Requirements for the M.S. and Ph.D. Degree

I. Completion of Materials Science and Engineering Program M.S. Degree requirements or equivalent thereof. (36 units) 9 classes

II. Materials Science and Engineering Comprehensive Examination

The comprehensive examination is a written examination that covers subject matter from six of the 12 core courses. If your advisor wishes you to take another class beside a class that is listed below you need to see the grad coordinator for approval.

Mandatory Core Courses
- MATS 201A Thermodynamics of Solids
- MATS 201B Solid State Diffusion and Reaction Kinetics
- MATS 201C Phase Transformations
- MATS 227 Structure and Analysis of Solids

Elective Core Courses
- MATS 205A Imperfections in Solids
- MATS 251A Electronic Photonic Properties of Materials
- MATS 251B Magnetic Materials: Principles and Applications
- MATS 252 Biomaterials/Med Devices
- MATS 253 Nanomaterials
- PHY 152 Introduction to Solid-State Physics

These two need to be approved by advisor & OGS

MATS 256 Energy Materials & Apps
MATS 257 Polymer Sci & Eng

The examination will consist of twelve questions. A passing grade of 70% is needed to stay in the Ph.D. program. The examination will not exceed six hours in duration. The examination will be administered the second week in January and a week to two weeks after Spring Quarter finals in June. This exam is taken by students pursuing a Ph.D. between the first and second year of study. This exam may only be repeated once before the end of the second year of study. An M.S. degree is granted along the way if students do not have one.

III. Literature Review (2nd year exam)

Upon passing the Comprehensive Examination, the student will present a Literature Review (by the end of the second year) to an examining committee and other interested faculty and graduate students. The examining committee will consist of three faculty members associated with the Materials Science and Engineering Program, including the student's advisor. The topic of the review may be related to the student's research or to some other research topic of interest. This review requirement must be completed before scheduling the Ph.D. Qualifying Exam.

IV. Ph.D. Qualifying Exam (Senate Exam) to Advance to Candidacy

The Ph.D. Qualifying Exam is an oral examination on the student's research proposal. The examining committee will consist of five faculty members associated with the Materials Science and Engineering Program, including the student's advisor. Two of the faculty members must be outside of the Department of the student's advisor. A written proposal on the student's research topic must be submitted to the examining committee at least one week before the oral exam. This examination is typically taken at the end of the third year of study.

V. Successful completion of 3 (three) advanced graduate courses (in addition to those courses required for the M.S. Degree), approved by the student's advisor.

VI. Meeting all the University's residency and other requirements.

VII. Successful completion and defense of a dissertation which, in the opinion of the dissertation committee, contains original work.

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MATS 200 seminar students are expected to attend and listen to 9 seminars per quarter. You can choose the 9 seminars from any seminar held within UCSD's Engineering department or related engineering (chemistry, physics) fields. The 9 seminars should be summarized and the write-ups turned in to Dr Sungho Jin as a hard copy no later than the deadline announced towards the end of each quarter.

The summary for each seminar (1/2 TO 1-page long, single spaced) should include the seminar title, speaker's name and affiliation, date of the seminar and a brief description of the seminar. You may optionally comment on the quality of the seminar, analysis and interpretations of the speaker, and discuss whether you agree or disagree with the speaker's analysis/conclusions.

The participation in seminars is to improve skills for extracting useful knowledge from a short presentation is a part of your professional training.

Reminder:

MS students must enroll for the MATS 200 for 3 three quarters.
PHD students must enroll for 6 six quarters.
The Literature Review Examination (2nd year Exam)

The Literature Review Examination tests the student's ability to prepare and present a comprehensive overview of a topic based on existing journal literature. It should be a comprehensive discussion of the literature, scientific theory, problems or theoretical deficiencies, and possible areas of research in some area of materials science and engineering. The topic may be in the general area in which the student plans to pursue his or her thesis research, or it may be in an unrelated field. The three-faculty member committee in advance of the seminar must approve the topic.

The Literature review Examination is not to be a discussion of the student's research project or their research proposal. A presentation, which includes the student's own work that has not been published will constitute a no pass grade. (example: it can be a 2-page abstract sort of paper, like a conference presentation, as in Chemistry). This exam must occur within one year of the student having passed the Comprehensive Examination.
ENROLLMENT

Graduate students may enroll in classes anytime during the official enrollment period for each quarter. Students enroll via TritonLink (http://mytritonlink.ucsd.edu).

