



CHEMICAL ENGINEERING
UC SANTA BARBARA

GRADUATE STUDENT HANDBOOK



September 2025

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Quick Reference for Current Ph.D. Students

◆ Department contacts

◇ Key administrative personnel

Graduate Advisor / Vice-Chair for Graduate Education: **M. Scott Shell**

Graduate Affairs Committee: **Scott Shell (chair), Brad Chmelka, Matt Helgeson**

Diversity Committee: **Todd Squires, Phil Christopher, Scott Shell**

Graduate Program Coordinator: **Erica Diaz**

Chair of the Department: **Michael Gordon**

Vice-Chair for Undergraduate Education: **Phil Christopher**

◇ Other contacts

Computer accounts

- see the College of Engineering website under ECI (Engineering Computer Infrastructure)

Employment – appointments and paychecks

- payroll@chemengr.ucsb.edu

Financial Aid, Work Study, TA Loans

- Financial Aid Office, South Hall

Keys and room reservations

- cheinfo@engineering.ucsb.edu

Federal Express, UPS, mailing labels, Xerox key operator, etc.

- cheugrads@engineering.ucsb.edu

Purchase orders (GSR's)

- chepurch@engineering.ucsb.edu

Students Services – registration, petitions, policies and procedures, general student concerns and questions, degree checks, graduation

- Erica Diaz – general items
- Graduate Affairs Committee - petitions of exception, etc.
- Graduate Division in Cheadle Hall – Graduate Division forms and requests

◆ General advice and guidelines for the timing of Ph.D. requirements

◇ A welcome to new students from the Graduate Advisor

Welcome to our department and program in Chemical Engineering at UCSB. Your experience as a Ph.D. student will simultaneously be one of the most creative, challenging, intellectually stimulating, focused, and personally rewarding times of your life. For most graduates, it is a formative experience in which they mature individual scientific approaches and ways of thinking about technical problems that permeates their entire careers. You will receive much advice during your time in our program, but let me offer three simple points that I think are especially useful to share with incoming students as they are making the transition from their undergraduate experiences.

- *Think of your advisor as an advisor, not a boss.* Ultimately, your Ph.D. thesis must reflect your ideas, contributions, and impact on a field. Your advisor's role is to provide many informed research suggestions, but let the leadership and initiative on your project stem from you, including even the theme and direction. Think along the lines "Here's what I think we should be doing and why. Let's discuss." rather than "What do you think we should do next?" in conversations with your advisor.
- *Keep in mind that you are now a member of the greater scientific community and research apparatus.* Your activities will have relevance beyond this program and department. Your research contributions will be seen by an international community of experts in your field, through publications and presentations, and their impact in that context will contribute to your readiness for graduation. At the same time, your support from grants and other funds is tied to the missions of external agencies, both public and private, and therefore your progress reinforces their investment in your education. Think along the lines "What must be solved to make progress in this field?" rather than "What do I need to make progress towards graduation?"
- *Know that research has significant uncertainty.* There are many aspects of research that will differ markedly from your undergraduate experiences: few concrete deadlines and schedules; infrequent reinforcement and feedback; not knowing a priori what results will make you successful; working through long time periods on your own and often without progress; generating many ideas that fail; and competing with groups and researchers that have significantly more knowledge and experience than you. Keep in mind that these are all normal parts of the research process, and you will acclimate to them. The combination of a careful work ethic, deep thinking, and creativity will eventually lead you to success, even if short-term uncertainty seems frustrating. Think along the lines "I'm developing a deep, world-class expertise and carving out previously unknown boundaries of the problem." rather than "I haven't yet been able to solve my problem this week."

Again, welcome to our program and to an exciting intellectual journey. I wish you the highest success, and an experience rich with good problems, creativity, and professional growth.

M. Scott Shell
Graduate Advisor for Chemical Engineering 2023-24

◇ **Planning your progress in the Ph.D. program**

The timeline on the next few pages summarizes the main requirements for the Ph.D. degree and provides you with a year-to-year overview. Details regarding specific requirements and procedures are given in subsequent sections in this document. Read the relevant parts of the handbook to understand them. Know that program requirements and deadlines are your responsibility to keep tabs on.

◇ **Coordinating with your advisor**

Many of your Ph.D. requirements and activities require your advisor's involvement. You should initiate discussions about these and take the lead in planning in advance of deadlines. Talk with your advisor to understand their particular expectations for the timing of activities. Keep in mind that faculty have dense schedules, planned well in advance, that make it difficult to accommodate one- or two-day turnarounds on requests from students. Instead, be cognizant of the lead time that you will need to provide your advisor before hearing back. Some typical times for faculty to complete activities are given below, although ultimately this is dependent on the advisor, their commitments and travel schedule, and the time of year.

- Substantive emails: 1-4 days
- Letter of recommendation: 2 weeks
- Feedback on a fellowship or other application draft: 2-3 weeks
- Feedback on a candidacy report draft: 3-4 weeks
- Feedback on a manuscript draft (for submission to a journal): 4-8+ weeks
- Feedback on dissertation draft: 3-4 weeks per chapter

When you prepare written materials for which you expect to obtain feedback, set a mock deadline in advance of the actual one to allow reasonable time for your advisor to return comments.

◇ **Coordinating with your committee**

Meetings with your dissertation committee require significant advanced planning to find overlap in the schedules of multiple faculty members. You should schedule committee meetings at least *two months* in advance if you meet during the school year, and *three months* if during the summer. Faculty have particularly busy summer travel schedules owing to conferences and meetings, and it can be difficult to find overlap during the summer months if not planned well ahead. During the school year, check your committee members' teaching schedules online before suggesting times.

Your committee plays a central role in overseeing your progress towards the degree of Ph.D., and its members need time to appropriately execute their responsibilities. Please observe the following hard deadlines when providing them with materials:

- Submit your complete candidacy report and portfolio to all committee members *no less than two weeks* prior to your exam. Provide it as a *single* PDF document. In addition, submit the PDF to the Graduate Affairs Committee through the Chemical Engineering Forum course site.
- In preparation for your annual committee meetings after candidacy, submit your annual report to all committee members *no less than two days* prior to the meeting. Submit it as a *single* PDF document to the Chemical Engineering Forum site.

- Submit a complete draft of your Ph.D. dissertation to all committee members *no less than three weeks* prior to your defense. Simultaneously, submit the draft to the Graduate Forum Site, and submit a completed & scanned Defense Scheduling Form to the Graduate Program Coordinator. After your defense, submit a revised PDF of your dissertation to the Graduate Forum Site for archival.

NOTE: *Students who do not observe the deadline for providing a document in advance of a candidacy exam or defense (as described above) will likely not be allowed to hold the respective meeting, even if it has already been scheduled.* Submission of PDF copies of documents to the Graduate Forum Site will provide a time-stamp. The Graduate Affairs Committee may grant exceptions to this policy in cases of emergencies, schedule constraints, or faculty commitments if the student submits an emailed exception request describing the extenuating circumstances. Poor planning or timing in the preparation of a candidacy report or dissertation is not an acceptable reason.

◇ **Coordinating with the Graduate Affairs Committee**

Generally, the Graduate Affairs Committee (GAC) needs a minimum of two weeks to discuss and process petitions and other requests for exceptions to policies outlined in this document. Complex requests may require more time. The GAC strives to respond efficiently to requests, but keep in mind that some petitions may require discussion and information-gathering.

If you have educational, training, advising, policy, or personal matters that you would like to discuss, please email the Graduate Advisor to set up a meeting. If the matter is urgent and the Graduate Advisor is unavailable or traveling (and a phone call is unsuitable), they may arrange for you to meet with another member of the GAC as appropriate.

If you have clarifications on general policy and department logistical issues, please contact the Graduate Program Coordinator, preferably by phone call or on a walk-in basis.

◆ Ph.D. program timing for first-year graduate students

The following timing gives a typical approximation of Ph.D. milestones. Requirements with hard deadlines are indicated in bold. Other text gives suggested and/or optional activities. You should consult your advisor to establish a concrete plan and schedule for these items.

| timing | activity |
|--|--|
| prior to arrival | <p>Arrange housing. The deadline for applications for San Clemente Village is May 15. For information about on- and off-campus housing, visit: http://www.housing.ucsb.edu/community/graduate-student</p> <p>Communicate with faculty and research groups of potential interest to obtain recent papers and manuscripts.</p> |
| before the start of Fall quarter | <p><i>Students from non-chemical engineering backgrounds: complete coursework interviews by contacting the Graduate Advisor.</i></p> |
| early Fall quarter | <p>Attend the First Year Symposium.</p> <p>Attend the Chemical Engineering Graduate Student Symposium to obtain an overview of current research in the department.</p> |
| first week of Fall quarter | <p>Attend Department new graduate student information meeting.</p> <p>Attend University new graduate student orientation.</p> <p>Complete online Sexual Harassment Prevention Training.</p> <p>Attend Diversity Awareness Training.</p> <p>Attend TA orientation workshop.</p> <p>Attend Laboratory Safety Course.</p> <p><i>International students: complete English Placement Exam.</i></p> |
| September-October | <p>Attend weekly faculty research presentations.</p> |
| October through mid-November | <p>Extensively investigate research projects and opportunities. You have 6-7 weeks to finalize your research advisor choice, a time that will pass very quickly in concert with your classes. Meet individually with at least 5 faculty to discuss research opportunities. Attend group meetings of groups of interest. Consult with senior graduate students about research in the department. Obtain copies of papers and manuscripts in preparation.</p> |
| end of the third full week in November | <p>Provide a completed advisor selection form with your top five choices to the Graduate Program Coordinator. For your top choice, provide a</p> |

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| | paragraph summarizing the project of interest. You must also obtain signatures of five faculty with whom you met to discuss research. |
| February-March | You are encouraged to assist in the recruiting new graduate students through admissions activities and prospectives visits. |
| early July | Submit your preferences when the list of available TA positions for the coming academic year is circulated. |
| July 15 | Submit your first research mini-proposal. Simultaneously, schedule a meeting with your advisor to discuss the research pre-proposal. |
| late July | Obtain feedback from your advisor on the mini-proposal and revise it accordingly. |
| August 15 | Submit your revised research mini-proposal. |
| early to mid September | Begin preparing for the First-Year Symposium. At the beginning of the month, you should schedule a practice talk with your group and/or your advisor for a week or so before the event. |
| Tuesday before Fall classes begin | Attend and present at the First-Year Symposium. |

◆ Ph.D. program timing for second-year graduate students

The following timing gives a typical approximation of Ph.D. milestones. Requirements with hard deadlines are indicated in bold. Other text gives suggested and/or optional activities. You should consult your advisor to establish a concrete plan and schedule for these items.

| timing | activity |
|--|--|
| early October | Attend the Chemical Engineering Graduate Student Symposium. |
| January 15 | Submit your second research mini-proposal. Simultaneously, schedule a meeting with your advisor to discuss the research proposal. |
| late January | Obtain feedback from your advisor on the mini-proposal and revise it accordingly. |
| February 15 | Submit your revised research mini-proposal. |
| February-March | You are encouraged to assist in the recruiting new graduate students through admissions activities and prospectives visits. |
| early March | Discuss your committee with your advisor. |
| late March | Secure members of your committee and a date for your candidacy exam. |
| May 15 | Submit the Department Candidacy Exam Confirmation Form to the Graduate Program Coordinator. |
| 10 weeks prior to the candidacy exam (June at the latest) | Begin preparation of your candidacy report in earnest. |
| 4-5 weeks prior to the candidacy exam (July at the latest) | Submit a draft of your candidacy report to your advisor, if you would like their feedback. This allows them 1-2 weeks to return comments, followed by 1 week for you to make edits. Schedule a practice time with your group and/or advisor for a week or two before your candidacy exam, if you so choose. |
| 2-3 weeks prior to the candidacy exam (early August at the latest) | Complete the Conflict of Interest Form and Ph.D. Form I to nominate the Ph.D. Committee. Obtain signatures from the Ph.D. committee members and submit the completed forms to the Graduate Program Coordinator for the Graduate Advisor's and Chair's signatures. |
| 2 weeks prior to the candidacy exam (early August at the latest) | Submit your candidacy report to your committee and to the GAC through the Graduate Forum. Reports that are not submitted a full two weeks prior will require rescheduling of the examination. |

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| at candidacy exam | Bring Ph.D. Form II to the examination or (better) have it ready to electronically sign online, to be signed by the committee. After, submit both completed forms to the Graduate Program Coordinator. |
| early July | Submit your preferences when the list of available TA positions for the coming academic year is circulated. |
| July or August | Submit a poster presentation abstract for the Graduate Student Symposium. |
| August 31 | Normal deadline for candidacy examination. |

◆ Ph.D. program timing for third, fourth, and fifth-year graduate students

The following timing gives a typical approximation of Ph.D. milestones. Requirements with hard deadlines are indicated in bold. Other text gives suggested and/or optional activities. You should consult your advisor to establish a concrete plan and schedule for these items.

