

**DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY
UNIVERSITY OF CALIFORNIA, SANTA CRUZ**

Graduate Student Handbook

2007-2008

Fall 2007

Dear Graduate Students in Chemistry and Biochemistry:

WELCOME TO UCSC!

This handbook is your guide to our graduate program in the Department of Chemistry & Biochemistry. As a new student, you can find answers to many of the questions that arise when planning a graduate career and beginning at a new university. Also, you may want to check our department's web pages at <http://www.chemistry.ucsc.edu>, where you will be able to access additional information about the department. For more information about the University of California, Santa Cruz, visit the web site <http://www.ucsc.edu>.



If you have any questions or need assistance during your time here at UCSC, please contact Janet A. Jones, Graduate Program Coordinator at (831) 459-2023 or jajones@chemistry.ucsc.edu. You can find Janet in 230B Physical Sciences Building.

In addition, the Chemistry and Biochemistry Department staff is available to assist you with all questions pertaining to the rules and regulations of the university. The Department office can provide university forms and general information about university procedures, or we can refer you to the appropriate office for further information. The Department office is located in room 230 Physical Sciences Building. Our phone number is (831) 459-4002.

For advising questions or any other matter or concern, please contact me at (831) 459-3776 or by email zhang@chemistry.ucsc.edu. My office is 152 Physical Sciences Building--stop by any time.

Good luck with your studies.

Sincerely,

Jin Zhang
Director, Graduate Program
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First Year

Attainment Exams

A solid foundation in undergraduate chemistry is vitally important to a student's progress in graduate studies and research. For this reason, all graduate degree candidates are required to take entrance (attainment) exams in the fields of biochemistry, inorganic, organic, and physical chemistry. Students who have no previous coursework in any one of these areas must take the corresponding upper-division course. Students who have previous coursework in any of the areas must take the exam. These exams are given a few days before the start of fall quarter classes; they are standardized American Chemical Society (ACS) exams and are written at an upper-division undergraduate level similar to that of well-known texts in the areas. Students entering in mid-year must take the exams when they arrive. Students who have taken these ACS exams at another university can skip an attainment exam at UCSC if they arrange to have their previous passing score sent to the Graduate Director before the examination for verification and approval. *Previous exam scores will only be accepted if the exams were not taken to meet a requirement for the Bachelor's degree or as part of a course required for the Bachelor's degree.*

The Graduate Affairs Committee will review the scores of the first-year attainment examinations. The results of the exams are used by the Graduate Director to assess the student's background and to help work out a course of study for the first year. Attainment examination deficiencies in areas of previous coursework must be made up during the first year by retaking and passing the exam. A student who fails to pass an exam on the third attempt is subject to dismissal and will not be allowed to take a course to satisfy the deficiency. Students who have no previous coursework in a given area will not be allowed to take the attainment exam, but will instead be required to make up the deficiency by taking the upper-division undergraduate course for a Satisfactory grade. Please note that Satisfactory work for a graduate student is denoted by an earned letter grade of "A" or "B."

Course Requirements

Successful completion of formal lecture courses is an integral part of any Ph.D. student's education in Chemistry. Many courses, particularly those in the 200 series, expose the student to chemical knowledge and methodology at the frontiers of contemporary research. Other courses can be chosen to add breadth to the chemical education, such as 100- or 200-series courses outside the student's area of specialization, sometimes even outside chemistry.

The Department has established core course requirements that pertain to all students except for those transferring into our program with advanced standing (i.e. who have a M.S. degree from another institution). The minimum number of lecture courses required is six; of these six at least four must be graduate level (200 series) courses. The remaining two may be either at the graduate level or at the advanced undergraduate level

(100 series). Out of the six, four must be Chemistry and Biochemistry courses. A maximum of two other courses may be in related disciplines such as Biology, Physics, Math, Computer Science, etc. Courses meeting this requirement *cannot* include Chemistry 163ABC, 112ABC, 143 or 151A, but can include 151B. Undergraduate courses taken to satisfy attainment exam deficiencies cannot be counted. The lecture course requirement must be met before advancing to candidacy. This minimum number of courses is quite small, and students often take more than six courses.

Students who enter with previous graduate work must discuss with the Graduate Advisor which prior courses might be used to satisfy the UCSC requirements. Course content must be documented in sufficient detail (course descriptions, syllabi, papers, exams) to determine whether it is equivalent to departmental course offerings. **This documentation must be provided before instruction begins in the first quarter of residency.** Previous coursework will be considered only if the courses were not taken as part of the requirements for a Bachelor's degree.

The Ph.D. student's program of study, which includes not only lecture courses but seminar courses, proseminars, research courses and occasionally independent studies, needs to be carefully planned and discussed with the Graduate Director (the first year) or the student's Research Advisor (the second year and beyond). **By departmental policy, the standard course load is three 5-unit courses per quarter (a minimum of 15 credits per quarter) while the student is enrolled in the program.** Note that two of the 3-unit 240 series courses are considered equivalent to one 5-unit course. These courses must all be taken for credit. Non-credit courses such as proseminars (lab group meetings) and enrichment courses from outside chemistry and related disciplines do not count.

Graduate students are expected to acquire an in-depth understanding of their area of specialization through a core curriculum that prepares them for advanced study and research. The core and required background courses should be completed in the first two years.

I. Biochemistry

Required Background Courses:	BMB 100ABC	Biochemistry (or equivalent)
Core Graduate Courses	Chemistry 200A	Advanced Biochemistry: Biophysical Methods
	Chemistry 200B	Advanced Biochemistry: Protein Structure and Function
	Chemistry 200C	Advanced Biochemistry: Nucleic Acids
Recommended Courses:	Chemistry 231	Enzyme Mechanisms & Kinetics
	Chemistry 234	Bioinorganic Chemistry
	Chemistry 238	Topics in Biophysical Chemistry
	Chemistry 265	Computer Simulation in Statistical Mechanics
	Chemistry 273	Applications of Symmetry and Quantum Mechanics

II. Biophysical Chemistry

Required Background Courses:	BMB 100ABC	Biochemistry
Core Graduate Courses:	Chemistry 200A	Advanced Biochemistry: Biophysical Methods

	Chemistry 200B	Advanced Biochemistry: Protein Structure and Function
	Chemistry 200C	Advanced Biochemistry: Nucleic Acids
Recommended Courses:	Chemistry 231	Enzyme Mechanisms & Kinetics
	Chemistry 234	Bioinorganic Chemistry
	Chemistry 238	Topics in Biophysical Chemistry
	Chemistry 261	Foundations of Spectroscopy
	Chemistry 262	Statistical Mechanics
	Chemistry 263	Quantum Mechanics
	Chemistry 265	Computer Simulation in Statistical Mechanics
	Chemistry 273	Applications of Symmetry and Quantum Mechanics

