
6. Systems Engineering (10.551).
7. One graduate subject in Chemical Engineering (Course 10) in applied process chemistry (see page 42).
8. Departmental Biology Requirement (see page 31).
9. Practice School coursework 10.80-10.85 (36 units), or 10.80-10.87 (48 units).
10. An additional elective, approved by the Practice School Director, if the student attends Practice School during the summer term, to make up for the credits of the 4th month of Practice School.

The first step of the PhDCEP program is the MSCEP program (see below). Therefore, courses which are required for the MSCEP degree are also required for the PhDCEP degree. These include the core courses (10.40, 10.50, 10.65, 10.34, 10.990, and 10.551), the Applied Process Chemistry course, and Practice School course work (10.80-10.87). The remaining course work for a PhDCEP student who has completed the MSCEP program includes the department's Biology Requirement, and the course requirements for the first two semesters of the Sloan School MBA program, as outlined by the Sloan School. For a more detailed description of the requirements for the MSCEP program, see page 43.

Twenty-four thesis credit units are required for PhD/ScD, PhDCEP, and PPSM. 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 36 credit units for research assistants and teaching assistants (not including 10.990/10.991/10.992 or other 10.9XX research seminars).

MSCEP students must complete:

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).
5. Systems Engineering (10.551).
6. Introduction to Chemical Engineering Research (10.990).
7. One graduate subject in Chemical Engineering (Course 10) in applied process chemistry (see page 42).
8. Additional requirements on page 43.

SM students must complete:

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).
5. Additional requirements on page 44.

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 Graduate-Level Chemical Engineering (Course 10) Elective.
- Minor Requirement.
- Biology Requirement.
- Systems Engineering: 10.551 (required for PhDCEP and MSCEP students).

A graduate student can retake a subject only once in order to get a grade of "B-" or higher.

ENGLISH EVALUATION TEST

From 9 am to 12 pm on **August 30, 2016**, in room 14E-310, entering international graduate students are required to take the English Evaluation Test, which identifies weaknesses in communication skills that may interfere with coursework, teaching, and research at MIT (https://mitgsl.mit.edu/academics-courses/english-evaluation-test-eet). Any remedial English course specified by the results of the test must be taken in the entering fall semester.

FINANCIAL SUPPORT

Graduate students 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, and GEM Fellowships. The MIT Office of the Dean for Graduate Education (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 Office website http://web.mit.edu/sfs/financial_aid/graduate_financial_aid.html.

Graduate students 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 36 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 their program of studying and research in a diligent manner.

Recipients of outside fellowships should check with the coordinating official in the MIT Office of the Dean for Graduate Education (room 3-138) to determine any obligations regarding their fellowships.

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

- **Research Assistants**

  Research Assistants (RAs) are supported from research contracts or grants, and are supervised by research advisor(s) who have 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 research advisor(s). In other words, the student declares that their thesis will be conducted in the area specified in the research project's grant (contract). Such RAs may register for no more than 36 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 36-credit unit maximum noted previously is still in effect. However, no academic credit is given for the RA appointment in that case. A typical time commitment to this type of research project would be 20 hours per week.

PhDCEP students are not allowed to serve as RAs, or to be funded via an RA, during their time at Sloan.

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

- **Teaching Assistants/Graduate Instructors**

  Teaching Assistants (TAs) 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. TA duties include. A more detailed list of TA duties will be provided at the beginning of the semester by the faculty member(s) teaching the class.

  - Developing and grading homework and exam problems.
  - Grading 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 course materials for the Student Office.

Some opportunities exist for students interested in gaining teaching experience to serve as a Graduate Instructor, otherwise known as an "Instructor G" (IG). Interested students 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, Martin Bazant, to discuss the appointment. Typically, students who can expect to compete successfully for an appointment as an Instructor G should have had exceptional performance in prior service as a TA, and should have interest in an academic career.

TA assignments are 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 page 20). 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 TA service. It is the responsibility of the student to coordinate the selection of the two semesters with their 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 (https://cheme-forms.mit.edu) should be completed and submitted online by the course instructor(s) and by the TA at the time of the meeting. Only one instructor needs to complete the evaluation form. Further, at the conclusion of the TA assignment, the TA must submit an electronic copy of all

course documents to the Student Office. The Student Office stores these course documents for the future use of Course Instructors and TAs. These materials should be submitted via Dropbox, Google Folder, or another file-sharing protocol. An email notification and electronic copy of the TA evaluation form will be sent 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's file in the Student Office for future reference.

TAs are expected to be available from September 1 to January 15 (Fall semester) or from January 16 to May 31 (Spring semester). Some 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. A student working as a full TA is expected to devote an average of 20 hours per week to TA responsibilities, which corresponds to a total of 389 hours. 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 36 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**

  Financial support is provided during the semester that students are engaged in project work at the Practice School stations.

- **Graduate Graders**

  Graduate Graders assist in the teaching of many subjects. These 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 $15/hour and can work no more than 10 hours per week. Grader positions are open to international students, as well as domestic students.

OFFICE SPACE, KEYS, AND CARD ACCESS

First-year students will receive their office assignments and desk keys from the Student Office during the first few days of the fall semester. When a student chooses a research advisor, they move into a laboratory or office space associated with the advisor's research group. The student should contact the Research Advisor's Administrative Assistant to secure an office key.

