Internships

The internship course is 3150:399 or Chem 399. It counts as elective credit towards the BA and BS in Chemistry and the BS in Biochemistry degrees. You may take Chem 399 only in your department. Students should take Chem 399 while in their junior year but may take earlier during your degree program. This course can be taken for a total of 6 credits.

I. How to enroll for Chem 399

I.A. Find an internship position

Such jobs can take place in industry, hospitals, state (for example NASA-Glenn) or university (say at OUA) labs. The jobs involve chemistry or biochemistry and come in a wide-ranging variety of research. Because of suggestions we together finding an internship

- Career Center http://www.ohio.edu/career/career-services/internships.cfm
- REU (Research Experiences for Undergraduates) programs sponsored by the National Science Foundation, NASA and various other research programs that are sponsored by US government agencies. Many of these programs involve research during the summer. The topics for these programs are diverse and may include organic and biochemistry. You can search the web for these internships. For example, search REU and the state or city that you live in.
- The Chemistry Department. Occasionally Prof. Teiser receives emails from students in internships that are official and in the degree program given by the Department of Chemistry.

I.B. Negotiate with the employer.

As a first step, you should have discussed with your employer. Ata minimum the following must be discussed.

- Will you be doing the internship for credit or for free? If you choose credit, etc. the instructor of this course. In such a case, discuss with the employer how you have to take place in regard to Work Conditions and hours. Some companies could be used on the job.
- How many hours will you work in the internship?
- What are the employer's expectations?
- Is the employer willing to provide a letter to Prof. Teiser that describes the internship? The letter should 1) include a description of the internship, 2) state the hours for which you work, and 3) include specify the dates and the number of hours you work.

employer whether you can be paired with old data to interpret, or whether you can do the same experiment that you usually do to obtain a complete data set that is not proprietary. You should have something in writing about this. If necessary, Prof. Teisseire is willing to enter into secrecy agreements with the company to protect your company's interests and to accept an oral presentation as a substitute for all of the report.

- Is your employer willing to provide a short (2-3 sentence) report on your performance during the internship?

I.C. Negotiate with the Chemistry Department.

You should meet with Prof. Teisseire to discuss, in person, the number of credits to be awarded (see next section) for the internship experience, any issues considered (see above) and to set the due date for your report. Once all negotiations are finalized, Prof. Teisseire will arrange for you to be registered for Chem 399. (You cannot do this by yourself.)

II. How many credits?

It is expected that the internship should be: 1) at roughly the same or higher degree of difficulty as an Advanced Lab course and 2) should take about the same amount of time as a two credit Advanced Lab course to be worth two credits. Each factor will be discussed separately.

II.A. Degree of difficulty

You should be learning and refining your knowledge of techniques and methods of chemistry (including biochemistry) throughout the internship. A question to discuss with your employer is whether the internship will teach you something new throughout or just at the beginning? If throughout, then you will have plenty to write about in your report. If you learn it at the beginning, then it is appropriate to register for fewer credits than the number discussed in the next section. The internship report should clearly reflect college-level learning.

II.B. How much time?

How much time should you spend on the internship? The Advanced Labs are two-credit and require you to spend about 6 hours a week in lab. There is also preparation and report writing time outside the lab. As a rough estimate, ~10 hours/week are required for the two-credit course. If there are 15 weeks of lab, then the student spends 150 hours for the two-credit lab or 75 hours per credit. By comparing this number to the total number of hours of your internship (other than time out for lunch, breaks, etc.), you can ESTIMATE how many credits your internship is worth. Note that an "A" student might spend more time preparing and writing than what was estimated. Another factor to consider is how much of your internship will be spent learning new things, refining your methods and skills, and simply doing research. If your internship was learning a few new things and then repeating the same thing over and over, then register for fewer credits.

III. How are grades assigned in Chem 399?

III.A. Your employer:

Input as to the quality of your work, attendance and attitude will be requested from your employer. We expect you to behave in an ethical fashion and that you will

you must include safety and risk. (See separate section on ethics and safety below.)

III.B. The internship report:

The format and grade will be determined by your sponsor. See the handout entitled *Internship Reports* for specific guidelines. You should prepare the first draft of the report at least two weeks before the end of the semester or the due date for your report. The instructor will work with you to improve the report to bring it up to the required level. It is important to have two or three drafts before the final version. It is expected that your paper will NOT be plagiarized. (See the section on ethics.) As required by ACS for accreditation purposes, a graded, hard copy of the final report will be kept by Professor Teisen for 3-5 years.

III.C. Long internships:

If your internship is longer than a semester, you may be given an IP (in progress) grade for the first semester. After the final report has been graded and credit has been obtained for your internship, a grade will be determined and that grade will replace any IP grades you earlier received. *Remind the instructor to change the IP grades to a letter grade when you turn in the final version of your report.* If you are receiving internship credit for a project that will take more than a year, you may be required to write more than one report.

III.D. Other activities:

You may encounter or be required to perform other tasks or activities. For example, as part of your internship you may be asked to attend a seminar or presentation. If time and the internship site allow, you may be able to attend an presentation by a visiting speaker. If you do attend, you should get a brief report together. Though these activities are not required, it is highly recommended that you take advantage of such opportunities. Make sure to report such activities you attend in your report. Include a brief report.

IV. The internship report

Our degree program is certified by the American Chemical Society (ACS). To maintain certification, the agency requires a gain at the US for chemists. To maintain certification for our program, students are expected to write a report that *at least* meets ACS guidelines. Though ACS does not provide specific guidelines for writing a report for an internship, ACS guidelines for writing a research report should be followed as much as possible. Specific directions are given in a separate handout. See: http://www.ccsu.edu/teisen/ccsu.htm (Scott Chem 399 - Guidelines for the internship report). *Do not turn in a report without having consulted this handout.*

V. Ethics in chemistry and safety

V.A. General ethical concerns in chemistry

A student at the University of Ann Arbor are expected to follow the Code of Conduct (http://www.ccsu.edu/ccsu/code-of-conduct.htm). Industrial laboratories require that no one work alone. Other issues may come in the laboratory to be considered and discussed.

A person in chemistry should conduct himself/herself in an ethical manner and such behavior is expected of Chem 399 students. Fraud, plagiarism, falsification, fabrication,

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VI. Career and professional school information:

The introduction to careers in chemistry is a copy of the ACS book *Careers for Chemists*. The information in this section can help you decide the field of chemistry in which you will find employment or pursue a related graduate school. If information on chemistry careers and graduate schools can be obtained at the following websites

ACS careers information
http://pubs.acs.org/page/acs/cen/?_fp=ts&_pageLabel=PP_CAREERS&node_id=87&_nfpb=true&_pageLabel=PP_CAREERS&_nfls=false&_nfls_rule=regular

Directory of Graduate Research (free for UA users via a UA VPN)
http://dgr.rsc.org/

UA career services
http://www.ua.edu/career/
http://www.ua.edu/ccc/