III. Inorganic and Bioinorganic Chemistry

Required Background Courses:	Chemistry 151A	Chemistry of Metals
Core Graduate Courses:	Chemistry 234	Bioinorganic Chemistry
	Chemistry 256A, B, or C	Advanced Topics in Inorganic Chemistry
Recommended Courses:	Chemistry 273	Applications of Symmetry and Quantum Mechanics
	Chemistry 200A	Advanced Biochemistry: Biophysical Methods
	Chemistry 200B	Advanced Biochemistry: Protein Structure and Function
	Chemistry 200C	Advanced Biochemistry: Nucleic Acids

IV. Organic Chemistry

Required Background Courses:	Chemistry 108AB or Chemistry 112AB	Organic Chemistry
	Chemistry 143	Organic Chemical Structure and Reactions
Core Graduate Courses:	Chemistry 240A	Kinetics and Mechanisms of Organic Reactions
	Chemistry 240B	Combinatorial & High-Throughput
	Chemistry 240C	Methods in Synthetic Chemistry
	Chemistry 240E	Organic Structure Analysis from Spectra
	Chemistry 240F	Modern Synthetic Methods
	Chemistry 240G	Selectivity and Strategy in Organic Synthesis
		Bioinorganic Chemistry of Amino Acids and Peptides
Recommended Courses:	Chemistry 200A	Advanced Biochemistry: Biophysical

Chemistry 200B	Methods Advanced Biochemistry: Protein Structure and Function
Chemistry 246A-G	Advanced Topics in Organic Chemistry
Chemistry 256A	Advanced Topics in Inorganic Chemistry
Chemistry 269	Electrochemistry

V. *Physical Chemistry—Chemical Physics*

Required Background Courses:

Physics 114AB

Core Graduate Courses:

Chemistry 261	Foundations of Spectroscopy
Chemistry 262	Statistical Mechanics
Chemistry 263	Quantum Mechanics

Recommended Courses:

Chemistry 200A	Advanced Biochemistry: Biophysical Methods
Chemistry 265	Computer Simulation in Statistical Mechanics
Chemistry 266	Advanced Topics in Physical Chemistry
Chemistry 268	Solid State and Materials Chemistry
Chemistry 269	Electrochemistry Applications of Symmetry and Quantum Mechanics
Chemistry 273	Electricity, Magnetism, and Optics Solid State Physics
Physics 110AB	
Physics 155	

The course requirements shown above are usually met as follows: During the first year, two of the three courses will typically be lecture courses while the third will be a 291 research seminar. It is possible to take three lecture courses, but we recommend this only if you are not working as a T.A. The 291 research seminar is required each quarter until you advance to candidacy. In the second year and beyond, as you get more involved in your thesis research, you will take fewer lecture courses and eventually none at all. For example, you may sign up for one lecture course, one seminar course and one research course (Chemistry 299) or for a research course (Chemistry 299) and a seminar course, etc. Permission for a reduced load must be approved prior to the beginning of the quarter by the Graduate Director.

Course Selection and Enrollment

Advising Appointment

First-year students enroll in the required first-year courses (Chem 292, 296, and 291 A, B, C or D) and plan the rest of their first-year courses at an advisory meeting with the Graduate Director after attainment exam results are known. In subsequent years, the student's research advisor may recommend courses to supplement the required core courses, as appropriate to the student's research interest.

The *Schedule of Classes* and the *UCSC General Catalog* can be consulted on the web at <http://gazos.ucsc.edu/soc/index.cfm> and <http://reg.ucsc.edu/catalog/index.html>. Hard copies are available at Bay Tree Book Store for a nominal fee. The *Catalog* is printed in even-numbered academic years (eg 2006-07, 2008-09), with updates for odd-numbered years published on the web only. The *UCSC General Catalog* and the *Schedule of Classes* list course prerequisites, restrictions and enrollment limitations. You may wish to choose one or more alternative course(s) in case one of the courses you want is unavailable.

Note: The university makes every effort to offer the courses listed in the *General Catalog* and *Schedule of Classes*. However, changes may occur after publication. Courses may be cancelled or teaching staff or time schedules changed. Such changes will be posted at the beginning of the quarter or as soon as they are known.

Enrolling in Courses

You enroll in classes online through your Student Portal at my.ucsc.edu, where you enter your student ID and password. This procedure establishes the official record of all courses for which you are accountable in the current quarter. You must complete and verify your enrollment on the web site by the published deadline for each quarter (see the Academic and Administrative Calendar posted outside the Department Office or go to http://reg.ucsc.edu/calendar/06_07calendar.pdf). No credit can be earned for courses in which you do not officially enroll. Your registration may be canceled for failure to enroll in classes. If you are a teaching assistant (TA) or a graduate student researcher (GSR) and fail to enroll in classes, your employment with the University will be terminated. For enrollment help, email reg@ucsc.edu or call (831) 459-4412.

IMPORTANT: A \$50 late enrollment fee is assessed if you have not enrolled by the seventh day of instruction in any quarter. Refer to the quarterly *Schedule of Classes* or the annual *Academic and Administrative Calendar* for exact dates.

ALSO IMPORTANT: If you have not enrolled in at least 5 units by the first day of the quarter, a hold will be put on your financial aid (TA or GSR fee credits, fellowships, loans, etc.) until you have enrolled.

Grading Options: Letter Grades vs. Satisfactory/Unsatisfactory (S/U)

You have the option to request either a letter grade or a satisfactory/unsatisfactory grade (S/U) or for the courses you take as a graduate student. A *satisfactory*, or passing, grade for a graduate student means an A or B letter grade. If you wish to request a letter grade, please do so **only in lecture courses**. Chemistry 292, 296, 291A-D, 299 or group meeting proseminars (282-290) should be taken for a *satisfactory/unsatisfactory* grade (S/U) only.

Chemistry 296 Teaching Chemistry

All new graduate students are required to take Chemistry 296 (3 units). This class is intended to introduce new graduate students to their responsibilities as teaching assistants, and equips TAs with effective contemporary pedagogical techniques and strategies. Chem 296 meets weekly throughout fall quarter. The class format includes discussions, guest speakers, and student presentations. The duties of teaching assistants are taken very seriously at UC Santa Cruz and we make a conscious effort to help our graduate students make the transition from an undergraduate student to a graduate teaching assistant. Students must pass this course to be appointed as TAs in future quarters.