When students vacate their offices, their desks and office spaces must be emptied. Any office or desk keys should be returned to the associated administrative assistant.

ROOM RESERVATIONS

To make a room reservation in Buildings 66, E17 (5th floor), E18 (5th floor), and E19 (5th floor), graduate students should request the assistance of the administrative assistant of their research advisors. For reservations in Building 76, email Mariann Murray at mariann@mit.edu.

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 rooms 56-483 and 66-365 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 webpage http://web.mit.edu/cmshop. Emails can be sent directly to the Central Machine Shop at cmshop@mit.edu. Within the

Chemical Engineering Department, Gerald Hughes (room 66-371, (617)715-2995, ghughes@mit.edu) is also available for consultation on machine shop issues.

LABORATORY SAFETY

Laboratory safety is of the utmost importance. Specific information on safety-related policies and procedures is available from the Departmental Safety Committee, chaired by the Department EHS Coordinator Brian Smith (room 66-471, (617)253-6238, bssmith@mit.edu). Another departmental resource person for general safety-related matters and general issues regarding departmental space and facilities is Gerald Hughes (room 66-371, (617) 715-2995, ghughes@mit.edu). Gerald acts as the EHS coordinator for the department when Brian Smith is away from MIT. 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. Carolyn Stahl (room N52-461, (617) 253-5564, csstahl@mit.edu) is a valuable resource at the EHS Office for biological safety issues. Ryan Toolin (room N52-468, (617) 258-3879, rtoolin@mit.edu) ,the EHS Radiation Protection Officer, is the person to contact for questions on radiation and lasers. Comprehensive safety information is available on the web from the MIT EHS office (http://ehs.mit.edu/site/).

Policies and procedures that describe each person's responsibilities for safe laboratory practices are detailed in the Chemical Engineering Department's "Chemical Hygiene Plan" (http://ehs.mit.edu/site/content/chemical-hygiene-program). Although the research and other work activities conducted in the Department are diverse, three requirements apply in all cases:

1. We are all responsible for our own safety, as well as for the safety of individuals who work with, and for, us.
2. An individual running an experiment or utilizing the laboratory space at any given time, is responsible for the safe conduct of the experiment, and for the safe utilization of the laboratory space.

3. The supervisor of an individual running an experiment should be satisfied that the individual performing the experiment is aware of, and follows, safe laboratory procedures.

Anyone planning to work in a laboratory must log into the EHS website (http://ehs.mit.edu/site/training) to take the Training Needs Assessment, and to complete the training required before starting work in a laboratory.

A one-hour presentation on safety-related matters will be delivered during the first session of the Departmental Student Seminar Series (10.991/10.992) each term. All graduate students, postdocs, and UROP students who work in Chemical Engineering laboratories that are covered by the Chemical Hygiene Plan are required to attend these presentations and to sign the attendance sheet.

Eye protection is required when working in all Chemical Engineering laboratories at all times. For many laboratory experiments, safety glasses with side shields are appropriate. If you require prescription eyewear and wish to obtain a free pair of prescription eyeglasses with side shields, please contact Sandra Lopes in Headquarters (66-350,,) slopes@mit.edu.

The MIT EHS policy mandates the use of lab coats in laboratory environments "at a minimum, a laboratory coat or equivalent protective clothing is required for work with hazardous chemicals, unsealed radioactive materials, and biological agents at BL2 or greater." MIT is currently in the process of launching a campus-wide initiative to encourage researchers to practice regular laboratory coat usage. However, wearing a coat is only the first issue; the second is choosing the right coat. It is important to choose a coat with features that are appropriate for the type of experiments that are being conducted in the laboratory. For example, pyrophoric chemical users may choose to purchase Nomex coats, organic solvent users may choose to purchase FR-treated-cotton coats, and biological materials users may choose to purchase a cotton-poly blend coat. There are several types of laboratory coats which are available to MIT vis-a-vis two

preferred vendors: Cintas and North Star. Information about the types of coats, pricing, and availability can be found at the following site: https://vpf.mit.edu/site/sourcing_procurement/what_s_new/lab_coat_services.

For general information about MIT's laboratory coat policy and other commonly asked questions, please visit: http://labcoats.mit.edu/.

PROFICIENCY IN WRITING

The ability to write clearly and succinctly is an essential skill for a successful career as an engineer. Every new Graduate Student is required to the take the Graduate Writing Skills Examination (http://cmsw.mit.edu/graduate-writing-exam/) the summer before starting at MIT. The Examination consists of two essays of 750–1250 words based on online readings. You will have 72 hours to write the two essays and submit them online. Based on the examination results, recommendations for remedial work may be made by the MIT Writing Program.

Each Graduate Writing Exam is assessed by two readers as to the degree to which the analytical summaries revealed an understanding of the conventions of academic writing, including:

- Comprehensiveness: offering an appropriately objective overview of the material.
- Synthesis: synthesizing the salient points of all five articles.
- Organization: organizing information logically, coherently, and analytically.
- Paraphrase Accuracy: paraphrasing authors' language concisely and accurately.
- Citation: citing sources accurately and fully.
- Style and Discourse: using clear, correct, and engaging prose.

