

General Chemistry Laboratory - #20073

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Locations DBH 244 Tu 11:00 am -1:50 pm Office Hours: M: 2-3 pm, TuTh 2-3 pm, W 9-10 am
and Times: & MH 564 Th 11:00 am -1:50 pm

Class Website: *The class website will be used for this laboratory section. Please check this site often for needed files and assignment submission links, and announcements or other news.*

Course Description and Learning Goals

The wet experiments, activities and virtual labs performed in this laboratory are designed to reinforce the concepts of thermodynamics, chemical kinetics, acid-base equilibrium and electrochemistry learned in the lecture portion of this course. In addition, you will do experiments that show you how chemists make new molecules and how they identify the molecular species present in mixtures. Goals we expect you to achieve:

1. Become proficient at visualizing processes at the atomic/molecular/ionic level.
2. Use standard laboratory equipment, modern instrumentation, and classical techniques to carry out experiments.
3. Master laboratory safety, including the use of personal protection equipment and proper procedures for the safe handling, use and disposal of chemicals.
4. Learn to report, record, calculate, graph and interpret observations and results in a laboratory notebook using appropriate techniques employed in a variety of industries.
5. Communicate the concepts and results of laboratory experiments through effective laboratory report writing.
6. Gain group effectiveness by developing interpersonal skills, leadership skills, teamwork, listening skills and oral communication skills.

Lab Manual

The most up-to-date version of the CHEM 120B Lab Manual is now available for purchase at the Titan Bookshops.

***Important* Course Policy Regarding Punctuality and Absences from Assigned Lab Time**

Laboratory punctuality, attendance, and completion of required assignments are mandatory. Unavoidable absences (serious illnesses, death in the family, etc.) must be proven with the appropriate documentation (doctor's note, death certificate, etc.), and the experiment must be made up within the time scheduled for that experiment or, at the discretion of the instructor, omitted. The following rules are to be implemented this semester:

1. Three missed lab periods that are not made up result in an automatic failure of the lab.
2. Each missed lab period that is not made up results in a 30% deduction for that lab report.
3. Two late arrivals to lab (10+ minutes past start time) is equivalent to one unexcused absence.

To schedule a make-up lab session you must provide proof that it is an unavoidable absence and once you have permission, obtain a make-up request form from the Chemistry Stockroom (MH-277). This form must be filled out by you, and then signed by you, your lab instructor, and the lab instructor receiving you for the make-up lab session. Give signed sheet to the instructor in the make-up lab session, who will then confirm with your section instructor your make-up of the lab.

While making up a lab is sometimes possible, it is NOT to be considered as your right. Scheduling conflicts that result in you being unable to find an appropriate make-up time may exist. You must make every effort to avoid any absences from your assigned laboratory time.

Course Organization and Grading Scheme

The grading scheme given below defines the grading for this course this semester. **Note that you must pass both the lab and the lecture portions of CHEM 120B in order to pass the course.**

Assignment	Individual Points	Total Points
Pre-Lab Worksheets:		
▪ <i>Standardization of Sodium Hydroxide</i>	(5)	
▪ <i>Preparation and Properties of Buffers</i>	(5)	
▪ <i>Synthesis of Aspirin</i>	(5)	15
Pre-Lab Notebooks:		
▪ <i>All 7 Experiments in Wet Lab</i>	(2 for each)	14
General Topics Activities:		
▪ <i>Kinetics Activity</i>	(6)	
▪ <i>Equilibrium Activity</i>	(6)	
▪ <i>Acid-Base Activity</i>	(6)	
▪ <i>Thermodynamics Activity</i>	(6)	
▪ <i>Electrochemistry Activity</i>	(6)	30
Virtual Lab Assignments:		
▪ <i>Excel Workshop</i>	(10)	
▪ <i>Lab Report Writing Workshop</i>	(10)	
▪ <i>Equilibrium and Le Chatelier's Principle</i>	(10)	
▪ <i>Titration of Strong and Weak Acids</i>	(10)	
▪ <i>Enthalpy of Reactions</i>	(10)	50
Wet Lab Assignments:		
<i>10 points are allocated as follows</i>		
○ <i>20% for prelab online quiz (2 points)</i>		
○ <i>80% for worksheet (8 points)</i>		
▪ <i>pH and Hydrolysis of Salts</i>	(10)	
▪ <i>Building a Galvanic Cell</i>	(10)	
▪ <i>Electrochemistry with a Power Source</i>	(10)	30
Formal Lab Reports:		
<i>25 points are allocated as follows:</i>		
○ <i>10% for prelab online quiz (2.5 points)</i>		
○ <i>15% for completed rough draft (3.75 points)</i>		
○ <i>5% for peer review (1.25 points)</i>		
○ <i>70% for final draft (17.5 points)</i>		
▪ <i>Standardization of Sodium Hydroxide</i>	(25)	
▪ <i>Preparation and Properties of Buffers</i>	(25)	
▪ <i>Synthesis of Aspirin</i>	(25)	75
Technical Document:		
○ <i>10% for prelab online quiz (1.6 points)</i>		
○ <i>80% for results/discussion section (14.4 points)</i>		
▪ <i>Kinetics of Bleaching of Methyl Orange</i>	(16)	16
ACS Exam:		20
Demeanor:		10
TOTAL POINTS		260