The schedule of classes, available on TritonLink, will contain the most recent scheduling information available for MSE. You must be registered for at least 12 units of graduate and/or upper division courses every quarter to maintain full-time status.

Enrollment information and deadlines will be sent to you via e-mail. The information is also posted on the web calendar at the Registrar's Office (http://registrar.ucsd.edu).

Questions may be directed to the MSE graduate coordinators.

Schedule of Classes:
The Schedule lists course offerings and other pertinent information for a given quarter. The schedule of classes can be viewed on-line via TritonLink.

Add/Change/Drop: For the first two weeks of the quarter, changes to your course schedule can be made via TritonLink.

After the second week of the quarter, an Add/Drop card, with departmental and OGS signature approval is required for each change. The card can be obtained from the Graduate Office. You are responsible for submitting the card to the Registrar.

Deadlines are as follows:
Adding a course = 4:00 pm, Friday of 10th week
Dropping a course = 4:00 pm, Friday of 9th week
ANNUAL EVALUATIONS (the evals are done electronically)

The Graduate Council policy requires that doctoral students be evaluated every spring; this annual evaluation is also known as the “Spring Evaluation.”

A satisfactory evaluation is necessary for financial support to be continued every year. For those who are pre-candidacy, this review requires the advisor and student’s signature. Once the student advances to candidacy, this evaluation will require three members of the student’s doctoral committee and the student’s signature.

Spring Evaluations are a substantive progress review. At least three members of the doctoral committee are to participate in the review.

The doctoral committee chair will write up the results and discuss them with the student.

All doctoral students are required to have an annual Spring Evaluation; the only exemptions are for:

1. A student advancing to candidacy during the current Winter or Spring quarter of the current academic year.

2. A student on an approved leave of absence during Spring quarter of the current academic year. In this instance an evaluation must be submitted by the end of the first quarter if return.

3. Students must sign the review, indicating that they have read it. The student’s signature does not necessarily indicate agreement. The student will also be given space to comment on the review.

4. Finally, the Department Chair reviews and signs all annual evaluations prior to their routing to the Office of Graduate Studies. Copies are placed in the student’s file.
Department Exam (Comprehensive Exam)

PROGRAM OF STUDY

Your program of study is determined in consultation with your advisor, who supervises your activities until the appointment of your doctoral committee. The doctoral program generally involves two stages.

The first stage requires at least three quarters of an academic residence and is spent fulfilling the requirements. After successful completion of the (comp exam) departmental exam, and when your advisor considers you ready to take the qualifying examination, the doctoral committee is appointed. The student in consultation with the advisor decides the committee membership.

ACADEMIC STANDING

Students must remain in good academic standing by meeting departmental and graduate studies standards. These include:

1) Maintaining a minimum 3.0 GPA and enrolling in at least 12 units of graduate level (200 series) and/or upper division (100 series) courses each quarter.

2) Obtaining satisfactory annual evaluations

3) Having no more than a total of eight units of "F" and/or "U" grades.

Good academic standing is required to obtain funding, advance to candidacy, take a leave of absence and to obtain a graduate degree from UCSD.

DEPARTMENTAL EXAM (comprehensive exam)

At the end of the first year, students are required to take a Departmental Examination (comprehensive exam). A comprehensive written exam will be given, typically during the 2nd or 3rd week in June. Typically, students should take the exam after one year of full-time enrollment. It may only be retaken once before the end of the second year of study.

2. The exam will cover the six core classes:

   MATS 201A Thermodynamics of Solids
   MATS 201B Solid State Diffusion and Reaction Kinetics
   MATS 201C Phase Transformations
   MATS 205A Imperfections in Solids
   MATS 227 Structure and Bonding of Solids
   MATS 252 Biomaterials
   MATS 253* Nanomaterials and Properties (SU04)
The exam will consist of 12 questions, two from each of the core classes.

3. The exam is closed book and notes. Crib sheets are not allowed. The exam will be broken up into two sessions: a morning session (9 am to 12 pm) and an afternoon session (1 to 4 pm). The morning session will cover 201A, 201B, and 201C. The afternoon session will cover 227, 205A and PHYS 152. Once the morning exam is handed in at noon, the students will not be allowed to access that portion in the afternoon.

The Departmental Examination (comp exam) is intended to test the general engineering background of the student, the ability to integrate material from specific courses in analyzing new problems, demonstration of a reasonable degree of originality and insight, and the ability to present clear verbal and/or written arguments. Failure to pass the examination may have these results, decided by the examination committee:
MSE - Qualifying Examination

Advancement to Candidacy Overview

We hope your research is going well, and that you are excited at the prospect of presenting your preliminary findings and proposed thesis project to your Doctoral Committee to Advance to Candidacy for the PhD. This is the last oral exam you will take before you defend your thesis. Please let us know if you have questions about the process or procedures described below. Best of wishes for your continued success!

