UC SANTA BARBARA
MATERIALS

GRADUATE STUDENT MANUAL

Fall 2025

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FACULTY

	Professor	Joint Appt.	Primary Area
*	Christopher M. Bates (MRL Assoc Director)	Chem E	Bio/Macromolecular
	Matthew R. Begley	ME	Structural
*	Erez Berg[+]	ECE	Functional/Quantum
	Irene J. Beyerlein	ME	Structural
*	Simon Billinge[+]	—	Functional/Quantum
*	Michael L. Chabinyc	—	Bio/Macromolecular
*	Raphaële Clément	—	Functional/Quantum
*	Steven P. DenBaars (SSLEEC Co-director)	ECE	Electronic/Photonic
*	Daniel S. Gianola (Dept. Grad. Advisor)	—	Structural
*	John W. Harter	—	Functional/Quantum
*	Craig Hawker (CNSI Director)	Chem	Bio/Macromolecular
*	Sriram Krishnamoorthy	—	Electronic/Photonic
*	Greg Mazur[+]	—	Electronic/Photonic
*	Robert M. McMeeking	ME	Structural
*	Shuji Nakamura (SSLEEC Co-director)	ECE	Electronic/Photonic
*	Daniel Oropeza	—	Structural
	Chris Palmstrøm	ECE	Electronic/Photonic
*	Angela Pitenis	—	Bio/Macromolecular
*	Tresa M. Pollock	—	Structural
*	Ananya Renuka Balakirshna		Structural
*	Cyrus R. Safinya	Physics/MCDB	Bio/Macromolecular
*	Jeff Sakamoto	ME	Electronic/Photonic
*	Omar A. Saleh (Chair)	Physics/BMSE	Bio/Macromolecular
*	Ram Seshadri (MRL Director)	Chem	Functional/Quantum
	Rachel A. Segalman	Chem E	Bio/Macromolecular
*	James S. Speck (ICWBS Director)	—	Electronic/Photonic
*	Susanne Stemmer	—	Functional/Quantum
*	Chris Van de Walle	—	Electronic/Photonic
*	Anton Van der Ven (Associate Chair)	—	Structural
	Vojtech Vlcek	Chem	Functional/Quantum
	Claude Weisbuch	—	Electronic/Photonic
*	Stephen D. Wilson	—	Functional/Quantum
*	Frank W. Zok (COEC Director)	—	Structural

*Majority appointment in Materials.
[+]Faculty Joining in Winter 2026.
Please see Departmental Website (www.materials.ucsb.edu) for Emeriti and Affiliated Faculty.

TECHNICAL STAFF

Rachel Behrens	MRL Polymer Lab Manager
Brian Carralejo	Metal Organic Chemical Vapor Deposition Laboratory
Arda Genç	Microscopy and Microanalysis Lab Supervisor
Jerry Hu	MRL Spectroscopy Lab Manager
Michael Iza	Metal Organic Chemical Vapor Deposition Laboratory
Anna Kallisotva	Microscopy and Microanalysis Lab Supervisor
Youli Li	MRL X-ray Lab Manager
Peter Maxwell	Composites and Nanoindentation Labs
Kurt Olsson	Molecular Beam Epitaxy (MBE) Laboratory
Dano Pagenkopf	Structural Materials Processing Laboratory Ceramics Processing Lab/Sample Preparation
Krishna Prasad Koirala	Microscopy and Microanalysis Lab Supervisor
Amanda Strom	MRL TEMPO Lab Manager
David Whitlatch	Metal Organic Chemical Vapor Deposition Laboratory

ADMINISTRATIVE STAFF

Alexia Cabral	Front Desk Assistant
Annie Chan	Finance Analyst
AJ Johnson	Staff Graduate Advisor
Celina Keefer	Financial Manager
Crystal Lua	Payroll/Personnel Coordinator
Amanda Maffett	Business Officer
Max McCumber	Contracts & Grants Manager
Brenda McGowan	Business Officer, SSLEEC
Fukiko Miyazaki	Financial Coordinator, SSLEEC
Roz Robertson	Faculty Coordinator
Elena Rossi	Academic Personnel Analyst
Jennifer Thorndyke	Academic Affairs Manager
Yukina Warner	Corporate Programs Manager, SSLEEC

For information technology assistance, contact: help@engineering.ucsb.edu

INTRODUCTION

THE UC SYSTEM

The University of California was chartered as a land-grant college in 1868. We recognize that the UC system occupies the land of the indigenous people of California. Ten UC campuses are now situated throughout the state, in Berkeley, Davis, Irvine, Los Angeles, Merced, Riverside, San Diego, San Francisco, Santa Barbara, and Santa Cruz. Together, the campuses have over 227,000 faculty and staff members and a current enrollment of over 290,000 students. About one-fifth of UC students are studying at the graduate and professional level. The University also operates a variety of laboratories, agricultural field stations, extension offices, and other facilities. The University is the primary state-supported academic agency for research, and the pre-eminent system of public higher education in the country.

The UC system is governed by the Regents of the University of California, a corporate board of 26 members. The Regents in turn, delegate authority to the President, the Chancellor of each campus, and to the Academic Senate, which represents the faculty.

THE UCSB CAMPUS

UC Santa Barbara campus was established in 1944 and moved to its present location in 1953. We acknowledge the traditional custodians of the land on which the campus is located – the Chumash people. We understand the importance of recognizing this area's rich history and culture, both past and present, as well as the significance of Native American peoples' place in the learning and research activities of this university. The 989-acre grounds include the main campus, the San Clemente, Santa Ynez and Storke apartments and the West campus. The student community of Isla Vista is surrounded by campus and the Pacific Ocean.

Within its beautiful setting, UC Santa Barbara is a major research institution offering undergraduate and graduate education in the arts, humanities, the social sciences, and science and technology. Large enough to have excellent facilities for study, research, and other creative activities, the campus is also small enough to foster close relationships among faculty and students. The total student population is about 26,420 of whom about 3,000 are at the graduate level. The faculty numbers over 1,200 and includes 5 current faculty that are Nobel laureates, along with recipients of the National Medal of Science, members of the National Academy of Sciences, the National Academy of Engineering, the American Academy of Arts and Sciences, Fellows of the Royal Society of London and the Royal Academy of Engineering, numerous Guggenheim fellows, Fulbright scholars, and fellows of the National Endowments for the Arts and for the Humanities.

UC Santa Barbara has 6 academic units: the College of Creative Studies, the College of Engineering, the College of Letters and Sciences, the Gevirtz Graduate School of Education, the Donald Bren School of Environmental Science & Management, and the Graduate Division.

THE COLLEGE OF ENGINEERING

The College of Engineering is the second largest undergraduate college at UC Santa Barbara, including approximately 1,700 undergraduate students and 800 graduate students. The College is one of the most dynamic engineering schools in the nation. It currently has a full-time, permanent faculty of about 140 and consists of seven degree-granting departments:

- Biological Engineering (Graduate Only)
- Chemical Engineering
- Computer Science
- Electrical and Computer Engineering
- Materials (Graduate Only)
- Mechanical Engineering
- Technology Management (Graduate Only)

Graduate students may also benefit from participating in the following multidisciplinary educational programs. (Please note that credit for courses taken under these programs toward the academic programs in Materials is limited. Consult with the Graduate Office in Materials before taking any of these courses.):

- Biomolecular Science and Engineering (BMSE)
- Computer Engineering Program (CE)
- Media Arts and Technology (MATP)

The College of Engineering is home to major funded Research Centers and Institutes, focused on Materials, some international in scope, including:

- California NanoSystems Institute (CNSI)
- Center for Multifunctional Materials and Structures (CMMS)
- Dow Materials Institute (DMI)
- Institute for Collaborative Biotechnologies (ICB)
- Institute for Energy Efficiency (IEE)
- Institute for Multiscale Materials Science (IMMS)
- Interdisciplinary Center for Wide Band-Gap Semiconductors (ICWBGS)
- International Center for Materials Research (ICMR) – an NSF-funded IMI
- Materials Research Laboratory (MRL) — an NSF-funded MRSEC
- Mitsubishi Chemical Center for Advanced Materials (MCCAM)
- Optoelectronics Technology Center (OTC)
- Solid State Lighting and Energy Electronics Center (SSLEEC)
- UCSB Nanofabrication Research Center
- BioPACIFIC – NSF funded MIP
- Quantum Foundry – NSF funded center
- NSF BioFoundry for Extreme and Exceptional Fungi, Archaea and Bacteria (ExFAB)

THE MATERIALS DEPARTMENT

The Materials Department at UCSB was established as a Graduate Program in 1985, and as an independent department in early 1987, building on existing research programs in the College of Engineering as well as the Physics and Chemistry Departments. The Department was conceptualized and built under two basic guidelines:

- to educate graduate students in advanced materials and
- to introduce them to novel ways of doing research in a collaborative, multidisciplinary environment.