Pre-Lab Worksheet

The Pre-Lab worksheet prepares you to get the most out of your lab. It consists of five questions for you to answer before you do the lab. An important advantage in doing the pre-lab is that your answers become the first draft for the Introduction of your lab report. Do the Pre-Lab Worksheet for the experiments you will do formal reports on: Standardization of Sodium Hydroxide, Preparation and Properties of Buffers and Synthesis of Aspirin. It must be uploaded to the Titanium link 10 minutes prior to start of lab, on the first day the experiment is to be performed. No late work will be accepted.

Pre-Lab Notebook

A lab notebook is required with either a carbon copy or a carbonless duplicate copy which will allow you to tear out the duplicate copies to turn in at the end of each lab period. Your lab notebooks will be reviewed each lab period and signed and dated for completeness. Failure to get it signed will result in the loss of points. Every wet lab performed will require a pre-lab written neatly in your lab notebook. ***This should be completed before you come to lab.*** Failure to have it completed will result in a loss of points and you will be sent out of the lab to complete it before you can work on the experiment. This will cause you to fall behind! Follow the “Chem 120B: Laboratory Notebook Guide” to do your pre-lab.

General Topics Activities

The activities will aid in your understanding of the concepts of Kinetics, Equilibrium, Acid-Base, Thermodynamics and Electrochemistry. Activities are done in class and will be turned in to the instructor at the end of the class period.

Virtual Lab Assignments

There will be five graded assignments for virtual lab. The assignments are done in virtual lab and can be turned in the same day at the end of the lab period, or at the beginning of the next virtual lab meeting.

Wet Lab Assignments

For 3 of the wet lab experiments, you will be required to fill out a worksheet which will go over the experiment data collected and analysis of the data as well as post-lab questions to help you understand the experiment concept. This is to be turned in one week after the experimental work is completed.

Formal Lab Reports

Three formal lab reports will be done based on three selected wet lab experiments for this lab. Detailed report writing guidelines will be covered the first few weeks of the course. In addition, a Pre-Lab Worksheet must be written up for the three selected wet lab experiments on the first day of that particular lab meeting. The formal lab report will be due one week after the completion of the wet lab experiment.

Technical Document

For the Kinetics of Bleaching Methyl Orange experiment, you will be required to complete a formal results section for the data collected. This will be due online one week after the completion of the experiment.

ACS Exam

An ACS Exam will be administered at the end of the course which will cover all the material learned in the 120B course. You will want to study for it by going over each of the lecture exams, quizzes and the various general topics activities done in wet lab, as well as the experiments done in lab. As you study for the ACS Exam you are also preparing yourself for the Final exam.

Demeanor

Participation, attitude, preparation, promptness, neatness, safety, interest and initiative all count in this course. The instructor will deduct points appropriately depending on your professionalism, or lack of it in the laboratory.

Grade Determination

You must pass the lab portion of this course as well as lecture in order to pass the course. It is in your best interest to keep all graded work for reference in case there is ever a discrepancy with your grades.

Late Assignments

To receive the best possible grade for your assignments, turn it in on time. Late assignments will be accepted if it is turned in within three days after the due date. You will incur a loss of 1.0 point for each day it is late. Assignments not turned in by the third day after the due date (weekends count), will not be accepted.

Email

Note that email is my only way to reach you. Check your [@csu.fullerton.edu](mailto:csu.fullerton.edu) address regularly! Also check the Class Titanium site regularly for any postings.

Late Nite Labs

In this course, some experiments will be performed virtually on a computer through the Late Nite Labs website. The code for Late Nite Labs is in the lab manual, which can be purchased from the bookstore. The price of the lab manual covers the subscription for the use of Late Nite Labs.

Lockers

Every student must pay a refundable \$10 locker deposit with their Titan Card in the Equipment Stockroom, MH-277, by Week 2 in order to get the combination for the locker.

Laboratory Attire

Please come to lab properly attired to do lab work. Laboratory coats, full goggles, and shoes with closed toes and backs are required. Shoes with cut-outs or vents that leave skin exposed and unprotected are not allowed. Lab coats must be a few inches below your knees in length, and must have long sleeves to cover the entire arm. They can be button-down or snap-fit in the front. Long hair must be tied back.

Appropriate leg coverage by long pants without any tears or holes is required for everyone working in the laboratory. Shorts, capri pants, or any other lower-body coverings that leave skin exposed or unprotected are not allowed. Skirts are appropriate if they are not too loose and are long enough to fully cover the leg.

