

RECEIVED

FEB 26 2014

OFFICE OF THE  
SENATE COUNCIL**Course Information**

Date Submitted: 10/30/2013

Current Prefix and Number: CHE - Chemistry , CHE 412G INORGANIC CHEMISTRY LABORATORY

Other Course:

Proposed Prefix and Number: CHE 412

What type of change is being proposed?

Major Change

Should this course be a UK Core Course? No

**1. General Information**

a. Submitted by the College of: College of Arts &amp; Sciences

b. Department/Division: Chemistry

c. Is there a change in 'ownership' of the course? No

If YES, what college/department will offer the course instead: Select...

e. Contact Person

Name: Arthur Cammers

Email: a.cammers@uky.edu

Phone: 8593238977

Responsible Faculty ID (if different from Contact)

Name:

Email:

Phone:

f. Requested Effective Date

Semester Following Approval: Yes OR Effective Semester:

**2. Designation and Description of Proposed Course**

a. Current Distance Learning (DL) Status: N/A

b. Full Title: INORGANIC CHEMISTRY LABORATORY

Proposed Title: INORGANIC CHEMISTRY LABORATORY

c. Current Transcript Title: INORGANIC CHEMISTRY LABORATORY

Proposed Transcript Title: INORGANIC CHEMISTRY LABORATORY

d. Current Cross-listing: none

Proposed – ADD Cross-listing :

Proposed – REMOVE Cross-listing:

e. Current Meeting Patterns

LABORATORY: 6

Proposed Meeting Patterns

LABORATORY: 6

f. Current Grading System: ABC Letter Grade Scale

Proposed Grading System: PropGradingSys

g. Current number of credit hours: 2

Proposed number of credit hours: 2

h. Currently, is this course repeatable for additional credit? No

Proposed to be repeatable for additional credit? No

If Yes: Maximum number of credit hours:

If Yes: Will this course allow multiple registrations during the same semester? No

2i. Current Course Description for Bulletin: A laboratory course that will acquaint the student with the synthesis, characterization and properties of inorganic and organometallic compounds of both main-group and transition elements. Laboratory, six hours per week.

Proposed Course Description for Bulletin: A laboratory course that will acquaint the student with the synthesis, characterization and properties of inorganic and organometallic compounds of both main-group and transition elements. Laboratory, six hours per week.

2j. Current Prerequisites, if any: Prereq: CHE 410G; Prereq or concur: a physical chemistry course at or above the 400 level.

Proposed Prerequisites, if any: Prereq: CHE 410G; Prereq or concur: a physical chemistry course at or above the 400 level.

2k. Current Supplementary Teaching Component:

Proposed Supplementary Teaching Component: No Change

3. Currently, is this course taught off campus? No

Proposed to be taught off campus? No

If YES, enter the off campus address:

4. Are significant changes in content/student learning outcomes of the course being proposed? No

If YES, explain and offer brief rationale:

5a. Are there other depts. and/or pgms that could be affected by the proposed change? No

If YES, identify the depts. and/or pgms:

5b. Will modifying this course result in a new requirement of ANY program? No

If YES, list the program(s) here:

6. Check box if changed to 400G or 500: No

## Distance Learning Form

Instructor Name:

Instructor Email:

Internet/Web-based: No

Interactive Video: No

Hybrid: No

1. How does this course provide for timely and appropriate interaction between students and faculty and among students? Does the course syllabus conform to University Senate Syllabus Guidelines, specifically the Distance Learning Considerations?

2. How do you ensure that the experience for a DL student is comparable to that of a classroom-based student's experience? Aspects to explore: textbooks, course goals, assessment of student learning outcomes, etc.

3. How is the integrity of student work ensured? Please speak to aspects such as password-protected course portals, proctors for exams at interactive video sites; academic offense policy; etc.

4. Will offering this course via DL result in at least 25% or at least 50% (based on total credit hours required for completion) of a degree program being offered via any form of DL, as defined above?

If yes, which percentage, and which program(s)?

5. How are students taking the course via DL assured of equivalent access to student services, similar to that of a student taking the class in a traditional classroom setting?

6. How do course requirements ensure that students make appropriate use of learning resources?

7. Please explain specifically how access is provided to laboratories, facilities, and equipment appropriate to the course or program.

8. How are students informed of procedures for resolving technical complaints? Does the syllabus list the entities available to offer technical help with the delivery and/or receipt of the course, such as the Information Technology Customer Service Center (<http://www.uky.edu/UKIT/>)?