The Materials Department is deeply committed to supporting a diverse graduate student cohort, and encourages and mentors students from all backgrounds to develop as scholars and professionals.

For the purposes of the academic program the Department is organized into four distinct but interconnected areas specializing in Electronic/Photonic materials, Bio/Macro-molecular materials, Structural materials and Functional/Quantum materials. Faculty, postdoctoral researchers, and students in the various specialties collaborate within and across these areas. Currently, the Materials Department has approximately 150 graduate students and 32 faculty members, many of whom have joint appointments with other departments (page 4). In addition, approximately 40 postdoctoral associates and visiting researchers are affiliated with the department in any given year.

Diversity, Equity, and Inclusion (DEI) committee:

The committee is composed of 3 professors, 1 staff member, and 2 students, and meets monthly to discuss how to promote community in the department. Current members of the committee are listed on the website at https://www.materials.ucsb.edu/about/diversity . The committee organizes annual climate surveys aimed to improve the experiences of students, postdocs, staff, and faculty in the Department. The committee also helps orchestrate regular Town Halls.

Diversity, Equity, and Inclusion (DEI) committee:
The committee is composed of 3 professors, 1 staff member, and 2 students meets regularly to discuss how to promote DEI in the department. Current members of the committee are listed on the website at https://www.materials.ucsb.edu/about/diversity. The committee can be reached through the email address materials-dei@ucsb.edu which is monitored by one of the students on the DEI committee, at monthly office hours. The committee also helps orchestrate regular Town Halls.

Materials Scientist Association (MSA):
The MSA is a graduate student-led organization focused on promoting social cohesion within the department, providing professional development opportunities for students and postdocs, and working to advocate on behalf of all students and postdocs within the Materials Department at UCSB. In addition, the MSA aims to foster a welcoming, healthy, and diverse community at all levels within the Department.

The MSA executive board consists of a President, Secretary, Treasurer, GSA (Graduate Student Association) representative, and First-year representative, and elections happen at the end of each academic year for the first four roles. MSA has four committees of student volunteers including social, outreach, professional development, and visit weekend. Committee members may meet every 2 weeks or once a month to plan events such as seminars and workshops, lunches with faculty, happy hours, outreach programs, BBQs, and more. Students of any year in the program can join at any time. If you are interested in learning more or becoming involved with MSA, visit our website (https://msa.materials.ucsb.edu) or contact msa-materials@ucsb.edu for more information.

THE MATERIALS DEPARTMENT CODE OF CONDUCT

All members of the Materials Department are expected to adhere to the relevant Codes of Conduct posted by UC Santa Barbara (https://www.compliance.ucsb.edu/ethics). The Materials Department reiterates here that all students (graduate and undergraduate), postdoctoral scholars, staff, faculty, and departmental visitors are held to the following standards:

• That all members of the academic community (students, staff, faculty, departmental visitors) be treated with respect regardless of their experiences and background, including (but not limited to) their cultural backgrounds, socioeconomic status, disabilities, race, age, religion, sexual orientation, citizenship status, neuro(a)typicality, and gender identity.

• That physical or mental harm, sexual harassment, aggression, bullying, retaliation, and derogatory language is not acceptable in any form.

• That the personal property of others, and University resources be respected. The unauthorized access, use, vandalism, or theft of equipment, computer servers, labs / offices / classrooms, etc. is a violation of this Code of Conduct.

• That the exchange of ideas be carried out in a thoughtful, respectful, and constructive manner.

It is expected that all of these standards are maintained regardless of venue, including conferences, workshops, off-site research, other professional and social events.

All Departmental stakeholders (as listed above) are also expected to be familiar with and follow posted guidelines for the responsible conduct of research (Research Ethics):

https://www.research.ucsb.edu/research-integrity/rcr

Relevant Documents:

The most up-to-date versions of the Student and Faculty Codes of Conduct posted by the University can be found at: https://www.compliance.ucsb.edu/ethics

Reporting:

• Title IX and Sexual Harassment Policy Compliance Office: https://titleix.ucsb.edu

If you have concerns, please reach out to the Materials Chair and/or the Materials Department Diversity, Equity, and Inclusion committee: materials-dei@ucsb.edu However, please be aware that the Chair and DEI committee are not confidential resources as defined by UC Title IX policy. “If a Responsible Employee learns, in the course of employment, that a student may have experienced Prohibited Conduct, they must promptly notify the Title IX Officer or designee. This includes resident assistants, graduate teaching assistants, and all other student employees, when disclosures are made to them in their capacities as employees.”

The consequences for violations of the Code of Conduct may include a formal warning, suspension, or expulsion from the University.

UCSB Incident Resources:

If you or someone you know is in danger or needs immediate help, call 911

UCSB has a wide array of units and offices that offer help and/or advice in case of undesirable incidents, including (but not limited to) situations of discrimination, harassment, assault, or mental health issues. A full list (with contact information and description of the purview of the unit) can be found here. Below, a few key resources are listed, with descriptions, as taken from the following website: https://diversity.ucsb.edu/incident-services

Confidential Resources

- Campus, Advocacy, Resources, and Education (CARE): https://care.ucsb.edu
  Campus Advocacy, Resources & Education office at UCSB provides confidential advocacy and support to students, staff and faculty impacted by sexual assault, dating/domestic violence and stalking. CARE also works collaboratively with students, faculty and staff to educate the campus community about the vital role that each of us has in ending interpersonal violence at UCSB.
- Office of the Ombuds: https://ombuds.ucsb.edu
  The Office of the Ombuds is a confidential resource available to faculty, staff and students which provides information about university processes and can help guide people in making the right decision for them.
- Counseling and Psychological Services: https://caps.sa.ucsb.edu
  Counseling & Psychological Services (CAPS) is committed to providing timely, culturally appropriate, and effective mental health services to our diverse UCSB student body, as well as professional consultation to faculty, staff, and families. All registered students are eligible for services at CAPS. When help is needed in sorting out a personal concern, CAPS is a resource for learning new skills in building self-confidence, relating to others, reducing stress, solving problems, and identifying options.

Non-confidential (reporting) resources

- Bias Incident Info and Reporting: https://studentlife.sa.ucsb.edu/equity-inclusion/bias
  At UCSB we strive to maintain an environment that is welcoming and safe for every member of our community. The UC system is encouraging students/staff/faculty to report hate incidents and crimes on a new website.
- Equal Opportunity & Discrimination Prevention Office: https://eodp.ucsb.edu/
  The Equal Opportunity & Discrimination Prevention Office (EODP) is the campus office responsible for the University's compliance with federal and state laws and University policies and procedures regarding affirmative action, non-discrimination, and retaliation for staff and faculty. EODP works to promote and integrate the principles of equal opportunity, affirmative action, non-discrimination, and excellence through diversity on campus.
- Title IX & Sexual Harassment Policy Compliance Office: https://titleix.ucsb.edu/
  The mission of the TIX/SHPC is to ensure all UCSB community members fulfill the campus' commitment to create and maintain a work and academic environment free of sex discrimination, sexual harassment and sexual violence.

GETTING STARTED

REGISTRATION

Registration is completed online via the GOLD system. Complete instructions on this process can be found in Registration & Enrollment. The Office of the Registrar will assess a *$50 late registration fee* to students who register after the deadline. (*The department will not cover this fee.*). Instructions for registering for classes and registration deadlines are published on GOLD. Students register for the upcoming quarter during the current quarter. Graduate students have until the 15th day of instruction to add classes to their schedule without approval from the Graduate Division.

FEES

The Department typically pays for registration, tuition, and health insurance fees for the first quarter. After the first quarter, the student's advisor typically pays the fees. Students are responsible for all other fees and charges incurred on their BARC account. It is the student's responsibility to make sure that their fees are paid by the fee deadline. A $50 late fee will be charged if there is an outstanding balance after the fee deadline. A fee deadline for all charges will appear on your BARC statement at the beginning of each quarter.

UPON ARRIVAL

ENTRANCE FORM

See the staff member at the front desk of the Materials Department, Engineering II 1355 to complete entrance paperwork.

OFFICES

Every incoming student will be assigned an office space. Where you sit will depend on your advisor. The front desk receptionist will give you the information in regards to your office space at the time you fill out an entrance form.