Chemistry 292 Faculty Research Seminar

All entering graduate students are required to take Chem 292 (2 units) in the fall quarter of their first year. This course introduces new students to each faculty member's research interests. In addition to attending weekly seminars where faculty members discuss their work, students are expected to investigate the research areas of at least three faculty members in some depth. A faculty member may request that an interested student read the pertinent literature, attend group meetings, and/or write a report.

Sub-discipline Research Seminar (Chem 291A, B, C, D)

Four subgroups within the Department of Chemistry and Biochemistry have established weekly research seminars to hear about and discuss current research in their field of interest. **All students are required to enroll in this course until they have advanced to candidacy.** Students are welcome to continue to participate in their sub-discipline seminar after advancing to candidacy, and many do. Faculty members frequently attend the seminars as well. The specific requirements for each seminar program are listed below:

- **Chem 291A Organic Research Seminar**
- **Chem 291B Biophysical, Biochemistry and Molecular Biology Research Seminar**
- **Chem 291C Inorganic Research Seminar**
- **Chem 291D Physical Chemistry Research Seminar.**

Other First- and Second-Year Requirements

Organic Cumulative Exams

Ph.D.-track organic students are required to pass four cumulative exams by the end of the second year (sixth quarter). **Students must take *each* of the regularly scheduled cumulative exams beginning in the fall quarter of their first year until they have passed four exams.** These exams broaden the student's exposure to currently active areas of organic chemistry. Failure to complete this requirement will result in removal from the program. These exams are given twice a quarter and consist of problems drawn from topics recently discussed in seminars or published in recent editions of major chemical journals. In a typical exam, questions are drawn from a list of current papers or general topics distributed two weeks prior to the exam. The questions may directly relate to the topics or papers or to some background material that is referred to in the papers. Exam performance will be taken into account at the time of the oral examination. Students should treat these examinations with the same seriousness as course work and thesis research.

Choosing a Research Advisor and Joining a Lab

Graduate students must choose their Research Advisor and join a lab by the end of the spring quarter of the first year. Ph.D. students choose two additional faculty members to complete their Research Committee (see below). All students without exception conduct lab research during the summer.

Forming a Research Committee

The first academic year of graduate study ends with the formation of a three-person Research Committee that includes the Research Advisor. A faculty member other than the Research Advisor acts as chair. Students discuss the composition of the

committee with the Research Advisor and with the Graduate Director, who must both approve the nominations. The committee meets with the student on a regular basis to review the student's progress and to advise on thesis research by providing outside viewpoints. The committee members decide when sufficient work has been completed for submission of a thesis, when progress is not satisfactory, and when it is necessary to recommend disciplinary action. The Research Committee serves as the committee for the **Second-Year Seminar** and the **Oral Qualifying Examination** (with the addition of a fourth member from outside the Department), and also as the **Dissertation Reading Committee**. The makeup of this Research Committee is the joint responsibility of the student and the Research Advisor. The Research Committee chair must be a tenured Chemistry faculty member other than the Research Advisor; s/he will also chair the Oral Qualifying Examination committee.

In addition to the above formal examinations, the Research Committee meets again in spring quarter of the student's fourth year to discuss research progress. The student submits a research **prospectus** to the Research Committee and the chair writes a **progress report** for the Graduate Director. A copy of the report is given to the student and a copy is placed in the student's file.

By the end of winter quarter of the student's fifth year, the student shall write an **updated prospectus** for the Research Committee and the Graduate Director. The prospectus is to be co-signed by the student and the Research Advisor. A copy of the prospectus will be placed in the student's file.

Students are expected to finish all requirements for the Ph.D. in five years. If a sixth year is necessary, the student submits an updated prospectus in fall quarter of that year.

If there are any problems with the student's progress, the Graduate Affairs Committee will recommend that the Research Committee meet in the beginning of the student's sixth year to review the updated prospectus with the student. The Research Committee chair will write a report for the Graduate Director regarding the student's progress or lack of progress and projected finish date. The student will receive a copy of this report and a copy will go in the student's file.

First-Year Academic Progress Review

The departmental Graduate Affairs Committee, chaired by the Graduate Program Director, reviews each student's academic progress annually. In July all students receive a letter summarizing their progress, rated Satisfactory or Unsatisfactory, and noting the following year's requirements. For first-year students in particular, the Graduate Affairs Committee monitors academic performance at the end of each quarter.

When a student has met all of the first-year requirements (attainment exams, most of the coursework and cumulative exams if applicable) and no problems have developed, the student will be encouraged to proceed with Ph.D. research.

When a student's preliminary work is of unsatisfactory quality, the Department will recommend to the Graduate Division that the student be placed on probation. In order to be removed from probation the student must satisfy any conditions set by the Department by the specified deadline. If the conditions are not met as prescribed, the student may be dismissed from the PhD program and advised to pursue a Coursework MS. A student can be placed on probation for:

1. Not passing two lecture courses (letter grade of C-F or Unsatisfactory).
2. Not passing one attainment exam after three attempts together with not passing the Second-Year Seminar.

3. Not having passed all four attainment exams by the end of the first year; that is, *all parts* of the attainment requirement *must be completed* by the end of Spring Quarter of the first year.
4. Other situations indicating lack of adequate progress as determined by the Graduate Affairs Committee.
5. Any of the above plus inadequate TA performance.

(See Academic Standing, Probation, Dismissal, p. 19.)

Second Year

During the second year students are expected to complete coursework and organic cumulative exams, if applicable, and engage more fully in research. Enrollment in a Chem 291 seminar continues until advancement to candidacy in the third year. If a student fails to complete the coursework requirement, has not passed the second-year seminar or the cumulative exams, or has not progressed sufficiently in research to present a passing oral exam, the student will be placed in the M.S. track.

Literature Seminar (Second-Year Seminar)

The Department of Chemistry and Biochemistry requires that all Ph.D. students give a literature seminar by the end of their sixth quarter. Earlier scheduling requires the approval of the Graduate Director. Seminars are integrated into the calendar of the sub-discipline research seminar classes (Chem 291ABCD). The ability to read and critically analyze research data, to organize those data into a coherent presentation, and to communicate the information in a clear, logical and engaging manner are important skills for the chemistry professional. The second year seminar provides an opportunity to develop and utilize these skills while discussing an area of recent research activity distinct from the student's own thesis project. The length of the presentation should approximate that of a professional seminar. Generally 45-60 minutes is sufficient to give an in-depth presentation, leaving ample time for questions and discussion.

The seminar topic should be of current interest to the chemical research community, and also an area in which you have not previously had experience--either through current or prior laboratory activity or library research. The seminar should cover more than one research paper. Generally you will read many background papers to support the actual work presented. Your goals should be to teach the audience something they didn't know and to relate it to information they do know. **The chair of your Research Committee must approve** the proposed topic before you begin library research. Then, contact the Chem 291 instructor early in Fall Quarter of the second year, so that the presentation can be scheduled as part of the year's seminar planning. All members of your Research Committee should be able to attend. **The Research Committee chair writes an evaluation** with input from all committee members, the 291 instructor and other faculty members attending the seminar.

