

UNDERGRADUATE RESEARCH IN CHEMISTRY CHEMISTRY 180

Undergraduate research can be a rewarding, beneficial, and enjoyable experience for Chemistry majors who are planning either industrial employment or graduate education following completion of the Bachelors degree. At UCI many undergraduates have participated in undergraduate research by enrolling in Chemistry 180 (Undergraduate Research). In many cases the undergraduate research experience has resulted in publications with undergraduate students as co-authors on the papers. The Chemistry faculty believes research can be an important component of the undergraduate education for many Chemistry majors, and the Department has facilities to accommodate a significant fraction of its majors in this activity. Majors are encouraged to consider undergraduate research in planning their undergraduate program. Proper planning, begun early, can do much to ensure that this opportunity can be realized.

Who is Eligible to Enroll in Chemistry 180?

There are no formal prerequisites for Chemistry 180, but Chemistry 180 students are expected to have a background consistent with the research project undertaken. Admission to Chemistry 180 requires the specific approval of a Chemistry faculty member who agrees to sponsor, help design, supervise, and evaluate your work and to provide desk and/or laboratory space, equipment, and supplies as required by the project selected. Most faculty members will expect a prospective Chemistry 180 student to have completed both General and Organic Chemistry; others may require completion of, or concurrent enrollment in, Analytical, Inorganic, and/or Physical Chemistry.

How Do I Choose a Faculty Member to Supervise My Undergraduate Research?

The Chemistry faculty have a very wide range of research interests, and this means that undergraduate research projects can involve organic or inorganic synthesis, laser or NMR spectroscopy, mass spectrometry, computational chemistry, atmospheric or environmental chemistry, biochemistry, analytical chemistry, polymer chemistry, nuclear chemistry, and many other topics. A good place to acquaint yourself with the research interests of the Chemistry faculty is the bulletin board across from the Chemistry Department Office in Natural Sciences 2 (NS2) Room 1101. Here you will find pictures of all the Chemistry faculty, statements concerning their research interests, and some references to recent scientific publications that you will be able to find in the UCI Science Library.

Students seeking an undergraduate research experience are often more successful in finding sponsorship from professors with whom they have had a class and who therefore know something about the students' aptitudes and educational background. Many students have also arranged undergraduate research by approaching a faculty member whom they have not had for a teacher but whose work they find especially interesting. A key ingredient in most cases is student initiative in identifying and approaching faculty members who are doing work of interest to the student. Occasionally a faculty member will invite an undergraduate student to do research in his or her laboratory; far more often the student is the one who initiates a discussion of this possibility.

Once you have arranged for a faculty member to sponsor your undergraduate research, you can enroll in Chemistry 180 in the usual way. Each Chemistry faculty member is listed separately in the Schedule of Classes as a Chemistry 180 sponsor with a separate course code number.

What is Expected of a Chemistry 180 Student?

A student enrolled in Chemistry 180 will usually select and plan a research project in consultation with the sponsoring faculty member. Direct supervision of the student's research may, in some cases, be provided by a graduate student or postdoctoral student who works with the faculty member. The project usually begins with a reading assignment designed to acquaint the student with the scientific background of the project and the techniques to be employed. In most cases an understanding of the scientific significance of the project can be expected to develop in parallel with carrying out the project.

Students are often surprised how much longer it takes to complete a project, or even a stage of the project, than would be suggested by a verbal or written description of what one plans to do. For this reason most faculty members will accept as Chemistry 180 students only those who are prepared to commit at least a full academic year to the project. This is one reason why it is important to start planning for undergraduate research early in your undergraduate career.

Since you will be getting 4 units of credit for each quarter of enrollment in Chemistry 180, you need to plan to devote at least as large a fraction of your time to your research as you do to any other 4 unit course. This usually means something like 12-15 hours per week. Don't expect to add undergraduate research on top of an academic schedule that is already full. Most faculty sponsors will want to confirm with you that you have planned your academic schedule for each quarter realistically, and most will expect you to keep a regular schedule of research work each week.

At the end of each quarter of enrollment you will be expected to submit to your supervisor a written report on your research work for the quarter. This must reach the supervising faculty member in time for review of the report prior to submission of grades for the quarter. Specific timing for submission of the report should be discussed with your supervisor. Interim reports, written or verbal, may also be required during the quarter. Students whose quarterly reports are late will receive an NR on their quarterly grade report with the usual implications for receipt of an NR. The Department does not authorize award of IP grades in Chemistry 180, and the I grade is given only in exceptional cases such as illness or other such circumstances beyond the student's control. Incomplete grades must be made up within a brief, specified time period. Incomplete grades will convert to a failing grade of (F), not pass (NP), or unsatisfactory (U), whichever is appropriate, after remaining on the student's record for 12 months.

The length and form of your quarterly research report should be discussed with your faculty sponsor. A document entitled Guidelines for Preparing a Research Report is located on the Undergraduate section of the Chemistry Department's website: <http://www.chem.uci.edu/undergrad>. This document was prepared for circulation by the Committee on Professional Training of the American Chemical Society. It provides a great deal of useful advice on the preparation of research reports.

Where Do I Go for More Information on Undergraduate Research?

You will find it informative to discuss undergraduate research with any faculty member with whom you have occasion to speak. Each can provide additional perspective on the value of the experience and advice on arranging for a sponsor. It will also be useful to discuss undergraduate research with other undergraduates who are currently involved in it or with graduate students whom you may meet as Teaching Assistants or in other circumstances. You may also wish to make an appointment with the Chief Undergraduate Advisor for Chemistry, Professor Craig Martens. Appointments can be made by calling (949) 824-8768 or via email: cmartens@uci.edu.

Warning: Undergraduate research may turn out to be so exciting that you want to neglect your regular course work to do it! Plan your time carefully.

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