MATERIALS DEPARTMENT
http://www.materials.ucsb.edu
College of Engineering
University of California, Santa Barbara

Student Name: _____ Perm:_____

DOCTOR OF PHILOSOPHY – MATERIALS – 2022-23

In addition to departmental requirements, candidates for graduate degrees must fulfill University requirements described in the "Graduate Education" section of the UCSB General Catalog.

Students admitted with a Bachelor's degree are required to complete a minimum of **72.0** units of academic work structured in the following manner: **42.0** units of 200-level courses (excluding seminars and independent study), **15.0** units of seminars and/or independent studies, and **15.0** units of dissertation research. 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. 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 possible six units of seminars) deemed to have been fulfilled by Master's studies elsewhere. Petitions should be directed to the Academic Affairs Committee.

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. A minimum grade of B in each of these courses is required prior to taking the Qualifying Examination (Advancement to Candidacy).

Time-to-Degree: 3 years to advance to candidacy, 5 years to complete the Ph.D.

CORE COURSE REQUIREMENTS (12.0 units total counted towards units of 200 level courses)			
COURSE #	COURSE NAME	UNITS	GRADE
MATRL 200A	Thermodynamic Foundation of Materials	4.0	
MATRL 200B	Electronic & Atomic Structure of Materials (Prerequisite: Matrl 200A)	4.0	
MATRL 200C	Structure Evolution (Prerequisite: Matrl 200A)	4.0	

Additionally, in developing an appropriate interdisciplinary course of study, Ph.D. students are expected to take both the available courses in their major area of interest as well as courses designed to broaden their knowledge of other materials. Individual students are required to develop their study plan in conjunction with their faculty advisor and deliver it to the Graduate Program Coordinator in the Materials Department by the end of their first quarter in residence. The study plan may be revised at any stage until all coursework is completed. Most courses will be selected from the main sequence of courses (offered every year) from one of the four principal areas of emphasis in the Department. Students should also take advantage of the opportunities to take any general or more specialized courses offered on a less frequent basis.

Students interested in taking courses associated with Emphases or Certificates outside the department during their graduate studies, e.g. the Bioengineering emphasis or the Technology Management Program, should consult with the Academic Affairs Committee about the eligibility of courses to count toward the unit requirements for the Ph.D. before filing their study plan.

**See the appropriate Course track from the Materials Graduate Student Manual.*

MAIN SEQUENCE COURSES			
COURSE #	COURSE NAME	UNITS	GRADE
GENERAL COURSES			
COURSE #	COURSE NAME	UNITS	GRADE
SPECIALIZED COURSES			
COURSE #	COURSE NAME	UNITS	GRADE

In addition to elective courses, students must register for one unit of MATRL 290 every academic quarter in residency in order to receive credit for attending group meetings and seminars. Students must also enroll in at least one unit of either MATRL 598 or MATRL 599 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 every single quarter in residence. Students should register for MATRL 598 until they have advanced to candidacy (by passing the qualifying examination), after which they register for MATRL 599.

GROUP SEMINARS (15.0 Units required)		
COURSE #	COURSE NAME	UNITS SATISFIED
MATRL 290	Research Group Studies	

INDEPENDENT RESEARCH (15.0 Units required total)		
COURSE #	COURSE NAME	UNITS SATISFIED
MATRL 598	MASTER'S THESIS RESEARCH AND PREPARATION	
MATRL 599	PH.D. DISSERTATION RESEARCH AND PREPARATION (AFTER ADVANCEMENT TO CANDIDACY)	

All Ph.D. students are required to act as Teaching Assistants for at least one quarter while in residence at UCSB (usually during the first two years), 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 may not be counted towards the 72 units of academic work required for graduation).

TEACHING REQUIREMENT		
COURSE #	COURSE NAME	QUARTER
MATRL 501	Apprentice Teaching	

OPTIONAL: 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.

APPROVED ADVANCED UNDERGRADUATE COURSES (8.0 maximum units)			
COURSE #	COURSE NAME	UNITS	GRADE

PRELIMINARY EXAMINATION (Advancement to Qualifying Examination)

The Preliminary Examination is administered 10-14 months after the student's entrance into the program. Students who do not meet this deadline may be recommended for academic probation and may become ineligible for financial support.

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.

At least 3 months prior to the examination date the student's advisor will assign the student a specific topic relevant to the student's 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 student is expected to prepare a short document (10 pages maximum including a suitable number of figures and references) summarizing their findings and ideas. The document must be submitted to
the committee at least one week before the examination date. At the examination, the student will present a 30-40 min seminar outlining their findings, outstanding scientific issues and ideas to address those issues through research. Additional details are given in the Graduate Student Manual.

Preliminary Committee: Chair: _____

Member: _____

Member: _____

QUALIFYING EXAMINATION (Advancement to Candidacy)

The Qualifying Examination is administered 22-26 months after the student's entrance into the program. Students who do not meet this deadline may be recommended for academic probation and may become ineligible for financial support.

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) that summarizes the intended research problem, the research approach, results to date, and future directions. This proposal should be submitted to the examination committee 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.) The format of the examination includes a 40-45 min 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 period of approximately 60-80 minutes. Additional details are given in the Graduate Student Manual.

Qualifying Committee: Qualifying Chair: _____

Dissertation Chair: _____

Member: _____

Member: _____ (external to the Department)

Member: _____ (optional)

ANNUAL PROGRESS ASSESSMENT

After advancement to candidacy, each student is required to report their 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 may be put on academic probation and may become ineligible for financial support.

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 their progress, research findings and ideas for the remaining work. 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 recommend that the student be put on probation and, if the problem is not corrected, recommend that the student finishes with an M.S. degree after completing the appropriate requirements.

Dissertation Chair: _____

Member: _____

Member: _____

Member: _____ (external to the Department)

Member: _____ (optional)

DISSERTATION/DEFENSE

The purpose of the dissertation defense is to ascertain that the student has completed a coherent, original body of research on their chosen topic and is able to defend the results and conclusions in front of a knowledgeable public. Students prepare and submit the final draft of the dissertation to the dissertation committee (as constituted for the Qualifying Examination) and the Department four weeks prior to the intended date of the dissertation defense. (Failure to deliver the dissertation draft to the committee and the Department on time may result in postponement of the defense.) Once approved 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.

Once the candidate has passed their dissertation defense, the last requirement is to file the dissertation.

Dissertation Chair: _____

Member: _____

Member: _____

Member: _____ (external to the Department)

Member: _____ (optional)