9. Will the course be delivered via services available through the Distance Learning Program (DLP) and the Academic Technology Group (ATL)? NO

If no, explain how student enrolled in DL courses are able to use the technology employed, as well as how students will be provided with assistance in using said technology.

10. Does the syllabus contain all the required components? NO

11.I, the instructor of record, have read and understood all of the university-level statements regarding DL.

Instructor Name:

SIGNATURE|MEIER|Mark S Meier|CHE 412G CHANGE Dept Review|20130615

SIGNATURE|RHANSON|Roxanna D Hanson|CHE 412G CHANGE College Review|20131106

SIGNATURE|JMETT2|Joanie Ett-Mims|CHE 412G CHANGE Undergrad Council Review|20140226

Courses	Request Tracking
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### Course Change Form

<https://myuk.uky.edu/sap/bc/soap/rfc?services=>

Generate R

[Open in full window to print or save](#)

Attachments:

<input type="button" value="Browse..."/>		Upload File				
<table border="1"> <thead> <tr> <th>ID</th> <th>Attachment</th> </tr> </thead> <tbody> <tr> <td>Delete 3082</td> <td>CHE 412 syllabus revised.docx</td> </tr> </tbody> </table>	ID	Attachment	Delete 3082	CHE 412 syllabus revised.docx		
ID	Attachment					
Delete 3082	CHE 412 syllabus revised.docx					
<input type="button" value="First"/> <input type="button" value="1"/> <input type="button" value="Last"/>						

Select saved project to retrieve...

Get New

NOTE: Start form entry by choosing the Current Prefix and Number (\*denotes required fields)

Current Prefix and Number:	CHE - Chemistry CHE 412G INORGANIC CHEMISTRY LABORATORY	Proposed Prefix & Number:	CHE 412
What type of change is being proposed?		<input checked="" type="checkbox"/> Major Change <input type="checkbox"/> Major - Add Distance Learning <input type="checkbox"/> Minor - change in number within the same hundred series, except 799 is the same "hundred series" <input type="checkbox"/> Minor - editorial change in course title or description which does not change in content or emphasis <input type="checkbox"/> Minor - a change in prerequisite(s) which does not imply a change in course content or emphasis, or which is made necessary by the elimination or significant alteration of the prerequisite(s) <input type="checkbox"/> Minor - a cross listing of a course as described above	
Should this course be a UK Core Course? <input type="radio"/> Yes <input checked="" type="radio"/> No			
If YES, check the areas that apply:			
<input type="checkbox"/> Inquiry - Arts & Creativity <input type="checkbox"/> Composition & Communications - II <input type="checkbox"/> Inquiry - Humanities <input type="checkbox"/> Quantitative Foundations <input type="checkbox"/> Inquiry - Nat/Maths/Phys Sci <input type="checkbox"/> Statistical Inferential Reasoning <input type="checkbox"/> Inquiry - Social Sciences <input type="checkbox"/> U.S. Citizenship, Community, Diversity <input type="checkbox"/> Composition & Communications - I <input type="checkbox"/> Global Dynamics			
1. General Information			
a.	Submitted by the College of: College of Arts & Sciences	Submission Date:	10/30/2013
b.	Department/Division: Chemistry		
c.*	Is there a change in "ownership" of the course? <input type="radio"/> Yes <input checked="" type="radio"/> No If YES, what college/department will offer the course instead? Select...		
e.*	* Contact Person Name: Arthur Cammers	Email: a.cammers@uky.edu	Phone: 8593238977
	* Responsible Faculty ID (if different from Contact):	Email:	Phone:
f.*	Requested Effective Date:	<input checked="" type="checkbox"/> Semester Following Approval	OR Specific Term: <sup>2</sup>
2. Designation and Description of Proposed Course.			
a.	Current Distance Learning(DL) Status:	<input checked="" type="radio"/> N/A <input type="radio"/> Already approved for DL* <input type="radio"/> Please Add <input type="radio"/> Please Drop	
*If already approved for DL, the Distance Learning Form must also be submitted unless the department affirms (by checking this box ) that the proposed changes affect DL delivery.			
b.	Full Title: INORGANIC CHEMISTRY LABORATORY	Proposed Title: *	INORGANIC CHEMISTRY LABORATORY