To officially advance to candidacy, you must complete ALL of these steps:

- Have a Doctoral Committee approved by UCSD at least two weeks prior to the Oral Qualifying Exam
- Pass the Oral Qualifying Exam. Have the required advancement paperwork signed off by the Doctoral Committee, MSE department and Graduate Studies Dean's Offices.
- Pay the UCSD Cashier the advancement fee

Your records will only show you as Advanced once you are advanced for a full quarter.

To remain in good academic standing in the PhD program, you must complete all of the steps listed above by the end of Spring Quarter. Extensions require prior approval by the Thesis Adviser, UCSD Graduate Affairs Committee. Students who do not advance by deadline will have a hold placed on their fall quarter registration.

Doctoral Committee

To meet University requirements for naming a doctoral committee, students must submit the names of the committee members at UCSD to the graduate coordinator so approval can be given. Students should email the Ph.D. Coordinator their committee names a minimum of two weeks prior to the examination date.

One of the purposes of a doctoral committee is to provide students with mentorship and guidance beyond that provided by the Thesis Adviser. Requirements on who serves on the committee were developed, in part, to provide some consistency across departments. Exceptions to these policies require both Graduate Affairs and Deans' approval. The Department policy of having Departmental Exam Committee members continue to serve on the doctoral committee is to provide students with faculty who, over time, are familiar with the student, their research, and the history of the exams. If a student has found other faculty with particular interests pertinent to the research, it is quite permissible to expand the committee to additional members; it is not necessary to delete a Departmental Exam Committee member to compensate. Below are guidelines for selecting a committee.
Doctoral committee may consist of five members all from the Group in Materials Science and Engineering with at least two departments represented; one member must be tenured from a department other than the committee chair's home department.

A minimum committee of five faculty members is required. Other members may be appointed at the student's discretion.

Set up your committee. Setting up a committee is now done electronically. Access the instructions/policies on who can serve on your committee at: http://ogs.ucsd.edu/academic-affairs/degree-information-procedures/doctoral-committee-membership.html. You should meet with your advisor to discuss who should be appointed to your committee. Once you have discussed your committee with your advisor, email the name, academic rank and research specialty to Charlotte at least 2 weeks before the time you expect to take the Senate Exam. The Graduate Affairs office will electronically route your committee request to the Chair and to the Dean of Graduate Studies. You cannot take the Senate Exam until OGS approves your committee. You will get an email from the Dean when your committee is approved.

Oral Qualifying Exam

The University requires a Qualifying Examination for Advancement to Candidacy for the PhD. The purpose of the examination is for students to gain approval of their proposed thesis research project from their Doctoral Committee.

Scheduling the examination. The exam must be scheduled at least two weeks in advance. Students first confirm with ALL of their committee members the date and time of the exam.

Students submit a summary to their doctoral committee at least two weeks before the Qualifying Examination. The summary should include a comprehensive description of the proposed thesis research (including key references), its significance, and the progress that has already been made.

The day of the examination, Ph.D. Coordinator ensures the needed forms are in the file "Nomination of Doctoral Committee for the Qualifying Examination". The Thesis Advisor will pick up the file and take it to the exam; the advisor is in charge of returning the file.

At the examination, students first give a 30-minute presentation. The presentation is followed by a question-answer period when the committee examines students for indications of the knowledge, insight, motivation, and demonstrated productivity required to produce an acceptable thesis in the normal time. The student may or may not be asked to leave the room for a time prior to hearing the committee's evaluation. Students may Pass, Provisionally Pass, or Fail the exam. The committee will inform
students of the results, and will explain any recommendations or requirements. These will be written on the internal "Comments" form; original stays in the student file, and students receive a copy.

**Finishing Up: Paperwork and Fee Payment**

As a student in the Joint Doctoral Program, signatures are required from both campuses and thus, unfortunately, several trips between the two campuses are required in order to acquire the necessary signatures. Once a student has fully passed the Oral Qualifying Examination, the committee will sign the "Report of Qualifying Examination" form. The file is then returned by the thesis advisor to the Student Affairs Office. The Ph.D. Coordinator ensures that required Departmental review/signatures are requested for "Final Report of the Qualifying Exam" form. Students are responsible for following up with the Ph.D. Coordinator after exam regarding the pick-up of "final" paperwork required for filing/fee payment. Be certain to ALLOW REASONABLE TIME between contacting Ph.D. Coordinator for pickup of forms and the advancement deadline. Files with original paperwork may take 2-3 days to return to Ph.D. Coordinator and/or availability of required Departmental reviews/signatures may require 1-2 days.