A successful second-year seminar should reflect a thorough understanding of the chemistry underlying the topic. The student should be ready to answer questions concerning all aspects of the research. Faculty comments, which are used to develop the evaluation for the seminar, tend to focus on the level of intellectual content, organization, delivery, quality of the abstract, etc. The choice of media aids (chalk talk, transparencies, Power Point presentation) should be discussed with the Chem 291 instructor.

One aspect of the second-year literature seminar that is not typical of a professional presentation is the abstract. This is perhaps the most important part of your presentation for the audience. Long after the talk is forgotten, the abstract provides ready access to the information. Special care must be taken to make this a polished document.

Your abstract should be constructed like a research paper, with a logical progression of ideas and citation of sources. The abstract should be three pages plus properly formatted references.

In summary, your talk should show that:

- you are able to select an exciting and appropriate contemporary topic.
- you can read the relevant literature and organize and deliver a logical and interesting presentation.
- you have prepared yourself with regard to both the topic and basic science pertinent to your presentation in a way that will allow you to respond thoughtfully to questions from the audience.

Third Year: the Ph.D. Oral Qualifying Examination

Timing and purpose

The Oral Qualifying Exam takes place in the student's **seventh quarter***. To be eligible for this exam a student must have passed attainment exams, presented the second-year seminar, completed required coursework, resolved any 'Incomplete' grades, met the cumulative exam requirement (organic students), satisfied the teaching requirement, and begun his/her own research.

The qualifying examination serves three purposes. First, it gives the student an opportunity to demonstrate the knowledge and thinking behind the thesis project and to examine research progress to date. Second, it examines the student's written and oral defense of an original research proposal. Finally, it tests the student's grasp of fundamental chemical concepts through questioning on both topics.

*A student wishing to take the Oral Q.E. early must have met all other preliminary requirements (Attainment Exams, coursework, Second-Year Seminar, Cumulative Exams (organic students), three quarters TAing) and in addition must obtain the written approval of the Graduate Director.

Procedure

Submit a *Committee Nomination for Ph.D. Qualifying Examination* form to the department office at least **35 days prior to the exam date** (download from the Graduate Division's web site http://graddiv.ucsc.edu/student_affairs/formsdownloads.php). Include a date and time agreeable to the Orals Committee.

The Orals Committee shall consist of the student's Research Committee and a fourth or 'outside' member. The latter must be either a tenured member in another department at Santa Cruz, a tenured Chemistry faculty member from another UC campus, or a chemist from another university or laboratory with a research record comparable to that of a tenured UC faculty member. The nomination of the fourth member is subject to approval by the Chemistry Graduate Director, and by the Graduate Dean. Qualifications must be documented by a *Curriculum Vitae* including publications; the student justifies the selection in a short paragraph submitted with the nomination form. The chair of the committee must be a tenured UCSC Chemistry faculty member who is not the Research Advisor.

The candidate distributes a one- or two-page abstract of the research proposal to the examination committee at least **30 days before the examination**. *This step may not be omitted*. The complete text of the research proposal must be distributed at least one week before the exam.

A pass or no pass will be given after the examination, based on the written and oral proposal defense and on the student's knowledge of the research project and chemical concepts. All three areas must receive passing marks from all members of the examining committee for a successful outcome. The proposal must be well organized and clearly written, with special attention to editing and figures. The student should consult with the Research Committee Chair in choosing presentation media (overhead projected transparencies, "chalk talk," data projector graphics). The examining committee will look for evidence of a fundamental knowledge of general chemical concepts at least at the level of the Department's advanced undergraduate courses. A higher level of understanding will be expected on topics that are required for either the research proposal or for the thesis topic.

Once begun, no examination will be continued or recessed to a later date. Students have the right to a second examination with the same committee if they do not pass the first examination. This second exam should be taken by the end of the quarter following the quarter of the first exam and may be based on the original, revised original, or a new research proposal.

If a student does not pass the Oral Qualifying Exam on the second try, he/she will be dismissed from the PhD program. A student wishing to pursue a MS degree must then petition the Graduate Affairs Committee.

Exam format

Part 1: Prepare and present a summary of research results, including some background and future experiments (20 minutes). The examining committee will not expect extensive or definitive research results, but they will expect the student to elaborate on the motivation behind the investigation and to discuss the possible direction(s) the research could take. The student should demonstrate a very good concrete and theoretical grasp of the thesis project, and should be prepared to discuss any aspect the committee asks about.

Part 2: Pick an *original* idea, and write a proposal and abstract. The topic can be either:

- a. An extension of current research but distinct from the current research plan and the PI's grant.
- b. A topic unrelated to the student's own research, outside the student's research area.

The selection of an independent research proposal topic is very important, and a thoughtful reading of the recent literature and attendance at pertinent seminars is essential. The topic cannot be the thesis subject, or any work that has been published, and should not be a project that has been, is being or is going to be carried out in the student's research group or another research group. However, it can be an extension of current research *as long as it is distinct from any current investigations* in the PI's lab. This caveat does not prevent the proposal from later developing into an actual project on its own merits. The specific systems and techniques proposed must be of the student's own devising. **The chair of the Research Committee must approve the proposed topic.**

The proposal should contain an abstract, the necessary background for the proposed project, the experimental design, and a discussion of expected results and potential experimental problems. How these problems could be circumvented by alternative experiments should also be discussed. The research proposal presentation should last 20 minutes.

The exam shall last 2-3 hours. The presentation of research progress shall be scheduled first and the proposal second. Each presentation is limited to 20 minutes, with

the possibility of spending more time on the discussion of the student's own research. The Chair of the examining committee is responsible for overseeing the total time spent on each section of the exam.

At any time during and after each presentation, the members of the examining committee may ask questions related to the project or proposal, and also general questions to test the student's mastery of the fundamentals of chemistry.

Nominating the Dissertation Reading Committee

Immediately following a successful Qualifying Exam, submit a *Nomination of Dissertation Reading Committee Form* to the Chemistry Graduate Program office with a \$65 advancement fee, made payable to UC Regents. This committee is usually identical to your Research Committee.

