

## College to Career and Research

### Chem 4950 (CRN 22229)

### Spring 2020

Prerequisites:	Chem 2400 with grades of C or higher (can be corequisite) or instructor approval
Instructor:	<b>Dr. Gigi B. Ray, Courtland North 212, (404) 413-5540, <a href="mailto:gbray@gsu.edu">gbray@gsu.edu</a></b>
Class:	<b>Wednesdays &amp; Fridays 11:00 am–12:15pm, Petit Science Center 311 (3-credit) Meet individually with instructor weekly to discuss writing/presentations</b>
Office Hours:	<b>Mondays 1:00 – 2:30pm, and Fridays 2:00 – 3:00pm Individual appointments: Mon 11am -12pm, Thurs 12pm – 1pm, Fri 2pm – 4pm</b>
Textbook:: <i>none</i>	Class handouts will be posted on iCollege: <b>CHEMICAL RESEARCH Section 096 Spring Semester 2020</b>
Contacts:	<b>Kelsey Jordan, Science Librarian, <a href="mailto:kjordan44@gsu.edu">kjordan44@gsu.edu</a>, Library South, Suite 542</b>
Learning Objectives:	<p><b>Career Readiness and development of transferable skills &amp; competencies. Introduction to research in many areas of chemistry: Organic, Medicinal, Physical, Analytical, Computational, Biophysical, Biochemistry, and Geochemistry. Introduction to drug development, biosensors and patents.</b></p> <p>Explore potential career paths with a chemistry or biochemistry major, job search strategies, professional organizations, and career of well-known scientist.</p> <p>Prepare resume, personal statement, LinkedIn profile, individual development plan. Attend professional club meetings, research seminars and conferences.</p> <p>Explore options for undergraduate research, on and off-campus summer internships, scholarships, graduate school, dual degree BS/MS program, Honors Thesis. Prepare to join a research lab at GSU.</p> <p>Explore the scientific literature by examining a science research topic of interest, and the development of a well-known scientist's career.</p> <p>Develop information research skills by becoming familiar with use of scientific databases: SciFinder Scholar, Web of Science, PubChem &amp; PubMed. Become proficient with use of the EndNote reference management system.</p> <p>Develop science communication skills by effectively reading and writing papers, giving oral presentations (individually &amp; groups), and presenting posters. Learn to communicate scientific knowledge to variety of audiences. Develop teamwork skills.</p> <p>Become proficient in the use of ChemBioDraw Ultra &amp; Chem 3D software to represent chemical reactions and mechanisms.</p>
Grading for Chem 4950	<b>40 points:</b> Research Report <span style="float: right;"><b>Total points: 150</b></span> <b>5 points each:</b> Two Oral Presentations (Individual & Group), Two sets of PPT Slides, Poster, Database Assignment, Resume, CITI/Hazardous Waste Training, Career Assignment, Individual Development Plan, Personal Statement, Faculty Research Summary, LinkedIn Profile <b>10 points each:</b> Class attendance/participation, ChemDraw/Synthesis assignment <b>15 points each:</b> Attendance/Participation, Seminar & Conference Summaries