| timing | activity |
|--|--|
| Early Fall quarter | Attend the First Year Symposium. |
| September/October | Present an oral talk the Chemical Engineering Graduate Student Symposium at least once at the start of your fourth or fifth year. Alternatively, present a poster at the Symposium in other years. |
| February-March | You are encouraged to assist in the recruiting new graduate students through admissions activities and prospectives visits. |
| April of your fourth year | Begin planning the forthcoming Graduate Student Symposium by participating on the organizing committee that consists of rising fifth years. |
| July or August | Submit a poster or talk abstract for the Graduate Student Symposium. |
| 2-4 months before annual committee meeting (e.g., May) | Schedule a date for your annual committee meeting with its members. |
| 2 days before annual committee meeting | Submit a yearly report to your committee members. |
| annual committee meeting must be before Sept. 30 | Hold an annual meeting with your committee. Bring the annual committee meeting form to the meeting. Afterwards, submit your report through the Graduate Forum. |
| end of 4 th year | Complete the End-of-fourth-year Academic Progress Plan and submit to the Graduate Program Coordinator. |
| 12 months prior to the Ph.D. defense | Consult with your advisor (individually) and committee (at your annual meeting) about expectations for finishing and defending, e.g., specific projects, manuscripts, or other requirements that must be completed by the defense. Begin the planning and organization of your dissertation. |
| 5-8 months prior to the defense | Touch base several times with your advisor about your progress towards and target time for your defense. Continue working on your dissertation. |
| 3 months prior to the defense | Secure a tentative date for the defense with your advisor and committee. Reserve a room suitable for the public portion of your defense. Keep in mind that your defense date is not official until you submit both the Defense |

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| | Scheduling Form and your finalized dissertation draft, and the GAC approves your date request. |
| 8-12 weeks prior to the defense | Provide your advisor with a draft of your thesis for their feedback. This allows 3-6 weeks to return comments, depending on the amount of unpublished content, followed by 2-3 weeks for you to make edits. Alternatively, provide your advisor with your thesis on a chapter-by-chapter basis. If a chapter is new (e.g., not based on one of your published papers), you should allow at least a 1-2 weeks <i>per chapter</i> for feedback plus another week for you to make edits. |
| at least 3 weeks prior to the defense | Submit your finalized thesis draft to your committee. Submit your draft dissertation to the GAC through the Graduate Forum. Submit the Dissertation Scheduling Form to the Graduate Program Coordinator. The GAC will approve the defense date if timing and requirements are met. Complete and submit Ph.D. Form IA if your committee has changed. |
| at least 1 week prior to the defense | Email the Graduate Program Coordinator with a publicly-distributable announcement for your defense, including an abstract, date, time, and location. |
| defense | Give a public, seminar-style presentation of your thesis, and subsequently defend it before your committee. Bring Ph.D. Form III to the examination, to be signed by the committee. Bring dissertation signature pages to the examination, to be signed by committee members. |
| by end of the summer of the 5 th year | Graduation within the department degree time expectation. |

◆ Report preparation and formatting

◇ General guidelines

Always adhere to these formatting standards in the preparation of any report:

- 11 or 12 pt font with 1" margins
- numbered pages, equations, tables, and figures
- standard figure sizes at 3.25" in width, unless necessary to span the page width
- informative captions for figures and tables

◇ Research mini-proposals

The format of reports is the following:

- single-spaced with a maximum of 5 pages for the report, not including references
- completed self-assessment form attached at the end
- completed advisor assessment form attached at the end

Each pre-proposal should contain the following sections:

- Project goals (including key scientific/engineering questions and hypotheses)
- Background and previous findings
- Preliminary results (with appropriately labeled figures and tables)
- Future plans

◇ Candidacy report

The full candidacy portfolio includes:

- a detailed, written candidacy research report
- summary transcripts of graduate coursework performance
- the two written research pre-proposals that were submitted during the first two years

The format of the candidacy research report is:

- double-spaced and typically 20-30 pages in length, not including references
- includes appendix or section describing connection to core chemical engineering areas

◇ Annual committee meeting form

The annual committee meeting form is similar to an individualized development plan. Use the template available on the Graduate forum. After your annual committee meeting, have you committee members sign and submit to the Graduate Program Coordinator.

◆ ChE interpretation of research grades

The Chemical Engineering Department's commitment to graduate student training in research includes its responsibilities to provide regular feedback on students' development of research skills and to assess and react to its training approach. Research grades for CHE 596/598/599 reflect student training in their academic progress towards their degree milestones including advancing to candidacy, their dissertation, and defense. They do not reflect assessment of work under employment. It is important to note that these grades are specifically reflective of student training progress (e.g., student research approach and research skill development), and are not direct quantifiers of publications or other outcomes, as the faculty recognize the varied nature of research projects and challenges. Thus, the interpretation of research grades, as agreed upon by the Chemical Engineering faculty, can reflect a variety of types of student training activities towards their dissertations, including:

- Research discussions and one-on-one meetings with faculty advisors or collaborators
- Engagement with research organization and execution
- Initiative, independence, and creativity in research ideas, planning, and approach
- Mastery of new research skills or techniques to advance dissertation research (experimental, computational, or theoretical)
- Familiarity with and understanding of the established and emerging literature
- Thesis chapter or manuscript preparation, or other technical writing training
- Research presentations at group, center, collaboration, or other meetings
- Research presentations and networking at conferences and meetings
- Engagement in and management of collaborations with other faculty, students, or external parties, if relevant

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| A+ | Student's progress and initiative, creativity, or approach have led to a major breakthrough towards their dissertation this term. This grade is given rarely (at most once/advisor/term). |
| A | Good progress is being made in research expertise (specific skills and/or ability to plan a research strategy). Student's trajectory is good for on-time dissertation preparation. |
| A- | Student's development of expertise and/or independence are impeded, but student/advisor have a plan for how to navigate and course correction is anticipated. No delays towards the dissertation are expected. |
| B+ | Student's achievement of intellectual expertise and independence are not at expected levels at this point in training. Dissertation progress is delayed, but the advisor and student are working together and expect significant improvement in the coming quarter. |
| B | There have been major delays in dissertation progress related to the student's abilities, approach, or effort towards their dissertation. This grade signifies a significant concern on the part of the advisor. Discussion with Department Vice Chair is strongly advised. |
| B- | Appropriate progress towards the degree is not being made. Discussion with the Department Vice Chair is necessary regarding plans and alternatives. This grade will likely result in Graduate Division placing student on "monitoring status" if their GPA drops below 3.0. |

Getting Started

◆ First matters

◇ Housing

Your first priority upon arrival at UCSB should be to secure appropriate long-term housing if you have not already arranged housing options. You can visit the UCSB Graduate Housing website at <http://www.housing.ucsb.edu/community/graduate-student> for community housing options, or consult other online housing resources.

◇ Stipend and Fees

For incoming first year Ph.D. students, registration fees, health insurance and non-resident tuition for Fall quarter are typically paid by the Department. Stipends for this quarter are paid as a lump sum (for the entire quarter) during the first week. In all subsequent quarters, students will be paid monthly (not quarterly) through a GSR or TA/Reader position; the first stipend payment after the first Fall quarter will be distributed on February 1. Students with fellowships will have a similar payout timing during the first year, although typically through a mixture of Department, TA/Reader, and fellowship funding sources. Students are responsible for all other fees and charges incurred. A fee deadline for all "now due" charges will appear on your statement at the beginning of each quarter. The deadline will appear on BARC Statements from the Registrar's Office. Questions regarding BARC statements should be directed to the Graduate Program Coordinator prior to this deadline. NOTE: A \$50.00 late fee will be charged if there is an outstanding balance after the "now due" deadline.

◇ Registration

The Department cannot pay students until they are registered. Registration must be completed online. Instructions for registering for classes and registration deadlines are published on GOLD. Students register for the upcoming quarter during the current quarter. The Registrar's Office will assess a \$50 late registration fee to students who register after the deadline. The class schedules for the Fall Quarter for first-year students with chemical engineering backgrounds are predetermined. Schedules for students entering the program from other disciplines should consult with instructors and the Graduate Affairs Committee to determine their schedules (see Coursework interviews below). Graduate students have until the 15th day of instruction to add classes to their schedule without approval from the Graduate Division. After this deadline, schedule adjustment petitions, accompanied by a letter of justification, must be submitted to the Graduate Division for approval.

◇ Requirements for the first quarter of registration

Graduate students must enroll for a minimum of 12.5 units per quarter. Students wishing to enroll for fewer units must petition the Graduate Affairs Committee for approval. First-year Ph.D. students with chemical engineering backgrounds must enroll in the course schedule prescribed by the Department. First-year Ph.D. students with non-chemical engineering B.S. degrees will follow a series of course work appropriate to their backgrounds, to be decided at the coursework interviews (see below).

◆ Meetings

◇ Coursework interviews

Prior to the beginning of the Fall quarter, new Ph.D. students entering the program without a chemical engineering background must meet with instructors of graduate courses held in fall, or suitable alternates, to review undergraduate course work in the areas covered by the first-year graduate core course work. These students should prepare an outline of material covered by relevant undergraduate courses, including textbooks, supplementary material, etc. A record of the recommendations by the faculty for each student will be compiled and retained in their permanent file. A copy of recommendations will be given to the student. Such students should not register until they have completed their course work interviews.

◇ New student information meeting

The Department Graduate Advisor and Graduate Program Coordinator will hold a formal meeting for incoming students prior to the start of Fall classes. Attendance is required.

◇ Sexual harassment prevention training

All incoming graduate students are required to complete sexual harassment prevention training online, and will be emailed the link to the online training from the office of Title IX and Sexual Harassment Policy Compliance. In addition, UCSB requires students to complete an online training module each year of their enrollment.

◇ TA orientation workshop

All incoming graduate students are required to attend the UCSB TA Orientation Workshop, held prior to the start of the Fall classes.

◇ Laboratory safety course

All incoming graduate students are required to attend the Laboratory Safety Course sponsored by Environmental Health and Safety, held prior to the beginning of Fall classes. This course is mandatory for all university personnel prior to working in any chemical engineering group.

◇ English placement exam (international students)

International students whose native language is not English are required to take the English Language Placement Exam (ELPE) and attend an oral evaluation. Students must register for and attend all ESL courses required as a result of the outcome of the ELPE exam. See the section on "International Students".

◆ Choosing a research advisor

The choice of a research advisor is likely to be the most important decision that a graduate student makes. It is necessary to devote significant thought to this choice. Students should be aware of the mechanism by which they are assigned to research advisors, and take full advantage of the information available to them in making their choices.

Assignments of first-year students to research advisors are made just before winter quarter. The department considers it essential that first-year graduate students investigate and educate themselves of available research areas and opportunities. For that reason, *no Ph.D. student will be considered to have a research advisor prior to that time*. Occasionally, students may be involved in short research rotations in the summer before they start, which are fine. However, rotations are not a commitment by the student to join that group, nor a commitment from the advisor to take them.

In October of each year, a series of *faculty research presentations* provide a formal overview that facilitates first-year graduate students' exploration of research opportunities. Each faculty member briefly describes his or her research program, current research projects, and opportunities for new students to join. Attendance is required of all first-year graduate students at all sessions.

New graduate students should approach the faculty research presentations as a preview of opportunities, and work on their own to develop a significantly more nuanced and informed exposure. Thus during Fall quarter, students should meet informally and individually with several faculty members to discuss areas of research and specific projects in more detail (typically 5-7 faculty). They should talk to senior graduate students and attend regular group meetings to learn about research groups of particular interest. Meeting at least 5 faculty members and attending their group meetings are essential steps in selecting an appropriate research advisor. The department views 5 meetings with faculty members, and 5 corresponding group meetings, as a required minimum.

Students should then thoroughly investigate at two or three potential top-choice advisors, meeting with them multiple times and maintaining extensive engagement with their groups during this period. Students should also inquire as to the nature of funding support available for their favored projects, to assess the feasibility and options for an advising situation. These issues play an important role in the advisor assignment process, particularly if an advisor receives more requests than he or she can support in terms of funding, group, time, and other resources. Students should be cautioned that faculty members may be hesitant to go to great lengths to arrange support for a student that has had little interaction and engagement (e.g., meeting only once with them).

By the end of the third week of November, students must provide a list of five, rank-ordered choices of advisors to the Graduate Program Coordinator. ***The student must have met with each of the five choices listed to discuss research opportunities, and each choice must correspond to a viable funding scenario that has been discussed with the potential advisor.*** A one-paragraph summary of the research topic the student wishes to pursue with their first-choice faculty advisor, and that advisor's signature, must also be submitted. The advisor's signature does not imply consent to an official advising relationship with the student, but is merely an acknowledgement that the advisor has discussed the research topic with the student. Any student not submitting such a list may be assigned an advisor at the sole discretion of the faculty.

The Graduate Affairs Committee will review these lists and make assignments based on both student preferences and availability of positions in research groups. The majority of students receive their

first choice of advisor; however, there may be unusual cases. For example, a faculty member may be over-subscribed by student choices and limited in available support. In such cases, the GAC will work closely with the student to determine an alternate option that suits his or her research interests. The Graduate Affairs Committee makes every effort to finalize research advisor assignments by the end of final exams week in Fall quarter, so that students may begin working with their advisors immediately in January.

Some students may choose to be jointly advised by a faculty member outside of the department. In such cases, it is a university policy enforced by the Graduate Division that they must have a co-advisor that is an active faculty member in Chemical Engineering during the entire duration of their Ph.D. to assure that they follow department policies and guidelines.

◇ **Failure to match with an advisor**

In some rare cases, the process described above may result in a student not being matched with an advisor by the end of the first quarter. Regardless of the circumstances by which this occurs, it is essential at this stage for the student to work with the Graduate Vice Chair to (i) understand the primary circumstances leading to a failure to match with an advisor, (ii) formulate a plan for identifying and matching with an advisor in subsequent quarters. This plan is likely to include meeting with faculty both inside and outside their initial rank-ordered group (potentially including faculty outside the department), but could also include research rotations in laboratories. During the period that the student is still searching for an advisor, the student should actively work with the department to determine a plan by which the student can remain financially supported through mechanisms including TA positions and temporary GSR appointments through rotations. Continued failure to match with a research advisor after multiple quarters will likely lead to the student being placed on academic monitoring status due to failure to form a dissertation committee. If the situation persists further, this may result in loss of financial support and, eventually, dismissal from the Ph.D. program.