c.	Current Transcript Title (if full title is more than 40 characters):	INORGANIC CHEMISTRY LABORATORY			
c.	Proposed Transcript Title (if full title is more than 40 characters):	INORGANIC CHEMISTRY LABORATORY			
d.	Current Cross-listing:	<input checked="" type="checkbox"/> N/A	OR	Currently <sup>2</sup> Cross-listed with (Prefix & Number):	none
	Proposed – ADD <sup>3</sup> Cross-listing (Prefix & Number):				
	Proposed – REMOVE <sup>3,4</sup> Cross-listing (Prefix & Number):				
e.	Courses must be described by at least one of the meeting patterns below. Include number of actual contact hours <sup>5</sup> for each meeting pattern				
Current:	Lecture	Laboratory <sup>5</sup>	Recitation	Discussion	Indep. Study
		6			
	Clinical	Colloquium	Practicum	Research	Residency
	Seminar	Studio	Other: Please explain:		
Proposed: *	Lecture	Laboratory <sup>5</sup>	Recitation	Discussion	Indep. Study
		6			
	Clinical	Colloquium	Practicum	Research	Residency
	Seminar	Studio	Other: Please explain:		
f.	Current Grading System:	ABC Letter Grade Scale			
	Proposed Grading System:*	<input checked="" type="radio"/> Letter (A, B, C, etc.) <input type="radio"/> Pass/Fail <input type="radio"/> Medicine Numeric Grade (Non-medical students will receive a letter grade) <input type="radio"/> Graduate School Grade Scale			
g.	Current number of credit hours:	2	Proposed number of credit hours:*	2	
h.*	Currently, is this course repeatable for additional credit?				<input type="radio"/> Yes <input checked="" type="radio"/> No
*	Proposed to be repeatable for additional credit?				<input type="radio"/> Yes <input checked="" type="radio"/> No
	If YES:	Maximum number of credit hours:			
	If YES:	Will this course allow multiple registrations during the same semester?			<input type="radio"/> Yes <input checked="" type="radio"/> No
i.	Current Course Description for Bulletin:				
	A laboratory course that will acquaint the student with the synthesis, characterization and properties of inorganic and organometallic compounds of both main-group and transition elements. Laboratory, six hours per week.				
*	Proposed Course Description for Bulletin:				
	A laboratory course that will acquaint the student with the synthesis, characterization and properties of inorganic and organometallic compounds of both main-group and transition elements. Laboratory, six hours per week.				
j.	Current Prerequisites, if any:				
	Prereq: CHE 410G; Prereq or concur: a physical chemistry course at or above the 400 level.				
*	Proposed Prerequisites, if any:				
*					

Prereq: CHE 410G; Prereq or concur: a physical chemistry course at or above the 400 level.			
k. Current Supplementary Teaching Component, if any:	<input type="radio"/> Community-Based Experience <input type="radio"/> Service Learning <input type="radio"/> Both		
Proposed Supplementary Teaching Component:	<input type="radio"/> Community-Based Experience <input type="radio"/> Service Learning <input type="radio"/> Both <input checked="" type="radio"/> No Change		
3. Currently, is this course taught off campus?	<input type="radio"/> Yes <input checked="" type="radio"/> No		
* Proposed to be taught off campus?	<input type="radio"/> Yes <input checked="" type="radio"/> No		
If YES, enter the off campus address:			
4.* Are significant changes in content/student learning outcomes of the course being proposed?	<input type="radio"/> Yes <input checked="" type="radio"/> No		
If YES, explain and offer brief rationale:			
5. Course Relationship to Program(s).			
a.* Are there other depts and/or pgms that could be affected by the proposed change?	<input type="radio"/> Yes <input checked="" type="radio"/> No		
If YES, identify the depts. and/or pgms:			
b.* Will modifying this course result in a new requirement <sup>2</sup> for ANY program?	<input type="radio"/> Yes <input checked="" type="radio"/> No		
If YES <sup>2</sup> , list the program(s) here:			
6. Information to be Placed on Syllabus.			
a. <input type="checkbox"/>	<table border="0" style="width:100%;"> <tr> <td style="width: 30%; vertical-align: top;">           Check box if changed to 400G or 500.         </td> <td style="vertical-align: top;">           If changed to 400G- or 500-level course you must send in a syllabus and you must include the differentiation between under and graduate students by: (i) requiring additional assignments by the graduate students; and/or (ii) establishing different grad criteria in the course for graduate students. (See SR 3.1.4.)         </td> </tr> </table>	Check box if changed to 400G or 500.	If changed to 400G- or 500-level course you must send in a syllabus and you must include the differentiation between under and graduate students by: (i) requiring additional assignments by the graduate students; and/or (ii) establishing different grad criteria in the course for graduate students. (See SR 3.1.4.)
Check box if changed to 400G or 500.	If changed to 400G- or 500-level course you must send in a syllabus and you must include the differentiation between under and graduate students by: (i) requiring additional assignments by the graduate students; and/or (ii) establishing different grad criteria in the course for graduate students. (See SR 3.1.4.)		