Grading Scale	<b>A+ 97%</b> <b>A 90%</b> <b>A- 87%</b> <b>B+ 84%</b> <b>B 80%</b> <b>B- 76%</b> <b>C+ 71%</b> <b>C 65%</b> <b>C- 59%</b> <b>D 50%</b> <b>F &lt;50%</b>
Assignments:	<p><b>Report Topics:</b></p> <ul style="list-style-type: none"> <li>(i) Discuss science topic of interest to student with a chemistry component (approved by instructor).</li> <li>(ii) Describe work &amp; career development of a famous, living research scientist, who is not at GSU or given seminar recently at GSU (approved by instructor)</li> </ul> <ol style="list-style-type: none"> <li><b>1) <u>Research Report</u>:</b> Write a research report on science topic, 3 – 5 pages of text, double spaced, with references in ACS style, using EndNote. 4 or more reference sources need to be used, with at least 3 from peer-reviewed journal articles: only one source can be a webpage. Check report in Grammarly and TurnItIn before submission. Each student will research a different topic.</li> <li><b>2) <u>Oral Presentations</u>:</b> Give 2 oral presentations to the class on two research topics, using PowerPoint slides. (i) Individual presentation on science topic, 6 – 8 mins, (ii) group presentation on scientist, 15 – 20 mins.</li> <li><b>3) <u>Poster (#9)</u>:</b> Present a poster on your first topic at the STEM Undergraduate Research Conference on Friday March 27<sup>th</sup>. Take a selfie by your poster.</li> <li><b>4) <u>Seminars (#6)</u>:</b> Attend 3 research seminars during the semester; at least 2 will be Chemistry seminars, and one can be from a related department (Biology, Neuroscience, MBD, CDT), or a professional club meeting. Submit a half page synopsis of the science presented (content) and discuss presentation style.</li> <li><b>5) <u>Conferences (#12)</u>:</b> Attend the Georgia State Undergraduate Research Conference (April 17). Submit summary of 3 posters &amp; discussion with presenters</li> <li><b>6) <u>Personal Statement (#7)</u>:</b> Submit a personal statement including why you are interested in science and your career goals.</li> <li><b>7) <u>Career Assignment (#4)</u>:</b> Submit 3 career descriptions &amp; training and experiences you will need to achieve these goals.</li> <li><b>8) <u>Resume (#2)</u>:</b> Submit a technical resume including skills &amp; experiences.</li> <li><b>9) <u>LinkedIn Profile (#11)</u>:</b> Create &amp; submit a professional profile with photo.</li> <li><b>10) <u>Individual Development Plan (#5)</u>:</b> Submit short &amp; long-term plans &amp; objectives</li> <li><b>11) <u>Synthesis Assignment (#8)</u>:</b> Using the ChemBioDraw software, students will create a drawing of a complex pharmaceutical compound, and reaction mechanisms (appropriate to their current chemistry lecture/lab course). Organic students will find a literature synthesis of a complex organic molecule and draw the reaction steps using ChemBioDraw, as well as a detailed mechanism step. Students will write a short 1-page explanation of the chemical transformations and types of reactions, and discuss the properties and uses of this molecule.</li> <li><b>12) <u>GSU Faculty Research (#10)</u>:</b> Write half-page summaries of the research area of 3 GSU STEM faculty; give a reference for, and include information from, one of their publications. Write an email introducing yourself to one of these faculty.</li> <li><b>13) <u>CITI (ethics) &amp; Hazardous Waste Training (#3)</u>:</b> Submit Completion Reports</li> </ol>

Policies:	<p><b>1) <u>Appointments:</u></b> Students will schedule 20-min appointments with the instructors every other week outside of class time to discuss their papers / presentation content and organization, and how to improve written work, PowerPoint slides, oral &amp; poster presentations (minimum 7 meetings/semester).</p> <p><b>2) <u>Attendance, timely arrival &amp; participation in ALL class meetings required:</u></b> If absent, it is the student's responsibility to makeup missed work. Students must pay attention to speaker (instructor, guest speaker, or classmate), <b>and NOT browse the internet or do other work during class.</b></p> <p><b>3) <u>Personal cell phones, iPhones, iPods, Blue tooth devices, headphones, and other electronic devices must be OFF during all classes.</u></b> Laptops and tablets will be allowed during some class meetings.</p> <p><b>4) <u>Submit hardcopy printouts of all assignments in class on due date:</u></b> Additionally, electronic copies of assignments &amp; research reports need to be submitted in <i>iCollege</i> dropbox that checks for content originality (use Turnitin). Late submissions will only be accepted as hardcopy printouts, submitted in person, up to one-week past the due date with loss of 10% points/day late.</p> <p><b>5) <u>Submitted work</u></b> must represent individual student effort (not plagiarized) and will be properly referenced.</p> <p><b>6) <u>Tuesday March 3<sup>rd</sup> is last day to withdraw from the class and receive "W"</u></b> 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): i) Give a WF to all students who are on their rolls but no longer taking the class. ii) Report the last day the student attended or turned in an assignment.</p>
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### CHEM 4950 – Spring 2020 TENTATIVE CLASS SCHEDULE (Subject to change)