MAILBOXES

Access to the Materials mailroom is limited, due to storage in the Materials office of sensitive educational records: Students can only access the mailroom during working hours (8am-5pm, weekdays). The office door is sometimes locked during those hours; students can request key card access for working hours for the office door. Depending on where your office is located you may receive an individual mailbox. Students with Materials offices do not have mailboxes and will receive an email Front Desk Assistant to collect mail.

EMPLOYMENT

Graduate students may be employed by the University as Graduate Student Researchers (GSRs), Teaching Assistants (TAs), Readers, Graduate Student Research Fellows, or Graduate Student Trainees, effective October 1, 2023. Please complete an employment worksheet with the Payroll Coordinator.

ESTABLISHING RESIDENCY (INTENT)

Out-of-state domestic graduate students must take the necessary steps to establish California residency (for non-resident tuition purposes) **immediately upon the first quarter of matriculation.** Students must immediately establish legal ties to California through acquisition of all applicable governmental evidence of intent by December 15, 2024 (last day of fall quarter, 2024, corresponding to the 4 consecutive quarters needed to establish residency). The campus Residency Deputy is the

person to contact for more information about establishing California residency, and can be reached at Residency@sa.ucsb.edu. To learn more, visit the UC Residency Requirements page.

GRADUATE PROGRAM

The Materials Graduate Program is designed primarily for doctoral students. However, there are two paths to a terminal master's degree available to graduate students including those originally admitted to the doctoral program. This document focuses on the specific degree requirements for the Ph.D. program. A brief description of the M.S. Program is given in this document for students interested in terminating at this level.

AREAS OF RESEARCH

The Materials Department offers programs leading to the Ph.D. degree with specializations in the following major areas: Electronic/Photonic Materials (compound semiconductors, electronic oxides, quantum structures and optoelectronic materials); Functional/Quantum Materials (ferroelectrics, thermoelectrics, battery/energy storage, optical, magnetic and strongly correlated materials); Bio/Macromolecular Materials (self-assembling polymers, biopolymers, biomembranes, and organic photovoltaics); and Structural Materials (materials for advanced energy and transportation systems, lightweight and threat protection structures, mechanics of functional and biological systems).

The curriculum in each area has the flexibility needed to provide multidisciplinary educational opportunities in the field of advanced materials, encompassing topics such as optoelectronic devices, semiconductor oxides, biomolecular systems and high temperature composites. Materials synthesis, processing and characterization feature prominently with courses in the processing of semiconductor materials, polymers and organic materials, alloys, ceramics, composites, as well as advanced topics in electron microscopy, spectroscopy and structural tomography.

SELECTING A RESEARCH ADVISOR

Each student must select a research advisor *within the first quarter of enrollment*; preferably earlier, based on mutual research interests and availability of research assistantships. Joint research advising by two faculty members is encouraged to ensure that research programs have a strong multidisciplinary character. Selecting a co-advisor can be done at any time, depending on the research topic selected by the student. Students must notify the Staff Graduate Advisor of their research advisor(s).

Change of an advisor. Students who join a research group may wish to change their PhD advisor, for a variety of reasons. Changing an advisor is allowable as long as a student is making academic progress, e.g. success in coursework, research, and exams. It is recommended that a student wishing to change their PhD advisor should meet with the Materials Graduate Advisor, Chair, or Associate Chair, who will provide guidance as to the available options and how to proceed. The Department will work with these situations on a case-by-case basis. Note that there is no guarantee that a particular group can accept a student depending on the availability of financial support.

PROGRAM STUDY PLAN

Incoming students are required to prepare a program study plan suitable to their interests and research field in consultation with their research advisor, and submit it for approval to the Academic Affairs Committee (AAC) via the Staff Graduate Advisor, *by the end of the first quarter of residence.* The study plan may be modified during the course of the student's program. (Modifications may be subject to approval by the AAC. The student should consult the Staff Graduate Advisor in the Materials Department Graduate Office for questions in that regard.)

Programs of study and research are individually tailored to accommodate research needs and student interest. Multidisciplinary education is strongly encouraged by means of joint faculty supervision of research and by the selection of courses. Students are also encouraged to cross over traditional boundaries into other departments on campus (for example, Electrical and Computer Engineering, Mechanical Engineering, Chemical Engineering, Biological Sciences, Chemistry and Biochemistry, and Physics) through collaboration and taking courses in those departments as appropriate. However, there are limitations to the number of courses that can be taken outside the department and counted for credit toward the Ph.D. in Materials (see *Coursework* under "Ph.D. Program"). Please check with the Staff Graduate Advisor when you file your program study plan.

ACADEMIC AFFAIRS COMMITTEE

Decisions regarding the M.S./Ph.D. program and graduate student affairs reside with the Academic Affairs Committee (AAC). This committee consists of four faculty members, including the Departmental Graduate Advisor and the Department Chair. The committee is responsible for approving study plans as well as examination and dissertation committees upon consultation with the student and research advisor(s). The committee is also responsible for reviewing all petitions regarding examinations and credit for courses taken elsewhere. It is also the focus for discussions and recommendations concerning improvements in the graduate curriculum and examination procedures.

DEGREE REQUIREMENTS, POLICIES, AND PROCEDURES

A brief description of the M.S. Program is given below for doctoral students interested in terminating at this level. Students wishing to terminate their graduate studies with a Master's Degree may choose from the two Plans of Study below, in consultation with their research advisor.

M.S. PROGRAM

Completion of an M.S. degree on the way to the Ph.D. is not required unless there are special circumstances like a change in research topic. Students who elect this path must follow Plan 1 (below), achieve a 3.5 grade-point average in their coursework, and pass the preliminary examination as described in the "Ph.D. Program" section below.

PLAN I (THESIS)

Students in this plan are required to:

1) complete 42 units including **27** units of formal coursework, of which
   a) a minimum of 21 units must be approved 200 level courses (200-289),
   b) at most 6 units of approved advanced undergraduate courses not used already for credit toward a previous degree (*optional*),
   c) 3 units of Matrl 290 (Research Group Studies[1]) and
   d) 12 units of Matrl 598 (thesis research), and
2) submit an acceptable thesis based on original research. There is no oral defense of the M.S. thesis, but the thesis must be approved by a committee of three faculty members,[2] including the student's advisor. At least one committee member must have a majority appointment in Materials, and one must have a non-zero appointment in Materials.

MS Plan1 Completion Requirements	**Required**	**Optional**
Total units to be completed	42	
Graduate coursework units	21-27	
Undergraduate coursework units		6
Research Group Studies units	3	
Thesis Research units	12	
Final degree requirement	Thesis approved by 3 faculty	

[1] The spirit of this course is for students to develop the ability to communicate their research to an interdisciplinary audience, beyond their own research group, and also learn about research from other groups. Examples include the Structural Materials Seminar Series and the MRL IRG group meetings.

[2] Please be aware that committee members must be academic senate members and any exceptions must be submitted to the Academic Affairs Committee and then to the UCSB Graduate Council for approval.

PLAN II (NON-THESIS)

Students in this plan are required to:

(1) complete 42 units including
   (a) 33 units of formal coursework of which a minimum of 27 units must be approved 200-289 level courses comprising of major sequence and elective courses
   (b) at most 6 units of approved advanced undergraduate courses not used already for credit toward a previous or concurrent[3] degree (*optional*),
   (c) in addition to formal coursework, no fewer than 3 and no more than 6 units of Matrl 596 (Directed Reading and Research) or Matrl 598[4] (M.S. Thesis Research), and
   (d) 3 units of Matrl 290 (Research Group Studies[1]), and

(2) submit an acceptable engineering report based on the independent studies. The report must be approved by a committee of two faculty members,[2] including the student's advisor. At least one member of the committee must have a majority appointment in Materials.

MS Plan 2 Completion Requirements	**Required**	**Optional**
Total units to be completed	42	
Graduate units	27-33	
Upper Division UG units		6
Research Group Studies units	3	
Reading and Research units	3-6	
Final degree requirement	Report approved by 2 faculty	

Appropriate course tracks for use in planning a program study plan are presented in a subsequent section. Further details are also available from the Materials Graduate Affairs Office.

[3] Students in the BS/MS programs cannot use any courses toward both the BS and the MS degree.
[4] Not available to students in the BS/MS program.

PH.D. PROGRAM

NORMATIVE TIME

Students are expected to complete the Ph.D. program within five years after entry at the Bachelor's level and within four years after entry at the Master's level.