◇ **Changing advisors**

While infrequent, a student may find that an advisor and project relationship is not a good fit, and desire to switch to a new advisor and project. In such cases, the student should first contact the Graduate Advisor to discuss options and steps moving forward. The discussion will also identify plans for funding support, which may involve TA positions during an advisor transition. Financial support is not guaranteed for students seeking extended time (e.g., beyond their current quarter) to identify a new advisor and/or project, but the department will work with them to identify potential TA support and other mechanisms of support.

◆ **Miscellaneous department information**

◇ **Employment**

Graduate students may be employed by the University as Graduate Student Researchers (GSRs), Teaching Assistants (TAs), or Readers. There are several forms to be completed, including eligibility for employment, which requires a US Passport or two other forms of identification (Driver's License and either Social Security card or Birth Certificate). International students must provide their passport and I-20.

Students will receive a stipend for Fall quarter and will go onto payroll for Winter quarter, beginning on January 1st. Paychecks are issued on the first day of the month following the start of employment; for Winter quarter this will be on February 1st.

◇ **Graduate Lounge**

Keys to the Chemical Engineering Graduate Student Lounge will be issued to incoming students at the New Student Information Meeting.

◇ **Computer accounts**

Each new student is automatically assigned a UCSB email account. This account must be activated and monitored because the Department and University use these accounts to disseminate important information. In addition, each graduate student in Chemical Engineering will also need an Engineering email account in order to access resources such as file servers, computer labs, etc. The online request form is on the ECI website at: <http://www.engineering.ucsb.edu/eci/>. The Engineering account provides an email alias (@engineering.ucsb.edu) that will forward to the UCSB account.

◇ **Mailboxes**

Each student is assigned a mailbox, which should be checked daily. Mail is delivered daily after 9:00 a.m. The mail collection box in the Department office is for official university use only. The campus mail service will not process personal mail.

◇ **Photocopiers**

A copy machine (with scanner functionality) is available for TA and research use in the Department office. It should not be used for personal copying.

◇ **ECI Computer Lab**

Computers and laser printers are available for student use in the ECI Computer Lab, located in Engineering II, room 3236. A valid Engineering computer account is required. **NOTE:** If your key card does not work, please see the Graduate Program Coordinator.

Degree Requirements, Policies, and Procedures

◆ M.S. Degree

◇ Nature of the M.S. program

The Department's training of graduate students is focused on doctoral studies. As a result, it does not maintain nor does it admit students directly to a master's program. However, two plans for a terminal master's degree are available to graduate students that were originally admitted to the doctoral program but that are not able to continue towards the Ph.D. degree. Generally, these options are appropriate for students in special circumstances, such as students that do not advance to candidacy or whose advisor transitions to a different institution.

◇ Plan 1, Thesis

30 credits of letter graded course work are required, of which 20 must be in 200-level courses in Chemical Engineering (or related fields subject to departmental approval).

- A thesis must be submitted and defended orally before a committee. The master's thesis and defense are generally distinct from those of the candidacy exam. The thesis must be submitted to the committee at least two weeks before the defense.
- The student must be registered for three consecutive quarters to satisfy the residency requirement.

M.S. Thesis Committee (Plan 1). A minimum of three regular faculty members is required. At least two must be regular faculty members in the Chemical Engineering Department. Others may serve as additional committee members. The committee is nominated by the Department Chair and verified by the Graduate Program Coordinator, and is approved by the Dean of the Graduate Division. It should be named early in the student's graduate career, and no later than the beginning of the final quarter of work.

The Department must approve any changes to the committee membership. A committee change petition will then be forwarded to the Graduate Division. The student must ensure that his/her committee forms are up-to-date. The Graduate Division will not award a degree if the thesis signature page bears names different from those of the committee of record.

◇ Plan 2, Non-Thesis

Comprehensive (non-thesis) degrees are given in some cases. 42 credits of letter graded course work are required, of which 24 must be 200-level courses in Chemical Engineering (or related fields subject to departmental approval). A committee of three or more regular faculty members in the Chemical Engineering Department administers a comprehensive exam.

M.S. Comprehensive Examination Committee (Plan 2). The examining committee is the Graduate Affairs Committee for all M.S. candidates taking the comprehensive examination in any given quarter. The Graduate Division does not need to approve examination committees for individual students.

◆ Ph.D. Degree

◇ Overview

The Ph.D. degree is awarded to Ph.D. candidates following successful defense of the dissertation. Students must first satisfy the candidacy requirements and advance to candidacy. The steps towards advancing to candidacy include:

- Attend the New Student Information Meeting.
- Attend the Laboratory Safety Course.
- Attend the UCSB TA Orientation Workshop.
- Complete the Sexual Harassment Prevention Training and complete the yearly online Sexual Discrimination, Harassment, and Violence training module.
- Attend Diversity Awareness Training
- Satisfy the requirements for English as a Second Language (international students).
- Satisfy the candidacy course and GPA requirements.
- Submit satisfactory research mini-proposals in a timely fashion.
- Present at the First Year Graduate Student Symposium.
- Register and be in residence for six quarters, to satisfy the residency requirement.
- Complete Ph.D. Form I to nominate the *Dissertation Committee*.
- Submit a written candidacy report and pass the oral candidacy exam.
- Complete Ph.D. Form II to report the outcome of the candidacy exam, and pay the fee for advancement to candidacy.

Additional steps towards the Ph.D. degree include:

- Satisfy core and elective course requirements (36 units total).
- TA at least three times (quarters). These typically occur once each in the first, second, and third years. Exceptions for not fulfilling the TA requirement must be approved by the Graduate Affairs Committee.
- Complete yearly online Sexual Discrimination, Harassment, and Violence training module.
- Complete the annual committee meeting form and meet with the dissertation committee once per year.
- Present a seminar once at the annual graduate student symposium on some aspect of the dissertation research. Students unable to meet this requirement due to the timing of the symposium may substitute a ChE 290 seminar.
- Submit and orally defend the dissertation.
- Complete Ph.D. Form III to report the outcome of the dissertation exam.
- File the dissertation with the Graduate Division.

◇ Course and GPA requirements

Graduate students are expected to undertake a program of courses in chemical engineering and related fields that provide a depth of understanding in the core areas of chemical engineering. Students are required to complete a minimum of 36 units of graded course work before graduation. This includes 30 units required to fulfill the core and technical elective course requirements, and 6 additional units of general electives.

Students must take six core courses, and achieve a grade of “B” or better in each core course. To be eligible to take the Candidacy Exam, students must achieve a core GPA of 3.25 or higher. Four of the six courses consist of the “A” level in each of the core course series. Two additional, student-choice depth core courses must be taken from the CHE210, CHE220, CHE230, and CHE240 series.

| Chemical Engineering Graduate Core Courses (21.0 units) | | |
|---|--|---------|
| COURSE # | COURSE NAME | UNITS |
| ChE 210A | Fundamentals and Applications of Classical Thermodynamics and Statistical Mechanics | 4.0 |
| ChE 220A | Advanced Transport Processes - Laminar Flow and Convective Transport Processes | 4.0 |
| ChE 230A | Advanced Theoretical Methods in Engineering | 4.0 |
| ChE 240A | Advanced Chemical Reaction Engineering | 3.0 |
| student depth choice | Must be a B/C/D/etc. level course from the ChE210, ChE220, ChE230, and ChE240 course series. | 3.0-4.0 |
| student depth choice | Must be a B/C/D/etc. level course from the ChE210, ChE220, ChE230, and ChE240 course series. | 3.0-4.0 |

Students must take 9 units from approved technical electives. These do not need to be completed prior to candidacy, but they must be taken for letter grades. A list of electives currently approved by the Graduate Affairs Committee is given below. Any Chemical Engineering graduate-level course qualifies as credit for a technical elective.

Other courses may be suitable as technical electives, provided they are graduate level and entail strong technical content and relevance to chemical engineering research areas. These must be approved *in advance of the course* by the Graduate Affairs Committee. To submit a petition, send an email to the Graduate Program Coordinator with attached the course syllabus or either a detailed course content description (e.g., from the instructor or course catalog).

| Approved Technical Electives (9.0 units total) | |
|--|---|
| Chemical Engineering | ChE 202, ChE 210C, ChE 210D, ChE 216A, ChE 216B, ChE 220C, ChE 220D, ChE 221, ChE/Matrl 222A, ChE/Matrl 222B, ChE 224, ChE 226, ChE 227, ChE 228, ChE 230B, ChE 230C, ChE/Matrl 238A, ChE/Matrl 238B, ChE 240B, ChE 241, ChE 246/Chem 264, ChE 248, ChE, 260, ChE 266, ChE 289A |
| Bioengineering | ChE 255, ChE 258, ChE 272, Engr 220A, Engr 220B, Engr 220C, Matrl 272, Matrl 276A, Matrl 276B |
| Materials | Matrl 200A, Matrl 200B, Matrl 200C, Matrl 204, Matrl 206A, Matrl 206B, Matrl 207, Matrl 209A, Matrl 209B, Matrl 209C, Matrl 211A, Matrl 211B, Matrl 214, Matrl 218, Matrl 227, Matrl 240, Matrl 271ABC, Matrl 278, Matrl 279, Matrl 280A, Matrl 286C, Matrl 286J, Matrl 287A, Matrl 289A, ECE 220A/Matrl 215A |
| Chemistry | Chem 217B, Chem 222A, Chem 222B, Chem 222C, Chem 224, Chem 225, Chem 226, Chem 240, Chem 262A, Chem 266, Chem 268A, Chem 268B, Chem 277, Chem 279, Chem 282A/C |
| Physics | Phys 205, Phys 215A, Phys 215B, Phys 215C, Phys 219, Phys 223A, Phys 223B, Phys 223C |

| | |
|-----------------------|---|
| Computation & Control | ChE 211A, ChE 211B, ChE 211C, ChE 211D, ECE 229, ECE 236, ECE 237, ECE 247, ECE 230A, ECE 230B, ME215B, Math260J, CS 291A |
|-----------------------|---|

Finally, 6 units of general electives related to Chemical Engineering may be upper-division undergraduate or graduate level. These courses must be taken for letter grades. These units cannot come from ChE 290, 291, or 596-599.

To maintain full-time status, graduate students must enroll in a total of 12.5 units for each of Fall, Spring, and Winter quarters. Generally, graduate students do not enroll in summer units. First-year Ph.D. students in their Fall quarter must enroll in 12 units of core coursework plus ChE 290 for a total of 12.5 units. In other quarters, the 12.5 units should be distributed among:

- **Department seminar, ChE 290.** These 0.5 units are required and students are expected to attend every department seminar.
- **Academic course units (as appropriate).**
- **Group meeting units, ChE 291 (as appropriate).** Most research advisors schedule weekly research group meetings with their students to discuss on-going research. Students in these groups should enroll in 1-2 units of ChE 291. The research advisor will counsel the student on the appropriate number of units.
- **Research units, ChE 596 / 599.** Ph.D. students enrolling in research units prior to advancing to candidacy must register for ChE 596. After advancing to candidacy, students must register for ChE 599.

Students are strongly advised to consult with their research advisors prior to registering for courses each quarter, to review their proposed class schedules. Importantly, if students plan to take *more* than the minimum required 36 units for the Ph.D. requirements, they should consult their advisors.

◇ **Credit for prior coursework**

Exceptions to or credit for Ph.D. course requirements arising from *prior coursework* will be considered on the basis of a petition directly from the student to the Graduate Affairs Committee. Normally, such petitions will be granted only if the student can demonstrate satisfactory performance and knowledge from a course taken prior to coming to UCSB that is substantially similar in content and level to one of the core courses. It is the responsibility of the student to supply sufficient information about any proposed substitution so that the GAC can judge its similarity in subject matter and level to the corresponding core course at UCSB. The GAC must also be able to certify that the grade earned at the other institution is sufficient to satisfy the minimum “B” requirement in core classes. Graduate elective courses are generally not appropriate for prior coursework credit, as the department views the elective requirement as an important complement to a student’s research at UCSB. In rare cases, however, the GAC may approve graduate elective credit for a student that is transferring to UCSB from another Ph.D. program where they have already made substantial progress through its coursework requirements.

◇ Coursework pathway for non-chemical engineering backgrounds

First-year students without a chemical engineering degree should develop a tailored coursework pathway appropriate to their particular background. The department allows such students to take undergraduate core courses in thermodynamics, kinetics, transport, and math, where needed to provide a foundation of prior knowledge before taking the corresponding graduate core courses. The department also allows such students to postpone their candidacy deadline by up to a year (but never longer) to provide for an extended coursework timeline, although in many cases this may not be necessary. The undergraduate coursework can be counted towards graduate general elective degree requirements.

It is typically expected that a student would only need to take one or two undergraduate courses to provide the necessary framework. It is not required that students take missing undergraduate coursework prior to the graduate courses as some students may feel suitably prepared, but in some cases it may be encouraged.