Date	Day	Topics	Meeting
Jan 15	W	<ul style="list-style-type: none"> <li>• Introduction to Course &amp; Scientific Literature</li> <li>• Searching Databases – SciFinder Scholar</li> <li>• Students select Research Topic for Report 1</li> </ul>	1
Jan 17	F	<ul style="list-style-type: none"> <li>• Undergraduate Research, Internships, Summer Programs, Scholarships, Honors</li> <li>• STEM Course planning, Biochemistry Concentration, ACS Certification</li> </ul>	2
Jan 22	W	<ul style="list-style-type: none"> <li>• Careers in Chemistry and Biochemistry</li> <li>• Searching Databases: Web of Science, PubChem, PubMed</li> <li>• Finding Research Articles on Topic</li> <li>• Joining a Research Lab</li> </ul> <p style="margin-left: 20px;">→ Submit Database Assignment #1 and Title of Research Report</p>	3

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Date	Day	Topics	Meeting
Jan 24	F	<ul style="list-style-type: none"> <li>• <b>Speaker: GSU Career Services: Job Searching Strategies, Resumes, Career Options &amp; Planning</b></li> <li>→ <i>Submit PDF files of 2 Articles on Research Topic (1 review)</i></li> </ul>	4
Jan 28	T	Attend Student Organization Fair (11am – 2pm), Student Center East	
Jan 29	W	<ul style="list-style-type: none"> <li>• <b>Speaker: Dr. Suazette Mooring - Individual Development Plans</b></li> <li>• <b>Effective Writing in the Sciences, Avoiding Plagiarism</b></li> <li>→ <i>Submit Outline for Research Report</i></li> </ul>	5
Jan 31	F	<ul style="list-style-type: none"> <li>• <b>Speaker: Dr. Ming Luo (Biochemistry, Virology)</b></li> <li>→ <i>Submit Abstract (Thesis Paragraph) for Research Report</i></li> </ul>	6
Feb 5	W	<ul style="list-style-type: none"> <li>• <b>Speaker: Dr. Victoria Mariani – Writing Personal Statements</b></li> <li>• <b>Preparing Oral Presentations, and Delivery Techniques</b></li> <li>→ <i>Submit Resume #2</i></li> <li>→ <i>Submit CITI and Hazardous Waste training completion reports #3</i></li> </ul>	7
Feb 6	R	Attend Internship & Co-Op Fair (11am – 3pm), Student Center East	
Feb 7	F	<ul style="list-style-type: none"> <li>• <b>Speaker: Dr. Ning Fang (Analytical, Biophysics, Nanoscience)</b></li> <li>→ <i>Submit Career Assignment #4 &amp; Individual Development Plan #5</i></li> <li>→ <i>Submit 1<sup>st</sup> Seminar Synopsis #6A</i></li> </ul>	8
Feb 12	W	<ul style="list-style-type: none"> <li>• <b>Using Reference Management (EndNote) &amp; ACS Style Bibliography</b></li> <li>→ <i>Submit 1<sup>st</sup> PowerPoint</i></li> </ul>	9
Feb 14	F	<ul style="list-style-type: none"> <li>• <b>Speaker: Maged Henary (Organic, Medicinal Chemistry)</b></li> <li>→ <i>Submit Research Report on Science Topic (hardcopy printout and electronic copy via iCollege TurnItIn with below 10% similarity score)</i></li> </ul>	10
Feb 19	W	<ul style="list-style-type: none"> <li>• <b>Drawing Structures and Organic Reactions Using ChemBioDraw (Synthesis Assignment)</b></li> <li>→ <i>Submit Personal Statement #7</i></li> <li>→ <i>Submit PowerPoint for Individual Oral Presentation (via iCollege)</i></li> </ul>	11
Feb 21	F	<ul style="list-style-type: none"> <li>• <b>Speaker: Dr. David Ashley (Public Health, Environmental Chemistry)</b></li> </ul>	12
Feb 26	W	<ul style="list-style-type: none"> <li>• <b>Individual Student Oral Presentation (6 students)</b></li> <li>• <b>Preparing and Presenting Technical Posters &amp; Sample Posters</b></li> </ul>	13
Feb 28	F	<ul style="list-style-type: none"> <li>• <b>Individual Student Oral Presentation (5 students)</b></li> <li>→ <i>Submit 2<sup>nd</sup> Seminar Synopsis #6B</i></li> </ul>	14
Mar 3	T	Last day to Withdraw and possibly receive a W	
Mar 4	W	<ul style="list-style-type: none"> <li>• <b>Individual Student Oral Presentation (5 students)</b></li> <li>• <b>Discuss 2<sup>nd</sup> Group Oral Presentation on Famous Scientist</b></li> <li>→ <i>Submit Individual Poster Draft</i></li> </ul>	15
Mar 6	F	<ul style="list-style-type: none"> <li>• <b>Speaker: Jun Yin (Chemical Biology, Cell Signaling)</b></li> <li>→ <i>Submit Revised Research Report and EndNote Library</i></li> </ul>	16