A score between 30-100 is assigned to each essay based on the combined overall scores of the two readers. Students who scored 80 or above on this exam show sufficiently developed abilities in all of these areas, with higher scores clearly indicating better performance. For students who score lower than 80, general information about

writing performance at each level is presented below:

75: Generally clear prose at a sentence level and accurate citation and paraphrase of sources. Exams at this level reveal weaknesses in focus and organization when working with complex scholarly sources; e.g., limitations in organizing material conceptually, synthesizing material from multiple sources, or highlighting the central information from the sources

60: Exams at this level reveal weaknesses in focus and organization; e.g., limitations in organizing material conceptually, synthesizing material from multiple sources, or highlighting the central information from the sources. In addition, these exams show a lack of clarity in syntax or word choice

40 – 50: Exams at this level reveal limited familiarity with the conventions of academic writing — limitations in organizing material conceptually and logically, presenting information clearly and objectively, and accurately representing the information in the articles. These exams also reveal a pattern of grammatical weakness.

30: However well written otherwise, exams at this level reveal significant weaknesses with accurate paraphrase and citation of the sources.

Students are notified by the Student Office during the summer of their scores. Students who receive a score of less than 80 on the exam are required to take 21W.794, "Graduate Technical Writing Workshop", a remedial writing class during IAP.

Students with an undergraduate degree from MIT are not required to take the writing examination. For any inquiries about the MIT Writing Program, including the results of the writing examination, please contact the Academic Administrator in the Student Office.

SELECTION OF RESEARCH TOPIC/RESEARCH ADVISOR(S)

First-year PhD/ScD, PhDCEP, and CSE PhD students take a seminar series (10.990) during the fall semester to inform the students about faculty research interests to aid them in selecting a research advisor. First-year MSCEP students are also required to take 10.990. Although PPSM students are not required to take 10.990, they are encouraged to attend those seminars that are of interest to them. First-year PhD/ScD, PhDCEP, and MSCEP students are required to attend **ALL** 10.990 faculty presentations. Attendance is recorded and monitored.

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 the Advisor Selection Form provided by the Student Office (see page 53 and online http://web.mit.edu/cheme/resources/gradstudents/index.html). Students are encouraged to be persistent in arranging meetings with faculty, and not to wait until the Fall semester is almost over to have these meetings. Each student should select two research projects (1st and 2nd choices) by the end of the fall semester, and indicate his/her 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, serious efforts will be made by the Department Head and the Graduate Committee Chair 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. PPSM students should contact their program advisor for information on the research advisor selection process.

For CSE PhD students, the selection of the research advisor is the same as for PhD and PhDCEP students.

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 Daniel Blankschtein and/or the Academic Administrator for consultation and assistance. If a change in research advisor(s) has been made, the student and faculty member 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.

*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 page 33).

PhDCEP students are not allowed to serve as RAs, or to be funded via an RA, during their time at Sloan. However, while at Sloan, PhDCEP students may serve as TAs and be funded via a TAship.

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

Qualifying Examination

The purpose of the Chemical Engineering Qualifying Examination is to assess whether the student possesses the necessary attributes to succeed at the doctoral level of study. These attributes include technical mastery of the various components of the chemical engineering discipline, the ability to integrate material across subject boundaries, and creative problem solving when confronted with unfamiliar scenarios. The qualifying examination at MIT consists of both written and oral components. Early in their program, each doctoral candidate must pass the Written Qualifying Examination, which consists of three questions that cover core undergraduate and/or graduate chemical engineering material (for details, see below). This examination is given twice each year, in January and May. The exam is normally taken in January of the first year. In any event, the exam must be taken by the end of the third regular term of study (fall, spring) after admission to the doctoral program; exceptions to this policy due to extenuating circumstances must receive prior approval by the Graduate Officer. Requests to take the Written Qualifying Examination are made by completing a form available in the Student Office. For the 2016-2017 Academic Year, the key dates are:

- **November 30, 2016 (Request Form due to the Student Office for January exam).**
- **January 12, 2017 (Written Qualifying Examination).**
- **March 31, 2017 (Request Form due to the Student Office for May exam).**
- **May 18, 2017 (Written Qualifying Examination).**

The written exam consists of three open-book questions, focused primarily (but not exclusively) on thermodynamics, transport, and kinetics. Graduate material on thermodynamics and transport may be included on the January exam, at the level of the corresponding core subjects offered in the Fall term (10.40 and 10.50), and graduate material on kinetics may additionally be included on the May exam, at the level of the corresponding core subject offered in the Spring term (10.65). Otherwise, the material is typical of that covered in undergraduate programs in chemical engineering. The exam is generally 3 hours long; exceptions to this schedule are announced at least one week before the exam. The results of the 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 students are prepared to be a doctoral candidate, and a decision of Pass or Fail on the Written Qualifying Examination is made. If the performance on the Written Qualifying Examination per se is unsatisfactory, the student will be so informed. Students who fail the Written Qualifying Examination may request to take it a second time, by petition to the Department Head. A student whose request is granted must retake the written exam at the next available offering; exceptions to this policy due to extenuating circumstances must receive prior approval by the Graduate Officer. In no case is a candidate allowed to retake the written exam more than once.