To facilitate a students' proposed coursework pathway, they should schedule a call or virtual meeting with the Graduate Advisor by August 1 prior to their first (Fall) quarter in residence. The purpose of this meeting is to understand the student's specific background, to identify and discuss appropriate options, and to converge to an agreed-upon plan. The student then should submit a brief write-up of the plan to the Graduate Program Coordinator, CCing the Graduate Advisor.

◇ Mini research proposals

Prior to and in preparation for the Candidacy Exam, each graduate student is required to write and submit two research pre-proposals that are assessed by the advisor and filed by the Graduate Affairs Committee (GAC). The goals of these reports are:

- to help the student formulate a research objective and specific aims, and precisely position the context of their work within their research community
- to engage the student in concrete planning of research activities
- to provide the student with early experience and feedback in technical writing that will lead into the preparation of his or her candidacy report
- to gather formal, documented feedback from the student advisor that assesses progress thus far and offers recommendations moving forward

This requirement is about formulating a compelling research proposal for the student's current and future work that motivates concrete objectives, directions, and plans. It is about crafting a carefully thought-out research story that illustrates the importance of the current problem of interest, defends a unique research approach to address it, and explains precisely how this approach fits into (and differs from) other efforts in the appropriate research subcommunity. It is *not* about reporting activities to the GAC and these mini-proposals reports should *not* list out a history of what the student has done. Instead, the report should involve a self-contained and clear formulation of the research story. This includes adequate motivation of the project, with background, goals, and specific questions spelled out. It should also provide a context for research activities, including hypotheses being tested and controls/interpretations expected in the research plan. Preliminary results can and should be included in the pre-proposal as supporting evidence for the viability of the overall plan.

Pre-proposals should address a general chemical engineering research audience, not a specialized reader in the research subfield. They should be concise at a maximum of 5 single-spaced pages for text and figures, not including references, and should be carefully proofread for grammar and spelling. Reports that do not adhere to formatting and presentation guidelines may be returned to the student for additional revision.

Generally, pre-proposals contain the following sections, typically in roughly equal proportion:

- *Overview and project goals*, including overall objective, specific aims, and key scientific/engineering questions and hypotheses
- *Background and previous work*, which should precisely delineate the project in the context of current work in the field
- *Preliminary results* from the most recent quarters to support the project plan and report any findings thus far (with appropriately labeled figures and tables)
- *Future plans* with specific details about hypotheses to be tested, possible problems and associated backup plans, and anticipated results & their interpretation. **Note: proposals must include at least one full page dedicated to future plans.**

Some specific stylistic guidance from the Graduate Affairs Committee, based on past reviews of pre-proposals, includes:

- *Overall objective and specific aims.* It is helpful to clearly delineate your overall objective, as well as a list your specific aims that support it, towards the start of the report. Specific aims should highlight focused, tangible goals that differentiate your activities from other work in the field.
- *Overarching info graphic.* Consider leading with an informative diagram or graphic that explains the system or strategies relevant to your proposal. These are incredibly effective in orienting the reader (and can save text).
- *Specificity of approach.* The research plan should be well-connected to identified specific aims and knowledge gaps. Importantly, it should be concrete, justifying the research design using physical insight, literature context, and clearly articulated, specific hypotheses
- *Level of detail in current and proposed work.* For a short proposal for a general audience, you should avoid reporting detailed procedural information (e.g., "We will use a 0.3 M concentration." or "Here are all of the specific parameters used in our simulation."). Instead, you should detail the overall approach in terms of hypotheses, interpretations, connections to the literature, physical significance, etc.
- *Results.* It is important to connect the specific results and research progress to the bigger picture and overarching goals. Make sure that the reader can connect your discussion of results back to their contribution to the main objective.
- *Future work.* This section must be detailed and reflect a thoughtful workshopping of strategy. It needs to have not only goals but specific steps (i.e. what you will actually do to get there), hypotheses, expected results and their interpretation, supporting literature, and backup strategies. It should outline a specific roadmap, with justified approaches and importantly mitigation plans if the initial approach does not work.
- Of course, it takes time to workshop specific future directions. But this is precisely the goal of a proposal, and of this requirement. Use this opportunity to engage in deep-thinking about next steps, potential issues, and backup plans. Be sure to allocate time to this process, which inherently involves stages of revisions as you are fine-tuning the plan.

- *Active voice.* Use first person active voice when you describe your work to delineate what you versus others have done. This also simplifies language and saves text.
- *Formatting and polish.* Clean and well-formatted documents better engage and impress the reader. Work to ensure that figures are publication-quality, with consistent formatting and legible text (9pt or above anywhere in the figure). Ensure that track changes have been eliminated, spacing is consistent, and text lacks typos.
- *Figures.* Figures and captions should be instructive and high-quality. If a reviewer reads through only them, they should still convey the basic story of your proposal, in short form. Captions should be detailed and explanatory.

The last part of the pre-proposal requirement is the self-assessment form, in which the student provides their own brief evaluation of progress made towards the project aims, and areas and goals of planned future effort. The self-assessment is not a recap of the report.

The submission of the pre-proposal occurs in two stages. By the first deadline, the student must submit the complete pre-proposal and self-assessment as a single PDF file to both the advisor and the GAC (the latter through the Graduate Forum). After this date, the student should work with their advisor(s) to solicit feedback on the proposal draft and assessment. It is typically expected that the advisor will give feedback in a one-on-one meeting, providing comments on both general progress and the report/writing at that time. The student should bring the advisor assessment form to this meeting, where the advisor can complete it and discuss their recommendations.

The student will then submit a final, revised pre-proposal to the GAC no later than four weeks after the original deadline. By then, the advisor should have completed the advisor assessment form. The revised proposal should include *both* the completed self and advisor assessment forms at the end.

The GAC will review final pre-proposals and evaluate both the student and advisor assessments. The GAC typically only provides an assessment of technical writing skills, but it may provide further feedback as needed to address unusual cases. Generally, the GAC will not provide detailed commentary on progress in research, unless requested by either the advisor or student. The main feedback that the student receives regarding progress is from the advisor.

Reports are due to the advisor and Graduate Affairs Committee (the latter through the Graduate Forum) on the following schedule:

- | | |
|-------------------------------|--|
| 1 st Pre-Proposal: | July 15 (draft for advisor), August 15 (revision for GAC) |
| 2 nd Pre-Proposal: | January 15 (draft for advisor), February 15 (revision for GAC) |

◇ **First year symposium**

Before Fall instruction begins, all PhD students near the end of their first year of graduate study will give a short presentation to the department in the First Year Symposium. Students will present the motivation for their project, their project objectives, and their early research progress if applicable. The symposium will be attended by professors and graduate students of chemical engineering. The first year symposium has several purposes:

- to encourage research progress in the first summer
- to encourage early advice on projects from the department

- to stimulate thinking about research projects (often highly specific) in the broader context for a general chemical engineering audience
- to encourage intra-department collaborations at early stages

Presentations are normally 12 minutes long (with 3 minutes for questions and changeover) so that all first year students can present in a single day. Participation is required for the first year students. Therefore, students should plan in advance for the event.

◇ **The dissertation committee**

A student's dissertation committee must have a minimum of four members, including the student's graduate research advisor(s):

- Three members must be regular faculty members from the Department of Chemical Engineering. They should be subject-matter experts in the student's general field of research.
- One member must be from a UCSB department other than Chemical Engineering. The fourth committee member can be a regular or adjunct professor. Faculty with joint appointments in Chemical Engineering are considered department faculty, not external, for the purposes of committees.
- Co-advisors count towards two of the minimum four committee members. If one of the co-advisors does not have an appointment in Chemical Engineering, they may count towards the external member requirement.

The dissertation committee may contain additional members from the Department or from other disciplines, at the Department's or the student's discretion. This committee should be named well in advance of the oral candidacy examination. The Chair of the committee is the faculty research advisor for the dissertation research; however, one of the other committee members from the Chemical Engineering Department must lead the Candidacy Exam.

The Chemical Engineering Department and the Dean of the Graduate Division must approve committee nominations. The Department must also approve any changes to the committee, and a committee change petition (Ph.D. Form IA) must be sent to the Graduate Division. The student must ensure that his/her committee forms are current, since the Graduate Division will not award a degree if the dissertation signature page bears names different from those of the committee of record.

◇ **Candidacy exam**

A comprehensive candidacy exam is required for advancement to candidacy. The exam provides an early forum for the dissertation committee to judge research progress and direction. It involves written and oral components as described below. The candidacy exam is normally completed by August 31 of a student's second year. Requests for extensions to this deadline must be made through petition to the GAC by May 15 of the second year. Extensions are granted only for exceptional cases (e.g., health reasons, extended absence of the advisor or co-advisor due to sabbatical, significantly delayed access to major instrumentation, change of advisor, or advisor move to UCSB.) Unacceptable justifications for an extension include not scheduling a candidacy exam adequately in advance (e.g., by late Spring quarter), and not meeting coursework requirements.

In late winter or early spring quarter of their second year, students should choose a dissertation committee and schedule their candidacy exam. Students who do not pass candidacy by the deadline

(either normal or an approved extension) will be recommended for monitoring status in the Ph.D. program. Failing to pass candidacy on time may also result in loss of stipend support and ultimately in dismissal from the Chemical Engineering program.

To be eligible to take the candidacy exam, a student must:

- have a grade of “B” or better in *each* of the following chemical engineering core graduate classes: ChE 210A, ChE 220A, ChE 230A, and ChE 240A
- have a grade of “B” or better in a further two core depth courses from the ChE 210, 220, 230, and 240 series
- have a GPA averaged over these six core courses that is at least 3.25
- have an overall GPA of at least 3.0
- have been registered for three consecutive quarters
- have cleared all I (incomplete) or NG (no-grade) entries on the transcript

If a grade lower than “B” is obtained in any of ChE 210A, 220A, 230A or 240A, the course must be re-taken and a minimum grade of “B” must be achieved before the student is eligible to take the candidacy exam.

◇ **Candidacy report and portfolio**

The Candidacy Exam is based on evaluation of a cumulative written portfolio submitted in advance by each student to his or her dissertation committee, and on an oral examination of the student’s research progress, directions, and background knowledge. The portfolio must include:

- a detailed, written candidacy research report
- summary transcripts of graduate coursework performance evidencing the GPA requirement outlined above
- the two written research pre-proposals that were submitted during the first two years

The Portfolio should be submitted to the student’s dissertation committee and to the GAC (the latter through the Graduate Forum) *no later than two weeks* prior to the oral Candidacy Exam.

The candidacy report should be written as a research proposal. It should justify the research direction, outline preliminary supporting results and progress made by the student, and clearly indicate the proposed directions for future research. The report should be prepared in consultation with the research advisor, but the student must write it. Each report will contain a description of the research project, including a discussion of the background literature, a description of the basic experimental or theoretical procedures employed, results obtained, and a coherent plan for future studies. The report should also contain at least one section or appendix that discusses explicitly how each of the core chemical engineering area of thermodynamics, kinetics, and transport broadly contribute to the scope of the student’s proposed research. Reports should be produced in 11 or 12 pt font with 1” margins and are typically 25-30 double-spaced pages in length. While the format of each individual report may differ depending on the student and the research advisor, the amount of work expected for advancement to candidacy will be equitable for all students.

◇ **The oral candidacy exam**

The oral component of the candidacy exam is attended by the exam committee (i.e., the future dissertation or thesis committee) and should be scheduled for at least 2 hours. The length of the student's presentation (if uninterrupted) should be approximately 30-40 minutes with typically 20-25 slides. The primary emphasis of the Oral Exam is a student's research progress and associated themes. Additional subject-matter questions that broadly relate a student's research to the core areas of chemical engineering are also an important component. Questions and discussion of core chemical engineering principles during the oral examination will be guided by the student's treatment of these areas in his or her written report.

A student must pass the Candidacy Exam in order to advance to candidacy and continue in the program as a Ph.D. student. The examination should be scheduled and held before August 31st at the end of the second academic year in residence. If the student has not taken the Candidacy Exam by this time, or by an extended time approved by the Graduate Affairs Committee, then the student will no longer be considered in good standing in Ph.D. program by the Department, and will be recommended for placement on Academic Monitoring or Probation status. Such students are no longer guaranteed financial support by the Department.

By May 15th of the second year, a student must have arranged a committee and date for the candidacy examination. To ensure this, the student must submit a completed Department Candidacy Exam Confirmation Form to the Graduate Program Coordinator by May 15 that includes the date, names of the committee members, and the signature of the advisor.

◇ **Candidacy examination committee decision**

At the end of the candidacy examination, the committee will render a decision with one of the following recommendations:

(1) Pass. The committee recommends that the student advance to candidacy without reservations. A passing outcome indicates that the student has demonstrated proficiency in the following research-related activities and skills:

- strong knowledge of the literature and field
- mastery of chemical engineering core fundamentals
- clear delineation and justification of research objectives and their impact
- knowledge and execution of relevant experimental/computational/or theoretical skills
- compelling preliminary results and their interpretation
- well-developed plans for future work and their justification
- ability to evaluate research ideas deeply and to think on one's foot

(2) Incomplete. The committee finds that the student did not present enough evidence to warrant passing, but does not see a clear assessment of failure and will allow the student to provide additional evidence for further consideration. Such evidence typically includes detailed written responses to committee questions, specific progress and productivity in research activities, or similar demonstrations of competence that were not apparent in either the student's written proposal or oral exam. The committee will determine the specific requirements for additional evidence and should clearly communicate these to the student at the end of the exam, as well as the timeline for providing it. The timeline is not to exceed a quarter's worth of time. Once the student has submitted the additional

evidence, the committee will make an evaluation and render its final decision as to whether the student passes or fails the candidacy examination. Until the student submits the evidence to their committee and subsequently successfully receives a passing assessment on their candidacy exam, the Department may recommend that the student be placed on Monitoring status.