## CHEM 4950 – Spring 2020 TENTATIVE CLASS SCHEDULE (Subject to change)

Date	Day	Topics	Meeting
Mar 11	W	<ul style="list-style-type: none"> <li>• Visualizing Structures Using ChemDraw 3D &amp; Finish Synthesis</li> <li>• Discuss Creating an Elevator Pitch</li> <li>➔ Submit 3' x 4' Individual Poster</li> <li>➔ Submit Name of Scientist &amp; Research Area for Group Project</li> </ul>	17
Mar 13	F	<ul style="list-style-type: none"> <li>• Speaker: Samer Gozem (Computational Chemistry, Photobiology)</li> <li>➔ Submit ChemBioDraw (Synthesis) Assignment #8</li> <li>➔ Submit an informative article about Scientist for Group Project</li> </ul>	18
<i>Mar 16-20</i>		<b>Spring Break, no class</b>	
Mar 23	M	➔ Submit Finalized 3' x 4' Individual Poster for printing #9	
Mar 25	W	<ul style="list-style-type: none"> <li>• Presentations of Elevator Pitch &amp; Joining a Research Lab</li> <li>➔ Submit 3 - 4 Articles for Group Scientist Project, including at least 2 Original Articles Written by Scientist (1 article per student)</li> </ul>	19
Mar 27	F	<ul style="list-style-type: none"> <li>• Discussion Group for Presentation on Famous Scientist</li> <li>• Present Poster at STEM Undergraduate Research Conference (1-4pm)</li> </ul>	20
Mar 27	F	<b>Attend Chemistry Graduate Student Association Symposium</b>	
Apr 1	W	<ul style="list-style-type: none"> <li>• Creating Professional LinkedIn Website</li> <li>➔ Submit 3<sup>rd</sup> seminar synopsis #6C</li> <li>➔ Submit Abstract (Summary) of Famous Scientist for Group Project</li> </ul>	21
Apr 3	F	<ul style="list-style-type: none"> <li>• Speaker: Nadine Kabengi (Geochemistry, Surface Chemistry)</li> <li>➔ Submit draft of PowerPoint for group presentation on scientist</li> </ul>	22
Apr 8	W	<ul style="list-style-type: none"> <li>• Undergraduate Research Student Panel</li> <li>➔ Submit Revised Resume (also reviewed by Career Services) #2B</li> <li>➔ Submit Revised Personal Statement #7B</li> </ul>	23
Apr 10	F	<ul style="list-style-type: none"> <li>• Speaker: Eric Huddleston (Polymer Chemistry)</li> <li>➔ Submit summary of 3 GSU Faculty Research projects of interest #10</li> </ul>	24
Apr 15	W	<ul style="list-style-type: none"> <li>• Exploring Graduate School, BS/MS Dual Degree (Rene Mondy), Honors Thesis, and National Scholarships.</li> <li>➔ Submit Final PowerPoint for Group Oral Presentation on Scientist</li> </ul>	25
Apr 17	F	• <b>Attend Georgia State Undergraduate Research Conference (GSURC)</b>	26
Apr 22	W	• <b>Group Student Oral Presentations (3 Groups)</b>	27
Apr 24	F	<ul style="list-style-type: none"> <li>• <b>Group Student Oral Presentations (2 Groups)</b></li> <li>• Peer evaluation of group project</li> <li>• Course Wrap-Up</li> </ul>	28
Apr 27	M	➔ Submit Professional LinkedIn profile #11 and Summary of three conference posters #12, in lieu of Final Exam (by 4pm)	