Advancing to Candidacy (ATC)

After successfully completing the oral exam, submitting the *Dissertation Reading Committee Form* and paying the \$65 fee, the student officially advances to candidacy the following quarter. PhD candidates are expected to complete the remaining degree requirements within nine quarters. Advanced (ATC) students are eligible for a significant reduction in tuition and an increase in GSR salary. Although international students are charged nonresident tuition every year (approximately \$5000), for the first nine quarters after advancement tuition is reduced to \$0; then tuition reverts to 100%. ***The Department of Chemistry and Biochemistry does not pay non-resident tuition for any international student who is more than nine quarters advanced or who has been in the program longer than six calendar years.*** PhD candidates must be registered for at least one quarter after advancement to candidacy before being awarded the degree.

After advancing to candidacy students who started the graduate program in winter quarter are expected to meet the same schedule of prospectus updates and research reviews with their Research Committee as students who started in fall quarter.

Fourth-, Fifth- and Sixth-Year Requirements

After advancing to candidacy the PhD candidate devotes full time to his/her own research and to writing the dissertation. A research project often develops into an article or poster presentation at a national or international conference, and later becomes the basis for a dissertation chapter. Publishing significant research results at this stage can be exciting and sharing them at a conference can prepare the way for later collaborations, as well as provide the basis for a dissertation chapter.

Generally speaking, advanced students must meet with their Research Committee at least once a year* to report progress and get advice and guidance. If the Chair and Advisor feel that progress is satisfactory in the fifth year, an updated prospectus without a meeting is sufficient; this is usually due in Winter Quarter. Always refer to your annual academic progress letter for the Graduate Affairs Committee's instructions in your particular situation.

****Note: Students who passed their Oral Qualifying Exam later (or earlier) than their seventh quarter are nevertheless expected to meet with their Research Committee by Spring of the following year and to follow the same procedure as for the Fourth-Year Review, described below.***

Fourth-year Prospectus and Review

The purpose of the fourth-year review is for the student to focus and plan his/her research and to begin shaping the final product—the research dissertation—as early as possible.

In spring quarter of the fourth year the student meets with the Research Committee to present, discuss and obtain feedback and guidance on research progress.

One week before the progress meeting the student gives the Research Committee an outline of the current research projects (finished and in progress), organized as dissertation chapters. The sections of the outline should cite any published papers, target a completion date for each research project, and estimate a time of completion for the thesis. The projected finish date should allow time for the process of writing, revising, incorporating changes suggested by the Dissertation Reading Committee, obtaining signatures and submitting the dissertation in the proper format.

The chair of the Research Committee writes a progress report based on the student's written and oral presentation, including the committee's evaluation and any modifications resulting from the discussion, specifying the target completion date for the dissertation. A copy of the report, along with the student's outline (signed by all members of the Research Committee), will be placed in the student's file.

Fifth-Year Prospectus

In Winter Quarter of the fifth year, the student will write an updated prospectus for the Research Committee and Graduate Director. The student and all three members of the Research Committee sign the prospectus and submit it to the Graduate Director for approval. A meeting with the Research Committee may be deemed necessary at the discretion of either the Research Committee Chair or the Graduate Director.

Dissertation and Dissertation Seminar

When the Research Committee agrees that the research is ready to be submitted, the student writes the dissertation according to the guidelines prescribed by the University Library and the Graduate Division. The dissertation title page is signed by all members of the Research Committee and by the Dean of the Graduate Division.

The dissertation seminar, a presentation open to the public, should be scheduled at least **one week prior** to submitting the dissertation. The faculty, through the Research Committee chair, makes the final departmental decision regarding the awarding of the Ph.D. degree. The decision is subject to the approval of the Graduate Dean.

Filing Fee

In some cases it may be appropriate for a student in good standing to apply for Filing Fee Status instead of registering as a full-time student in the final quarter. The cost of FFS is one-fourth of the University Registration Fee, or \$119. However, when you go on filing fee status, most campus services, campus employment and financial aid become unavailable. In addition, you must be officially registered the academic quarter or on approved leave of absence **before** paying the filing fee. A student may go on filing fee status only once. Contact the Chemistry Graduate Program office for more information and an application form.

Applying to Graduate

Students who anticipate receiving a degree must file an *Application for the Doctor of Philosophy Degree* early in the quarter in which they wish to graduate (see the Academic and Administrative Calendar for deadline). The application is your official

notification to the Graduate Dean of your intent to graduate. This form is available in the Chemistry Graduate Program office or you can download it from the Graduate Division's web site www.graddiv.ucsc.edu/formsdownloads.html.

Academic Standing, Probation, Dismissal

The by-laws of the Academic Senate state that graduate students can be dismissed at any time for not making satisfactory progress. Special circumstances might justify small delays in meeting the above requirements. Students may petition the Graduate Director for permission to postpone a particular exam, with the approval of their Research Advisor. This petition must be received in the quarter preceding the event. Failure to comply with this requirement can lead to a dismissal from the Ph.D. program.

Since three courses per quarter (15 units) is the required load in the Department of Chemistry and Biochemistry, a student passing fewer than three is subject to academic sanction. If a student passes only two courses in any quarter, the Graduate Director sends a warning letter to the student.

If the student repeats and again passes only two courses, the Graduate Director will recommend to the Dean of the Division of Graduate Studies that the student be placed on academic probation. Similarly, if a student passes fewer than two courses in any quarter, probation will be recommended. A student can also be placed on academic probation at the request of the Research Committee on the grounds of poor research progress or failure to pass any of the milestone requirements along the path to either graduate degree.

When a student's research has not advanced sufficiently to present at the oral qualifying exam by the end of the third year, the Department will recommend that a part of the research be completed and submitted as a MS research thesis.

The Research Committee and the Graduate Director will scrutinize most carefully the research progress of students who have been enrolled more than nine ATC quarters. When a student's research and writing has not progressed sufficiently in the opinion of the Research Committee and the Graduate Director after the fourth, fifth or subsequent annual review during the nine quarters allotted to students to complete their dissertation work, the student's Research Committee and the Graduate Director can decide whether to recommend probation or to move the student to the MS program.

TA performance is also an important factor, and feedback from the evaluations submitted by students and supervising instructors can be taken into consideration along with other measures of a TA's academic progress.

Academic probation is declared by the Graduate Dean in writing, permanently noted on the student's record, and is only lifted after the prescribed actions are taken by the student. One consequence is that students on academic probation are not eligible for merit fellowship support and will receive lower priority for academic appointments at UCSC, including teaching and research assistantships. The probation period can last from less than one quarter to a maximum of one academic year. Once the student's satisfactory status is restored, if subsequent performance is unsatisfactory in any way, dismissal is automatic.