(3) Fail. The committee finds significant deficiencies in student's ability to meet the expected criteria of the candidacy exam. This option is infrequently given but signals major concerns about the student's preparedness for conducting independent research. The Department will recommend that the student be placed on Monitoring status. If the student was already on Monitoring status prior to the exam, the Department may recommend that the student be placed on Probation status.

With a Fail outcome, the student has two options to continue in the program. The student is strongly advised to consult with their advisor, committee, and the Graduate Advisor / Vice Chair about the suitability of these options given the concerns expressed at the candidacy exam.

- The student elects to re-take the candidacy exam. Students are allowed only one retake and it must be completed within the equivalent of a quarter's time. The student may submit a revised candidacy proposal if they choose (minimum one week before the exam), but a new oral examination is always required. After the exam, the committee will decide if the student passes or fails; "incomplete" outcomes are not permitted for a retake. If the student fails the second candidacy exam attempt, the Department may recommend Probation status.
- The student elects to complete a Master's degree, according to the requirements for that degree set forth above. The student may seek additional enrolled time to complete the requirements, which is typically a quarter.

For students that fail a candidacy exam (a first or second time) and elect to pursue a Master's degree, the Department does not guarantee funding support for additional quarters. If the student seeks additional enrollment time to complete the Master's requirements, they should identify their support mechanism through discussions with their advisor and the Graduate Advisor. The Department can help in arranging TAs to support the student and cover tuition and fees. Note that a TAship is not always available, and so the student should contact the Graduate Program Coordinator as soon as possible to investigate TA options.

◇ **Advancement to Ph.D. candidacy**

Advancement occurs when a Ph.D. candidate successfully completes the core course requirements, passes the Candidacy Exam, and files the appropriate paperwork (Forms I and II). Except for summer, students *must* be enrolled during the quarter that the candidacy exam is attempted. Students enrolled in the spring quarter prior to advancing to candidacy in summer are not required to enroll in Summer Session. After the Candidacy Exam, Ph.D. Form II must be completed; the student pays a fee for advancement to candidacy to the cashier, and then takes the receipt and Form II to the Graduate Division. Once Form II and the receipt of payment are accepted by the Graduate Division, advancement to candidacy is formally complete.

Advancement to candidacy has several benefits:

- The candidate is eligible for faculty privileges at the library. To receive a new library card, the candidate must take a validated receipt from the Graduate Division to the Library.
- Beginning in the quarter following advancement to candidacy, international students receive a 100% reduction in their non-resident tuition for three years. However, if the degree is not

completed by the end of the third year, non-resident tuition will again to be assessed at the full (pre-candidacy) rate.

◇ **Annual meetings with the Ph.D. dissertation committee**

To encourage contact between each student and his or her dissertation committee, Ph.D. candidates are required to meet with the committee at least once each academic year after completion of the candidacy exam. Students are expected to meet with their committee members collectively.

These meetings are led by the student and their goal is to explicitly solicit committee advice and feedback on research projects, plan for the dissertation, timeline towards the defense, and career planning. To facilitate these aims, the student should complete the annual committee meeting form available on the Graduate Forum site and distribute it to the committee members *at least two days in advance of the meeting*. Research progress reports are no longer required.

Meetings should be planned for an hour's time and can adopt a variety of formats. The student should organize the meeting along their priority discussion points as needed to make best use of the hour, such as plans for finishing up, feedback on specific results and directions, thesis content and composition, brainstorming research directions, strategizing publications, etc. For example, rising 4th year students may choose to focus the meeting more on project and publication planning, while rising 5th years may prioritize a discussion about dissertation timeline and finishing up. When soliciting feedback on current and future projects, students should provide enough project or technical background to enable committee members to provide meaningful feedback.

Generally, the student will present slides to provide a meeting structure, but should be cognizant to leave ample time for discussion with the committee (i.e., the student should not aim for more than a ~20 minute presentation if uninterrupted). A typical number of slides is 10-20, but this will depend on the student's goals for the meeting. Time should also be allotted to discuss student career plans and professional development (10-15 minutes). The GAC recommends that students include the following in their slides:

- current thesis outline with connection to publications (and progress)
- timeline for the next year
- career plans, goals, and questions

The GAC recommends that the student bring a few printed copies of the completed annual meeting form to the meeting for committee members to review during discussion. After the meeting, committee members should sign (or DocuSign) the signature page and the student should then submit the complete form to the Graduate Program Coordinator and to the Chemical Engineering Forum site.

The deadline for meeting with the committee and submitting a copy of the report and signature form is September 30th. Requests for extensions must be approved *in advance* by the Graduate Affairs Committee; petitions for extension must be signed by the research advisor and submitted no later than September 1st. Failure to comply with these meeting requirements will result in a grade of "U" in ChE290, and may lead to a recommendation that the Dean of the Graduate Division place the student on Academic Probation and/or to a reduction in financial support for the following academic year. Note: the annual committee requirement is generally waived during the summer for students that will defend in the subsequent Fall quarter.

◇ **Teaching assistantships**

Participation as a TA is a significant part of the Ph.D. experience that engages graduate students in the broader educational mission and functions of the Department and University. The Department views the requirement to TA as an essential component of graduate education. Students should approach this requirement seriously and with a sincere work ethic.

All graduate students must be employed as either a TA or reader for at least three total quarters, typically one quarter of each academic year for their first, second, and third years in residence. Students with fellowships that prohibit such employment will be excused for the duration of the fellowship. Other exceptions must be approved by the Graduate Affairs Committee. In rare cases, a student may need to TA an additional quarter as a component of their overall financial support package.

At the beginning of each summer, the Graduate Program Coordinator will distribute a list of TA positions available the following school year and solicit courses of interest from graduate students in the form of a survey. Both the Undergraduate and Graduate Affairs Committees will then work to identify TA assignments. Student preferences and research areas will be considered to the extent permitted by logistical constraints and the availability of positions.

NOTE: Graduate students must be on campus during the 11-week quarter in which they TA (until grades are submitted). Personal time off is governed by the conditions set forth in the UCOP-UAW agreement/contract. For students that need to take extended travel time during the school year (e.g., travel to shared facilities, rotations in external labs/groups, internships, or international students that travel home), please indicate these constraints in the TA preferences survey sent out by the Graduate Program Coordinator during the summer so that they can be considered.

◇ **Graduate student symposium**

Approximately one year prior to the Ph.D. defense, all Ph.D. students are required to give an oral presentation on their research at the annual graduate student research symposium. Typically, the presentation requirement will be completed at the beginning of the fifth year, allowing for potential incorporation of constructive feedback from symposium attendees into the thesis.

The Graduate Student Symposium is typically held in late September. It is organized by a group of graduate students that may consult and draw upon the guidance of the Graduate Advisor and GAC. Planning begins in April of each year and is generally the responsibility of the rising fifth year graduate students (i.e., the likely presenters).

Participation in the Graduate Student Symposium is subject to advisor approval. If extenuating circumstances prevent presentation in the Graduate Student Symposium, students may satisfy this requirement by scheduling an advertised ChE 290 seminar at UCSB *no less than six months prior to the defense*. In this case, seminar times and locations should be determined in consultation with the Departmental Graduate Advisor and the CHE 290 seminar committee.

◇ **End of 4th year academic progress plan**

Before their fifth year, students should complete the end of fourth year academic progress plan and submit it to the Graduate Program Coordinator. The purpose of this form is to ensure that coursework, milestones, and other related activities leading up to the defense are sufficient to satisfy degree

requirements. If any issues are identified, the Graduate Program Coordinator can work with the student to develop a plan for meeting requirements in advance of the targeted defense date.

◇ **Final Ph.D. dissertation defense**

The University and the Chemical Engineering Department establish the rules and regulations for this defense. The Department requires that all students give an open, advertised defense in a venue that allows attendance by interested parties. Upon completion of a seminar-style presentation by the candidate, the dissertation committee, as well as interested faculty, remain for the defense portion of the exam.

Students should observe the following timeline for the defense:

- Copies of the dissertation must be provided to committee members at least *three weeks* in advance of the defense. At that time, students should also submit a PDF copy to the GAC through the Graduate Forum and a completed Defense Scheduling Form to show compliance with the required three-week notice.
- The defense should be advertised to the department at least *one week* in advance. Students should email the Graduate Program Coordinator with announcement information, including an abstract, date, time, and location.
- A PDF copy of the finalized thesis (the same one provided to the Graduate Division) should be submitted to the GAC through the Graduate Forum after the defense.

◇ **Normative time**

Normative time is the number of twelve-month years that a department considers reasonable for completion of a particular Ph.D. program by a full-time student who matriculates with no deficiencies. This time is measured from the quarter a student begins graduate study at any level at UCSB. The normative time in Chemical Engineering is 6 years, which the department interprets as a maximum, not an average, for completion of the Ph.D.. The department expects most students to graduate nearer to a 5 year time horizon, with only rare cases that require close to 6 years. Except under extraordinary circumstances, no student will be supported after six years of residence.

◇ **Degree deadlines**

The departmental normative time differs from the institution-wide degree deadline. *In every Department, the degree deadline is seven years for a Ph.D., and four years for an M.S. degree.* Students who exceed degree deadlines may petition the Graduate Council for an extension. Normative time, however, cannot be extended for individual students. Normative time is a departmental statement of ideals, not of actual averages or of individual possibilities.

◇ **Good academic standing**

Students that are making acceptable progress in their research and that have satisfactorily completed all degree requirements consistent with their time in the program are considered by the Department to be in good academic standing. Acceptable research progress is assessed by the advisor(s) in conjunction with a student's Ph.D. committee members. Such assessments can be made at annual com-

mittee meetings, but may also occur at other times by discussion of the committee if problems become apparent. For students in their first or second year, advisors can also consult with the GAC on research progress.

Students that miss requirement deadlines, without having petitioned and then received approval by the GAC, will not be considered by the Department to be in good academic standing and will receive a grade of unsatisfactory or "U" in the current or subsequent ChE290 course. These requirements include the post-candidacy annual committee meetings.

Students that do not have an active faculty advising relationship and active Ph.D. project are also considered by the department not to be in good standing, since research training is the primary focus of the program.

◇ **Probation and dismissal**

Only the Dean of Graduate Division may dismiss a student from graduate status. This is done on the recommendation of the Department. Graduate students must maintain a minimum GPA of 3.0 in all upper division and graduate courses. In addition, students are required to make continual progress towards the degree. Probation provides students whose performance is less than satisfactory with a period of time in which to make up their deficiencies. The Department will provide written notice to the student indicating the work that the student must complete in order to attain minimum standards, and set a reasonable time limit within which the work must be completed.

◆ **Finishing**

◇ **Degree checks**

Master's degree. The Graduate Division initiates a degree check for a Master's degree student when the student submits a thesis, or when the department notifies the Graduate Division that a student has passed the comprehensive examination. Master's students are required to file a "statement of candidacy" with the Graduate Division in the quarter they intend to graduate. This form acts both as a check on the student who believes he/she is graduating in any quarter, and as a means of collecting data for Master's students, such as sources of financial support and post-graduate plans/placements.

Ph.D. degree. The Graduate Division initiates a degree check for a Ph.D. student when the student turns in a dissertation and/or when the department notifies the Graduate Division on Ph.D. Form III that the student has either defended the dissertation or has had the defense waived.

◇ **Incompletes**

Except for "thesis preparation" or "dissertation preparation" units, which are obviously completed when the document is accepted, *no Incomplete grade may appear on the transcript of a graduate degree award.* Removing Incompletes in future quarters sometimes causes problems with fees, and will not automatically trigger a second degree check. Students with Incompletes must persist until they are sure the degree is awarded, since at present there is no fail-safe mechanism to initiate another degree check.

◇ **Fee status**

A student must be in fee relationship (i.e., either registered or paying the filing fee) with the university in the quarter s/he finishes all degree requirements. Fees paid for one quarter cover activities undertaken until the next quarter begins. Spring fees also cover summer session, until Fall quarter begins.

◇ **Degree timing and dates**

Students should discuss the timing of their defense and filing with their advisor and the Graduate Program Coordinator. Students that are employed at least 35% (out of a 50% appointment) in a quarter are eligible for tuition and fee coverage through GSR positions. Students that defend earlier in a given quarter may be liable for these expenses given campus employment logistics.

Degrees are granted four times a year, on the last day of each quarter including summer session. Students must have finished all requirements by the final day of the quarter in order to receive a degree dated that quarter. A dissertation filed between quarters (during the Christmas break, for example) will not cost the student additional fees if s/he was enrolled during the previous quarter; however, the degree will be dated as of the *end of the next quarter*.

◇ **Thesis and dissertation preparation**

The acceptable format for theses and dissertations is described on the Graduate Division's website. The most critical elements are paper quality, margin size, and page numbering.

Note that the UCSB Graduate Council has established a policy on coauthorship, previously published material, copyright, and acknowledgments in theses and dissertations that must be followed.

◇ **Thesis and dissertation filing**

M.S. theses and Ph.D. dissertations are filed online with ProQuest at

<http://dissertations.umi.com/ucsb>

Students must also (1) submit a PDF copy of their finalized dissertation to the GAC through the Graduate Forum, and (2) provide their advisor with a bound copy on cotton bond paper (no particular type so long as it is cotton bond.).