<sup>1</sup>See comment description regarding minor course change. *Minor changes are sent directly from dean's office to Senate Council Chair.* If Chair deems the change as "not minor," the form will be sent to appropriate academic Council for normal processing and contact person is informed.

<sup>2</sup>Courses are typically made effective for the semester following approval. No course will be made effective until all approvals are received.

<sup>3</sup>Signature of the chair of the cross-listing department is required on the Signature Routing Log.

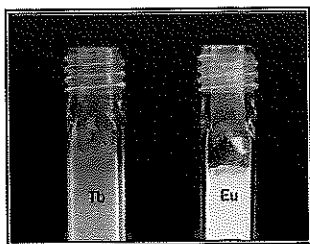
<sup>4</sup>Removing a cross-listing does not drop the other course – it merely unlinks the two courses.

<sup>5</sup>Generally, undergrad courses are developed such that one semester hr of credit represents 1 hr of classroom meeting per wk for a semester, exclusive of any lab meeting. Lab meeting generally two hrs per wk for a semester for 1 credit hour. (See SR 6.2.1.)

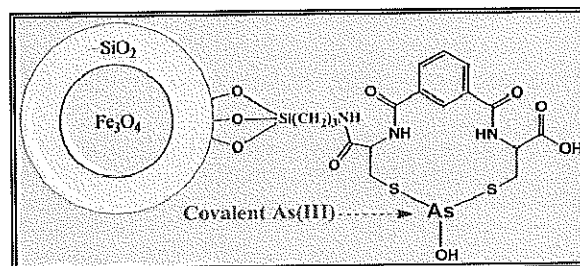
<sup>6</sup>You must also submit the Distance Learning Form in order for the course to be considered for DL delivery.

<sup>7</sup>In order to change a program, a program change form must also be submitted.

Submit as New Proposal    Save Current Changes



**CHE 412**  
**Inorganic Chemistry**  
**Laboratory, Fall 2013**  
**SYLLABUS**



### I. Course Information

Section: 412-001, M, W (12:00-2:50pm; CP-301 and CP-302) Credit: 2.0

Instructor (Office Hours): David Atwood (T, R, 10-11am or email for appointment)

Teaching Assistants (Office Hours): John Walrod and Daniel Burriss (M, W, 10-11 am; CP-239)

Required Laboratory Notebook: Student Chemistry Duplicator Lab Notebook (75 pages, carbonless duplicate pages), The Book Factory, \$11.99, Product Number: LAB-075-WTR-CHEM-D; The UK Book Store will have this available but you could order it directly online at:  
<http://shopping.netsuite.com/s.nl/c.ACCT107430/sc.23/category.2474/f>

### Blackboard Website

Access CHE 412: Inorganic Chemistry Laboratory (Fall 2012) through your "My UK" account.

### II. Course Description

This laboratory will provide an introduction to the synthesis, isolation, and characterization of inorganic and organometallic compounds. The student will conduct basic synthetic laboratory procedures and utilize a variety of analytical characterization techniques. Each student will complete a series of structured, interconnected laboratory experiments derived from the current literature. The Laboratory Reports associated with the experiments will incorporate fundamental inorganic chemistry information from textbooks, reference works, and peer-reviewed journals. The experiments have two purposes: 1) provide an understanding of fundamental inorganic concepts (learned in CHE 410G), and 2) have you understand and experience important inorganic characterization techniques. The student will keep an appropriately formatted laboratory notebook to record the details of each experiment. Each student will write an American Chemical Society (ACS) formatted article based on the final multi-component experiment.