The Oral Qualifying Examination requirement is met by the satisfactory presentation of the thesis proposal at the first meeting of the candidate's Thesis Committee (*c.f.* Thesis Proposal). The candidate should be able to demonstrate familiarity with the relevant background, explain the motivation and specific aims of the project, and defend the proposed research plan; the student should also demonstrate professionalism in preparing and presenting the proposal. A typical thesis proposal presentation should be no more than 45 min long, with an additional 45 min for discussion, questions, and deliberation of the Thesis Committee. If the performance is unsatisfactory in the judgment of the MIT faculty serving on the Thesis Committee, the student will be so informed. Students who fail the oral exam may request to revise and present the proposal a second time, by petition to the Department Head. A student whose request is granted must repeat the thesis proposal presentation by the end of the next regular term (fall or spring); exceptions to this policy due to extenuating circumstances must receive prior approval by the Graduate Officer. In no case is a candidate allowed to retake the oral exam more than once.

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

CSE PhD students take 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 they return 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 PPSM program, the research advisor need not be a Chemical Engineering faculty member, but must be a PPSM faculty or affiliate. For students in the CSE PhD program, the Thesis Committee must contain a member of the Center for Computational Engineering (CCE) (see the list of faculty: http://computationalengineering.mit.edu/about-cce/researchers/department-chemical-engineering-faculty-and-researchers).

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 22). 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 (see page

10). Reporting Forms for the Thesis Proposal Presentation as well as for the Thesis Committee Progress Reports are online, electronic forms (cheme-forms.mit.edu).

The interaction of the doctoral student with their 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 above, 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 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 receive early feedback on the thesis project from the combined expertise and experience of the Thesis Committee members. Failure to complete the Thesis Proposal and the oral presentation within the aforementioned 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. The oral presentation of the thesis proposal also serves as the Oral Qualifying Examination (*c.f.,* Qualifying Examination). Students who fail the oral exam may request to revise and present the thesis proposal a second time, by petition to the Department Head. A student whose request is granted must repeat the thesis proposal presentation by the end of the next regular term (fall or spring); exceptions to this policy due to extenuating circumstances must receive prior approval by the Graduate Officer. In no case

is a candidate allowed to retake the oral exam more than once.

Scheduling of meetings with faculty can be challenging 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 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 (see page 10). Reserving the room and submitting 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. 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.

Although the format of each Thesis Proposal is a matter to be worked out between students and their research advisor(s), the outline below may serve as a useful guide:

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.

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 relevant to the proposed studies.

4. **Research Plan**
   - Discusses the planned research with particular emphasis on expected difficulties and challenges.
   - Presents preliminary results.
   - Indicates how the proposed experimental and/or theoretical results will serve to meet the proposed objectives.

5. **Safety**
   - Discusses any safety-related issues including personal and environmental safety, and 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.
   - Includes a career and professional developments statement. Here, the student discusses briefly career goals, fellowships, classes, and training required. It should also include the intended minor.

Thesis Proposals, including literature citations, figures, and tables, should not exceed 25 pages, using at least an 11-point font and one-inch margins. The Thesis Proposal is a statement of the intended plans for the research program, and is not meant to be a document containing a significant volume of research already completed by the student. At the completion of the meeting, it is the responsibility of the student to submit an online Report of Thesis Proposal Presentation Form within one week. Once submitted, this form is electronically sent to the Research Advisor(s) and to the Thesis Committee for approval.

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 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 their 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, to enable each Thesis Committee member to be better prepared for the meeting.

The Thesis Committee Meetings should not exceed 90 minutes, with about half of it devoted to the student's presentation and the other half to discussions. Career and professional goals should be discussed for no more than 10 minutes at the end of the research presentation. This discussion should include the career plans of the student, as well as fellowships, classes, and training that the student intends to pursue. 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 their research to date, as well as indicate any real or potential problems identified. The form also includes comments pertaining to professional development which must also be completed. The student should submit the Written Progress Report online within one week following the Thesis Committee Meeting. The online form will then be sent electronically to the research advisor(s), and to each Thesis Committee member for approval. The student, the research advisor(s), and other members of the Thesis Committee, will receive a copy of this form, including a meeting summary and notes, for future reference via email. An electronic copy of the form and supporting materials will also be kept in the graduate student's 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 30.

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 30). 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 30). At the Plan-to-Finish Thesis Committee Meeting, the Thesis Committee should evaluate a Written Plan-to-Finish Report prepared by the student. This 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) 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 30). 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 26). In the semester during which students plan to defend their thesis, they 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 55) 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 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.

Outcome (a) is most likely. In Outcome (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. Outcome (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. The best source of information about this process is the "Thesis Packet for Doctoral Candidates", which is located online on the Departmental website at http://web.mit.edu/cheme/resources/gradstudents/index.html. This packet describes in detail the procedures for preparing for a Thesis Defense and submitting a Doctoral Thesis (the procedures for preparing and submitting a Master Thesis are the same). In addition, at the beginning of each term, the Student Office holds an information session about the thesis defense process, for students who are approaching their defense. Information about this session is listed on the Departmental calendar.

The sequence of steps for the Doctoral Thesis Defense are as follows:

1. **Beginning of the Term: Submit Application for Advanced Degree** – 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

(http://web.mit.edu/registrar/calendar/), depending on which term (Fall, Spring, IAP, or Summer) the student plans to defend.

