



Washburn University, Department of Chemistry, CH 390 Undergraduate Chemical Research

Purpose: “Laboratory or theoretical computational research in any of the fields of chemistry, a typed formal report is required.” CH 390 is designed to develop the student chemist’s abilities in four areas:

- 1) development of experimental procedures and laboratory skills,
- 2) assimilation, application and communication of chemical concepts,
- 3) problem solving techniques, and
- 4) critical thinking skills.

This capstone course requires summative reflection, serving as a culminating experience for Bachelor's degree students. Significant focus will be placed on 1) searching, accessing, reading, interpreting and understanding the primary and secondary chemical literature, 2) effective oral and written communication of chemical concepts, and 3) discussion of ethics.

Prerequisite: Departmental permission

Textbook: All of the primary and secondary chemical literature.

Attendance: For every one hour of research credit enrolled, a minimum of three hours of laboratory time per week (six hours per week in the summer) is expected for 16 weeks. There are no sick days or excused absences, so any missed hours must be made up. At the beginning of the semester the student chemist is expected to set a tentative schedule. He/she should realize that due to the demands of the research being explored, significant deviation from the tentative schedule might need to occur.

Grading: Final grades will be assigned based on attendance (30%), research participation and technique (30%), and a formal research report (40%). “Positive” results are not required to be successful in this course, whereas clear and honest results are a must. Scientific integrity and the personal safety of all the researchers involved are of paramount importance.

Formal Research Report: The formal report is expected to conform to both the ACS-CPT “[Guidelines for Preparing a Research Report](#)” and the *ACS Style Guide*, by J. S. Dodd. A due date for the report will be mutually agreed upon, allowing time for revisions if necessary.

Research Project: A research project outline will be established and agreed upon by the instructor and student at the beginning of the semester. It will be in either written or verbal form. As the semester of active research progresses the project outline may be modified due to the demands of the chemistry investigated.

Lab Notebook:

- It should be treated as a legal document. Use only permanent, black ink. All errors should be crossed out with a single line, date and initial. Don’t worry, mistakes happen to all of us.
- All procedures must indicate necessary safety precautions.
- Document EVERYTHING.
- Be very clear and organized.