

# Chemistry 220L: Inorganic & Physical Chem Lab (1h)

Fall 2017, 2-5 pm

Bullock Science Center Room 310W (pre-lab in BSC308)

**Chemistry 220L: Inorganic & Physical Chem Lab:** Laboratory courses introduce students to the analysis and interpretation of observations. This particular course will also illustrate fundamental principles of chemistry including: reactivity of main group and transition metals; bonding and its relation to behavior; solution behavior; gas laws; heat capacity and enthalpy changes; and kinetics of reactions.

**Prerequisite:** CHE-150; CHE-150L (minimum grade of C- in each)

**Corequisite:** CHE-220L

**Learning Outcomes:** Students will have:

- 1) Increased knowledge and understanding of physical and inorganic chemistry concepts
- 2) Acquired basic laboratory skills relevant to physical and inorganic chemistry
- 3) Increased ability to analyze and discuss scientific data
- 4) Increased collaboration and communication skills
- 5) Honed scientific writing skills developed in Che 150

**Required Course Materials:** Lab goggles or safety glasses, a scientific calculator, a blue or black pen, and some kind of notebook for use in the laboratory (to record weights and measurements and comments etc).

**Recommended Course Materials:** Any general chemistry textbook

**Lab Manual:** The lab manual is available as a series of files on the lab course's *Moodle* site (<http://courses.agnesscott.edu/>)

**Attendance:** Attendance to all laboratory and pre-lab sessions is **required**. If you miss a lab, you will receive a zero grade for that missed lab. However, if you know in advance that your attendance is not possible because of (i) death of an immediate family member, (ii) observance of religious holidays or (iii) participation in events or activities sponsored by the college, you should provide the professor with an excused absence explanation in writing as soon as possible and no later than 24 hours *before* the missed lab. If you become seriously ill or injured or experience an emergency that will require you to miss a lab at short notice, you should notify the office of the dean of students (x6391) of your situation as soon as possible (and you should ask the dean of students to contact your professors on your behalf). Your instructor will likely take an average of your other lab reports when assigning your final grade.

**Punctuality:** Please be on time for class. If you miss the pre-lab session, you may have missed vital safety discussions and you should report to the instructor prior to working in the lab. If the lateness is unexcused, you will not be allowed to attend lab and will receive a grade of zero for that lab. *Please note:* Students arriving late to lab will **NOT** be given extra time to complete the lab.

**Lab Time:** Due to liability concerns, students must have finished all laboratory work and have their workspace cleaned by the end of the scheduled lab time (5pm).

**Teamwork:** At the beginning of the semester, you will be assigned a team. Your team will work together for the entire semester, and you will be assigned a team role each lab session. This is to encourage you to learn to work together, to give you time to learn the roles, and to practice negotiating responsibilities.

### ***Team Roles***

While each role carries with it a set of responsibilities, the team will not function if it does not work together towards a common goal. The experimental work cannot not be completed accurately and in a timely fashion unless each person is a fully contributes to the endeavor. The responsibilities and expectations for the individual roles are as follows:

**Manager:** Oversees the lab session and lab report. This includes organizing and delegating work, handling time management issues within the team, calling team meetings, obtaining and perusing the Material Safety Data Sheet (MSDS) for each chemical and reporting safety issues to team. Also responsible for making sure that every member of the group has working knowledge of the whole experiment, writing the introduction/purpose and conclusion of the lab report, and turning in the final version of the lab report to the instructor.

**Chemist:** Oversees the preparation, handling, and disposal of the chemicals. This may include deciding what chemicals/solutions and amounts needed, deciding volumes and concentration of solutions to be prepared, and performs necessary calculations. Also responsible for assisting in data analysis and writing the results section of a lab report.

**Technician:** Oversees the setting up of the experiment. This may include gathering and reading background material and training fellow team members on use of an instrument and recording all data obtained during an experiment. Also responsible for assisting in data analysis and writing the procedure section of a lab report.

**NOTE:** *If your team has only two members, one member will serve as the Manager and the other as the Technician. The manager will divide up the Chemist responsibilities.*

### **Course Structure:**

Before each lab session, you should read the laboratory procedure found on Moodle and take a pre-lab quiz (for more information see below).

During the lab afternoon, you will first meet in BSC 308 with your team to discuss the lab and obtain additional instruction from the laboratory instructor. Each team member should be able to articulate the purpose of the lab, and the lab work should be organized and delegated to each member. Your team should then proceed to the laboratory in BSC 310W. You will complete the lab together, carry out calculations, analyze your data and draw valid conclusions based on your data analysis. You may choose to begin typing your group report during the laboratory afternoon if time permits (computers are available in BSC304W).

After lab, each group will be responsible for submitting a typed lab report for the first 7 labs. All members of the group should collaborate during the production of these reports. A document on our Moodle site contains detailed guidelines for lab reports. All reports are due by 2pm on the due date (see due date schedule in table below).

**Pre-Lab Online Quizzes:** Prior to each lab there will be an online quiz worth 10 points that each student must take prior to the laboratory period. These quizzes will be available on Moodle starting one week before the due date and will be removed for grading at 1:30 pm the day of lab. Students will receive a grade of zero on a quiz that is not taken before the scheduled laboratory session. These quizzes are open note and open book. You have unlimited time to complete the quiz, but can only make one attempt at your online quiz. Your lowest quiz score will be dropped.

**Grading:** There will be 8 chemistry labs (see the table below or *Moodle* for the schedule) and there will be 8 pre-lab quizzes. Your team will turn in 7 typed reports. The nine-solutions lab does not have a lab report associated with it, and you will just turn in your work prior to leaving the laboratory afternoon. Each team member receives the team grade for that report or worksheet. If your team does not submit your report on time, each team member's score will be reduced by three (3) points per day (deducted from the team report grade), including Saturdays and Sundays, up to a maximum of 7 days. After 7 days the report will no longer be accepted.