2. **At Least Four Weeks Prior to Defense: Request Thesis Defense Scheduling Form Approval** – The Thesis Defense Scheduling Form is used to communicate approval to the Student Office and inform the Student Office of the proposed date and time of the defense. The student should work with their thesis committee members to identify and secure a suitable date and time for their thesis defense, such that as many members of the thesis committee are present. 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. Although the date should be arrived at via committee consensus, this form only requires the approval of the research advisor(s).
3. **Four Weeks Prior to Defense: Submit Thesis Review Form** – Promptly after the Thesis Defense Scheduling Form has been approved, and four weeks prior to the defense, students must submit the electronic, online Thesis Review Form to their entire committee. This is the last and most important approval required to defend on the proposed date. If the thesis committee members do not submit their approval via this form, then students must reschedule their thesis defense date. Upon submission, this form will be sent to the research advisor(s) and to every thesis committee member. The thesis committee members will have two weeks to review, comment upon, and possibly suggest changes to the thesis document.
4. **After Date is Approved: Reserve a Room** – As soon as the date and time are confirmed via the Thesis Defense Scheduling Form, the student should reserve a room (see page 10).
5. **Two Weeks Prior to Defense: Thesis Review Form Approval Due** – Exactly two weeks prior to the defense date, approval of the thesis and approval to defend are required from each thesis committee member, via the Thesis Review Form. It is the responsibility of the student to monitor the progress of this form, and to remind their thesis committee members of the deadline for submission of this form, to ensure its timely submission.

6. **Two Weeks Prior to Defense: Submit Technical Summary** – Students should email a PDF of their "technical summary" to the Student Office. The technical summary is a text-only document, no longer than two pages (12 point font, 1 inch margins, single-spaced), that 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. Upon receipt of the technical summary, the Student Office will distribute it to the entire faculty in the department via an email announcement designed to generate faculty attendance at the Final Thesis Defense. All thesis committee members are expected to be present.
7. **Within Two Weeks of Defense: Secure Faculty Presider –** The thesis defense must be presided over by a faculty member who is a member of the Chemical Engineering Department, but not the/a research advisor to the student. The majority of the time this task falls to a ChemE, non-advisor faculty member who is a member of the thesis committee. It is the responsibility of the student, with the help of the research advisor(s) if needed, to secure a presider for the defense in advance of the thesis defense, to ensure that this requirement is met. The student must email the name of the presider to the Student Office.
8. **Day of the Defense: The Thesis Defense** – The student should plan to speak for no more than 30-40 minutes. The thesis presider (from the MIT Chemical Engineering faculty) will 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.
9. **Two Days After the Defense: Turn in Forms to Student Office** – Once the thesis defense is successfully completed, the student has two days to assemble the final version of the thesis document. The student should turn in to the Student Office two final copies of the thesis, and at least two title pages (on archival bond

paper) signed by the research advisor(s). The final version must be printed on archival bond paper. The Final Thesis will then be distributed* to the MIT Archives and the 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 documentation to the Student Office (found within the Thesis Packet for Doctoral Candidates, located on the departmental website at: http://web.mit.edu/cheme/resources/gradstudents/index.html):

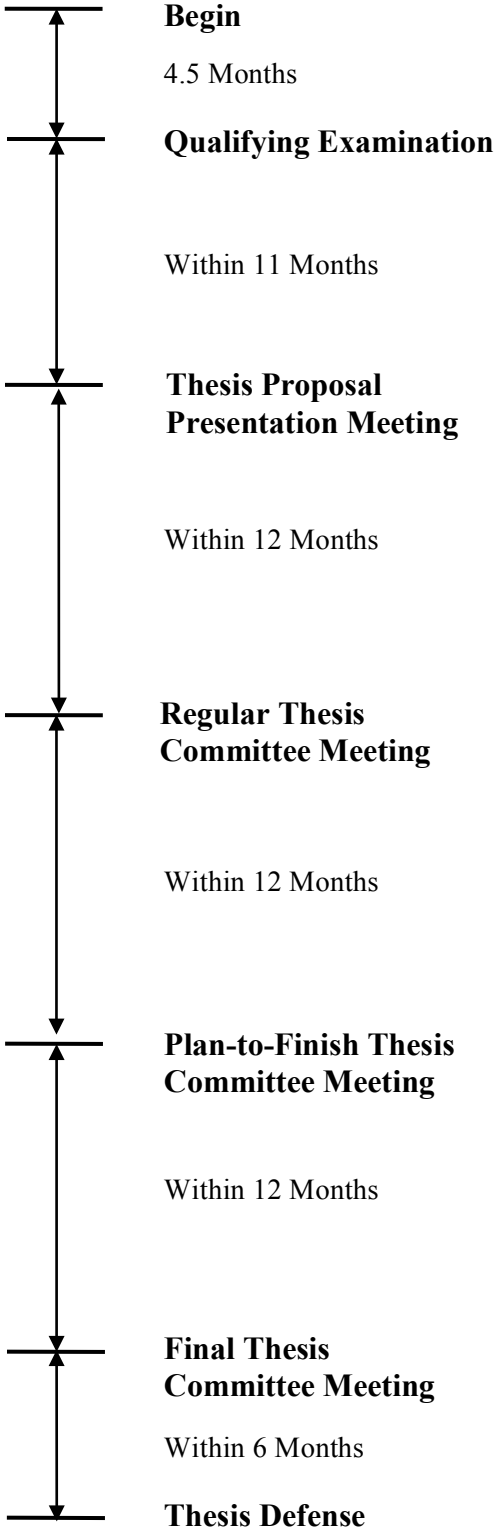
- University Microfilms Form (UMI).
- One extra copy of the Thesis Title Page.
- One extra copy of the Thesis Abstract.
- Chemical Engineering Department Departure Form.
- Forwarding Address and Recruiting Questionnaire (electronic form).