PhD Program Requirements Timetable

First Year		
Fall	Winter	Spring
Attainment exams	(Attainment exams)	(Attainment exams)
Advisory meeting		
Chem 292 Chem 296 Chem 291A, B, C, or D	Chem 291A, B, C, or D	Chem 291A, B, C, or D
<----- Core courses in field of specialization ----->		
<----- Other courses as advised ----->		
		Join lab, form Research Committee
<----- Organic students must take each cumulative exam until they achieve four passes ----->		
Summer: Chem 299A. Conduct research in lab you have joined.		
Second Year		
Fall	Winter	Spring
Chem 291A,B, C, or D	Chem 291A,B, C, or D	Chem 291A,B, C, or D
<----- Core courses in field of specialization ----->		
<----- Other courses as advised ----->		
<---- Organic students continue to take each cumulative exam until they pass a total of four exams ---->		
<----- Finish required coursework ----->		
<----- Present second-year literature seminar F, W or Sp ----->		
Summer: Dissertation Research		
Third Year		
Fall	Winter	Spring
Chem 291 A, B, C, or D		
Nominate orals committee Take Oral Qualifying Exam Nominate Dissertation Reading Committee	Advance to candidacy	
<----- Chem 299 Dissertation Research ----->		
<----- Chem 282-290 Group Meeting ----->		
Summer: Dissertation Research		

Fourth Year		
Fall	Winter	Spring
<----- Chem 299 Dissertation Research ----->		
<----- Chem 274-290 Group Meeting ----->		
		<i>Fourth-year prospectus and review</i>
Summer: Dissertation Research		

Fifth Year		
Fall	Winter	Spring
<----- Chem 299 Dissertation Research ----->		
<----- Chem 274-290 Group Meeting ----->		
	<i>Updated Prospectus</i>	Write <i>dissertation</i> Present <i>dissertation seminar</i>
Summer: Dissertation Research		

Most students finish in five to five and one-half years. If a sixth year is necessary, it begins with an updated Dissertation Prospectus and progress review meeting with the Research Committee, even if the student expects to finish in Fall Quarter.

Sixth Year		
Fall	Winter	Spring
<----- Chem 299 Dissertation Research ----->		
<----- Chem 274-290 Group Meeting ----->		
Update dissertation prospectus Meet with Research Committee to review progress		
Summer: Dissertation Research		

Ph.D. Requirements Summarized

1. Pass all four attainment exams and meet any deficiencies as directed by Spring of first year.
2. Take 292 and 296 in Fall of first year.
3. Take 291A,B,C, or D Research Seminar every quarter until advanced to candidacy.
4. Join a lab and form Research Committee in Spring of first year.
5. Present second-year literature seminar on a topic outside research area by end of 6th quarter.
6. TA at least three quarters in the first year and second years, *before* attempting PhD oral qualifying exam.

7. Pass six lecture courses by end of 7th quarter: at least four at 200 level, at least four in Chemistry & Biochemistry; on departmental approval, up to two courses may be at upper division undergraduate level. Courses taken to satisfy attainment requirements do not count.
8. In Fall of the third year, pass PhD oral qualifying exam before examining committee consisting of three Research Committee members plus one outside member approved by the Graduate Dean. Candidate presents and defends two research proposals: one on proposed original thesis research and one on an unrelated Chemistry or Biochemistry research topic.
9. Nominate Dissertation Reading Committee (DRC) and pay \$65 fee,
10. After advancing to candidacy (ATC) students are expected to spend full time on research, except for an TA
11. Meet with DRC to review research progress and written prospectus in Spring of fourth year.
12. Submit updated prospectus to DRC in Winter of fifth year.
13. Meet with DRC at discretion of Chair and Graduate Director if research extends to a sixth year and periodically thereafter when the committee feels additional review is warranted.

The average time to degree is five to five and one-quarter years. PhD candidates are expected to complete research and write the dissertation within nine quarters of advancement (ATC). Financial support is no longer available after 18 quarters in the graduate program.

For both PhD and MS students, the standard course load is three courses per quarter, or a total of at least 15 units per quarter. A student passing only two courses in 2 successive quarters will be placed on academic probation.

If a PhD student fails to meet any requirement in the prescribed time, s/he may be dismissed from the PhD program and directed to pursue a coursework MS degree.

FELLOWSHIPS AND GRANTS

AGEP Fellowship: UCSC's Alliance for Graduate Education and the Professoriate AGEP is a partner in this UC system-wide effort to increase the number of underrepresented minority students (African American, Hispanic/Latino, Puerto Rican, Native American and, Native Pacific Islander) who are in science, engineering, and mathematics Ph.D programs and who are interested in careers in the professoriate. UCSC AGEP provides fellowships, activities and support services for eligible undergraduate and graduate students. For more information see http://graddiv.ucsc.edu/student_affairs/agep.php.

ARCS Fellowship: A national organization, the ARCS Foundation (Achievement Rewards for College Scientists) provides funds for fellowships to high-achieving students in the fields of natural science, mathematics, medicine and engineering. Since 1976, the foundation has provided more than \$1,200,000 to 207 students at UCSC. Faculty advisors recommend their students in February, and the Graduate Affairs Committee submits one nominee to the campus-wide competition. Awards range from \$5,000-10,000.

CBSE Graduate Fellowship: Diversity Fellowships for Graduate Research in Genomic Sciences allow outstanding students to pursue research projects in areas relevant to the

human genome, including the ethical, legal and social implications of genome research. These awards support the NHGRI's goal to increase the numbers and capabilities of minority scientists and science professionals. Four graduate awards each year provide stipend, fees, tuition. (This is an example of several fellowships administered by the Center for Biomolecular Science and Engineering (CBSE). For more information, see http://www.cbse.ucsc.edu/outreach/outreach_program_divfellows.shtml.

Chancellor's/Provost's/Dean's Fellowships: The Division of Physical and Biological Sciences awards a limited number of "super" fellowships consisting of a \$21,000-30,000 stipend plus fees and tuition for the first year and an additional \$10,000 stipend for the second year. Departments nominate their most academically outstanding applicants as part of the admissions process. Twelve awards were made for the 2007-08 academic year. Recipients may also be offered TAs in addition to this award. The benefits of these "super" fellowship awards vary from year to year. Apply by completing the Financial Aid part of the online application, due January 15.

Cota Robles Fellowship: The Eugene Cota-Robles Fellowships are merit-based awards limited to US citizens and Permanent Residents who are being recommended for admission to a PhD program and plan to pursue an academic career in research and teaching. This two-year award pays a stipend, fees and an applicable tuition plus two months summer GSR support in the first year. The Graduate Council makes 40 awards from among UCSC graduate programs; students are nominated by the department's admissions committee during the admissions process. Apply by submitting the Financial Aid and Diversity Fellowship parts of the online application by the graduate program application deadline (January 15). Awards are based on: 50% academic achievement, 40% diversity, 10% departmental mentoring and financial contribution.