◇ **Deadline problems**

Students who are trying to file a thesis or dissertation by the end of a particular quarter are encouraged to take samples of their thesis or dissertation to the Graduate Division ahead of time to ensure that the format is acceptable. Students who miss the end-of-quarter filing deadline by even one day will be placed on the next quarter's degree list. If requested, the Graduate Division / Registrar's Office will provide a letter certifying the actual date of completion of requirements and guaranteeing award as of the next date.

◇ **Graduation ceremony**

The Graduate Division's graduation ceremony is one of seven coordinated by representatives of the colleges and the Chancellor's office. Students are eligible to participate in the June ceremony even if they have not yet completed all of the requirements for the degree, provided that both they and their departments really expect them to complete all requirements within the near future.

Master's candidates simply show up with cap and gown in hand, and write their name on a card to hand to the announcer. Ph.D. students are traditionally presented by their mentors and must register for Commencement on the Graduate Division's website in spring of the year in which they wish to participate in the graduation ceremony.

◇ **Diplomas and transcripts**

After the Graduate Division finishes a degree check, it notifies the Registrar, who posts the degree to the transcript and orders diplomas. Degree checks and posting take 6-8 weeks after the end of the quarter. Students wishing to order transcripts that show the degree awarded should request to hold for posting of degree.

As part of the degree check process, the Graduate Division notifies the student and Registrar's Office. Students should notify the Graduate Division if a letter of completion is needed. Once the degree has been confirmed by the Graduate Division, a letter of completion may be ordered through GOLD.

Registration and Coursework

◇ Graduate status and GPA requirement

Maintaining graduate status involves (1) paying fees, (2) registering each quarter, and (3) maintaining an overall GPA of 3.0. Failure to maintain this academic standard will result in probation or dismissal, or failure to pay fees and/or register (unless on an approved leave of absence) will result in lapse of graduate status. Only work completed while a student has graduate status may count toward a graduate degree.

Students must be registered for classes and their fees paid by the third week of the quarter. Graduate students in good academic standing and that are making acceptable progress towards research will have their fees and stipend paid through a Graduate Student Researcher, TA, and/or Reader position. It is the student's responsibility to make sure that their fees are paid by the fee deadline. A student who allows their status to lapse may petition for reinstatement.

Registration as a graduate student in the Spring quarter will cause graduate status to be maintained until the beginning of the following Fall quarter. A student who registers in Spring may, therefore, take examinations or file a thesis or dissertation during summer without incurring additional fees. A student who does *not* register in Spring quarter will be required to register and pay fees for Summer Session in order to take exams or file a thesis or dissertation.

◇ Registration requirements and full-time status

The University of California considers graduate students to have full-time status if they enroll in 8 units each quarter. Chemical Engineering students are required to enroll in 12.5 units per quarter that includes ChE 290 (Departmental Seminar, 0.5 units). Students wishing to enroll in fewer units must petition the Graduate Affairs Committee for approval. Detailed course requirements are outlined in the Degree Requirements section.

◇ Part-time graduate status

At present, there is no provision in the Department of Chemical Engineering for part-time graduate status. All graduate students are assessed full fees no matter how many units they enroll in. Students who are physically elsewhere are considered "in residence" at UCSB if they pay fees and register for classes. Students doing research outside the state of California may be eligible for a fee reduction through "in absentia registration."

◇ Leaves of absence

Continuous registration is expected of all graduate students. Leaves of absence may be granted under extraordinary circumstances, and must be approved by the Graduate Affairs Committee, prior to petitioning Graduate Division. The deadline for leave of absence petitions to the Graduate Division is two weeks prior to the beginning of the quarter. Students should ensure that the Graduate Affairs Committee has sufficient time to evaluate their request prior to this deadline.

◇ **Miscellaneous registration information**

Continuing students register during the current quarter for the following quarter. For Fall quarter, students enroll during Spring quarter.

New students and those returning from a leave of absence register at the beginning of the quarter.

Enrollment and schedule changes must be completed in the GOLD system on the Registrar's Office website. Courses requiring instructor approval may only be added using an approval code issued by course instructor.

Schedule adjustments can take place during the first week of the quarter. Students may add and drop courses without a fee. After this period, each schedule change incurs a fee. Graduate students have until the 15th day of instruction to add classes to their schedules without approval from the Graduate Division. After this deadline, a schedule adjustment petition, as well as a letter of justification, must be sent to the Graduate Division. Graduate students may drop classes up to the last day of instruction.

◇ **Department course numbers**

Courses numbered in the 1-99 range are lower division courses and may not be used for credit toward a graduate degree. They are not used for computing graduate students' GPAs.

Upper division courses (100 series) are accepted in most departments for credit toward an advanced degree if they are not repetitions of work completed as an undergraduate. Upper division independent studies courses (198, 199) and undergraduate courses required for chemical engineering B.S. students may not be used to fulfill graduate degree requirements, unless approved by the Graduate Affairs Committee.

Graduate level courses are the 200 series.

The 500-599 series is reserved for advanced study and research. These classes are not available to undergraduates, even by petition.

594 Special topics: Special seminar on research subject of current interest. Variable unit course, usually 1-4.

596 Directed Reading and Research: Experimental or theoretical research undertaken under the direction of a faculty member for graduate students who have not yet advanced to candidacy.

598 Master's Thesis Research and Preparation: *Not applicable to course requirement for Master of Science degree.* Only for research underlying the thesis and writing the thesis.

599 Ph.D. Dissertation Research and Preparation: Only for research underlying the dissertation and writing the dissertation.

Other Policies and Procedures

◆ Graduate Affairs Committee (GAC)

The Graduate Affairs Committee (GAC) is comprised of faculty members and the Graduate Program Coordinator and is chaired by the Graduate Advisor / Vice-Chair for Graduate Education in Chemical Engineering. The GAC is responsible for reviewing and establishing departmental policy and procedures pertaining to graduate affairs. This committee oversees formal aspects of the normal degree procedures and makes decisions on petitions for exceptions. The GAC consults with the Graduate Student Association to obtain student feedback about requirements, policies, programs, and other department items of concern to graduate students. Additional student suggestions, grievances, etc. should be brought to the Graduate Advisor for initial deposition.

◆ Graduate Student Association (GSA)

The Chemical Engineering Graduate Student Association (GSA) is a student organization that promotes activities and a support structure for the graduate community in the department. Leadership of the GSA is typically through an executive committee of graduate students. The executive committee is encouraged to bring recommendations or suggestions about department graduate policies to the Graduate Advisor and/or GAC.

◆ Chemical Engineering Honor Code

It is critical to the continued development of a graduate program of the highest quality that an atmosphere of mutual trust and respect prevail among the students and between the students and faculty. In this spirit, the Graduate Affairs Committee has established of a formal code of conduct that provides a guide to both students and faculty in the administration and operation of our graduate program. The Chemical Engineering Honor Code reads:

No person, either student or faculty, will act in a manner that is dishonest, that misrepresents their own or others' work and activities, or that takes unfair advantage of others.

Each entering Ph.D. student will be required to sign a formal pledge that he/she will uphold this code throughout his/her graduate career. It is essential that all members of the department respect its principle, *e.g.*, in graduate coursework, in the assignment and performance of TA duties, in research and in all other aspects of the graduate program.

The Chemical Engineering Department also adheres to and will strictly enforce UCSB's Academic Conduct Policy:

The core of the university's integrity is its scholastic honesty. Academic dishonesty vitiates the university's educational role and defrauds all who comprise its community. It is expected that students understand and subscribe to the ideal of academic integrity and are willing to bear individual responsibility for their own work. Materials submitted to fulfill academic requirements must represent a student's

own efforts. Any act of academic dishonesty, such as plagiarism or other forms of cheating, is unacceptable and will be met with disciplinary action.

Finally, the Chemical Engineering Department places the upmost value in the Code of Ethics set forth by the American Institute of Chemical Engineers, and expects all members of its community to respect and abide by it. The Code of Ethics is available at <http://www.aiche.org/about/code-ethics> and is reproduced here:

The Board of Directors of the American Institute of Chemical Engineers adopted this Code of Ethics to which it expects that the professional conduct of its members shall conform, and to which every applicant attests by signing his or her membership application. Members of the American Institute of Chemical Engineers shall uphold and advance the integrity, honor and dignity of the engineering profession by: being honest and impartial and serving with fidelity their employers, their clients, and the public; striving to increase the competence and prestige of the engineering profession; and using their knowledge and skill for the enhancement of human welfare. To achieve these goals, members shall:

- 1. Hold paramount the safety, health and welfare of the public and protect the environment in performance of their professional duties.*
- 2. Formally advise their employers or clients (and consider further disclosure, if warranted) if they perceive that a consequence of their duties will adversely affect the present or future health or safety of their colleagues or the public.*
- 3. Accept responsibility for their actions, seek and heed critical review of their work and offer objective criticism of the work of others.*
- 4. Issue statements or present information only in an objective and truthful manner.*
- 5. Act in professional matters for each employer or client as faithful agents or trustees, avoiding conflicts of interest and never breaching confidentiality.*
- 6. Treat all colleagues and co-workers fairly and respectfully, recognizing their unique contributions and capabilities by fostering an environment of equity, diversity and inclusion.*
- 7. Perform professional services only in areas of their competence.*
- 8. Build their professional reputations on the merits of their services.*
- 9. Continue their professional development throughout their careers, and provide opportunities for the professional development of those under their supervision.*
- 10. Never tolerate harassment.*
- 11. Conduct themselves in a fair, honorable and respectful manner.*

◆ Diversity, Inclusion, and Professional Conduct

◇ Department diversity statement

Our department aspires to cultivate an inclusive, welcoming, and supportive community of diverse scholars, spanning distinct backgrounds, races, ethnicities, national identities, genders, sexual orientations, religions, ideologies, and intellectual styles.

We recognize the social and ethical imperative to train a diverse cohort of future engineers, scholars, and leaders. We also recognize the critical role that diversity plays in innovation, particularly in our highly collaborative environment and in the global chemical engineering community.

We value our differences, and strive to have an open and continuous dialogue within our community per our commitment to support the diversity of its members. We are also committed to actions that foster equitable opportunities and that promote the success of individuals from diverse backgrounds.

Supporting a diverse department and campus community is an essential component of our educational mission and research enterprise. As such, we endorse the [College of Engineering's commitment to diversity](#).

◇ Reporting issues related to diversity, inclusion, and climate

If students experience or witness concerning or problematic behavior, they can bring this to the attention of the Chair, Vice Chairs, or a faculty member of the department Diversity Committee. Alternatively, they can report to the college-level Diversity, Equity, and Inclusion committee. Generally, these groups will strive to keep such conversations confidential to the extent possible; however, keep in mind that some matters, in particular sexual harassment issues, require legally-mandated reporting. Confidential, non-mandated offices on campus that students can consult include the Office of the Ombuds and the CARE (Campus Advocacy Resources and Education) Office.

◆ Vacation

Personal time off is governed by the conditions set forth in the UCOP-UAW agreement/contract for GSR and TA positions.

◆ Establishing California Residency

The funding model for Ph.D. students in the Department of Chemical Engineering relies on a rapid transition away from Non-Resident Supplemental Tuition (NRST), which is assessed above the nominal tuition for non-residents of the State of California. It is therefore imperative for students to establish California Residency during their first academic year. Students are responsible for understanding the process required, and should start this process early in their first year. Instructions regarding the process and documents for becoming a California Resident can be found on the Office of the Registrar website at the following link: <https://registrar.sa.ucsb.edu/residency/establishing-residency>.

Domestic and permanent residents in the Chemical Engineering Ph.D. program will have their NRST paid by the Department for the first year. After this period, students are expected to establish California Residency so that they are no longer assessed NRST. ***Failure to establish residency will result in the student paying the NRST fee on their own, starting in Fall quarter of the second year.*** International students are not eligible to establish California residency and therefore are not subject to this policy.

For students entering Ph.D. programs Fall, 2015 and forward, the International Doctoral Fellowship program (IDRF) will provide for payment of Non-Resident Supplemental Tuition (NRST) for all international doctoral students beyond their first year of residency who have not yet advanced to candidacy. This award will be provided for the second year of enrollment only. Students are expected to advance to candidacy during the summer prior to entering their third year. International students

will not be assessed non-resident tuition for nine quarters beginning the quarter immediately following advancement to candidacy through the fifth year. Students enrolled in the sixth year will again be assessed non-resident tuition.

The Office of the Registrar, using information provided by the student, decides the residency of new students. There are four basic components of the residency rules:

1. Citizenship: Students must be an adult U.S. citizen, an adult immigrant, or an adult non-immigrant on an A, E, G, I, or K visa. *International students on student visas may not establish California residency.*

2. Continuing presence: Students must be able to prove that they have been present in California for one full year prior to the residency determination date published each quarter in the Schedule of Classes.

3. Financial independence: If the student's parents are not residents of California, the student must demonstrate that, for a minimum of the current calendar year: a) s/he has not been and will not be claimed as a tax exemption by parents; b) s/he has not received and will not receive more than \$750 during each year from parents; c) s/he has not lived with and will not live with parents for more than six weeks per year.

NOTE: Teaching Assistants and GSRs (Graduate Student Researchers) employed at least 49% time are exempt from the financial independence criterion. All other criteria apply.