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.

Proposed Timeline for Completion of Doctoral Program



Biology Requirement

Each doctoral student is required to take at least one subject on the molecular and cellular basis of biological systems, which can be satisfied by one of 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 online.

A grade of "B-" or higher must be received in any course listed to satisfy the Biology Requirement.

Minor Requirement

The Departmental Minor Requirement broadens 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, in Chemical Engineering, 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., polymers, energy systems, applied mathematics) or non-technical (e.g., energy policy, management, foreign languages), but must have a coherent theme. It is the responsibility of the graduate student to provide a clear written rationale for the selection of the three courses to demonstrate that they indeed represent a coherent theme. In this respect, the three courses selected for the Minor should pass at least one of the following three tests of coherence:

(1) they should be offered by the same department,

(2) although perhaps not offered by the same department, they should be part of a conceivable major,

(3) research in all three subjects could be published in the same specialty journal.

Criterion (2) applies primarily to disciplines that span multiple departments, such as biology, chemistry, and mathematics. In general, courses with a 10.xxx designation, or courses with a J designation taught by course 10 instructors, cannot be used to fulfill the Minor Requirement. This guideline was put in place because the purpose of the Minor is to expose our graduate students to ways of thinking and perspectives which are different from those typically encountered in Chemical Engineering. Exceptions to these guidelines may be made at the discretion of the Graduate Officer if the content of a course deviates significantly from the Chemical Engineering core curriculum, or if there is little or no involvement of Chemical Engineering faculty in teaching the course. Courses selected to satisfy the Minor requirement should be graduate-level courses. In cases where no graduate-level introductory course is available to build the intellectual foundation required to pursue the selected Minor, and undergraduate-level course(s) are required to gain fundamental understanding of a subject, these may be approved at the discretion of the Graduate Officer. For example, if a graduate student proposes a Minor in Statistical Mechanics without any previous background on the subject, then, it is acceptable for the student to first take an undergraduate-level course in Statistical Mechanics, and then to take two graduate-level courses on this subject. Another example involves a Minor in foreign languages, where some of the courses offered in the chosen language are undergraduate-level courses, which are required to advance to the next level of difficulty. In all Minor requests involving exceptions, it is the responsibility of the graduate student to present convincing arguments, and as needed, to provide appropriate documentation (e.g. rationale for the selection, syllabi, a supporting letter from the course instructor) to justify his/her petition. To avoid potential misunderstandings, students must seek approval of their Minor Program from the Graduate Officer before taking any of the three proposed courses. Note that the Proposal for Doctoral Minor Form is available on online. Failure to follow this last guideline may result in rejection of the Minor Petition. In all cases, the proposed Minor Program must be approved by the Graduate Officer before the Regular Thesis Committee Meeting. At that meeting, the student will be asked to briefly discuss his/her choice of Minor, including documenting it in the Regular Thesis Committee Form. 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. The five graduate-level subjects in Computational Science and Engineering required of the CSE PhD program satisfy the Departmental Minor Requirement, and no formal petition for approval is required. Students in the PPSM program must take three subjects in Chemical Engineering, in addition to those that are part of the PPSM 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).

A grade of "B-" or higher must be received in every subject 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 32 of the Thesis Proposal Presentation Meeting, by completing the appropriate section in the online Report of Thesis Proposal Presentation Meeting Form. Students must complete 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 a 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 Student Seminar (PhD/ScD and PhDCEP Programs)

Two subjects (10.991–fall semester and 10.992–spring semester) have been designated as doctoral student 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 to 4:00/4:30 p.m. (in room 66-110). Typically, on a given Monday afternoon, two third-year doctoral students will deliver presentations on their research. All doctoral students are also expected to regularly attend the Friday afternoon Departmental seminars (3:00 to 4:00 p.m. in room 66-110) delivered by visitors to the Department. Both sets of seminars provide an excellent opportunity for students to broaden their perspective in many areas of Chemical Engineering research.

The purpose of the third year talk is manifold. For the attending students, it provides an opportunity to (1) keep aware of the scope of active research in the department, (2) practice critically evaluating and giving constructive feedback to speakers via the evaluation forms, and (3) gain confidence asking questions in a public, but supportive, forum. As such, attendees are strongly encouraged to listen carefully, give useful feedback, and participate during the question and answer session. The feedback will be

provided to the speaker anonymously. It will not be shared with the faculty, nor will it influence the speaker's satisfactory completion of the requirement, so attendees are encouraged to be honest and forthcoming. For the presenter, it provides an opportunity to prepare and deliver a more general talk than a typical talk at a group meeting or even conference talk; each attending student should be able to follow the content of the talk and learn from it. Thus, the goal of the seminar is not to impress the audience with the magnitude of the presenter's results, but instead to focus on creating a clear, concise message with a unifying theme and sufficient context and motivation.

Attendance is taken at the Monday seminars (via online 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, or for the mandatory safety seminar. Doctoral students who do not attend at least 50% of the total seminar presentations will receive an "F". PPSM students are exempt from 10.991/10.992. For PPSM students, 10.960 satisfies the seminar requirement in the Fall and Spring semesters. CSE PhD students are required to attend and complete the mandatory 50% attendance.

