Senior Research (CHEMISTRY LABORATORY IVA-CTW) Dr. Ray

Chemistry 4160 (CRN 13671)

Spring 2016

Prerequisites:	Chem 4000, 4110 or 4330, and Chem 4600 with grades of C or higher, or equivalent
Instructor:	**Dr. Gigi B. Ray, 212 Courtland North, Tel. (404) 413-5540, gbray@gsu.edu**
Class:	**Mondays 9:00 am – 11:30 am, 311 Petit Science Center (3-credit hour course)** **Also meet individually with instructor weekly to discuss writing/presentations, TBA**
Office Hours:	**Wednesdays 1:00 – 3:00pm and Fridays 10:00am – 12:00pm at 212 Courtland North**
Text:	Class notes will be posted on Desire2Learn: **CHEMISTRY LABORATORY IVA-CTW SECTION 005 SPRING SEMESTER 2015**
Course Objectives:	Chemistry Laboratory IVA. Concurrent enrollment in Chem 4160 and 4170 is not allowed. ***Independent research on special topic related to chemistry. Capstone project that integrates different aspects of chemistry (biological, organic, physical, analytical).*** Become proficient in the use of: SciFinder Scholar, Web of Science, Medline (Pub Med), ChemBioDraw Ultra, Accelyrs Visualizer, PDB (Protein Data Bank), and EndNote. Do Molecular Modeling project using Accelrys Visualizer for protein structure analysis. Develop presentation skills: Oral (using PowerPoint), Poster and Written (reports) Develop critical thinking and writing skills, including rewriting and improving reports (final Chem 4160 Report submitted to department). Careers component: write resumes & cover letters, explore jobs & internships.
Policies:	**1) Students will select a research topic of interest to them (from list), write two short reports and do one short oral presentation (15 mins) using PowerPoint on *several aspects* of their topic/theme.** **Students will also present a cumulative 30min Oral Presentation (*three subtopics*), and submit a final 8-12 page Chem4160 Report in ACS Journal style.** **2) Students are required to schedule 20-min appointments with instructor or TA, every other week outside of class to discuss paper / presentation content & organization, and how to improve written work & oral presentations (minimum 5 times per semester).** **3) Students are required to complete Responsible Conduct of Research online Physical Science module, and submit completion report. Go to:** **http://www.citiprogram.org** **4) Students are required to attend 4 seminars/events outside of class, during the semester *(sign in)*:** Science seminar, Science conference, Career fair, Career seminar. Submit one paragraph synopsis of each seminar (describe content & style).

Policies:	**5) Attendance, timely arrival and participation in all class meetings required.** If absent, it is the student's responsibility to makeup missed work. Students must pay attention to speaker (instructor, guest speaker, or classmate), **do not browse the internet or do other work during class.** **6) *Submit hardcopy printouts of all assignments* at class meetings, rather than emailing assignments to instructor. Late submissions only accepted in person during office hours (points deducted)** **7) Cell phones, iPhones, iPods, blue tooth, tablets, and other electronic devices must be OFF during all classes. Laptops are allowed.** **8) Tuesday March 1st is last day to withdraw from the class and receive "W".** You are responsible for withdrawing before the deadline if you need to do so. The University requires that faculty members must, on a date after the mid-point of the course to be set by the Provost (or his designee): 1. Give a WF to all those students who are on their rolls but no longer taking the class 2. Report the last day the student attended or turned in an assignment.
Grading:	**Total points: 200** *(see grading rubric)* **25 points each:** Final Semester Report #3, Final Oral Presentation, Molecular Modeling Project Report **15 points:** Resume (8pts), Cover Letter (4pts), Job Adds (3pts) **15 points:** PowerPoint slides #1 to #4 collectively (3,3,3,6pts) **10 points each:** Report #1, Report #2, Poster, 1st Oral Presentation **8 points:** Seminar Summaries collectively (2 pts each x 4) **5 points each:** Web of Science assignment #1, Research Topics assignment #2, SciFinder Scholar assignment #3, Responsible Conduct in Research assignment #4, ChemBioUltra Draw assignment #5, NMR Spectra assignment #6, EndNote reference list #7, semester project Outline/Articles **15 points:** Class attendance/participation
Grading Scale:	**A+ 97% A 90% A- 87% B+ 84% B 80% B- 76% C+ 71% C 65%** **C- 59% D 50% F <50%**

TENTATIVE CLASS SCHEDULE (Subject to change)