Doctoral Student Sabbatical Fellowship: The Division of Graduate Studies sponsors this fellowship program that pays recipients the equivalent of one quarter's TA salary plus the associated fees, so that students without other funding can focus on their research without having to TA for one quarter. Eligibility: Students must have worked as TAs for six out of the last nine quarters. Applications accepted in April for the following Fall and in September for the following Winter, Spring and summer.

Graduate Students' Association Travel Grants: UCSC's Graduate Student Association (GSA) offers travel grants of up to \$250 to assist students who travel to perform thesis-related research or attend conferences related to their graduate projects. You may only apply after travel has been completed. Applications are accepted at the end of each quarter.

UCSC Minority Biomedical Research Support (MBRS): The MBRS program offers in-depth experience in the academic and experimental aspects of biological research and prepares students to compete successfully for entry into graduate programs, internships, and professional schools. Stipend and fees for each approved quarter; some TAing required. Eligibility: full-time graduate students who meet academic qualifications. Website: <http://marcmbrs.ucsc.edu>. Application deadline: Sep 25, 2007.

President's and Chancellor's Dissertation Year Fellowships: The Graduate Council awards four *President's* fellowships based on the academic achievement of the nominee, the potential for success in academic, and the extent the nominee contributes to the diversity of the pool of doctoral degree recipients. Pays a stipend of \$21,000 (2007-08) plus fees for the academic year. Eligibility: US citizen or Permanent Resident; plan to finish dissertation by the end of the fellowship year. The *Chancellor's* fellowships are similar, but eligibility is extended to international grad students. Deadline: April/May.

Regents' Fellowship: Stipend offered to new graduate students for their first or first and second years in addition to any TAs or GSAs. These awards are competitive and are determined by the department's admissions committee during the admissions process. Apply by submitting the Financial Aid part of the online application by the January 15 graduate program application deadline.

STEPS Fellowship: STEPS Institute for Innovation in Environmental Research. Founded to integrate science, technology, engineering, policy, and society (STEPS), the institute focuses interdisciplinary research on three major global environmental issues: genetic restructuring of ecosystems, alteration of major water systems, and climate change. The institute provides research funds for UCSC graduate and undergraduate research projects in the environmental sciences. Contact: steps@ucsc.edu. Website: <http://www.steps.ucsc.edu/>.

External Fellowships: For information on the many other fellowships available from sources outside UCSC, contact the Graduate Program Coordinator (email jajones@chemistry.ucsc.edu or call 9-2023) for a list of internet fellowship links.

THE MASTER'S PROGRAM IN CHEMISTRY & BIOCHEMISTRY

UCSC currently offers two types of Master's programs in chemistry: a research degree and a coursework degree.

Master's Degree, Research Path

This Master of Science program is a two-year sequence with requirements similar to those of the first two years of the Ph.D. program. Thus, all MS students must take the attainment exams on entrance, enroll in three courses per quarter, and take Chemistry 292 (thesis path) and 296 (if TAing) their first quarter. The coursework minimum is five lecture courses in Chemistry and Biochemistry beyond those required for fulfillment of UCSC's BA/BS requirements. At least three courses must be at the graduate level (200 series), and the other two courses can be either at the graduate level or the advanced undergraduate level (100 series). These can include 151B, but not Chemistry 163A, B or C. With permission of the Department, a few carefully chosen courses in such fields as Mathematics, Physics, Biology, and Computer Science may be substituted for some of the Chemistry courses.

Research M.S. students are not required to present a seminar in their second year or take an oral exam. The degree does require a Master's Thesis based on original work carried out during the first and second year. This thesis must be approved by a committee of three faculty members, who are selected at the end of the first year. It is not expected to be as comprehensive in scope or in depth as a Ph.D. thesis.

Master's Degree, Coursework Path

The Department of Chemistry and Biochemistry offers a coursework path to the Master's degree in which a student may earn the M.S. degree after one year of coursework and a "capstone" seminar. We hope the program will serve the needs of such diverse groups as teachers on sabbaticals, technicians from industry, and re-entry students. The degree can be finished in one year if the student is well prepared for all four attainment exams. Requirements are:

1. Pass the entrance (attainment) exams.
2. Take Chem 296 in the first quarter and Chem 291A,B,C or D each quarter the student is registered.
3. Students enroll in three Chemistry and Biochemistry courses per quarter for three quarters.
4. Nominate a three-member Master's Committee in Spring of the first year.
5. Nine courses are required; of these, at least seven must be lecture courses offered by the Department of Chemistry and Biochemistry. The remaining two courses may be lecture courses, seminars, or independent study.
6. Of the seven lecture courses, at least four must be graduate level (200), but up to three may be advanced undergraduate level (100), excluding Chemistry 112. Courses used to satisfy attainment examination deficiencies (Chemistry 163ABC, 151A, 103, 143) do not count.
7. The seven lecture courses must include representatives from **at least three** of the chemistry sub-disciplines: biochemistry, inorganic, organic, and physical.
8. Final, "capstone" requirement. The candidate is required to present a passing literature seminar on a topic of his/her choosing, demonstrating the ability to read and critically analyze research data, to organize those data into a coherent presentation, and to communicate the information in a clear and logical manner. A three-member Master's Committee and also the Chem 291 instructor must approve the topic **before** the candidate begins library research. The seminar should be announced in the same manner as other seminars sponsored by the Department, and the Master's Committee must submit its

evaluation within one week. The length of the presentation should approximate that of a professional seminar--45 minutes to one hour, followed by questions and discussion.

The topic of this seminar should be one of current interest to the chemical research community. Generally you will read many background papers to support the actual work presented. Your goals should be to teach the audience something they didn't know, and to connect it to information they do know.

A successful capstone seminar should display a thorough understanding of the chemistry underlying the topic for discussion. The student should be ready to answer questions concerning all aspects of the research. Faculty comments, which are used to develop the evaluation for the seminar, will focus on the level of intellectual content, organization, delivery, quality of the abstract, etc.

M.S. REQUIREMENTS SUMMARIZED

Research Thesis Path:

1. Pass all four attainment exams in the first year.
2. Take 292 in Fall of the first year.
3. Take 296 in Fall of the first year if TAing at any time.
4. Join a lab and form Research Committee in Spring of the first year.
5. Pass at least five Chemistry & Biochemistry lecture courses, of which at least three must be graduate level (200). Courses taken to satisfy attainment examination deficiencies may not be counted.
6. Conduct original laboratory research.
7. Capstone requirement: thesis based on original research.

If a research thesis MS student fails to meet any requirement in the prescribed time, s/he will be subject to dismissal from the research program and will be directed to pursue a coursework MS degree.