The Department Head 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 deliver a Departmental seminar. Students should plan to deliver their doctoral seminar two years after they pass the Qualifying Examination. Students who attend the Practice School will be given an extra semester 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 to 2 pages), should be emailed (in PDF format) to the Student Office one week before the 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.

Nonresident 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 (room 3-133) 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% of the regular full tuition. Thereafter, it is charged at approximately 15%. 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% 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 Graduate Officer of 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, and 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 policies) 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 (2016–2017)

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 students defend their 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 POLYMERS AND SOFT MATTER (PPSM)

This section is intended to summarize the expectations of the Department of Chemical Engineering for students in PPSM 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 PPSM Office http://polymerscience.mit.edu (room 76-253, (617)253-0949). The following guidelines apply:

1. The PPSM 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 PPSM must take three subjects in Chemical Engineering, in addition to those that are part of the PPSM 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). 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 PPSM students. During their first Fall semester at MIT, PPSM students are strongly encouraged to attend 10.990 seminars delivered by PPSM faculty and affiliates.
4. First-year students are required to meet with at least five faculty or affiliates of PPSM to discuss possible research topics. Each faculty should sign a form provided by the

PPSM office. The selection of a research advisor(s) should be made in consultation with the PPSM Director Darrell J. Irvine (room 76-261C, (617) 452-4174, djirvine@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. PPSM 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. Both the student and the research advisor(s) must sign this section of the Form.
7. The Qualifying Examination administered by the PPSM faculty replaces the Chemical Engineering Qualifying Examination. The PPSM Qualifying Examination is offered once a year, at the end of the spring semester. Requests to take the PPSM Qualifying Examination should be made in writing to the PPSM Director by April 15. The written portion of the PPSM Qualifying Examination consists of five or six one-hour questions split into two sessions, with a break in between. The oral portion of the PPSM Qualifying Examination involves responding to two or three questions posed by the PPSM faculty in a single 45-minute session. The PPSM Qualifying Examination covers material presented in the first two semesters of the PPSM core curriculum, as well as general knowledge of an introductory nature in the area of polymer science and engineering.

COMPUTATIONAL SCIENCE AND ENGINEERING (CSE) PhD PROGRAM

This section is intended to summarize the expectations of the Department of Chemical Engineering for students in the CSE PhD program 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 Kate Nelson in the CSE Office kpnelson@mit.edu (room 35-329, (617) 253-3725). The following guidelines apply:

1. CSE PhD students must complete the Chemical Engineering core curriculum (10.34, 10.40, 10.50, and 10.65), the Chemical Engineering Biology Requirement, and one additional graduate level subject in Course 10 (see page 4).
2. CSE PhD students must complete four graduate subjects from the Center for Computational Engineering (CCE) approved list of computational science and engineering subjects (http://cce.mit.edu/cse), which is called the "Major Field of Study" by CCE. These classes also satisfy the Chemical Engineering Minor Requirement. A grade of "B-" or higher must be received in every course taken to satisfy the Minor requirement.
3. During their first fall semester at MIT, CSE PhD students are required to attend 10.990 seminars.
4. Beginning in their first spring semester at MIT, CSE PhD students are required to attend 10.991/10.992 seminars.
5. First-year CSE PhD students are required to meet with at least six faculty to discuss advisor selection and possible research topics. Each faculty should sign a form provided by the ChemE Student Office (see page 53).
6. The Thesis Committee should consist of two or more members, in addition to the research advisor. At least one of these must be a faculty member in Chemical Engineering. Additionally, one of the two following conditions must be met: either a CCE faculty member must serve as the Thesis Committee Chairperson & Research Advisor, OR two CCE faculty members must serve as members of the Thesis Committee (if the research advisor is not a CCE member).
7. PPSM students admitted by the Department of Chemical Engineering are required to serve as a Teaching Assistant (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. Both the student and the research advisor(s) must sign this section of the Form.

8. CSE PhD Students take the Chemical Engineering Qualifying Examination (see page 16).
9. CSE students are required to notify the CSE administrator (Kate Nelson; kpnelson@mit.edu) of the outcome of all qualifying examinations and to provide CSE a copy of the thesis proposal.

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, about 60% 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 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 http://web.mit.edu/cheme/academics/practice/form.html.

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	12
Heat and Mass Transfer	10.50	12
Reaction Engineering	10.65	12
Systems Engineering	10.551	9
Numerical Methods	10.34	9
Introduction to Chemical Engineering Research	10.990	6
Applied Process Chemistry	10.25, 10.391J, 10.392J, 10.541, 10.542, 10.544, 10.569, 10.585, 10.586, 10.625J, 10.626, 10.652J, 10.571, 10.572, 10.817J (others are also allowed with consent of the Practice School Director)	9 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	69 or more

For students attending in the fall and spring semesters, additional credit requirements include:

Practice School Projects	10.80 through 10.87	48
	Total Units for MSCEP Degree	117 or more

For summer session students, the credit requirements include:

Elective	**Consent of Practice School Director**	**9 or more**
Practice School Projects	10.80 through 10.85	36
	Total Units for MSCEP Degree	114 or more

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.

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. The four core graduate subjects (10.34, 10.40, 10.50, and 10.65, see page 4) are required for the SM degree. Units that have been used to satisfy other master's program degree requirements (e.g., MSCEP, see page 39) 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.

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 the required 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 cannot 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 they is receiving support. Students receiving support from the Department must 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.