COURSEWORK

Students admitted with a Bachelor's degree are required to complete a minimum of 72 units of coursework and a minimum of 2 units of Matrl 501 (Teaching Assistant Practicum – See Teaching Assistantships). The 72 units of coursework are structured in the following manner:

- 42 units of 200-level courses (excluding 290 and 500 series)
  - Of the required 42 units of 200-level courses, students are recommended to complete a minimum of 27 units within the Materials Department.
  - Up to 8 units of upper division undergraduate courses may be taken for credit toward the 200 level course requirements with prior approval of the student's advisor and the AAC.
- 15 units of Matrl 290 (Research Group Studies[1])
  - Students are required to enroll in one (and only one) unit of Matrl 290 for every quarter of residence they spend at UCSB, even if they have exceeded the unit requirement.
- 15 units combined of Matrl 598 (M.S. Thesis Research) and 599 (Ph.D. Dissertation Research)
  - Students must register in 598 prior to advancing to candidacy and in 599 afterward. Both courses count toward the research unit requirements. Students must continue to register for 598 or 599 units every quarter (except Summer) even if they have exceeded the unit requirement.

Students entering with a M.S. degree may petition to waive certain unit requirements for the Ph.D. (up to 15 units of 200-level courses and a maximum of six units of matrl 290) deemed to have been fulfilled by Master's studies elsewhere. Please refer to the "Petitioning for Course Credit" section below for more information.

PhD Completion Requirements	Required	Optional
Total units to be completed	72	
Graduate units	34-42	
Upper Division UG units		8
Research Group Studies units	15	
Thesis Research units	15	
Final degree requirement	Defend & file dissertation	

CORE COURSE SEQUENCE

All Ph.D. students are required to complete the following series of core courses in the appropriate sequence:

- **Matrl 200A** – Thermodynamic Foundation of Materials
- **Matrl 200B** – Electronic & Atomic Structure of Materials
- **Matrl 200C** – Structure Evolution

In preparation for more advanced and specialized courses within their area of specialization, students are strongly encouraged to complete this core course sequence during their *first year of study.* (These courses may not be waived). A minimum grade of **B** in each of these courses is required prior to taking the Qualifying Examination.

PRIMER COURSES

There are two optional primer courses in the fall to prepare students who may lack the needed background for the 200A, 200B, and 200C core course sequence. These two courses consist of (1) MATRL 200Q, a quantum mechanics for materials introductory course, and (2) MATRL 200S, an introduction to structure and phase stability primer course. This is significant as the core 200B course (taught in the winter) will begin to present material assuming some basic knowledge of quantum mechanics and the core 200C course (taught in the spring) will assume some basic knowledge of structure.

TEACHING ASSISTANTSHIP

All Materials Ph.D. students are required to act as Teaching Assistants for *at least one quarter* while in residence at UCSB (usually during the first year), in either Materials courses or within departments providing courses consistent with the student's undergraduate background. **To receive credit for the required teaching, *students must register for MATRL 501* under the instructor in charge of the class *while serving as Teaching Assistants*.** (2 units for 25% TA, 4 units for 50% TA. These units are not counted towards the 72 units of academic work required for graduation). Teaching Assistants supervise labs, conduct recitation, tutor undergraduate students and give seminars. Because this is an academic requirement of the program, students' stipends will remain *unchanged* while serving as Teaching Assistants.

RESEARCH GROUP STUDIES

Students are also required to present research seminars as part of Matrl 290 (Research Group Studies), thereby ensuring that they gain experience in organizing and presenting lectures. Seminars are expected at both the group level (about one per quarter) and the program level (one per year). Presentations at conferences are strongly recommended after the first year of study. Such activities enable students to improve the skills necessary for the subsequent pursuit of opportunities in teaching or research.

DEVELOPING YOUR PROGRAM STUDY PLAN

In developing an appropriate interdisciplinary program study plan, Ph.D. students are recommended to:

- Take 3 courses selected from those listed under "Main Sequence Courses" on the Course Tracks found on pages 20-23.
- Take both specialized courses in their major field as well as any general courses deemed necessary or recommended.

- Take courses designed to broaden their knowledge of other materials as well as selected courses in other departments that may enhance their education.
- Complete a minimum of 27 units of Materials courses out of the required 42 units of 200-level courses.

Main sequence courses are typically offered every year and students typically take a number of these courses in their first year. However, students with interests in more than one area may take main sequence courses in another area. Specialized electives and general courses are taken during the second year, and often on the third year since some specialized courses are only offered on alternate years or less regularly. Students should consult the appropriate Course Track for guidance in planning a program study plan.

PETITIONING FOR COURSE CREDIT

Students entering may petition to have course credit from another graduate program, e.g. a M.S. degree, to count toward the requirements for the Ph.D.:

- Up to 15 units of 200-level courses, 8 units of which may be upper-division undergraduate courses.
- A maximum of six units of Matrl 290 deemed to have been fulfilled by Master's studies elsewhere.
- Only accept courses with a grade of B or better.
- The core course sequence (Matrl 200A, B, C) cannot be waived.

Petitions will be granted only if the student can demonstrate satisfactory performance in courses taken while enrolled in another graduate program that are substantially similar in content and level to the courses offered at UCSB. A list of Materials courses may be found on the department website. The General Catalog is a good resource for all UCSB courses.

It is the responsibility of the student to supply sufficient information about any proposed course credit to judge its similarity in subject matter and level to the corresponding course at UCSB. The Staff Graduate Advisor will use the information provided and pass it along to the instructor of the course at UCSB for approval.

The petition may be found on the Materials website.

SPECIAL PROGRAMS

There are no formal requirements regarding special programs. However, Ph.D. students are encouraged to incorporate courses from outside their area of specialization into their curriculum in order to broaden their knowledge of the materials field. They are also encouraged to take advantage of courses offered under specialized emphases, as appropriate to their major (e.g. Bioengineering), or certificate programs such as the Technology Management Program.

Note, however, the courses used toward an emphasis or a certificate may not be counted toward the course requirements for the Materials Ph.D. or M.S. The student may petition to have **one** course from these programs, e.g. the Technology Management Program or the Bioengineering Emphasis, count toward their Ph.D. requirement as long as it is compatible with the study plan (and approved by their advisor and the AAC).

FOREIGN LANGUAGE

There is not a formal foreign language requirement, but all students are encouraged to explore opportunities for international research experiences at one of our collaborating institutions. Students having a particular interest in strengthening their background in foreign languages may pursue the necessary coursework to fulfill that interest, but these units may not be used to satisfy the course requirements for the Ph.D. It is strongly recommended you consult with the Staff Graduate Advisor before you take courses not included in your study plan to ascertain whether they would count toward your unit requirements, and file an amended study plan as appropriate.

REGISTRATION & COURSEWORK

In addition to required or elective courses needed for their program of study, students must register for the following:

MATRL 290

Register for 1 unit of Matrl 290 (under their academic advisor's code) every academic quarter in residency in order to receive credit for attending research group meetings and interdisciplinary seminars. Students must check with their academic advisor the appropriate requirements for earning the credit in Matrl 290 – see additional information under Research Group Studies)

MATRL 598 & 599

Register for at least 1 unit of either Matrl 598 (prior to candidacy) or Matrl 599 (while in candidacy) every academic quarter after having selected an advisor and having begun research. The number of units in Matrl 598 or Matrl 599 should be selected to bring the quarter total to at least 12 units.

CROSS-LISTED COURSES

When taking cross-listed courses, enroll under the Matrl course number; for example, students should take Matrl 215A instead of the equivalent ECE 220A. All courses with Matrl course numbers are listed on the department website each quarter. If the course is "full", obtain an enrollment approval code for the Matrl course from the instructor (contact the Staff Graduate Advisor) rather than enrolling in the equivalent cross-listed course.

FULL-TIME STATUS

The Graduate Division considers graduate students to have full-time status if they enroll in 8 units each quarter. However, Materials students are required to enroll in 12 units per quarter, which includes Matrl 290, Matrl 598/599, and Matrl 501 (when holding a Teaching Assistant position). Materials students do not enroll in summer units. Detailed course requirements are outlined in the Degree Requirements section.

PAYMENT OF FEES

Students must be registered for a minimum of 8 units in order for their fees to be paid by the fee payment deadline, which varies by quarter. Graduate students in good academic standing will have their fees paid by their advisor or the department. It is the student's responsibility to make sure that their fees are paid by the deadline. Failure to register and or pay fees (unless on an approved leave of absence) will result in lapse graduate status. The Office of the Registrar will assess a *$50 late registration fee* to students who register after the deadline. (*The department will not cover this fee.*). A student who allows their status to lapse may petition to reinstate. Students must check their registration deadlines on GOLD well before the start of every quarter so that late fees are not assessed onto their BARC accounts.

SCHEDULE ADJUSTMENTS

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 and justification must be sent to the Graduate Division. Graduate students may drop classes up to the last day of instruction.