Student Affairs strives to notify students quickly when forms are ready for pickup; students should follow up with Ph.D. Coordinator on readiness of forms for required signatures. Once it is signed the student goes and pays the Advancement to Candidacy fee at the UCSD Cashier.

**Congratulations, you are now Advanced to Candidacy for the Ph.D.!**
MSE - DISSERTATION AND FINAL EXAM

A draft of the doctoral dissertation should be submitted to each member of the doctoral committee at least four weeks prior to the final examination. The form of the final draft must conform to procedures outlined in the "Preparation and Submission Manual for Doctoral Dissertations and Master's Theses "Bluebook," (http://ogs.ucsd.edu/academicpolicy/Dissertations_Theses_Formatting_Manual.pdf).

We encourage students to publish appropriate parts of their theses in engineering literature. In some cases, individual chapters are published as research articles prior to completion of the entire dissertation.

The doctoral committee supervises and approves the candidate's dissertation and conducts the final oral examination, which shall be publicly defended and so announced.

The Report of the Final Examination and Filing of the Dissertation for the Degree of Doctor of Philosophy form is initiated by the Department, and signed by members of the doctoral committee and the Department Chair.

The candidate electronically submits the dissertation to the Office of Graduate Studies (OGS) and, upon approval by the Dean of Graduate Studies, files the dissertation with the University Archivist, who accepts it on behalf of the Graduate Council. Acceptance of the dissertation by the Archivist, with a subsequent second approval by the Dean of Graduate Studies, represents the final step in the completion by the candidate of all requirements for the doctor of philosophy degree. Dissertations submitted electronically are catalogued electronically and available through the UCSD Library website: http://libraries.ucsd.edu/.
There are several electronic publishing methods available. The Office of Graduate Studies at the preliminary filing appointment will explain these options.

When you are ready to submit your thesis/dissertation, please do the following:

1. Provide the Graduate Coordinator with one copy of your dissertation abstract via email.

2. Make a room reservation with the Graduate Coordinator once you have set a date and time with the committee.

3. After exam return forms for signature.

4. Turn in all keys.

5. Update mailing address on TritonLink (http://mytritonlink.ucsd.edu).
Graduate Student Financial Support

**TYPES OF FUNDING**

Financial support is typically available to students in the form of fellowships, grants and graduate student researcher positions and or teaching assistantships.

**Fellowships**

Fellowships provide funding for tuition, fees and stipends for living expenses, and depending on the source, vary in amount and duration of award. They are the most desirable arrangement for graduate student support from the point of view of the student.

Information and tools to help students identify fellowships may be found at:

[http://ogs.ucsd.edu/current-students/fundraising-academic-wards.html](http://ogs.ucsd.edu/current-students/fundraising-academic-wards.html)

Students are encouraged to obtain extramural support by applying directly to fellowship granting agencies.

**Graduate Student Researcher (GSR)**

GSR positions provide the bulk (about 70% at MSE) of student support.

A GSR performs research support under the direction of a faculty supervisor on their research grants/contract. In the most desirable cases, the contract supports the student and provides other funds necessary for the work leading to the dissertation.

The simplest way for a student to find support is to find a project within an existing research program. In particular, first and second year
students should move quickly to establish contact with the members of their curricular group and the groups with similar interests. Consulting with other students and faculty is useful but there is no substitute for meeting with the curricular group members and reading their papers and the dissertations of their students.

An alternative to taking up an existing project for which a funding base exists is to generate a project in collaboration with an interested staff member.

A GSR represents a form of salaried appointment, as well as, a research opportunity. The Principal Investigator (P.I.) or grant recipient has the right to ask for up to 20 hours a week of research work. In the most ideal situation this research work will also form the basis of the doctoral dissertation, but this need not be so.

Many students, for example, are Graduate Student Researchers on grants or contracts administered by members of the research staff.

Teaching Assistants (TA)

TAs assist in the instruction of lower and upper division courses under the supervision of the instructor. Application for TA-ships is done online. So check the webpages of all the departments.

Remember MSE does not have our own TA’s we must go outside of the program to get TA’s from other programs.