Pre-lab quizzes (lowest 1 dropped)	20%
Typed lab reports	70%
The completed worksheet for the nine-solutions lab	10%

Grades will be assigned according to the following scale: 93-100 A; 90-92 A-; 87-89 B+; 83-86 B; 80-82 B-; 77-79 C+; 73-76 C; 70-72 C-; 67-69 D+; 63-66 D; 60-62 D-; < 60 F.

### **Plagiarism**

Each student is responsible for his or her own laboratory notebook and quiz answers. Laboratory reports will be completed in collaboration with other members of your group. Collaboration in the laboratory is encouraged, however, each notebook should reflect individual effort. Students should not "cut and paste" from the materials on Moodle. Reference any sources used. A student may use information from their laboratory notebook and textbooks to assist them during their weekly quiz; however, each student's quiz answers should be obtained through individual effort.

**Resource Center for Math and Science (RCMS):** The *Science Learning Center* (branch of the RCMS) is staffed by science learning assistants (LAs). The LAs are happy to answer questions about your lab, and the center is a great place to work on your reports with other students. The location is the ground floor of Campbell, and the hours are posted outside the learning center.

### **Proper Lab Attire**

*Shoes:* Closed toe. No flip-flops or crocs. If you wear improper shoes, you will be asked to change and return to lab.

*Clothing:* Shoulders and back covered (NO TANKS), no bare midriffs, and clothing must reach the knee. If your lab attire does not follow these rules, you must wear a lab apron or lab coat. Lab aprons are provided in the lab. Failure to comply with this policy will result in the student being asked to change and return to lab.

*Eye Protection:* Goggles or lab glasses must be worn at all times.

### **End of Semester Course Evaluations**

Course evaluations will be conducted on-line at the end of the semester. I encourage your participation as your feedback is essential in helping me provide the best learning experience possible for future students.

### **Pregnant Women, Nursing Mothers or Immuno-suppressed Individuals**

These individuals should be aware that they may receive unwanted exposure to some chemicals in the lab. Official guidelines and resources are available from Alix Valcin (BSC101W) to assist you in making an informed decision about taking or continuing with this course. The guidelines recommend that you also:

1. Obtain a list of chemicals that will be in use in the course (see your instructor).
2. Take this information to your doctor, consult with the physician about the risks involved, and obtain advice from the doctor about taking or continuing the course.
3. The doctor should provide the chemistry department and your adviser with a letter indicating whether you should continue or drop the course. If the doctor advises dropping, the letter must indicate that you should not continue in the course due to a heightened health risk from exposure to substances used in the lab.

*If you do decide to drop the course, the chemistry department and the Academic Standards Committee will work on a solution to accommodate your academic needs.*

**Accommodations:** Agnes Scott College seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in this class, please contact Kelly Deasy in the Office of Academic Advising (X6150) to make or complete the registration process. Once registered, please contact Dr. Winget by email in order to make an appointment to discuss the specific accommodations needed for this course.

**Inclusion:** This course adheres to the principles of diversity and inclusion integral to the Agnes Scott community. We respect people from all backgrounds and recognize the differences among our students, including racial and ethnic identities, religious practices, and gender expressions. We strive for our campus to be a safe space in which all students feel acknowledged and supported. We request and invite your thoughtful and constructive feedback on ways that we can, as a community of learners, respectfully assist and challenge one another in our individual and collective work.

**Title IX:** For the safety of the entire community, any incidence of, or information about, sexual misconduct must be reported immediately to Title IX Coordinator Marti Fessenden ([mfessenden@agnesscott.edu](mailto:mfessenden@agnesscott.edu), 404-471-6547), Deputy Title IX Coordinator Karen Gilbert ([kgilbert@agnesscott.edu](mailto:kgilbert@agnesscott.edu), 404-471-6435), or Vice President for Student Life and Dean of Students Karen Goff ([kgoff@agnesscott.edu](mailto:kgoff@agnesscott.edu), 404-471-6449).

*This course adheres to the principles of diversity and inclusion integral to the Agnes Scott community. We respect people from all backgrounds and affirm people's decisions about gender expression and identity. Please feel free to correct Dr. Winget if your preferred name or gender pronoun are different from that listed on the class roster.*

**Chemistry 220L**  
**Fall 2017**  
**Schedule of Lab Experiments**

<b>Week</b>	<b>Lab</b>	<b>Due in Lab</b>
8/21	<b>No Lab – First week of classes</b>	--
8/28	Lab 1 – Thermodynamics	--
9/4	<b>No lab – Labor Day</b>	--
9/11	Lab 2 – Gas Laws	Lab 1
9/18	<b>No lab this week</b>	--
9/25	Lab 3 – Investigating Chemical Equilibrium	Lab 2
10/2	Lab 4 - Nine Solutions (report due at the end of the lab period)	Lab 3
10/9	<b>No lab – Fall Break this week</b>	--
10/16	Lab 5 – Metal Activity Series	--
10/23	Lab 6 - Electrochemistry	Lab 5
10/30	Lab 7 – Synthesis of Nickel Complexes of Ethylenediamine	Lab 6
11/6	Lab 8 – Kinetics Part 1	--
11/13	Lab 7 continued – Finish Nickel lab	--
11/20	<b>No Lab – Thanksgiving Break Week</b>	--
11/27	Lab 8 continued – Kinetics Part 2	Lab 7
12/4	<b>No Lab – Last week of classes</b>	Lab 8