MAJOR COURSE TRACKS

ELECTRONIC/PHOTONIC MATERIALS

Please note course offerings may change from year to year.

Course Number	Course Title	Units
	Major Sequence Courses:	
206A-B	Fundamentals of Electronic Solids I, II	4
209A	Crystallography and Diffraction Fundamentals	3
211A	Engineering Quantum Mechanics	4
215A-B-C	Semiconductor Device Processing (215A is *required for authorization to work independently in clean room.*)	4
268A-B	Semiconductor Lasers I, II	4
	General Courses:	
209B	X-Ray Diffraction	3
209C	Electron Microscopy	3
219	Phase Transformations	3
228	Computational Materials	3
279	First-Principles Calculations for Materials	3
281	Technical Communication and Presentation Design	3
	Specialized Courses:	
204	Introduction to Magnetism and Magnetic Materials	3
211B	Engineering Quantum Mechanics II	4
217	Molecular Beam Epitaxy & Band Gap Engineering	3
226	Symmetry and Tensor Properties of Materials	3
227	Metal Organic Chemical Vapor Deposition	3
263	Thin Films and Multilayers	3
288A	Topics in Quantum Materials	3
	Background Courses	
162A	Quantum Description of Electronic Materials	4
162B	Fundamentals of Solid State	4
ECE 162C	Optoelectrical Materials and Devices	4

FUNCTIONAL/QUANTUM MATERIALS

Please note course offerings may change from year to year.

Course Number	Course Title	Units
	Major Sequence Courses:	
209A	Crystallography and Diffraction Fundamentals	3
218	Introduction to Inorganic Materials	3
274	Solid State Inorganic Materials	3
	General Courses:	
209B	X-Ray Diffraction	3
209C	Electron Microscopy	3
211A	Engineering Quantum Mechanics	4
219	Phase Transformations	3
222A	Colloids & Interfaces	3
228	Computational Materials	3
241	Structural Inorganic Chemistry	3
281	Technical Communication and Presentation Design	3
	Specialized Courses:	
204	Introduction to Magnetism and Magnetic Materials	3
226	Symmetry and Tensor Properties of Materials	3
242	Symmetries and Group Theory	3
245	Electrochemistry and Electrochemical Methods	3
251	Processing of Inorganic Materials	3
286C	In Situ/ In Operando Methods for Materials Science Research	3
286G	Structural Families of Functional Inorganic Materials	3
286M	Experiments in Inorganic Materials	3
286N	Functional Inorganic Oxides	3
	Background Courses	
Chem 175	Physical Inorganic Chemistry	3

MACROMOLECULAR/BIOMOLECULAR MATERIALS

Please note course offerings may change from year to year.

Course Number	Course Title	Units
	Major Sequence Courses:	
271A	Synthesis of Macromolecules	3
271B	Structure and Characterization of Complex Fluids	3
271C	Properties of Macromolecules	3
	General Courses:	
214	Advanced Topics in Equilibrium Statistical Mechanics	3
228	Computational Materials	3
253	Liquid Crystal Materials	4
273	Experimental Techniques in Macromolecular Materials	3
281	Technical Communication and Presentation Design	3
	Specialized Courses:	
272	Mechanical Forces and Biomolecules	3
276A	Biomolecular Materials I: Structure & Function	3
276B	Biomolecular Materials II: Applications	3
278	Interactions in Biomolecular Complexes	3
280A	Synthesis and Electronic Structures of Conjugated Polymers	3
280B	Organic Electronic Devices	3
287A	Structure and Symmetry	3
287B	Electrostatics in Polar Solvents	3
	Background Courses	
135	Biophysics and Biomolecular Materials	3
160	Introduction to Polymer Science	3

STRUCTURAL MATERIALS

Please note course offerings may change from year to year.

Course Number	Course Title	Units
	Major Sequence Courses:	
207	Mechanics of Materials	3
220	Mechanical Behavior of Materials	3
234	Fracture Mechanics	3
	General Courses:	
209A	Crystallography and Diffraction Fundamentals	3
209B	X-Ray Diffraction	3
209C	Electron Microscopy	3
219	Phase Transformations	3
228	Computational Materials	3
281	Technical Communication and Presentation Design	3
	Specialized Courses:	
230	Elasticity and Plasticity	3
232	Plasticity	3
240	Finite Element Structural Analysis	3
251	Processing of Inorganic Materials	3
261	Composite Materials	3
263	Thin Films and Multilayers	3
289G	Phase Stability & Microstructure Evolution	3
289H	Statistical Mechanics of Crystalline Solids	3
289J	Crystal Growth and Solidification	3
289LM	Dislocations and Dislocation Dynamics	3
289X	Dynamic Mechanical Behavior	3

GUIDELINES FOR THE TIMING OF PH.D. REQUIREMENTS

Year 1	Year 2	Year 3	Year 4-5	Year 5-6
Select research advisor before the end of first quarter in residence	Preliminary Exam	Qualifying Exam	Annual Progress Assessments	Dissertation Defense

The timeline on the next page is intended to summarize the year-to-year requirements for the Ph.D. degree. Details regarding specific requirements and procedures are given in subsequent sections in this document; all students are advised to read the entire student manual to understand them.

As a Ph.D. candidate, *successful completion of the requirements in the program is solely your responsibility.* Neither your advisor nor the program administration and staff are responsible for informing you of and ensuring compliance with deadlines; reminders are a courtesy only. Therefore, you should not wait to be prompted for any particular requirement due.

ACADEMIC GOOD STANDING

To remain in good academic standing, a graduate student must make timely progress toward degree completion and meet the following standards of scholarship established by the Academic Senate and the Graduate Council:

- **Establish a GPA** by taking courses for letter grades
- Maintain a minimum **cumulative grade point average of 3.0** [5]
- **Complete course work**. The standard will not be met if the student has 12 or more units of unfinished coursework: Incomplete (I), No Grade (NG), or No Record (NR)
- Meet all **departmental degree requirements**
- **Doctoral students** must meet departmental specific time-to-degree standards

NORMATIVE TIME-TO-DEGREE FOR DOCTORAL STUDENTS

College of Engineering	Years to Advance	Years to Complete
Materials Program	**3***	**5**

*If the student does not advance to candidacy by the end of their third year, the Graduate Division will place the student on monitoring for the remainder of the academic year or until the milestone is completed.

UCSB GRADING SYSTEM

A+ = 4.0	A = 4.0	A- = 3.7
B+ = 3.3	B = 3.0	B- = 2.7
C+ = 2.3	C = 2.0	C- = 1.7
D+ = 1.3	D = 1.0	D- = 0.7

A SUMMARY OF GUIDELINES & MILESTONES

It is recommended that you print a copy of this page and keep it for reference on your desk. If you

[5] This is the Graduate Division minimum; note the higher GPA requirements to be eligible for certain milestones, listed below

have questions or need clarification please consult with the Staff Graduate Advisor*.

Before the end of your first quarter in residence you must:

- Select a research advisor who has a funded position and is willing to accept you into his/her group.
- Prepare a program of study in consultation with your research advisor and submit it for approval to the Academic Affairs Committee via the Staff Graduate Advisor. You must clearly specify your selected major sequence.

Every quarter in residence:

- Take 12 units of academic credit comprising the following: 200 level coursework (until course requirements are satisfied), one unit of Matrl 290, and as many units of 598 or 599 needed to reach the total of 12 units.

On the quarter in which you are a teaching assistant

- Enroll in 2 (or 4) units of Matrl 501 (or the equivalent course if you TA in another department).

1st year in residence:

- Take one of the core departmental courses (Matrl 200A, B, C) per quarter and one of the primer courses if needed. Take one unit of 290 and as many units of 598 to make up for 12 units per quarter.
- Take one of the courses from your main course sequence per quarter. This may be extended into the second year for students with interests in more than one area, e.g. inorganic and structural, or macro and electronic/photonic materials. Discuss with your advisor what the proper sequence of courses should be to optimize your educational experience.
- Attend Orientation for Preliminary Examination in the Spring Quarter.
- Prepare for your preliminary examination during the Summer, concurrently with advancing your research work.

2nd year in residence

- Take two courses per quarter, including any remaining major sequence courses and elective courses. Take one unit of 290 and as many units of 598 to make up for 12 units per quarter.
- Review your program of study prior to your preliminary examination. Submit for approval to the AAC if you have made changes from the previous version.
- Take your preliminary examination during the first quarter of your second year.
- Attend orientation for your Qualifying Examination in the Spring Quarter.
- Prepare for your Qualifying Examination during the Summer, concurrently with advancing your research work.