**Prerequisites:** CHE 410G; Prereq or concur: a physical chemistry course at or above the 400 level.

### III. Student Learning Outcomes

At the conclusion of this semester each student will have learned and experienced:

1. Basic synthetic laboratory techniques.
2. Important inorganic characterization techniques (with relevance to pharmaceutical R&D).
3. Experience maintaining a professional laboratory notebook.
4. The *safe* preparation of inorganic compounds and solid-state materials.
5. How to obtain and interpret safety and toxicity information for chemicals.
6. Interpretation, evaluation, and explanation of synthetic and analytical information.
7. Communication of laboratory results in written form.
8. How to place laboratory results in the context of the existing literature.
9. Working collaboratively with peers on common projects.
10. Writing an original ACS publication.
11. Application of fundamental inorganic concepts to laboratory experiments.
12. Build and develop critical thinking skills for career and life.



#### IV. Expectations and Advice

The biggest problem you will face as a college student is time management. I would encourage you to get some sort of planner so that you can mark the days that your classes meet and the days the various assignments are due. This will allow you to plan your week and budget your time accordingly. In general you should plan to study three hours out of class for every hour you spend in class. This means you should set aside nine hours a week for this class. The reading assignments are designed to help you establish this important habit which you should apply to all your courses. It will be very important that you begin the assigned readings several days before the class meeting.

#### V. E-Mail Capability

You must have a UK U-Connect e-mail account for e-mail and electronic submission of assignments. You can obtain your account on-line at any student computing laboratory on campus. You are responsible for checking your e-mail on a regular basis. A communication from me through e-mail will be considered the same as one delivered orally or in writing in class. That is, you are expected to have read what has been transmitted by e-mail and taken the necessary action.

#### VI. Blackboard Course Information

Internet access is required for this course. You will receive information from the instructor through email and must be able to access the Blackboard (Bb) website for the course (see I. above).

The Bb website has five folders that you will use throughout the semester: *Announcements*, *Course Schedule*, *Syllabus*, *Experiments*, and *Basic Chemistry*. The "Experiments" section of the website will contain specific documents associated with each experiment: 1) Instructions for the Pre-Laboratory Notebook Entries (these are due at the beginning of the lab), 2) Procedure (details on how to conduct the experiment) and 3) Laboratory Report Guidelines. A single document will typically contain these three laboratory components so that you can work on them simultaneously. The Experiments folder will also contain any spectra or other analyses derived from the experiments (as well as results from previous semesters).

1) Pre-Laboratory Notebook Entries ("Notebook Entry"). These are identified as "PL" in the Semester Schedule. The Guidelines describe what you should write in your laboratory notebook before coming to the lab. Each Notebook Entry is worth 10 pts and must be submitted at the beginning of the lab before you begin the experiment. The Notebook Entry will typically have an *Introduction* section and an *Experimental* section.

A. The *Introduction* section will contain basic information about the chemistry, safe handling, and disposal of the reagents and products used and generated during the experiment. You should read the *Background Information* document(s) (see 1B below) and other sources of information before writing the Notebook Entry Introduction.

B. The *Experimental* section of the Notebook Entry will be a written description of what you will do in the laboratory that includes a table for recording experimental details. In most cases all of this information will be provided in the *Procedure*. You must turn in the carbon-copy of the Notebook Entry at the beginning of each laboratory.

2) Procedure. This document contains the specific instructions for each experiment, in some cases replicated from peer-reviewed publications. You will use this document to write the Experimental

section of your Notebook Entry. You can bring a print copy of the Procedure but should still have the calculations and summary of the procedure in your laboratory notebook.

3) Laboratory Report Guidelines. The eight Laboratory Reports will incorporate the results of several separate experiments. The Report Guidelines provide instructions on the specific information and discussions that should be included in the Report. The due date for each Report is listed in the syllabus.

4) Basic Chemistry. This is a separate folder on the Blackboard main menu that will contain publications, encyclopedia articles, and other information you should read before conducting the laboratory experiment and use to write the laboratory report.

## VII. Attendance

*Attendance at each class meeting is mandatory.* Excused absences will be granted only for the reasons listed in the Student Rights and Responsibilities code (S.R. section 5.2.4.2). If you have an unexpected health issue that requires a visit to the doctor or hospital you must obtain a written doctor's excuse to submit to the instructor or TA at the next lab meeting. A screen-shot showing a doctor's appointment does not constitute a written excuse. You should not schedule appointments, doctor's or otherwise, during the lab meeting times.