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. 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 their graduate program, must submit the following two forms:

1. Forwarding Address and Recruiting Questionnaire (Online).
2. Chemical Engineering Department Departure Form:
    - This form requires various approvals, including those of the student's research advisor(s) and either the Facilities Manager, Gerry Hughes (room 66-466, (617)715-2995, ghughes@mit.edu), or the Dept. EHS Coordinator, Brian Smith (room 66-471, (617)253-6238, bssmith@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, desk, and lab keys must be returned to the Administrative Assistant associated with the student's research advisor), prior to leaving the Institute.

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 their 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 U.S. 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:

- Prof. Paula T. Hammond, Department Head, Room 66-350, (617)258-7577, Hammond@mit.edu
- Prof. Daniel Blankschtein, Graduate Committee Chair, Room 66-442B, (617)253-4594, dblank@mit.edu
- TBD, Academic Administrator, Room 66-366
- Esther Estwick, Personnel Administrator, Room 8-331, (617)253-4563, estherg@mit.edu

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

- Mary Rowe, Special Assistant to the President and Ombudsperson, Room 10-213, (617)253-5921, mrowe@mit.edu
- Toni Robinson, Ombudsperson, Room 10-213, (617)253-5921, trobins@mit.edu
- Alison Alden, Vice President for Human Resources, Room E19-215, (617)253-6512, aalden@mit.edu
- Sarah Rankin, Institute Title IX Coordinator, Room W31-223, (617) 324-7526, srankin@mit.edu
- Jason McKnight, Assistant Dean for Graduate Education, Room 35-338, (617) 253-5427, jrmac@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/.)

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

The above procedures are intended to resolve issues within the Institute, and follow the guidelines explained in the MIT Policies and Procedures Guide (Updated 8.5.2015) http://web.mit.edu/policies/. The procedures 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

Most departmental forms are now electronic forms, and may be found at: https://cheme-forms.mit.edu

ADVISOR SELECTION FORM 2016
CHEMICAL ENGINEERING DEPARTMENT

Directions: All PhD / ScD / PhDCEP students should submit this form to the Student Office (66-366) by Friday, December 9, 2016. This form will not be accepted without all of the required Faculty Signatures.

STUDENT

NAME:_____

I. RECORD OF MEETINGS WITH POTENTIAL RESEARCH ADVISORS

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. ADVISOR & PROJECT SELECTION

1. FIRST CHOICE

Advisor

Name:_____

Project

Title:_____

Advisor Agreement: I hereby agree that if the student named above 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 2, 2016)**

_____.

2. SECOND CHOICE

Advisor

Name:_____

Project

Title:_____

RECORD OF THESIS COMMITEE MEETINGS
September, 2016

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 2016-2017 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 3/27/2011

Committee Dates	**Thesis Committee Members**
2/15/2012	Ludwig Boltzmann
3/27/2011	Nicholas Sardi Carnot

Student Signature _____

Research Advisor(s) _____

_____

_____

CHEMICAL ENGINEERING DEPARTMENTAL

MSCEP STUDENT DEPARTURE FORM

Name:_____

Office Number: _____

Phone Number:_____

Email:_____

Date of Graduation:_____

1. Office space has been returned to satisfactory condition:

    a) Desk drawers and shelves are completely emptied:_____

    b) Desk top, drawers, and shelves have been cleaned of any food residues, dust, and other detritus:_____

    c) Desk drawers are left unlocked:_____

    d) Any needed repairs have been reported:_____

    _____

    Confirmed and signed by: Gerry Hughes (room 66-371, (617)715-2995, ghughes@mit.edu) or Brian Smith (66-471, bssmith@mit.edu, 3-6238)

2. All office and desk keys and material borrowed from the Chemical Engineering Dept. have been returned to the Executive Officer Assistant in 66-350.
    Yes _____ No_____*

    _____

*Keys are not being returned at this time because student is staying in the department for _____ months as _____ (on voucher payroll) working with Prof. _____.

Confirmed and signed by Executive Officer Assistant (66-350)

CHEMICAL ENGINEERING DEPARTMENTAL
PHD/SCD/PHDCEP/MS STUDENT DEPARTURE FORM

NAME:_____

ROOM NUMBER:_____

PHONE NUMBER:_____

DATE:_____

1. Office and/or laboratory space is in satisfactory condition. All chemicals are under my care.

   _____Research Advisor(s)

2. Final Date of Support by Research Advisor: _____

   Research Advisor's Initials: _____

3. Laboratory space is in satisfactory condition:
   a) All chemicals (whether the bottles are opened or unopened), all wastes, and all samples must either be removed from your laboratory and properly disposed of, or someone else (your advisor, another student, or lab mate) must sign this form indicating that he/she accepts all chemicals, wastes and samples left in your laboratory.
   b) Boxes, junk, etc. have been discarded.
   c) Laboratory is orderly and clean

   _____
   Gerry Hughes (66-371, (617)715-2995, ghughes@mit.edu)
   or Brian Smith (66-471, 3-6238, or bssmith@mit.edu)

4. All keys and materials borrowed from the Chemical Engineering Department have been returned. Yes ____ No____*

   _____
   Group Administrative Assistant

5. Returned Credit Card: _____
   Group Administrative Assistant

***Keys are not being returned at this time because student is staying in the department for _____ months as _____ (postdoc or on voucher payroll) working with Prof. _____.**