3^{rd} – 5^{th} years in residence

- Take any remaining courses needed to satisfy your 200 level unit requirements. Take one unit of 290 and as many units of 599 per to make up for 12 units per quarter.
- Schedule and take your annual assessment with your committee.
- Prepare and schedule your defense in agreement with your advisor. Please check with the Staff Graduate Advisor that all other requirements have been satisfied before scheduling your defense.

MONITORING PROGRESS THROUGH THE PHD PROGRAM

The Materials Department has the following system of annual assessments to monitor the student's progress through the Ph.D. program.

- Start of Year 2 — Preliminary Examination
- Start of Year 3 — Qualifying Examination (Advancement to Candidacy)
- Start of Years 4, 5, … — Annual Progress Assessments
- End of Program — Dissertation Defense

TIME OF COMPLETION

With the exception of the Dissertation defense, all assessments are to be performed by a faculty committee within ±2 months of each anniversary of the student's entrance into the Department (typically between August and November of each year).

Students must complete the following for all assessments:

- A written document (described below for each case)
- An oral presentation and a period of questions and discussion, after which the committee will render its assessment of the student's progress and make recommendations for future actions.
- Send an electronic copy of their written document to the Staff Graduate Advisor for the departmental records at the same time the document is delivered to the committee
- Consult with the Staff Graduate Advisor regarding the filing of any necessary paperwork for each stage.

GENERAL REPORT FORMATTING GUIDELINES

The general guidelines for all written documents prepared by the students for the assessments are:

- 12 pt font with 1" margins on all sides, and single or 1.5 lines spacing.
- A cover page including the title, type of assessment, name of student, names of the committee members, date, time and place of the exam and an abstract.
- The text should comprise 10 pages maximum, not counting the cover.
- References and figures are to be placed after the text and are not included in the number of pages of text specified for the corresponding document.

PRELIMINARY EXAMINATION

The Preliminary examination is intended to assess whether the student has the fundamental knowledge, intellectual maturity and degree of understanding of his/her major field and prospective research topic to be able to write a dissertation proposal successfully over the course of the following year. It is also expected that by this point in time the student should have had some initial research experiences and be able to relate those to the literature he/she has researched.

TIME OF COMPLETION

The Preliminary Examination is administered 10-14 months after the student's entrance into the program. Students who do not meet this deadline and do not petition for an extension based on a justifiable reason (e.g. extended absence of their advisor or co-advisor due to sabbatical) may be placed on academic probation and may become ineligible for financial support. Students entering with a M.S. may petition to take the examination earlier if they feel prepared for it.

Each student may have two opportunities to pass the Preliminary Examination. Students who fail the examination in the first opportunity must take it again within a 2-4 month period from the first exam.

COMMITTEE NOMINATION

The examination committee consists of three ladder faculty members[6] from the student's major field, including the student's advisor:

- At least two should have a non-zero percent appointment in Materials, and preferably at least one should have a majority appointment.
- One member of the committee, other than the advisor, will serve as Chair of the Preliminary Examination committee.

The committee members are selected by the student in consultation with his/her advisor and are subject to approval by the AAC. The names of the committee members should be submitted to the Staff Graduate Advisor at least 3 months prior to the examination. If the committee changes because of scheduling conflicts the student must notify the Staff Graduate Advisor immediately and ensure the new committee is approved before the examination.

On the day of the examination the Staff Graduate Advisor will bring the documentation for the exam to the examination room and ascertain the committee is properly constituted.

GPA ELIGIBILITY

Students with a GPA of 3.5 or better in the graduate program are automatically eligible to take the examination. Students with a GPA above 3.2 may petition for a waiver of the 3.5 GPA requirement. The petition must be filed with the Staff Graduate Advisor and is evaluated by the Department Graduate Advisor (and the AAC, if required) in consultation with the student's advisor.

MONITORING STATUS

Students with a GPA less than 3.2 at the end of their first year are ineligible to take the Preliminary Examination and will be placed on monitoring by the Graduate Division. Students may remove the

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[6] The University requires committee members to be Academic Senate members. Non-senate members with established affiliation with UCSB may be included, but a petition must be filed with the Graduate Division before the committee is approved. Please consult the Staff Graduate Advisor to determine if any of your committee members is not considered a Senate member.

monitoring status if they increase their GPA to above 3.2 within the next academic quarter, at which point they may petition the Department for an opportunity to take the exam, with prior consent of their academic/research advisor.

PRELIMINARY PAPER

At least 3 months prior to the examination date the student's advisor will assign the student a specific topic relevant to his/her intended research project. The student will research the literature on the assigned topic, identify key outstanding issues and/or research opportunities, propose ideas on how to address these issues and/or exploit the opportunities, and outline a tentative research plan. The reading, writing, and slide preparation carried out in preparation for the Preliminary Examination should be in concert with PhD research (training, reading, labwork, *etc*.) and is not meant to require weeks or months away from the student's research.

The student is expected to prepare a short document (roughly 5 pages, including figures and suitable references) summarizing his/her findings and ideas. Refer to the section above for formatting guidelines. The document must be submitted to the committee and the Staff Graduate Advisor ***at least one week before the examination date.***

PRESENTATION

The student will present a 30-35 minute seminar outlining his/her findings, ideas and prospective research plan. After the presentation, the committee will probe the student's understanding of the subject, his/her knowledge of the fundamentals of materials science relevant to the problem, and his/her ability to think soundly and creatively.

COMMITTEE DECISION

After the examination the committee may render one of the following decisions, with recommendations for future action or corrective measures as appropriate:

(i) Advance to the Qualifying Examination without reservations.

(ii) Advance to the Qualifying Examination with a warning of deficiencies in the student's background or understanding that need to be corrected (e.g. by taking additional courses, independent reading, etc.) by the time of the Qualifying Examination. This is normally identified as a "provisional pass".

(iii) Requirement that the student takes the Preliminary Examination again before he/she is allowed to advance to the Qualifying Examination. This second exam must take place within a 2-4 month period following the first one. *Failure to advance after the second exam requires the student to leave the program, with the option of completing an MS degree.* During the time that the student has not passed the preliminary examination he/she will be placed on monitoring by the Graduate Division. If the student fails for the second time he/she will have to comply with the conditions in the next paragraph.

(iv) Recommendation that the student finishes at the MS level under Plan II, which should be completed within two years of the student's first enrollment quarter. In exceptional cases the student may petition for an additional quarter, subject to approval by his/her advisor and the AAC. The student will be placed on monitoring by the Graduate Division and, if progress toward the MS degree is not deemed satisfactory, the student may be placed on probation. Students finishing at the MS level are not required to satisfy the TA requirement but the Graduate Division will enforce the B minimum requirement in the core courses.

QUALIFYING EXAMINATION (ADVANCEMENT TO CANDIDACY)

The purpose of the qualifying examination is to assess whether the individual has acquired the requisite understanding of their research topic and critical thinking ability to elaborate and execute a sound research plan for their dissertation. Some preliminary research is required to elaborate the dissertation proposal, but the exam is not intended to evaluate a project that is well past the planning point.

TIME OF COMPLETION

The Qualifying Examination is administered 22-26 months after the student's entrance into the program. Students who do not meet this deadline and do not petition for an extension based on a justifiable reason (e.g. extended absence of their advisor or co-advisor due to sabbatical) may be placed on academic probation and may become ineligible for financial support.

ELIGIBILITY

Pre-requisites for the Qualifying Examination include:

- Successful completion of the Preliminary Examination;
- Completion of the Materials Department core courses (200A, B, C) with a minimum of B in each of the courses; and
- A minimum 3.5 GPA in the graduate program. Students with a GPA above 3.2 may petition with the Academic Affairs Committee for a waiver of the 3.5 GPA requirement. Students with a GPA below 3.2 are not eligible to advance to candidacy and will be placed on monitoring by the Graduate Division.

COMMITTEE NOMINATION

The examination committee consists of at least four faculty[7], including the student's advisor:

- At least three need to have more than a 0% appointment in the Materials Department, and preferably at least one of them should have a majority appointment in Materials
- One member with no more than a 0% appointment in the Materials Department
- One member of the committee, other than the advisor, will serve as Chair of the Qualifying Examination committee.

Members of the examination committee are nominated by the student and research advisor at least 3 months prior to the examination and must be approved by the Academic Affairs Committee. The examination committee typically becomes the dissertation committee.

DISSERTATION PROPOSAL

The examinee must submit a formal dissertation proposal (maximum 10 pages of text plus a sensible number of figures and a substantial list of references both placed after the text) that summarizes the intended research problem, the research approach, results to date, and future directions. This proposal

[7] Committee members must be Academic Senate members but exceptions can be made by petition to the Graduate Division as noted in footnote 5 in the Preliminary Examination section.

should be submitted to the examination committee and the Staff Graduate Advisor ***at least two weeks before the examination.*** (Failure to deliver the thesis proposal to the committee on time may result in postponement of the examination.)