## **Websites:**

- GSU Career Services: <http://career.gsu.edu/>
- Chemistry Department webpage: <http://chemistry.gsu.edu/>  
Research (Area of Focus), Faculty Research Brochure, Undergraduate Resources, Seminars (Fridays 3:0 – 4:30pm, PSC 101): <https://chemistry.gsu.edu/spring-2020-seminars/>
- GSU Center for Diagnostics & Therapeutics: <https://cdt.gsu.edu/>  
CDT Seminars: <https://cdt.gsu.edu/events-and-seminars-2/current-events-and-seminars/>
- Molecular Basis of Disease: <https://mbd.gsu.edu/>  
MBD Seminars: <https://mbd.gsu.edu/events/>
- GSU STEM Resources: <http://cas.gsu.edu/stem/>
- Center for the Advancement of Students and Alumni (CASA) - graduate studies <http://casa.gsu.edu>
- Library Resources: <http://research.library.gsu.edu/chemistry>  
SciFinder-n Access: <https://research.library.gsu.edu/scifinderscholar>
- Honors Resources: <http://honors.gsu.edu/research/>
- Chemistry & Engineering News: <http://cen.acs.org/index.html>
- American Chemical Society:  
<https://www.acs.org/content/acs/en/careers/college-to-career/chemistry-careers.html>

## **Spring 2020 Events:**

- **Wednesday Jan 22** – On Campus Job Fair (10am – 1pm), Dahlberg Hall, [career.gsu.edu](http://career.gsu.edu)
- **Tuesday Jan 28** – Student Organization Fair (clubs) (11am-2pm), Student Center East Ballrooms
- **Thursday Feb 6** – Internship & Co-Op Fair (11am - 3pm) Student Center, [career.gsu.edu](http://career.gsu.edu)
- **Saturday Mar 21** – Atlanta Science Festival (11am – 4pm), Piedmont Park, [atlantasciencefestival.org](http://atlantasciencefestival.org)
- **Friday Mar 27** – Undergraduate STEM Research Conference, NSC 5<sup>th</sup> Floor, (1 – 4 pm)  
[cas.gsu.edu/stem](http://cas.gsu.edu/stem)
- **Friday Mar 27** – Chemistry Graduate Student Association Research Symposium, PSC 101  
(3:30pm oral presentations, 5:30pm posters)
- **Friday Apr 17** – Georgia State Undergraduate Research Conference,  
(9am-5pm) Student Center, [gsurc.honors.gsu.edu](http://gsurc.honors.gsu.edu)

## **Professional Student Clubs:**

<https://cas.gsu.edu/academics-admissions/undergraduate-learning/stem-education-programs/resources/>

- Chemistry Club – ACS Student Affiliate (ChemClub)
- Undergraduate STEM Research Society (USRS)
- American Medical Student Association (AMSA)
- Pre-Pharmacy Professional Society (PPPS)
- American Undergraduate Dental Association (AUDA)
- Pre-Physicians Assistant Association
- Minority Association of Pre-Health Students (MAPS)
- Beta Beta Beta National Biological Honors Society (TriBeta)



### Career Management

- articulate interests, skills, and values
- set and achieve goals
- show attention to detail
- demonstrate an awareness to digital presence
- identify support groups needed to achieve goals

### Critical Thinking/Problem Solving

- conduct academic and archival research
- connect valid research to support arguments/claims
- provide useful summaries/precis

### Digital Technology

- demonstrate technical and program literacy
- create audience-appropriate layouts
- know and apply field-related technology to solve challenges

### Oral/Written Communication

- communicate to a mass audience
- use presentation software effectively
- edit and publish material

### Professionalism/Work Ethic

- meet deadlines
- accept responsibility
- solicit and adjust to feedback

### Teamwork/Collaboration

- collaborate in group projects
- assist in organizing and planning
- participate in collaborative writing
- follow through on tasks

### Global/Intercultural Fluency

- show an awareness of diverse perspectives
- approach team/group communication with sensitivity and openness

## CHEM 4950: College to Career and Research

Course provides students a structured path to career readiness competencies and the development of transferable skills.

It is linked to Georgia State's College to Career Program which seeks to address both student learning outcomes and student success.

The overall aim of the plan is to help students become:

- **aware** of the career-readiness competencies that are most valued by employers
- **understand the connections** between their educational experiences and the career-readiness competencies they are developing
- **demonstrate** through a variety of media and settings the career-readiness competencies that they have acquired

Career-readiness competencies are based on the National Association of Colleges and Employers (NACE) competencies.