For excused absences, you will be given an opportunity to make-up the missed class. You will not be given an opportunity to make-up an unexcused absence. Unexcused absences will result in a 10 pt deduction from your total semester points. If a Pre-Laboratory Notebook assignment was due on the date of the unexcused absence, the 10 pt deduction will be effected by receiving 0 pts for the missing Notebook Entry. Arriving more than 15 minutes late will result in a 5 pt deduction from your total grade or 5 pt deduction from the Notebook Entry grade. Arriving more than 30 min late will result in a 10 pt deduction from your total semester points or a grade of 0 pts for the Notebook Entry. If you were working in a group on the day you missed you will have to conduct the experiment independently and possibly from the beginning of the experiment.

Students anticipating absence for a major religious holiday during the fall semester must notify me in writing or email prior to the last day for adding classes. The acceptable religious holidays that are considered excused absences are listed in the Interfaith Calendar (<http://www.interfaithcalendar.org/2012.htm>). Additional information regarding dates of major religious holidays may be obtained through the religious liaison, Mr. Jake Karnes ([jkarnes@email.uky.edu](mailto:jkarnes@email.uky.edu), 257-2754).

## VIII. Academic Offenses

All work must be the original product of your own efforts, and all materials quoted from others must be properly credited. Using pre-written work constitutes academic dishonesty and could result in your being expelled from the university. A link to a paper "Plagiarism: What is it?" may be found at the Ombud website (<http://www.uky.edu/Ombud/Plagiarism.pdf>). The Ombud Web site also includes a link to a Prentice Hall Companion Website "Understanding Plagiarism" ([http://wps.prenhall.com/hss\\_understand\\_plagiarism\\_1/0,6622,427064-,00.html](http://wps.prenhall.com/hss_understand_plagiarism_1/0,6622,427064-,00.html)).

Per university policy, students shall not plagiarize, cheat, or falsify or misuse academic records. Students are expected to adhere to University policy on cheating and plagiarism in all courses. The minimum penalty for a first offense is a zero on the assignment on which the offense occurred. If the offense is considered severe or the student has other academic offenses on their record, more serious penalties, up to suspension from the university may be imposed.

Plagiarism and cheating are serious breaches of academic conduct. Each student is advised to become familiar with the various forms of academic dishonesty as explained in the Code of Student Rights and Responsibilities. Complete information can be found at the following website: <http://www.uky.edu/Ombud>. A plea of ignorance is not acceptable as a defense against the charge of academic dishonesty. It is important that you review this information as all ideas borrowed from others need to be properly credited.

Part II of *Student Rights and Responsibilities* (available online <http://www.uky.edu/StudentAffairs/Code/part2.html>) states that all academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression. In cases where students feel unsure about the question of plagiarism involving their own work, they are obliged to consult their instructors on the matter before submission.

When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording or anything else from another source without appropriate acknowledgement of the fact, the students are guilty of plagiarism. Plagiarism includes reproducing someone else's work, whether it be a published article, chapter of a book, a paper from a friend or some file, or something similar to this. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work which a student submits as his/her own, whoever that other person may be.

Students may discuss assignments among themselves or with an instructor or tutor, but when the actual work is done, it must be done by the student, and the student alone. When a student's assignment involves research in outside sources of information, the student must carefully acknowledge exactly what, where and how he/she employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content and phraseology intact is plagiaristic. However, nothing in these Rules shall apply to those ideas which are so generally and freely circulated as to be a part of the public domain (Section 6.3.1).

**Please note:** Any assignment you turn in may be submitted to an electronic database to check for plagiarism.

### **IX. Disability Statement**

Any students with disabilities who need accommodation in this course are encouraged to speak with the instructor as soon as possible to make appropriate arrangements.

### **X. Safety**

Safety goggles must be worn, *at all times*, within the laboratory (CP 301, CP 302, and CP 303). Failure to wear safety goggles will result in one of the following: a first offense results in a verbal warning, a second offense, will result in a 10% reduction in the total points available for the experiment being conducted at the time of the offense, and a third offense will result in expulsion from the laboratory and a 50% reduction in the total points available for the experiment being conducted. No make-up time will be allowed for a third offense. Subsequent offenses will result in discussions with the Instructor, student, and Chair of the Chemistry Department to decide the appropriate measures to be taken.

Shorts, dresses, tank tops, and open-toed or highly-breathable shoes are not permitted within

the laboratory. Laboratory coats and/or aprons are not required but are highly recommended. Food, drink, and cell phone use are forbidden in the laboratory.