PRESENTATION

The format of the examination includes a 40-4 minute presentation of the dissertation proposal by the student, during which time only questions of clarification will be allowed. The presentation will be followed by questions from the committee for a total period of approximately 60 minutes.

COMMITTEE DECISION

A decision will be rendered by the committee at the end of the examination, with one of the following recommendations:

(i) Advance to Candidacy without reservations.

(ii) Advance to Candidacy with reservations, which should be re-evaluated in the subsequent annual assessment.

(iii) Requirement that the student takes the examination again before he/she is allowed to advance to Candidacy. This second exam must take place within a 6-month period following the first one. The Graduate Division will place the student on monitoring status during this period. *Failure to advance to candidacy after the second exam requires the student to leave the program, with the option of completing an MS degree.* Please see details for finishing with an MS in the MS program section above.

(iv) Failure to meet the standards for advancement to candidacy, which requires the student to leave the program with an option to finish at the MS level under plan I or II. It is assumed that at this stage the student would have finished all the coursework and may have up to an additional 6 months after the exam, but no more than 3 years after his/her first enrollment in the program, to finish his/her requirements for the MS degree. The student will be placed on monitoring status and, if progress toward the MS is not deemed satisfactory within the first quarter after the exam, he/she may be placed on probation.

ANNUAL PROGRESS ASSESSMENTS

After advancement to candidacy, each student is required to report his/her progress to the dissertation committee at least once a year on a formal basis (*i.e.* 36±2, 48±2 and, if needed, 60±2 months after the student's entrance into the program). Students who do not meet this deadline and do not petition for an extension based on a justifiable reason (e.g. extended absence of their advisor or co-advisor due to sabbatical) may be placed on academic probation and may become ineligible for financial support. *The annual requirement is generally waived for students defending during the academic year.*

PROGRESS REPORT

- The student is expected to prepare a short, written progress report for the committee, deliver it to the members and meet with them for an oral presentation of the progress report and discussion of his/her progress, research findings and ideas for the remaining work.
- Alternatively, the student may provide a draft of a paper submitted for publication in lieu of the document, as example of his/her progress, with a brief summary of accomplishments during the previous year.

ASSESSMENT BY COMMITTEE

Students are expected to meet with their committee members collectively. The committee will assess the progress and provide advice to the student on problems that may hinder the completion of the dissertation on a timely basis. If the student is not progressing satisfactorily toward completing his/her degree, the committee may give incomplete or unsatisfactory grades in the thesis units, and recommend that the student be put on monitoring status or probation. If the problem is not corrected, it may be recommended that the student finish with an MS degree after completing the appropriate requirements.

FAILURE TO COMPLETE

It is the student's responsibility to ensure that the annual progress assessments are being completed once a year after completion of the candidacy exam. Failure to meet the annual requirement will result in a grade of "U" in Matrl 290 and may lead to a recommendation that the Dean of the Graduate Division place the student on monitoring status or probation.

DISSERTATION DEFENSE

The purpose of the dissertation defense is to ascertain that the student has completed a coherent, original body of research on his/her chosen topic that represents a significant contribution to the literature, and is able to defend the results and conclusions in front of a knowledgeable public.

The committee must ascertain the suitability of the dissertation draft and provide comments and recommendations for amendments to the dissertation. In cases where concerns are identified, the committee may request the candidate to address these issues and submit a revised draft of the dissertation prior to the date of the defense or before the final version of the dissertation is approved for filing. Once the dissertation draft is deemed suitable by the committee permission is granted for the candidate to present a formal defense of the dissertation, which should be done in a public seminar.

Any attendee at the defense can question the candidate. However, the committee chair has the authority to terminate inappropriate questioning. After public discussion is concluded, the audience will be asked to leave the room and the committee will continue the examination of the candidate in private. After the examination, the committee will deliberate and render a decision on whether the candidate has earned the Ph.D. degree. As noted earlier, the committee may require amendments to the dissertation before signing the signature page.

PREPARING FOR DEFENSE

Students must use the following timeline to properly prepare for the defense:

- Verify with the Staff Graduate Advisor that all University and Departmental degree requirements have been met. This must be done 2 months in advance of the proposed defense date.
- Verify with the Staff Graduate Advisor that your dissertation committee has not changed since your Qualifying Examination. If so, a Committee I-A form will need to be submitted to the Graduate Division.
- Submit an electronic copy of your dissertation draft to the committee and the Department via the Staff Graduate Advisor, four weeks prior to the scheduled defense to allow sufficient time for the dissertation committee to read it and comment on it. Individual committee members may require the student to submit a paper copy. (Failure to deliver the dissertation draft to the committee or the Department on time may result in postponement of the defense).
- Two weeks prior to the defense send your abstract to the administrative coordinator, at materials@engineering.ucsb.edu, your abstract. Please provide your dissertation title and name of the Chair of the committee, along with the details of the defense (ie. time, date, and location). The coordinator will then officially advertise your defense, ensuring the opportunity for attendance by interested people
- Remind your dissertation committee about the defense; the entire dissertation committee must attend. Arrangements for electronic participation of a committee member absent from campus because of travel are allowed, but the Department must be notified in advance of such arrangements.
- Take your dissertation signature page to the defense.

FILING PROCESS

Once the candidate has passed his/her dissertation defense and made the amendments requested by the committee, the last requirement is to file the dissertation with the Graduate Division:

- Information on how to complete the filing process may be found on the Doctoral Degree Filing

Checklist.

- Figure out which filing deadline you intend to meet.
- Review and use the thesis and dissertation resources, templates, and tutorials provide by the Graduate Division.
- Check the Grad Post for upcoming Filing Workshops, Dissertation Writer's Room hours, and Dissertation Writing Retreats.
- When you are ready to file, the Graduate Division recommends that you stop by to have a Pre-Check with one of their advisors. You only need to print out your preliminary pages and a chapter for the advisor to review.

DEGREE CONFERRAL

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 will not cost the student additional fees if s/he was enrolled during the previous quarter; however, the degree will be dated the end of the next quarter.

DISSERATION BINDING

The department will cover the cost to have three (3) copies printed and bound. One copy will be kept in the departmental collection, the second stays with you, and the third will be given to your advisor. Any additional copies may be purchased via ProQuest at the time you file. Another option is to order additional dissertation copies directly from the UC Bindery. For more detailed information, please visit the department website.

DIPLOMAS & TRANSCRIPTS

After the Graduate Division finishes a degree check, it notifies the Office of 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.

Students should notify the Graduate Division if a letter of completion is needed. Once the Graduate Division has confirmed the degree, a letter of completion may be issued to you via email.

You may find more helpful resources on defending, filing, and binding on the Materials Department website.

FUNDING

The policy of the Materials Department is that all Ph.D. students who are making satisfactory progress toward the completion of their degree receive a stipend and have their fees paid by their advisor.

The Materials Department establishes a minimum funding level for each entering Ph.D. class ('cohort'), to be paid throughout their time as a PhD student. For the F23 cohort, that minimum is $40,651 (effective 10/1/23). The common cohort funding level might increase over the course of a Ph.D. student's time on campus, due to changes in departmental policy, or changes to campus policy, including any relevant changes to the GSR or TA contracts. For students with external fellowship support: if the fellowship payment is less than the common cohort level, the student will receive supplementary funding so as to reach the common cohort level.

BONUS AWARDS

Students who arrive with, or receive during the course of their PhD program, a major, external, academically competitive fellowship will receive, in recognition of the honor of their achievement, a one-time bonus award from the Department of $4,000. Students who receive a minor, external, academically competitive fellowship will receive a one-time bonus award from the Department of $2,000. The bonus will be given as soon it is feasible to do so, upon notification of receipt of the fellowship. 'Major' external fellowships correspond to those that endure for 3+ years, and provide funding support for more than 50% of the full annual graduate student fees and stipend. 'Minor' external fellowships are those that provide funding support for more than 50% of the full annual graduate student fees and stipend, but only endure for 1 or 2 years. Note, the terms and conditions of some fellowships may restrict some mechanisms of augmentation of support.

SUMMER QUARTER 7.5% MANDATORY PRE-TAX DEDUCTIONS (SAFE HARBOR)

Non-exempt students who are not eligible for the Retirement Choice Program or membership in UCRP) make mandatory contributions of 7.5 percent to the Defined Contribution Plan (DCP) Pretax Account. This pre-tax deduction is placed into a Defined Contribution Plan (DCP) called Safe Harbor. When you leave UC employment permanently, you need to provide the Plan with instructions on what to do with the money in your account to avoid an automatic payout that may be subject to early distribution penalties. A summary description of the plan may be found here. Money accumulated in the Pretax Account remains in the Plan until the participant leaves employment and takes a distribution (see "Distributions: Former Employees," on page 11).