Coursework Path:

1. Pass all four attainment exams in the first year.
2. Take 296 in Fall of first year if TAing at any time, and 291A,B,C or D each quarter student is registered.
3. Nominate Master's Committee in Spring of the first year.
4. Pass nine courses. Of these seven must be lecture courses (at least four at 200 level) **from three of the four sub-disciplines**. Courses used to satisfy attainment examination deficiencies do not count.
5. Capstone requirement: literature seminar.

If a coursework MS student fails to meet any requirement in the prescribed time, s/he will be subject to dismissal from the graduate program.

THE TEACHING ASSISTANT EXPERIENCE IN CHEMISTRY

Teaching Assistant Requirement

The focus on high quality undergraduate education is one of the most outstanding features of the UCSC campus. Teaching is a job that is taken very seriously and many graduate students and faculty come to UCSC because they want to be in an atmosphere where **both** teaching and research are important. Therefore, we require that each chemistry graduate student serve as a TA for a **minimum of three quarters**. Students must meet this requirement before advancing to candidacy. As a TA you have an opportunity to make a contribution to the education of students who are excited about learning science. Teaching can be a very rewarding aspect of your graduate career. You will assume substantial responsibility, and in doing your job well, you will receive respect and acknowledgment from others. In addition, you may discover that you have abilities of which you were not aware. A further advantage is the opportunity to learn the subject matter with a thoroughness that a student seldom achieves. Finally, you will have the opportunity to work closely with people and experience new relationships. Whether or not your eventual career is in teaching, the experience will be invaluable.

Chem 296 Teaching Chemistry

As excited as one can be about teaching, as many creative ideas as one might have, as eloquent or patient as one might be in the classroom, a new student usually finds that teaching can be a difficult process. Even the best teachers on this campus constantly work to improve their teaching. Regardless of your experience before coming to UCSC, there is much to learn about this new activity. For this reason we have established a series of weekly seminars (Chem 296) to explore and develop your teaching skills throughout the Fall Quarter. In Chemistry 296, students will begin to develop a solid foundation in the mechanics and art of teaching, as well as receive instruction on the safety, health and emergency response issues relevant to their teaching and research career within the Department. The orientation and 296 seminars are required for all new graduate students.

You may have some unique ideas about what you want to try in your classroom—perhaps some techniques that you learned from outstanding professors. There also may be some things that you will never do. Between these two extremes there is much room to learn about how to be an effective teacher. Often what we call “poor” teaching is the result of simply not knowing how to do what works best for you in the classroom. Each 296 seminar will be devoted to a broad topic, such as laboratory or discussion section teaching, asking questions effectively, or writing evaluations. Rather than emphasize specific techniques, we will encourage you to share your experiences (the good ones and the bad ones), to learn from others and to discuss and try new ideas. We cannot overemphasize that there is no “correct” way to teach. Throughout the course, you will get comments on your effectiveness. One of the best aspects of Chem 296 is that you will develop friendships and working relationships with your peers.

Teaching Assignments and Duties

TA assignments are made through the Chemistry Graduate Program office on the basis of applications submitted each quarter by graduate students. It is important for TAs to communicate which courses they prefer to teach. While it is not always possible, every attempt is made to honor these wishes. Other factors determining assignments and assignment changes are course enrollment, previous experience, seniority, previous performance, instructor preference, conflicts with TAs' own course schedules, etc.

A Teaching Assistantship is a 50% appointment. The total commitment is 20 hours per week (220 hours per quarter). Duties include formal contact hours in class and lab sections; grading problem sets, lab reports and exams; attending the instructor's lectures; preparing for sections; holding office hours, attending TA meetings, etc.

The Graduate Division sets Teaching Assistant salaries annually. Besides being a form of employment, a TAship carries financial aid in that it offset most of a student's quarterly fees.

It is important to fulfill all the teaching assignments and responsibilities of the Teaching Assistantship. The Chemistry Department considers prior TA performance when awarding TAships each year. Unsatisfactory performance will affect priority for subsequent TA assignments and TAship renewal.

Lab and Discussion Section Teaching

The primary teaching responsibility for most Chemistry TAs is laboratory teaching and discussion section(s). TAs teach either two lab sections or four discussion sections. TAs are expected to be well prepared for their sections. A critically important responsibility of this job is to insure safety in the laboratory. Requirements and responsibilities for teaching discussion sections vary and will be discussed by the professor teaching your course at the beginning of the quarter.

Record Keeping and Evaluations

You need to keep records of student attendance in the lab sections, completion of assigned experiments, and quality of the student's work. In part, your assessment of the student is based on their lab reports and on periodic inspection of lab notebooks.

At the end of the course, you will provide the professor with a short written paragraph commenting on each student's work in your section(s). Some professors may use your comments verbatim as part of the official Narrative Evaluation of student performance. Others may use your paragraph as the basis for statements they write about student performance in the lab part of the course. Some instructors use automated systems to produce customized Narrative Evaluations. Writing narrative evaluations is covered in Chem 296.

Undergraduates complete written evaluations of their TAs and professors at the end of the course. Student evaluations of teaching provide valuable guidance and comments to TAs and become a part of institutional records. You are encouraged to take these evaluations seriously and to read them each quarter.

Office Hours

As a TA you will hold "office hours," that is, hours when you will be available for consultation with students. Arrange at least two 60-minute hours per week at times that are convenient for both you and for students. For example, you might set office hours at 10:00 to 11:00 a.m. on Wednesdays and 1:00 to 2:00 p.m. on Thursdays. Do not schedule office hours in the same course "slot," i.e., 10:00 to 11:00 a.m. Wednesday and Friday, because students taking a course MWF at 10:00 a.m. would have no chance of seeing you.

Usually TAs hold office hours at their desks in their offices. Other places are acceptable providing it is regularly available to you for that purpose and convenient for access by students. Ask the Department Office Assistant for help if you want to arrange a special place for office hours.

The University of California provides standard cards for posting office hours. They are available in the Department Office; complete and post this card outside your office. Office hours are usually set at the beginning of each quarter.

Responsibility for Teaching Your Sections

You are responsible for teaching your assigned sections at the day, time and location arranged. If an unavoidable absence prevents you from teaching your section, please contact the instructor of the class well ahead of time with arrangements for a qualified replacement, preferably another TA for the same course.

Association of Student Employees (ASE/UAW)

Since the ratification of the first UC/ASE (UAW) agreement in 2000, UCSC Teaching Assistants are represented by a bargaining unit. The full text of the current agreement can be accessed on line at http://atyourservice.ucop.edu/employees/policies/systemwide_contracts/uaw/index.html.