## **XI. Laboratory Experiments**

### **A. General Guidelines**

Read the MSDS (Manufacturers Safety Data Sheet) on all reagents used in the lab. This information will be incorporated into the Pre-Laboratory Quizzes and a component of some of the Laboratory Reports. You should include important information from the MSDS in your laboratory notebook and your reports (toxicity, handling precautions, solubility in water and other solvents). These two websites, as examples, could be used to obtain MSDS information: <http://www.msds.com/> and <http://www.ilpi.com/msds/index.html>. Another good resource for safety data on chemicals and a great deal of other useful chemical information is: <http://www.chemspider.com/SimpleSearch.aspx>

### **B. Glassware Cleaning Procedure**

Develop the habit of cleaning glassware while you are conducting each experiment. If possible, glassware from a previous experiment should be cleaned before beginning a new experiment, or shortly after completing an experiment. There is a strong detergent solution in a plastic container near your sink. When you finish an experiment wash the glassware with the solvent that will dissolve the reagent or compound. You will have determined the most appropriate solvent for cleaning your glassware before you began the experiment. The MSDS sheets for the chemicals will usually indicate which solvents the compound or reagent is soluble in. However, you might have to find this information from another source. You will also save time by being able to more quickly clean your glassware. The procedure is listed out in Appendix A. You will be given a copy of the procedure and it will be posted in the laboratory.

### **C. Hazardous Waste**

If the reagent or compound must be handled as a *hazardous waste* do the solvent-rinse in one of the hoods with the solvent bottles located there and pour the solution into the appropriate aqueous or organic waste container. Before you begin each experiment you will identify which reagents and compounds must be handled as hazardous waste. You will also determine which solvent would be appropriate to remove the reagent or compound from your glassware. Aqueous (water solutions) and organic waste containers are located in the hood on the right side of the near the door to CP-302.

### **D. Non-Hazardous Waste**

If the reagent or compound is not hazardous then wash the glassware in the sink with dilute HCl solution or a non-hazardous solvent. Then wash with water using a brush. Rinse with acetone and let the glassware dry before putting it back in your drawer. If needed, you could put the glassware in the soap solution container located by each sink after removing any solids present. If this doesn't clean the glassware then it should be soaked in the base bath (KOH and EtOH). Talk to your TA or instructor before you use the base bath. You must wear thick, butyl-rubber gloves when working with a base bath (not the thin nitrile or latex gloves you use in the hood). Retrieve and rinse the glassware at the next laboratory period. If stored in the base bath the glassware must be rinsed with 5% HCl to neutralize the base.

## **XII. Laboratory Notebooks**

### **A. Required Notebook**

You must obtain this specific notebook (available at the UK Book Store): Student Chemistry Duplicator Lab Notebook (75 pages, carbonless duplicate pages), The Book Factory, \$11.99, Product Number: LAB-075-WTR-CHEM-D. You can order this directly online at: <http://shopping.netsuite.com/s.nl/c.ACCT107430/sc.23/category.2474/.f>

## **B. Pre-Laboratory Notebook Entry Guidelines**

You will submit a hand-written Pre-Laboratory Notebook Entry before each experiment. *Carbon copies of the pages containing the Introduction and Experimental must be submitted to the instructor when you arrive to the laboratory (before you begin any experiments).* The Pre-Laboratory Notebook Entries should be formatted according to the outline provided in the Guidelines located in the "Experiments" folder on Blackboard. *Each experiment will have an associated MS Word version of the Pre-Laboratory Notebook Entry Guideline in Blackboard.* However, remember to handwrite this information into your Laboratory Notebook. Section C. shows the Pre-Laboratory Notebook Entry Guideline for Experiment 1 as an example. The Notebook Entries will consist of an *Introduction* section and an *Experimental* section.

The *Introduction* section will contain basic information about the chemistry, safe handling, and disposal of the reagents and products used and generated during the experiment. You should read the *Background Information* document(s) (X.B.) and other sources of information before writing the Notebook Entry Introduction.

The *Experimental* section of the Notebook Entry will be a written description of what you will do in the laboratory that includes a table for recording experimental details. In most cases all of this information will be provided in the *Procedure* document. You must turn in the carbon-copy of the Notebook Entry at the beginning of each laboratory. There are 19 experiments so there will be 19 Pre-Laboratory Notebook Entries. An example of a Notebook Entry is provided in Section C. below.

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