LAB SAFETY POLICY

Safety is the first priority in all laboratories at UCSB. As UCSB students, you are responsible to observe safe practices per faculty, Teaching Assistant, and University policies and regulations. Environmental Health & Safety (EH&S) provides safety training and maintains updated information related to safety practices and policies on their website: http://www.ehs.ucsb.edu/

It is **mandatory** that all new Graduate Students attend the EH&S *Fundamentals of Laboratory Safety* LIVE course that is typically scheduled on the Wednesday before instruction begins. You can find updated schedules at https://www.ehs.ucsb.edu/training/fundamentals-laboratory-safety-live

If you arrive on campus before attending the live lab safety course, you must take the online lab safety course before entering any UCSB lab and/or office space located in a lab building.

The *Fundamentals of Laboratory Safety – ONLINE* course can be taken through the UCSB Learning Center at http://www.learningcenter.ucsb.edu

It is also mandated by the Materials Department that you retake the EH&S *Fundamentals of Laboratory Safety* course once per year at https://www.ehs.ucsb.edu/training/uc-fundamentals-laboratory-safety-refresher-online

Detailed instructions on accessing EH&S Fundamentals of Laboratory Safety can be found at https://www.ehs.ucsb.edu/sites/default/files/docs/ls/administrators_training_instructions_0.pdf

Individual laboratories require additional safety training procedures that must be completed before the student is allowed access to the lab and use of the equipment. Students should consult with the technical staff person in charge of the lab (or the faculty advisor for individual labs) to ensure they have met all the safety training requirements.

Access to laboratories not only requires lab safety training, but also personal protective equipment (PPE). Please see: http://www.ehs.ucsb.edu/ppe

You will be issued PPE, e.g. laboratory coats, eye protection, and other items, based on the specific needs for the laboratories for which you have been approved to access. The safety officer for a particular lab will direct you to the Laboratory Hazard Assessment Tool (LHAT), which will determine what PPE is required for a given lab and provide information about where to pick-up the equipment on campus.

CONFLICTS AND RESOLUTION OF DISPUTES

Occasionally, disagreements about decisions, policies, procedures, and issues of academic judgment may arise among members of the Materials Department community. Such issues may include a conflict between a student and a research advisor, between students, or concerns regarding TA responsibilities.

If issues arise, the involved parties should discuss and attempt to come to a collegial solution. While the majority of issues can be solved collegially, differences of opinion can still arise. If the student feels that they are unable to achieve an internal resolution and if areas of disagreement still remain after a meeting, then the student is encouraged to informally and confidentially consult with the Graduate Advisor. If the conflict involves the person acting as Graduate Advisor, the student can reach out to a faculty member of the DEI committee or the Department Chair. The faculty consulted will then seek to find a pathway to a resolution that is satisfactory to all parties.

If there is no resolution of the conflict at the Departmental level, there are other resources available. Students may consult with the Graduate Division Academic Counselor or contact the UCSB Office of the Ombudsman (see online information at: https://ombuds.ucsb.edu), which is a confidential, impartial, and informal resource to help students understand their options and resources.

GENERAL RESOURCES FOR STUDENTS

The Division of Student Affairs provides essential support services and resources to help UCSB students handle the challenges of university life:

1. Help during exams
Students with disabilities may request academic accommodations for exams online through the UCSB Disabled Students Program at http://dsp.sa.ucsb.edu/. Please make your requests for exam accommodations through the online system as early in the quarter as possible to ensure arrangement.

2. Responsible scholarship
Honesty and integrity in all academic work is essential for a valuable educational experience. The Office of Judicial Affairs has policies, tips, and resources for proper citation use, recognizing actions considered to be cheating or other forms of academic theft, and students' responsibilities, available on their website at: http://studentconduct.sa.ucsb.edu/

Students are responsible for educating themselves on campus research policies and to abide by them. If a student is supported by particular research grants, there may be required training in Responsible Conduct of Research that students must participate in. The UC Santa Barbara Office of Research is the best resource for policies and training.
https://www.research.ucsb.edu/research-integrity/overview

3. Managing stress
Personal concerns such as stress, anxiety, relationships, depression, cultural differences, can interfere with the ability of students to succeed and thrive. For helpful resources, please contact UCSB Counseling & Psychological Services (CAPS) at 805-893-4411 or visit http://caps.sa.ucsb.edu/

4. Mental Health Statement
Students may feel overwhelmed or depressed with coursework, stress and/or other personal challenges. If you find yourself, or another student, in need of support, please do not hesitate to reach out to Counseling and Psychological Services (CAPS), 24/7 at (805) 893-4411. http://caps.sa.ucsb.edu/

5. Diversity, Equity and Inclusion
The Department maintains links to a variety of campus resources related to diversity, equity, and inclusion. https://www.materials.ucsb.edu/about/diversity

Bias Incidents. A bias incident is an act of bigotry, harassment, or intimidation that is motivated in whole or in part by bias based on an individual's or group's actual or perceived race, color, creed, religion, national origin, gender, age, marital status, disability, public assistance status, veteran status or military affiliation, sexual orientation, gender identity or gender expression. For reporting bias incidents, see: https://studentlife.sa.ucsb.edu/bias

Personal Identity. If a student would like to disclose information related to pronouns, name changes, or identities, we encourage you to do so. UCSB's Resource Center for Sexual and Gender Diversity on the 3rd floor of the Student Resource Building is also available to advocate for and support students: https://rcsgd.sa.ucsb.edu/

OTHER IMPORTANT PROCEDURES

ELECTRONIC KEY CARD ACCESS

Access ID cards are required to gain entry to many buildings, office spaces, or labs. If you need an Access ID card, go to https://www.accessid.ucsb.edu/ and follow the instructions for Graduate Students. Once a student has been issued a card, they will need to contact the managers of the appropriate space to have their card activated for entry into that space. Students must meet all the training and safety requirements before they are allowed use of the labs.

COMPUTING FACILITIES

Incoming students are allowed to bring in personal laptops and workstations for use on the Materials Networks and Campus Wireless Networks. To use the Campus Wireless Network you will need a UCSB NetID to authenticate. To use the Materials Physical Network please us the web form to request a IP Address:

https://materials.ucsb.edu/resources/computer-support/request-ip-address

Please be aware that UCSB has strict network security policies, please review the Network Security Policy's if you have any questions:

https://materials.ucsb.edu/resources/computer-support/computer-network-security-policy

All Students are issued a UCSB Connect Email Account that is associated to their UCSB NetID. If you require access to the College of Engineering Resources you are eligible to request a COE Account through the Engineering Computing Infrastructure (ECI). To request an account please use the following link:

https://eci.ucsb.edu/account-creation-links

The Materials Department Computer Support is part of the Engineering Computing Infrastructure. We are availbale to answer and questions concerning computing services and other technical needs, you can reach out to the ECI at:

help@engineering.ucsb.edu

ON-LINE RESOURCES

The Materials Department web site (http://www.materials.ucsb.edu) is a valuable source of departmental and university information. On the web site, you will find:

- Quarterly schedule of Materials courses
- Listings of Materials personnel (faculty, staff and students) with email addresses
- Links to faculty web pages
- List of available facilities within the department
- List of related research centers and groups (with links to their web pages)
- Procedures to be approved for Electronic Lab Access via your Access Card
- Health & safety information, including links to EH&S and UCSB Emergency information.

- Travel policies and procedures manual

Please note that some facilities and other useful information are available under one of the various materials research centers with which the Department faculty are affiliated, e.g. MRL, CNSI, SSLEC, etc. Check those pages online for specific information on facilities and support available there.

ACKNOWLEDGEMENT OF HAVING READ THE GRADUATE STUDENT MANUAL

(Print this page, sign it after reading the manual and turn it in to the Staff Graduate Advisor* by the end of the first full week of classes following the orientation session for new students.)

I, _____acknowledge that I have carefully read and understood the contents of the Graduate Student Manual for the Materials Department (Revised Edition Fall 2025). I understand my first point of contact for any questions regarding the Graduate Manual or the Materials Graduate Program is the Staff Graduate Advisor* in the Materials Department, who may refer me to the Graduate Advisor** in the Materials Department.

_____

Signature

_____

Date

* The current Staff Graduate Advisor is AJ Johnson

** The current Graduate Advisor is Prof. John Harter