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

Chemistry 4160 (CRN 53370) **Summer 2015**

Prerequisites:	Chem 4000 and Chem 4110 with grades of C or higher, or equivalent
Instructor:	**Dr. Gigi B. Ray, 212 Courtland North, Tel. (404) 413-5540, gbray@gsu.edu** **Dr. Jyotsna Thota, 219 Courtland North, Tel. (404) 413-5524, jthota@gsu.edu** **Jackie Werner, Library South 5, Suite 542, Tel. (404) 413-2869, jwerner3@gsu.edu**
Class:	**Tuesdays & Thursdays 9:00 am – 11:45 am, 311 Petit Science Center (3-credit hr)** **Also meet individually with instructor weekly to discuss writing/presentations, mostly on Tuesday/Thursday afternoons.**
Office Hours:	**Tuesdays and Thursdays 1:00 – 4:00 pm in 212 Courtland North**
Course Objectives:	***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. Develop oral presentation skills. Develop critical thinking & writing skills - rewriting and improving reports. Molecular Modeling project using Accelrys Visualizer for protein structure analysis. Careers: resumes, cover letters, and explore jobs & internships.
Grading:	***Total points: 200*** *(see grading rubric)* **30 points:** Final Semester Report **25 points each:** Final Oral Presentation, Molecular Modeling Report **15 points:** Resume (8pts), Cover Letter (4pts), Job Adds (3pts) **15 points each:** Class attendance/participation, Responsible Conduct in Research #4 **10 points each:** Report #1, Report #2, 1st Oral Presentation, Final PPT #4 **5 points each:** Web of Science assignment #1, Semester Outline/Articles/Research Topic assignment #2, SciFinder Scholar #3, ChemBioUltra Draw #5, NMR Spectra #6, EndNote reference list #7, PPT #1, PPT #2, PPT #3
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
Jun 9	**T**	Introduction to Course **Searching Scientific Literature - SciFinder Scholar & Web of Science** Select Chemistry Research Project Topic (related to current issues)	**1**
Jun 9-12	**T- F**	→ meet Dr. Thota to finalize semester topic (outside class appointment) → meet with Librarian to finalize literature search (outside class appointment)	
Jun 11	**R**	**Searching Databases and Structure Information - SciFinder Scholar** **Discuss Good Writing Skills and How to Avoid Plagiarism** → submit 1page detailed **Outline** of entire semester's Research Project (12pFri) → submit Web of Science assignment #1 and Research Topic assignment #2	**2**

Jun 16 **T**	**Drawing Structures & Reaction Mechanisms - ChemBioDraw Ultra** **Discuss Writing in the Sciences** → submit 5 – 8 **PowerPoint slides #1** (topic Introduction) → submit printouts of 1 review article & 1 research article on semester topic → submit SciFinder assignment #3	**3**
Jun 18 **R**	**Searching for NMR/IR Spectra** **Reference and Database Management (Introduction to EndNote)** → 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) → submit Responsible Conduct of Research Report by this date	**4**
Jun 23 **T**	**Careers in Chemistry: Resumes, Cover Letters, and Internships** → submit 10 – 12 **PowerPoint slides #2** (including Synthesis / Mechanism, and revised Introduction slides) → submit NMR Spectra assignment #6 (with peaks assigned & labeled)	**5**
Jun 25 **R**	**1st Oral Presentations using PowerPoint (30 min each, 4 students)** → 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 –hardcopy printout	**6**
Jun 30 **T**	**1st Oral Presentations using PowerPoint (30 min each, 4 students)** → submit **Report #1 revisions**	**7**
Jul 2 **R**	**Accelyrs Visualizer Molecular Modeling Activity #1 – Tripeptide** → submit final Resume and Cover Letter revisions → submit 12 – 15 **PowerPoint slides #3** (including Introduction, revised Synthesis/Mechanism, and NMR Spectra analysis slides)	**8**
Jul 6 ***M***	***Last day to Withdraw and possibly receive a W***	
Jul 7 **T**	**Accelyrs Visualizer Modeling Activity #2 – Protein Active Sites** Review Endnote usage/formatting & linking to text → submit **Report #2** (including revised Introduction, and Synthesis / Reaction Mechanism, and NMR Spectra analysis, with References formatted in ACS style using EndNote; 6 – 8 pages) - **(submit hardcopy & electronic copy)** → submit Molecular Modeling Preliminary Exercises	**9**
Jul 9 **R**	**Accelyrs Visualizer Modeling Activity #3 – Protein Identification and Structure/Function Analysis** Address Final Oral Presentation questions → submit final, properly formatted EndNote Reference List for entire semester (assignment #7) → submit 16-20 **Final PowerPoint slides #4** (email, include all revised slides)	**10**
Jul 14 **T**	**Accelyrs Visualizer Activity #4 – Introduction to Protein Data Bank** → 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) → submit completed Molecular Modeling Project Report & Computer Files	**11**
Jul 16 **R**	**Final (2nd) Student Oral Presentations (30 min each, 4 students)**	**12**
Jul 17 **F**	**Final (2nd) Student Oral Presentations (30 min each, 4 students)** Semester Wrap Up	**13**
Jul 21 **T**	**→ submit Revised Final 4160 Report (hardcopy printout and electronic copy), in lieu of Final Exam, by 1pm**	**14**