4. Intent: Documented intent to make California the permanent residence is the final component in the residency rules. Relevant proof of intent might include registering to vote and voting in California, using a California permanent address, possessing a California driver's license and vehicle registration, paying or filing California taxes, having a lease or rental agreement for more than an academic year, having a savings and/or checking account, California employment, etc. *These steps should be taken immediately on arrival, before the beginning of classes.*

During the summer between the first and second year of residence, non-resident domestic students and permanent residents will be required to complete a Statement of Legal Residency and submit it, with documentation proving that California Residency has been established, to the Registrar's Office. It may take several weeks to process these forms, therefore the process must be completed several weeks prior to the beginning of Fall Quarter. The Statement of Legal Residency form can be completed online at Registrar's Office web site at www.registrar.ucsb.edu. Click on the Residency button. Students under the age of 24 will need a letter of support from the department. Contact the Graduate Program Coordinator to obtain this letter.

Contact the Office of the Registrar (x3033) for counseling on residency questions. The final authority on residency matters rests with the Registrar. Students who leave the state, either on a leave of absence or with lapsed status, must file a residency statement when they return or reapply. Consequently, the student should maintain as many of the above indications of residency as possible while away.

◆ Petitions

◇ Guidelines and forms for petitions

The UCSB Graduate Division maintains detailed instructions and forms for a variety of petitions, including Forms I, II, and III for the regular Ph.D. program. Obtain the most recent forms at:

<http://www.graddiv.ucsb.edu/academic/forms-petitions>

NOTE: Not all petitions are relevant to Chemical Engineering, and students should consult the GAC before pursuing any of the non-regular options or forms offered at that website. Generally, petitions must gain approval at the Department level through the GAC before submission to the Graduate Division. Department policies on some of these petitions are given below.

◇ Leaves of absence

Continuous registration is expected of graduate students. Leaves of Absence may be granted under extenuating circumstances, and should be approved by the Graduate Affairs Committee, prior to petitioning Graduate Division. Students who simply drop out will have to re-apply and be evaluated with the new applicants, should they wish to return.

Both graduate advisors and students should think carefully about the timing of leave requests. A "student" is one who pays fees and registers. Persons on leave are not, technically speaking, students. Student loans, visas, university housing, access to career and counseling services, student health, financial aid, etc., are either unavailable or only on fee-for-service bases to unregistered persons. Details on the nature and consequences of leaves of absence are at:

<http://www.graddiv.ucsb.edu/academic/forms-petitions/leave-of-absence>

◇ Reinstatement from lapsed status

A student who fails to pay fees and/or to register by the third week of the quarter loses his/her student status. The student may petition for reinstatement if the lapse lasts three quarters or less. For lapses longer than three quarters, a student may be required to re-apply for admission. Re-application is not a guarantee of re-admission. The Graduate Advisor evaluates reinstatement petitions with the same care given to new applications.

◇ Withdrawal

Leaving the university after the quarter begins constitutes "withdrawal". A student must file a withdrawal petition with the Registrar; otherwise, all the classes in which he/she is registered will be awarded "F" grades. In an emergency, when a student cannot process a withdrawal petition in person, the Dean of Students' office will do so. A withdrawal should be completed as early as possible in the quarter, to ensure a maximum refund of fees. If a student intends to return to UCSB in a subsequent quarter, he/she may choose to file a leave of absence petition to make returning easier.

◇ Incompletes

A student must file a petition in the Registrar's office to receive an incomplete grade "I". If this petition is not on file, the instructor cannot submit an "I" grade. Incomplete grades are converted to F's at the end of the quarter following the original class, unless the instructor submits a letter grade to the Registrar. An instructor may extend an Incomplete for additional quarters by requesting the extension in writing directly to the Registrar's office.

Advanced degrees are not awarded to students carrying Incompletes. When a student removes an Incomplete while on leave or during summer session, without registering again, the Graduate Division will be unaware of the need to initiate another degree check. A student who has completed his/her course work, but carries one or more Incompletes, must inform the Graduate Division that he/she wishes another degree check to be carried out.

◆ Procedures for appeal of academic disqualification

The following is quoted from the UCSB Academic Senate Manual.

A) Within 30 days after the date of the notice of academic disqualification, the graduate student may submit a formal written appeal to the Graduate Dean with a corresponding copy to the Chair of the relevant department(s). The student's appeal must cite an appropriate cause for consideration of the appeal and state specific and succinct reasons the student believes the decision should be overturned. The following are examples of "appropriate cause" for an appeal of academic disqualification:

1. procedural error;
2. judgments based upon non-academic criteria;
3. specific mitigating circumstances contributing to performance; or
4. substantial evidence of remedied performance or progress toward the degree.

Disagreements over evaluation of academic quality will not be considered an appropriate basis for such appeals.

B) Within 30 days of receipt of a student's appeal, the Graduate Dean will seek written input from the chair of the relevant department. Based upon the appeal and this information, the Dean may seek to meet with the student. If there is good reason to overturn the disqualification, the student will be allowed to continue on probation until such time as the student meets all standards of scholarship and thus will be returned to good academic standing.

C) If the Graduate Dean still recommends academic disqualification after step B, the student has 14 days to submit a written request to Graduate Council that Council consider an appeal. The appeal can be based only on the existing record. All relevant information will be forwarded to the Graduate Council, and the Graduate Dean will inform the student that the appeal has been referred to Graduate Council for further review. Within 60 days of the referral from the Dean, Graduate Council will issue a written recommendation that either the Graduate Dean's decision be overturned or that the Dean's decision should stand. Taking Graduate Council's recommendation into consideration, the Graduate Dean will respond to the student in writing by certified mail within 7 days, upholding or overturning academic disqualification. In cases where academic disqualification is overturned, the Graduate Dean may reinstitute probationary status until such time as the student meets all standards of scholarship and can be returned to good academic standing.

◆ Inter-campus Exchange Program for Graduate Students (IEPGS)

Occasionally, UCSB graduate students may wish to study temporarily at another UC campus. If a student desires to take a course not offered at UCSB, wishes to study under the guidance of a specialist in residence at another UC campus, or needs to have continuing access to library holdings or facilities not available at UCSB, s/he may apply to the Inter-campus Exchange Program. Approvals are required from the department chairs and the graduate deans on both campuses. Applications are available in the Graduate Division.

Separate applications are required for each quarter and must be filed with the Graduate Division at least four weeks before the beginning of the quarter in which the student wishes to make the exchange.

The student pays fees at UCSB and files registration materials at both campuses. This procedure maintains academic residence at UCSB even though the student is not physically present. Classes taken on the other campus appear on the UCSB transcript, and are figured into the UCSB grade point average. Ordinarily, the Graduate Division will not process an inter-campus exchange petition until the student has completed at least one quarter satisfactorily on this campus.

◆ Self-care and life balance

While the research environment and progress towards the Ph.D. can be demanding, it is important for students to be cognizant of and nurture their physical and mental health. Many self-care and life balance resources are available to graduate students on campus. The Department maintains a resource handout in the Chemical Engineering graduate portal. Similarly, the Graduate Division maintains a resource website here:

<https://www.graddiv.ucsb.edu/profdev/life-balance>

◆ Internships

Graduate students pursuing internship and other related opportunities must notify the Graduate Program Coordinator at least two months prior to the intended experience in order to coordinate campus and department logistics. Summer (July 1-September 30th) internships are the easiest and most seamless quarter to participate in internships. Starting an internship during a regular quarter can require ending GSR or TA appointments early and this has significant financial repercussions. Since dates of internships vary, it is imperative that you speak to the Graduate Program Coordinator as early as possible.

International Students

◆ English as a Second Language (ESL) requirements

◇ Overview of ESL policy

Graduate Council policy requires that any student for whom English is not the native language satisfy proficiency requirements in both spoken and written English for the purposes of research and communication with colleagues, before he or she will be awarded a degree at UCSB.

◇ On-campus employment forms

If you are required to indicate an employer in the Chemical Engineering Department as part of the process of employment verification (e.g., obtaining a social security number), please indicate that this person is Chemical Engineering's Payroll Analyst. The specific staff member can be located on the Department Contacts page at the start of this handbook, or emailed at payroll@chemeng.ucsb.edu.

◇ TA language evaluation

Language evaluations for chemical engineering graduate students are administered by the UCSB ESL Program in September, prior to the beginning of the second year of residence.

The Graduate Council requires international TAs whose native language is not English to be tested for language proficiency. A faculty member from the Chemical Engineering Department and the Director of the ESL program will evaluate the prospective TA, based on a 5-min presentation on an academic topic assigned in advance by the Department. The evaluators will assess the student's ability to explain academic concepts, and to understand and answer questions of the type posed by undergraduates in a classroom setting.

Only students who demonstrate acceptable spoken proficiency in the English language evaluation are eligible for classroom teaching responsibilities. TAs who fail the language evaluation will be assigned alternate, non-teaching responsibilities, and will be required to take an appropriate ESL class.

◇ ESL compliance

The Chemical Engineering Department assists the Graduate Dean in monitoring the following aspects of ESL policy:

- All new international graduate students are required to take the English Language Placement Exam (ELPE) at the beginning of the quarter in which they first enroll at UCSB. Based on their performance on the ELPE, they will be placed in appropriate Linguistics classes, or considered exempt from ESL.
- Students who fail to take the ELPE are considered delinquent and will have their registration blocked for future quarters until they take the ELPE.

- Continuing international students who need additional ESL coursework will be pre-registered by the ESL Program in the appropriate classes.
- Attendance at ESL classes is *compulsory*. Students who do not attend their assigned ESL classes during the first week of classes (and the remainder of the quarter) are considered delinquent. Such students may have their registration blocked for future quarters until they can prove they are attending their assigned classes.
- Students are expected to complete the ESL course progression (Lx 1, English Skills Review; Lx 2, ESL Writing Skills Practicum; Lx 3G, ESL Graduate Writing) within three quarters.
- Linguistics 4, an ESL Self-Paced Tutorial class, is available to avoid scheduling conflicts involving ESL classes and to give the Department the option of asking a student who is having trouble speaking or writing English to obtain additional assistance. The Department may recommend that students needing extra help sign up for this class when it is offered.
- If university ESL requirements are not met, the Graduate Division will enforce one or more of the following options: withholding of GSR appointments; withholding of degrees; blocking of registration for future quarters and/or blocking advancement to candidacy.

◆ Office of International Students and Scholars

The Office of International Students and Scholars (OISS, <http://oiss.sa.ucsb.edu/student>) has counselors to assist and advise international students in many areas, including:

- housing
- visas and immigration matters
- financial aid
- cross-cultural programs
- English conversation classes

◆ Travel outside of the U.S.

International students should consult proper procedures before traveling outside of the U.S. In particular students should have a current Travel Validation in the form of a travel signature on the I-20 form prior to any such travel in order to re-enter the U.S. upon return. To obtain this signature, students should drop off their I-20 to the OISS office at least two business days before departing Santa Barbara. Detailed procedures are given here:

<http://oiss.sa.ucsb.edu/student/current-students/current-f-1-students/travel-for-f-1-students>

◆ Financial aid

Graduate students may apply for President's Work Study through the Office of International Students after three quarters of enrollment on campus.

◆ Optional Practical Training (OPT) post-graduation

Students on F-1 Visas may be eligible for Optional Practical Training that allows up to three years of post-graduation employment in the U.S. while on F-1 visa. Students can apply for OPT status no more than 90 days before the degree completion date. As OPT processing times can run into several months, students are encouraged to submit OPT application requests to the OISS well before graduation to comply with OPT deadlines and timing. Details can be found here:

<http://oiss.sa.ucsb.edu/student/current-students/current-f-1-students/f-1-employment/after-graduation-optional-practical-training>

Fees, Financial Support, and Fellowships

◆ Financial support

The policy of the Chemical Engineering Department is that Ph.D. students are guaranteed financial support (stipend, tuition, and fees) when they meet the following criteria:

- are within normative time
- are working towards the Ph.D. degree objective
- have an overall GPA of 3.0 or above and meet the requirements for good academic standing
- are not on Monitoring or Probation Status
- have an active advisor relationship and active involvement in a thesis research project

Department financial support is generally paid for by a combination of GSR, TA, or Reader positions. Stipend and fee payments for students enrolled after their fifth year of residence are not guaranteed, and are at the research advisor's discretion. Except under outstanding circumstances, no student will be supported after six years of residence.

◆ Fees

◇ Quarterly fee breakdown

A detailed fee chart can be found at <http://registrar.sa.ucsb.edu/feechart.aspx>.

◇ Non-resident tuition reduction

Beginning in the quarter following advancement to candidacy, international students receive a 100% reduction in their non-resident tuition for three years. However, if the degree is not completed by the end of the third year after advancement to candidacy, non-resident tuition will again be assessed at the full rate.

◇ Filing fee

A student must be in fee relationship with the University in the quarter during which s/he finishes all degree requirements.

The filing fee is for the use of a student who is completing one final requirement for a degree. Students who are registered during the quarter they complete requirements for the degree need not pay the filing fee. Paying the filing fee terminates graduate student status; therefore, it may be used only by Ph.D. students and terminal Masters' students. Masters' students may use it if all their coursework is complete but they still need to take comprehensive exams or file a thesis. Ph.D. students may use the filing fee to file and defend dissertations.

The filing fee is one-half the amount of the student services fee; consult the Graduate Division for the updated amount. The fee should not be paid unless it is certain that the dissertation or thesis will be

filed during the quarter the fee is paid. We suggest it be paid on the way to the Graduate Division, final paperwork in hand. The filing fee may *not* be carried forward from one quarter to the next, since it terminates graduate status. Reinstatement may then be required after lapse status, along with re-advancement, at the committee's discretion. Leaves of absence will not be granted following lapses or after "filing fee leaves" in which the thesis or dissertation was not filed.

