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## Internships

The internship course is 3150:399 or Chem 399. It counts as elective credit towards the BA and BS degrees. Eventually, Chem 399 will also count as an elective toward our newly approved BS in Biochemistry. You may take Chem 399 only with department permission. Most students who take Chem 399 will be in their junior or senior year. With permission, Chem 399 may be taken earlier during your degree program.

### I. How to enroll for Chem 399

#### I.A. Find an internship position

Such positions can take place in an industrial, hospital or national (for example NASA) laboratory. The position must involve chemistry. There are a number of places, both on and off campus to get help with this task.

✧ The Chemistry Department: Prof. Tessier forwards information on internships to all students in the Chemistry Department that have signed a degree contract. If you haven't done so or have been accidentally left off this mailing list, send Email to Prof. Tessier at [tessier@uakron.edu](mailto:tessier@uakron.edu). Your name can also be forwarded to employers. This will only be done if you have provided written permission (Email is OK). For reasons of confidentiality, only your name and Email address will be forwarded.

✧ The Arts & Sciences Career Center

<http://www3.uakron.edu/ascareer/interns.html>

✧ Other internship contacts

<http://www3.uakron.edu/ascareer/miscntrninfo.html#Other%20Contacts>

#### I.B. Negotiate with the employer.

As a first step, please share this handout with your employer. Several things need to be discussed. Will you be doing the internship for pay or for free? How many hours a week will the internship involve? What are the employer's expectations? Your employer must provide a letter which 1) includes contact information, 2) summarizes the type of work that you will do, and 3) specifies the dates and the number of hours you will be working. The letter must convince the Department of Chemistry that the project you will work on is deserving of college credit. For this reason, it is preferred that the letter is from someone with at least a masters or doctorate degree in the sciences or engineering fields or from someone with considerable experience in the work you will be doing. In some cases, the work will be proprietary and discussions between the employer and the instructor may need to take place.

#### I.C. Negotiate with the Chemistry Department.

You should meet with Prof. Tessier to discuss how many hours you will work, the number of credits to be awarded (see next section) to the internship experience, and to set the due date for your report. Once all negotiations are finalized, you will be allowed to register for Chem 399.

### II. How many credits?

It is expected that the internship should be at roughly the same or higher degree of difficulty as an Advanced Laboratory course and should take about the same amount

of time. How much time is this? The Advanced Labs are two-credits and require you spend about 6/hours a week in lab. There is also preparation time and time spent writing the reports. As a rough estimate, ~10 hours/week are required for the two-credit course. If there are 15 weeks of lab, then the student works ~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 (of time at work but not at lunch, break, 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.

### **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 of your employer. We expect you to behave in an ethical fashion and that you follow all your employer's requirements on safety. (See separate sections on ethics and safety below.)

#### **III.B. The internship report:**

The major part of your grade will be determined by your report. See the handout entitled *Internship Reports* for more specific guidelines. You should plan on completing the first draft of the report at least one-two weeks before the end of the semester or the due date of your report. The instructor will work with you to help you revise the report to bring it up to the required level. It is not unusual to have two-three draft reports before writing the final version. It is expected that your paper will NOT be plagiarized. (See the section on ethics.) A copy of *graded* report should be given to the Department of Chemistry main office (KNCL 103).

#### **III.C. Long internships.**

If your internship takes two semesters, you will be given an IP (in progress) grade for the first semester. *Remind the instructor to change the IP grades to a letter grade when you turn in the final version of your report.* If you plan an extensive internship experience that will last more than a year, you will be required to turn in a report at the end of each year and at the end of your last semester.