Date	Day	Topics	Meeting
Jan 11	**M**	Introduction to Course **Searching Scientific Literature - SciFinder Scholar & Web of Science** Select Chemistry Research Project Topic (related to current issues)	**1**
Jan 18	***M***	***Martin Luther King Holiday, no class*** → submit detailed topic for semester presentations & reports (by email)	
Jan 19-22	**T-F**	→ meet with Dr. Ray to finalize semester topic (outside class appointment)	
Jan 25	**M**	**Searching Databases and Structure Information - SciFinder Scholar** **Discuss Good Writing Skills and How to Avoid Plagiarism** → submit detailed **Outline** of entire semester's Research Project (1 page) → submit Web of Science assignment #1 → submit Research Topic assignment #2	**2**
Jan 26-29	**T-F**	→ meet with Librarian to finalize literature search (outside class appointment)	
Feb 1	**M**	**Drawing Structures and Reaction Mechanisms using ChemBioDraw** **Discuss Writing in the Sciences** → submit 5 – 8 **PowerPoint slides #1** (topic Introduction and Scientists) → submit printouts of 1 review article & 1 research article on semester topic → submit SciFinder assignment #3 → submit Responsible Conduct of Research Report #4 by this date	**3**
Feb 8	**M**	**Careers in Chemistry: Resumes, Cover Letters, and Internships** → submit **Report #1** (Introduction to ***entire*** semester's Topic; 3 – 4 pages) → submit ChemBioDraw Ultra Drawing assignment #5 (detailed Synthesis or Mechanism relating to your research topic)	**4**
Feb 15	**M**	**Searching for NMR/IR Spectra** **Reference and Database Management (Introduction to EndNote)** → submit 10 – 12 **PowerPoint slides #2** (including Synthesis / Mechanism, and revised Introduction slides) → submit 3 job adds for related positions, with different educational qualifications (BS, MS, PhD or Professional Degree) → submit Cover Letter for one specific internship or job application → submit Technical Resume (by 12 noon on Friday Feb 19) → submit 1st synopsis of seminars attended in January/February	**5**
Feb 22	**M**	**1st Oral Presentations using PowerPoint (15 min each, 7 students)** → submit **Report #1 revisions** → submit NMR Spectra assignment #6 (with peaks assigned & labeled)	**6**
Feb 29	**M**	**1st Oral Presentations using PowerPoint (15 min each, 7 students)** → submit 12 – 15 **PowerPoint slides #3** (including Introduction, revised Synthesis/Mechanism, and NMR Spectra analysis slides) → submit final Resume and Cover Letter revisions	**7**
Mar 1	***T***	***Last day to Withdraw and possibly receive a W***	
Mar 7	**M**	**Accelyrs Visualizer Molecular Modeling Activity #1 – Tripeptide** → submit **Report #2** (including revised Introduction and Synthesis or Mechanism, and NMR Spectra analysis), with References formatted in ACS style using EndNote; 6 – 8 pages) → submit 2nd synopsis of seminars attended in February/March	**8**
Mar 14-18		***Spring Break, no class***	

TENTATIVE CLASS SCHEDULE (Subject to change)

Date	Day	Topics	Meeting
Mar 21	**M**	**Accelyrs Visualizer Molecular Modeling Activity #2** → submit **Poster** (12 slides, including revised PPT slides #3 and how the drug or system works) → submit Molecular Modeling Preliminary Exercises	**9**
Mar 28	**M**	**Accelyrs Visualizer Molecular Modeling Activity #3** → submit **Report #2 revisions** → submit final, properly formatted EndNote Reference List for entire semester (assignment #7) → submit 3rd synopsis of seminars attended in March	**10**
Mar 30 – Apr 1	**W-F**	**Do Research Poster presentation (1hr, all students)**	
Apr 4	**M**	**Accelyrs Visualizer Molecular Modeling Activity #4** **Protein structure analysis (Protein Data Bank)** Review Endnote usage & formatting questions → submit 16 – 20 **Final PowerPoint slides #4** (including all revised slides) → submit 4th synopsis of seminars attended during semester	**11**
Apr 8	**F**	**→ submit completed Molecular Modeling Project Report and Computer Files** by 3pm	
Apr 11	**M**	**Final (2nd) Student Oral Presentations (30 min each, 5 students)** → submit printout of 3D protein structure reference article related to your semester topic (including PDB protein structure filenames)	**12**
Apr 18	**M**	**Final (2nd) Student Oral Presentations (30 min each, 5 students)** → submit **Final Report #3** (including Introduction, revised Synthesis / Mechanism, NMR Spectra & Protein Structure analysis, and how the drug or systems works (8–12 pages text, plus Figures & References)	**13**
Apr 25	**M**	**Final (2nd) Student Oral Presentations (30 min each, 4 students)** Semester Wrap Up	**14**
May 2	**M**	**→ submit Revised Final 4160 Report (hardcopy printout and electronic copy), in lieu of Final Exam by 1pm**	