NOTE: Students must be registered in the quarter prior to the filing fee quarter. Students who allow their registered status to lapse will be required to register and pay full fees for the quarter in which they file their thesis or dissertation.

◆ Student employment

◇ Academic and extramural appointments

To be employed, Graduate Student Researchers (GSRs), Teaching Assistants (TAs), and Readers must be registered graduate students in good standing, i.e., with a GPA of at least 3.00 and fewer than 12 units of incomplete grades. Departmental policy requires all graduate students to be TAs or readers for one quarter during each academic year after the first year of residence. Students on fellowships will be assigned a TA or reader appointment where permitted by the fellowship.

All wages (including stipends and those earned as a TA, reader or GSR) are fully taxable.

Academic appointments for domestic students are generally limited to 50% time (20 hours per week). If this time limitation exerts an undue hardship on the student or the Department, the Graduate Division may approve a temporary exception up to a maximum of 75% time for total combined UC employment. International student employment is limited to 50% time per quarter during the academic year.

It is expected that Chemical Engineering graduate students will not have jobs outside the university. The Graduate Affairs Committee should be consulted on exceptions.

Domestic students employed by UCSB must be enrolled for a minimum of 8 units per quarter during the academic year (4 during summer session) to be exempt from paying Federal Insurance Contribution Act (FICA, or Social Security) taxes. Students who do not meet the registration requirement will be assessed the taxes. This *does not* affect International Students, who are automatically exempt from paying Social Security taxes.

Graduate students who are not enrolled for summer session do not meet the course load requirement, and therefore lose their exemption. The required contribution is 7.50% of salary to an individual account in the University's Defined Contribution Plan as an alternative to paying Social Security taxes. An additional 1.45% of salary is assessed for Medicare.

The Defined Contribution Plan is a qualified retirement plan established and maintained under section 401(a) of the Internal Revenue Code. The Plan is administered by University of California Employee Benefits in the Office of the President, located in Oakland. The required 7.50% plan contribution is deducted from gross salary each pay period, and income taxes are calculated on remaining pay, thus reducing taxable income. Taxes on the contributions and any earnings are deferred (i.e.,

postponed until withdrawal of money, which can occur only upon termination of UC employment or retirement).

◆ Need-based financial support

Graduate students may apply for need-based grants, loans, and work-study awards through the Financial Aid Office. The programs are based entirely on demonstrated financial need. Only U.S. citizens and permanent residents may apply for funds administered by the Financial Aid Office. A student's eligibility for aid is determined by comparing the "Estimated Student Budget" with the individual student's actual resources. Financial Aid has estimated student budgets for both single and married students.

Assistance from Financial Aid is usually offered as a combination package of the following types of aid:

- **Grants.** Like fellowships, grants are non-repayable awards.
- **Work-Study.** In this program, student salaries are paid partly by the federal government and partly by the hiring Department (usually a 60/40 split). Any on-campus job may employ students with work-study funding. Domestic graduate students are required to complete the FAFSA each winter quarter to determine their eligibility of work-study funding. *Approximately two weeks after the FAFSA has been completed, the student must log in to find out whether work-study has been awarded, and must report the amount to the Graduate Program Coordinator.*
- **National Direct Student Loan.**

In addition, students may supplement their financial aid awards by applying for one or both of the following loan programs:

- **Guaranteed Student Loans (GSL)**
- **California Loan to Assist Students (CLAS)**

To apply for financial aid, students must submit a Student Aid Application for California (SAAC) and tax certification forms, with copies of their (and in some cases their parents') previous year's income tax documents.

The deadline for application for financial aid is March 15. The Financial Aid Office evaluates on-time applications and mails offers of aid in April. Students who apply after the deadline are rarely funded.

◆ Other financial support

◇ TA loans

Graduate students employed as TAs may apply for a TA loan, up to the amount of the first month's salary, beginning two weeks before the start of classes, through the Office of Financial Aid. Loans are repayable in three installments by the end of the quarter (i.e., 1/3 per month).

◆ Department of Chemical Engineering graduate student fellowships

◇ Dow Chemical Discovery Fellowship

The Dow Discovery Fellowships are established through a generous gift from the Dow Chemical Company to support two outstanding graduate students who have advanced to candidacy in the Chemical Engineering Department at UC Santa Barbara and who have research interests in classical areas of chemical engineering of interest to Dow, as noted below. The Fellowships are intended to encourage outstanding doctoral students to solve the most important and pressing engineering problems of their time. The Chair of the Department will administer the Fellowships. The Fellows will be selected by the faculty as a whole at the annual faculty retreat, which will normally be held before the start of classes in the Fall Quarter. The Fellowship will commence at the beginning of the Fall Quarter and will pay the student stipend (at the normal Chemical Engineering rate), tuition and fees up to a maximum value of \$50,000 per year for each Fellow (this number will be revised from time to time to reflect funds available from the annual payout from the endowment). Fellows will not be absolved of any of the normal duties and responsibilities of doctoral students as described in the Chemical Engineering Department Graduate Student Handbook. Teaching Assistant duties will be the same as the prevailing duties assigned to NSF Fellows. The Dow Fellowship will normally last for three (3) years (subject to the Fellow making satisfactory progress towards the doctoral degree, as determined each year by their doctoral dissertation committee) in order to provide sufficient time for the Fellow to complete a substantial contribution to their field of study.

The Dow Discovery Fellowships will be made to outstanding students based on merit, academic standing and faculty recommendations. These individuals will be honored and recognized as “Dow Chemical Company Fellows.” Students who already receive a full Fellowship from another sponsor (e.g., NSF Fellows, Hertz Fellows, etc.) are not eligible to receive a Dow Discovery Fellowship. Dow Discovery Fellowships are reserved for our bravest and most fearless thinkers who are ready, willing and able to take on high-risk, high-reward research projects. If it is determined that no candidates fit these criteria in a given year then no fellowships will be awarded. The funds will roll over to the following year. Upon notification of the recipients to the Dow Chemical Company by the Department of Chemical Engineering, the company will have the opportunity to meet the Fellows to hear first-hand about the students and their research.

Areas of Interest

Reactor engineering, catalysis or combustion

Transport processes

Advanced separation technology

Applied process modeling, control and optimization, both steady-state and dynamic

Energy related research including electrochemical engineering

Process analysis based on engineering fundamentals and data-driven technologies

Computational sciences and analytics

Theoretical, experimental and applied chemical engineering

◇ Mitsubishi Chemical Scholarship for Excellence in Chemical Engineering Research

The Mitsubishi Chemical Fellowship is established through a generous gift from the Mitsubishi Chemical Corporation, Japan to support an outstanding graduate student who has *advanced to candidacy* in the Chemical Engineering Department at UC Santa Barbara. The Fellowship is intended to encourage outstanding doctoral students to solve the most important and pressing engineering problems of

their time in any area of chemical engineering. The Chair of the Department will administer the Fellowship. The Fellow will be selected by the faculty as a whole at the annual faculty retreat, which will normally be held in early September each year. The call for applications will be made early in the academic year (so that candidates in their second year of residence can plan ahead to take their candidacy exams in time to compete for the fellowship) with the final selection of the Fellow made by September of the same academic year so that the Fellow can take up the Fellowship in time for the beginning of the Fall Quarter of the following academic year (i.e., approximately two weeks after the selection has been made and announced). The Fellowship will commence at the beginning of the Fall Quarter and will pay the student stipend (at the normal Chemical Engineering rate), tuition and fees up to a maximum value of \$50,000 per year for each Fellow (this number will be revised from time to time to reflect funds available from the annual payout from the endowment). The Mitsubishi Chemical Fellow will not be absolved of any of the normal duties and responsibilities of doctoral students as described in the Chemical Engineering Department Graduate Student Handbook. Teaching Assistant duties will be the same as the prevailing duties assigned to NSF Fellows. The Mitsubishi Chemical Fellowship will normally last for three (3) years (subject to the Fellow making satisfactory progress towards the doctoral degree, as determined each year by their doctoral dissertation committee) in order to provide sufficient time for the Fellow to complete a substantial contribution to their field of study.

The Mitsubishi Chemical Fellowship will be made to outstanding students based on merit, academic standing and faculty recommendations. These individuals will be honored and recognized as "Mitsubishi Chemical Fellows." Students who already receive a full Fellowship from another sponsor (e.g., NSF Fellows, Hertz Fellows, etc.) are not eligible to receive a Mitsubishi Chemical Fellowship until their existing fellowship has ended. Mitsubishi Chemical Fellowships are reserved for our bravest and most fearless thinkers who are ready, willing and able to take on high-risk, high-reward projects. If it is determined that no candidates fit these criteria in a given year then no fellowships will be awarded. The funds will roll over to the following year.

◇ **Schlinger Scholarship for Excellence in Chemical Engineering Research**

The Schlinger Scholarship recognizes outstanding accomplishments in doctoral research in Chemical Engineering, as evidenced by publications, submitted manuscripts, or other measures of impact. Chemical Engineering graduate students who have advanced to candidacy are eligible to be nominated for the Schlinger Scholarship. The awardee will receive a supplementary stipend of \$2000, as well as an additional \$1000 for research-related expenses.* The awardee will also give The Schlinger Lecture at the annual Chemical Engineering Graduate Student Symposium. The nomination must include a one-page nomination letter from a faculty member involved with the student's research, one additional supporting letter, the nominee's CV, and a one-page summary of the nominee's research accomplishments. Nomination documents should be sent electronically as a single PDF file to the Graduate Program Coordinator. The Department will notify Graduate Students when this Scholarship is available.

◇ **CSP Technologies Teacher-Scholar Fellowship**

The CSP Technologies Teacher-Scholar Fellowship is supported by a generous gift from CSP Technologies, and will be given to a Chemical Engineering graduate student who demonstrates exceptional promise in both teaching and research. The fellowship is designed to provide pedagogical experience to a student who has academic career interests and a corresponding research trajectory. The

awardee will receive a one-time \$2,000 fellowship award and will co-teach an undergraduate Chemical Engineering course with a faculty mentor in one quarter of the academic year. The course/mentor will be chosen by the Vice-Chairs in consultation with the fellow, taking faculty teaching assignments and course suitability into account.

The Fellow will be selected by a committee of faculty including the Chair and Vice-Chairs during the summer. To qualify, a student must have passed to candidacy and have the approval of his or her faculty advisor(s) to co-teach during the target award time frame. The Teacher-Scholar co-teaching assignment will count towards the Ph.D. TA requirement and the Fellow will not be required to have an additional TA assignment the same year.

◆ UCSB fellowships

◇ Fellowships available to continuing graduate students

The Graduate Division administers a number of fellowships and grants to which continuing students are able to apply. Students are encouraged to visit their website at:

<http://www.graddiv.ucsb.edu/financial/central-campus-fellowships>

The site includes a full description of the eligibility, criteria, level of support, and an application for each award. Deadlines are typically in February and March, and the announcement of awards typically occurs in June. Note that some fellowships allow direct applications from the student. Others (typically providing more substantial support) require nomination at the Department level. Students can contact the Graduate Advisor in late February to learn about nomination-only fellowship opportunities.

In addition, the Graduate Division maintains lists of other campus and extramural fellowships:

<http://www.graddiv.ucsb.edu/financial/other-ucsb-fellowships>

<http://www.graddiv.ucsb.edu/financial/extramural-funding>

◆ Other Funding

◇ UCSB Academic Senate Doctoral Student Travel Grants

Ph.D. students who have advanced to candidacy, and who have been invited to present a paper at a scholarly meeting or to present results before a distinguished audience, are eligible to receive support for one trip during their graduate career. Funds are available for the following transportation costs, varying by area: \$400 California; \$900 all other U.S. locations, Mexico, Canada; \$1340 Puerto Rico, Europe; \$1400 Central or South America; and \$1600 Asia, Africa, Middle East, South Pacific.

There is no deadline, and funds are awarded until expended.

<https://senate.ucsb.edu/grants/doctoral.student.travel/>

◆ Tax information

Generally speaking, stipends are taxable and graduate students alone are responsible for any owed tax and the management and timing of payments. Students should review their tax responsibilities in detail. UCSB and Departmental staff may not advise individual students on these matters, but information and links are provided by the Graduate Division at:

<http://www.graddiv.ucsb.edu/financial/tax-information>

Briefly, the 1986 Tax Reform Act eliminated the tax exempt status of nearly all graduate student awards and earnings. The law distinguishes between two major categories of graduate student support:

1. Fellowships, scholarships, and grants are fully taxable, except for that portion that is used for the payment of tuition and "course-required fees, books, supplies and equipment". Thus, a student receiving a fellowship that includes a stipend, the payment of fees, and tuition, will pay taxes only on the stipend. A student receiving only a stipend will subtract the amounts used from the stipend to pay fees and tuition and pay taxes on the remainder. Nonresident tuition fellowships, fee payment fellowships, and In-Candidacy Fee Offset Grant (ICFOG) payments are not taxable. The university neither withholds taxes on fellowships nor reports fellowship payments to the Federal government. Students are responsible for reporting fellowship income and arranging for estimated quarterly tax payments through the IRS office.
2. Any earnings received in return for any expectation of work on the part of the student are fully taxable. The exemption formerly allowing exclusion from taxes of stipends earned while pursuing a degree requirement for teaching or research was repealed effective January 1, 1987. The amount the student pays from these earnings for fees, tuition, books, etc. may not be excluded.