### **IV. The internship report**

Our BS degree programs are certified by the American Chemical Society (ACS), the largest professional organization in the US for chemists. To maintain certification of our programs, students are expected to write a report that *at least* meets ACS guidelines. Though ACS does not provide specific guidelines for writing a report of an internship, ACS guidelines for preparing a research report should be applied as much as possible:

[http://portal.acs.org/portal/fileFetch/C/CTP\\_005606/pdf/CTP\\_005606.pdf](http://portal.acs.org/portal/fileFetch/C/CTP_005606/pdf/CTP_005606.pdf)

In addition to these general directions, more specific directions are in a separate handout. *Do not turn in a report without having consulted this handout.*

### **V. Ethics in chemistry and safety**

A professional chemist should conduct him/herself in an ethical manner and such behavior is expected of Chem 399 students. Fraud, plagiarism, falsification, fabrication, bias, selective deletion of undesirable data, conflict of interest, lack of

acknowledgement, disrespect, dishonesty, mistreatment of laboratory animals, and lack of concern for the environment or for safety are some of the unethical behaviors that occur in the field of chemistry. The ACS Chemist's Code of Conduct (see web site below) defines such behavior. A number of web sites discuss ethics and provide guidance in how to act in various situations. "Green chemistry" is the term used for chemistry that is done with concern for the environment.

✧ UA Student Misconduct

<http://www.uakron.edu/studentlife/sja/SJAdef.php>

✧ ACS Ethical and Professional Guidelines

[http://portal.acs.org/portal/acs/corg/content?nfpb=true&pageLabel=PP\\_TRANSITIONMAIN&node\\_id=1095&use\\_sec=false&sec\\_url\\_var=region1](http://portal.acs.org/portal/acs/corg/content?nfpb=true&pageLabel=PP_TRANSITIONMAIN&node_id=1095&use_sec=false&sec_url_var=region1)

✧ Case studies on ethics in chemistry

<http://chemcases.com/>

✧ "On Being a Scientist" – a 1995 report by the Committee on Science Engineering and Public Policy representing the National Academy of Sciences, the National Academy of Engineering and the Institute of Medicine

<http://bob.nap.edu/readingroom/books/obas/>

✧ UA Department of Environmental Health and Safety

<http://www.healthandsafety.uakron.edu/>

✧ ACS safety sites (free downloads of safety booklets at the second site)

<http://membership.acs.org/c/ccs/>

<http://membership.acs.org/c/ccs/publications.htm>

✧ MSDS (Material Safety Data Sheets) sources

<http://ull.chemistry.uakron.edu/erd/>

<http://www.ilpi.com/msds/index.html>

<http://hazard.com/msds/>

✧ Chemistry and Engineering News safety letters (published by ACS)

<http://pubs.acs.org/cen/safety/index.html>

✧ NIOSH (National Institute for Occupational Safety and Health) Pocket Guide to Chemical Hazards

<http://www.cdc.gov/niosh/npg/>

✧ ACS Green Chemistry Institute

[http://portal.acs.org/portal/acs/corg/content?nfpb=true&pageLabel=PP\\_SUPERARTICLE&node\\_id=1415&use\\_sec=false&sec\\_url\\_var=region1](http://portal.acs.org/portal/acs/corg/content?nfpb=true&pageLabel=PP_SUPERARTICLE&node_id=1415&use_sec=false&sec_url_var=region1)

Plagiarism is a particularly important ethical concern in Chem 399 because a written report comprises the largest part of the grading. **The paper you submit for Chem 399 will be checked for plagiarism.** Carefully read the comments on plagiarism in the handout entitled *Internship Report*.

## VI. Career and professional school information:

The instructor can lend you a copy of the ACS book *Careers for Chemists*. The internship experience can help you decide the field of chemistry in which you would like to find permanent employment or may inspire you to attend graduate school. Information on chemistry careers and graduate schools can be obtained at the following web sites.

✧ ACS career resources information

[http://portal.acs.org/portal/acs/corg/content?\\_nfpb=true&\\_pageLabel=PP\\_CAREER\\_S&node\\_id=87&use\\_sec=false&sec\\_url\\_var=region1](http://portal.acs.org/portal/acs/corg/content?_nfpb=true&_pageLabel=PP_CAREER_S&node_id=87&use_sec=false&sec_url_var=region1)

✧ Ann Bolek's (Physical Science Bibliographer at UA's Science and Engineering Library) Career Information for Chemists

<http://gozips.uakron.edu/~bolek/chem-career.html>

✧ Directory of Graduate Research (free from UA computers or via UA VPN)

<http://dgr.rints.com/>

✧ UA career services

<http://www3.uakron.edu/ascareer/>

<http://www.uakron.edu/counseling/career.php>