Chemistry 552: Research II

Dr. T. Christian Grattan (Office Sims 301B)
Spring 2011 – Winthrop University
F 10:00-10:50 AM (Sims 302)
3 Credit Hours

Textbooks: *The ACS Style Guide*, 3rd ed., Coghill and Garson, 2006 (or 2nd ed., 1997)

Course Objectives: This course represents the second half of a two-semester sequence (Chem 551) intended to provide you with experience in conducting a year-long research project and presenting your results. Your work this semester will again focus on the following:

- Planning and conducting an investigation in one of the main disciplines of chemistry
- Completing searches of the chemical literature relevant to your topic
- Collecting and analyzing data
- Writing a research paper in the style of a scholarly article
- Presenting your work orally, both formally and informally

Office Hours: M 2:00 – 3:00 PM, T 1:30-2:30 PM, W 11:00 – 12:00 PM or by appointment

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Attendance: Due to the unique nature of this course, each and every class meeting is important to facilitate the growth and development of your overall research experience. Class time will be spent discussing research progress and methods, analyzing literature articles and reviewing students' writing. The students are responsible for all assignments for the course regardless of absence. Students are required to attend and participate in all meetings; each class missed will drop you one letter grade, A → A- for example.

Time Commitment: You are expected to devote at least 9 hours per week to laboratory research, in addition to time spent preparing course assignments. Additional requirements will be outlined by your research mentor.

Research Mentor: Your research mentor will again outline the project goals and guide your research throughout the semester, providing instruction in techniques and instrumentation as required, and making you aware of potential hazards and proper

safety protocols. He or she will also be the first reviewer of your oral and written work. You are expected to meet with your mentor at least once each week.

Research Committee and Committee Chair: Your research committees will continue to track your progress and help to evaluate your work. As in CHEM 551, you will be responsible for getting assignments to committee members and arranging the required committee meeting(s).

Assignment Policies:

- ***Written assignments***

  1. Drafts of other written assignments (e.g., Literature Search, Proposal . . .), must be submitted to mentors by the scheduled due dates.

  2. Mentors will review assignment drafts and provide feedback for you to incorporate. You will then submit these revised assignments to your mentor and committee members. The sections of your research paper (e.g., Results/Disc, . . .) will undergo a second round of revision based on committee comments (see schedule).

     a. You are responsible for submitting assignments directly to committee members, either electronically or in paper form (depending on committee preference).

     b. Your mentor/committee may elect to deduct points for late assignments.

  3. Your mentor and at least one committee member will grade each of your written assignments, according to guidelines set out for all CHEM 552 students. Grades will be recorded by your Committee Chair, and feedback will be shared with you.

     a. Your "final" CHEM 552 paper (Title/Intro/Methods/Results sections) will additionally be graded by Dr. Grattan.

- ***Oral assignments***.

  1. You are required to discuss all oral assignments with your mentor prior to presenting them, either in class or in front of your committee.

  2. All committee members will participate in grading your presentations to them.

3. Your final oral presentation will be given to the Chemistry faculty. All Chemistry faculty will participate in grading this presentation.

Assignments/Grading:

1. **Semester Plan/Progress Report** (50 pts) A written description of your project goals for the semester, to include benchmarks for laboratory progress (i.e. updated or expanded Specific Aims from CHEM 551) and aims for improvement of the written paper/presentation. This should also include an updated literature search to align with the current direction of your project and a focused effort on any new areas that have yet to be explored in the literature.

2. **Committee Meeting #1** (100 pts) An oral presentation to the committee (15-20 minutes) given during the week of March 5th. The goal will be to brief committee members on all research progress since 551.

3. **Paper Sections** (150 pts total) Drafts must be fully referenced (except *Abstract*), with in-text citations and endnotes in your chosen format:

    a. *Results/Discussion and Conclusions* (100 pts)

    b. *Abstract* (50 pts)

4. **Final Presentation** (150 pts) A 10-12-minute oral (PowerPoint) presentation of the semester's work given to students and faculty **at the semester's end**. The successful presenter will: (1) review the goals and significance of the project and the scientific basis of the techniques employed, (2) describe experimental methods utilized and results obtained, (3) discuss the interpretation(s) and implications of the results and (4) briefly describe possible future directions for the project.

5. **Final Paper** (150 pts) The final research paper (consisting of Title, Abstract, Introduction, Methods, Results, Discussion, Conclusions and References sections) incorporating feedback from previous drafts. These papers must contain **at least 15 literature citations**

6. **Laboratory Notebook** (50 pts) Mentors will grade notebooks on format, neatness, and completeness.

7. **Laboratory Technique** (50 pts) Mentors will assign grades based on the quality of students' laboratory work.

8. **Participation in Weekly Meetings** (100 pts) The Research Coordinator will assign grades based on the quality of students' oral participation. Each student will be required to give brief presentations during the course of the semester.

***Total Points Possible*: 800**