

Course Meets: Friday 12:30-1:20, Sims 113C

Course Coordinator: Dr. Takita Felder Sumter (sumtert at Winthrop dot edu), Sims 302;
803- 323-4991

Office Hours: MTW 8:00-8:50am and by appointment

Course Objectives: CHEM 552 is the second of a two-semester sequence that provides a [faculty](#) mentored research experience that exposes undergraduates to hypothesis-based investigations in chemistry. Upon completion of the two courses, students should be able to design experiments, analyze and skillfully interpret data, and communicate their findings to informed audiences.

Required Textbooks: 1) *The ACS Style Guide, 3rd ed., Coghill and Garson, 2006 (or earlier editions)* and 2) *A Short Guide to Writing about Chemistry, 2nd ed., Beall and Trimbur, 2001*

Student Learning Outcomes: Students will learn to:

- Use scientific databases such as [SciFinder](#) and [PubMed](#) to access primary literature
- Read and appreciate the significance of relevant journal articles
- Design and carefully perform experiments using scientific instrumentation and techniques
- Analyze and interpret scientific data with respect to the research goal
- Write, review, and revise a formal report of their research (in the form of a scholarly article)
- Present their work to faculty from a wide range of chemistry disciplines

Student Responsibilities:

Pre-read assignments: Read assignments before class so that you will be able to contribute to the in-class discussions relating to the various assignments. These readings are from the required texts and are outlined in the course schedule.

Conduct Research: Students are expected to devote at least 9 hours per week to laboratory research. Students and their mentors will agree on these hours and outline them in CHEM 552 course contracts. The goal of updating the contract is to revise any modifications to the project goals and agreed upon laboratory schedule.

Class Attendance Policy: In addition to this time, you will also spend time preparing course assignments. The nature of these assignments will be discussed when the course meets on Friday at 12:30-1:20. Each class meeting is designed to enhance the undergraduate research experience and students must attend at least 75% (no more than two absences) of the classes to pass the course. Students missing class are responsible for all course assignments. Students are required to attend and participate in all meetings; each unexcused absence will **lower your course grade by one level (A to A⁻ to B⁺, etc.)**.

Collaborate with a Faculty Research Mentor: Students in this course have already selected a faculty research mentor and are expected to continue to meet at least once each week. The faculty mentor will provide technical instruction and make students aware of any potential hazards and safety procedures. He or she will also review oral and written work prior to submitting to the faculty research committees, who assist in evaluating student work. However, **STUDENTS** should be first reader of their work and should not submit documents that have not been edited and proofread.

Submit all Assignments as Scheduled: Several written and oral assignments are required for successful completion of this course. Students are to pay careful attention to due dates and submit the first draft to mentors as scheduled. The revised document should be submitted to the mentor and the committee. The mentor's copy should have a document revision form attached that specific outlines students' actions in response to comments. Your committee may impose a point penalty for late assignments.

Arrange Faculty Research Committee Meetings: Students must submit assignments to committee members and arrange meeting(s) as required. Your final research presentation will be given in an open forum to all Chemistry faculty (who will participate in the final grade).

Grading: Course grades will be determined based on the total points earned. Grades will be assigned as follows:

A(93-100%); A-(90-92%); B+(87-89%); B(83-86%); B-(80-82%); C+(77-79%); C(70-76%); D(60-69%); F (<60%)

Assigning an incomplete grade indicates that, for a valid reason, the course has not been completed. Due to the nature of this course, justifications for incomplete grades must be documented by the University's Dean of Students.

Graduate Student Requirements: Graduate credit in the course will be awarded based on completion of all undergraduate course requirements in addition to completion of a research paper and oral presentation that is not directly related to your research. This assignment must be 5-7 pages containing at least 15 primary literature references formatted according to ACS guidelines. Additionally, the student will present this work orally to their research committee. This assignment is worth an additional 150 points. Graduate students should also note that the plus/minus grading system will not be used.

Additional Requirements for Honors Credit Students earning honors credit will be required to orally present a paper on a topic not directly related to their research. The faculty mentor and course instructor will be in attendance and will participate in grading this assignment. The assignment will worth an additional 100 pts and must be completed by April 22nd.

CHEM 552 Assignments:

In addition to adding new sections, CHEM 552 will revise materials generated in CHEM 551. Revision is an on-going process that involves working on the overall content, organization, and line editing.

- 1. Chemical Hygiene and Safety Quiz** (25 pts) An individual, signed agreement between student and mentor that specifies the expectations for the semester. At a minimum, the contract **must contain:** time slots for laboratory work (at least 9 hrs/wk) and weekly student-mentor meetings, names of faculty committee members, and any additional requirements not listed in the syllabus. The contract may also include plans to participate in any professional meetings. You will also be required to attend laboratory safety training and complete a quiz worth 25 pts.
- 2. Updated Semester Goals Statement and Oral Progress Update** (200 pts; 100 pts ea) A written description of your project goals for the semester, to include safety precautions, benchmarks for laboratory progress (i.e. updated or expanded Specific Aims from CHEM 551) and aims for improvement of the written paper/presentation. **Due: 2/15**
- 2. Oral Progress Report and Revised Methods/Results/Discussion** (200 pts, 100 pts ea) An oral presentation to the committee (15-20 minutes) given the week ending 2/22. The goal will be to brief committee members on all research progress since December. For the written progress report, students will provide a description of their research project progress and remaining experimental plans. Your document should include:

- A near final draft of each table or figure that summarizes your data complete with clear legends or captions that convey as much information as possible about the experiment.
 - A fully revised experimental methods and results section (based on feedback from CHEM 551) including a description of the findings (with specific references to figures or tables).
 - A description of remaining experimental plans for the semester's end. *Due: Feb. 22nd*
4. **Final Presentation** (200 pts) A 10-12-minute oral (PowerPoint) presentation of the semester's work given to students and faculty **at the semester's end (tentatively April 24, 2013 at 2:30pm)**. 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 revised Title, Abstract, Introduction, Methods, Results, Discussion, and References sections) incorporating feedback from previous drafts. These papers must contain **at least 15 literature citations. Due 4/22**
- Paper Sections-** Drafts must be fully referenced, with in-text citations and endnotes in ACS format:
- a. Revised *Results*
 - b. *Abstract*
 - c. *Discussion*
- Note: Upon consultation with the mentor, students may elect to combine the Results and Discussion sections of the paper.*
6. **Laboratory Notebook** (100 pts) Mentors will grade notebooks on format, neatness, and completeness.
7. **Laboratory Technique** 125 pts) Mentors will assign grades based on the quality of students' laboratory work.
8. **Laboratory Safety** (75 pts) Mentors will assess students' laboratory hygiene and safety practices.
8. **Participation in Weekly Meetings** (125 pts) The Course Coordinator will assign grades based on the quality of students' participation in peer review exercises and oral presentations. Each student will be required to give brief presentations during the course of the semester.

Total Points: 1300 (including honors credit assignment)

Student Code of Conduct: Responsibility for good conduct rests with students as adult individuals. The policy on academic misconduct is outlined at <http://www2.winthrop.edu/studentaffairs/handbook/StudentHandbook.pdf>

Students with Disabilities: Winthrop University is dedicated to providing access to education. If you have a disability and need accommodations, please contact Gena Smith, Coordinator, Services for Students with Disabilities, at 323-3290, as soon as possible. Once you have your Professor Notification Form, you should show it to me so that appropriate arrangements can be made.