Academic Integrity:

You are expected to take seriously your responsibility as a student (see UPS 300.021, available at http://www.fullerton.edu/senate/publications_policies_resolutions/ups/UPS%20300/UPS%20300.021.pdf, also visit <http://www.fullerton.edu/integrity/resources/pdfs/Titan%20Integrity.pdf> . All work submitted for credit should be your own. Any incidents of cheating or plagiarism will at minimum result in a zero grade for the assignment upon the first incident of dishonesty and a grade of F for the entire course for any subsequent incident of dishonesty. Incidents of dishonesty will be reported to the Associate Dean for Judicial Affairs for notation on your records. Repeat violations may result in further disciplinary actions, up to and including suspension from the University and the CSU system.

Students who violate university standards of academic integrity are subject to disciplinary sanctions, including failure in the course and suspension from the university. Since dishonesty in any form harms the individual, other students and the university, policies on academic integrity are strictly enforced. Cellular phones and all other electronic communication devices must always be turned off during class time and exams, without exception, to avoid unnecessary disruption of the class. Absolutely NO electronic devices other than calculators during quizzes and exams; cell phones are not acceptable for use as calculators.

If any of these devices in your possession disrupts the class, you may be asked to leave for the remainder of the lab.

Special Needs Considerations:

Disability Support Services (DSS) in UH 101 has been delegated the authority to certify disabilities and to prescribe specific accommodations for students with documented disabilities. DSS professional staff reviews the documentation from the referring agency and prescribes individual disability-related accommodations and support services on the campus and in the classroom. Visit <http://www.fullerton.edu/DSS/> if you require alternate accommodations.

CLASSROOM SAFETY:

Emergency procedures can be found on: <http://emergencypreparedness.fullerton.edu/>

- In the event of an emergency such as earthquake or fire:
 - Take cover and hold on during an earthquake until tremors have abated
 - Take all your personal belongings and leave the classroom (or lab).
 - Use the stairways located at the east, west, or center of the building.
 - Do not use the elevator. They may not be working once the alarm sounds.
 - Go towards Nutwood Avenue; as far away from Dan Black Hall as possible without being on the street. Stay with class members for further instruction. Do not linger between buildings. Obey marshals with orange vests.
 - Anyone who may have difficulty evacuating the building must notify the instructor on the first day of class.
- Dial 911 on any campus phone, your cell phone, or blue emergency phones to connect directly to University Police. Stay on the line until asked to hang up.
- If you want to bring visitors to the classroom, you must obtain permission from the instructor in advance.
- In light of well-established health risks associated with exposure to secondhand smoke, CSUF is a 100% smoke and vape-free campus.

LAB SAFETY:

- Proper eye protection, covered-toe shoes, lab coats, and tied-back hair are required at all times.
- Food and drinks are NOT allowed in the lab at any time. Food or drink waste and wrappers must not be disposed of in the lab trashcans.
- Familiarize yourself with the location of the fire extinguisher, safety shower, and eye wash station in your lab classroom.
- Do not attempt to use experimental equipment without proper training by your instructor.

PERSONAL INJURY:

***In all cases of personal injury**, an injury report must be filled-out and submitted to PI or EHS (report then must be submitted to the Chemistry/Biochemistry Department Office).*

All Injuries – Minor and Major

- * Immediately inform supervisor and EHS. Obtain medical attention, if necessary.

Minor Cuts and Puncture Wounds

- * Vigorously wash injury with soap and water for several minutes.

Chemical Spill on Body

- * Flood exposed area with water from safety shower or faucet for at least 15 minutes.
- * Remove contaminated clothing at once. Make sure chemical has not collected in shoes.
- * Call 911 as this is considered a medical emergency.

Clothing on Fire

- * Roll person in fire blanket or on the floor to smother flame, or
- * Drench with water if safety shower is **immediately available**.
- * Call 911 as this is considered a medical emergency.

Hazardous Material Splashed in Eye

- * Remove and discard contact lenses if present.
- * Immediately rinse eyeball and inner surface of eyelid with water from eyewash, continuously for at least 15 minutes.
- * Forcibly hold eye open to ensure effective wash behind eyelids.
- * Call 911 as this is considered a medical emergency.

***Tentative Wet Lab Schedule (DBH-244)**

Week	Dates
Week 1	January 22 <i>*January 21 campus closed (Mon)</i>
Week 2	January 29
Week 3	February 5
Week 4	February 12
Week 5	February 19
Week 6	February 26
Week 7	March 5
Week 8	March 12
Week 9	March 19
Week 10	March 26
	April 1-4
Week 11	April 9
Week 12	April 16
Week 13	April 23
Week 14	April 30
Week 15	May 7

**Schedule subject to changes*

***Tentative Virtual Lab Schedule (MH-564 or MH-617)**

Week	Dates	Experiment	Items Due/Required
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Week 1	January 24 <i>*January 21 campus closed (Monday)</i>	Sig Fig Review, Analyzing Results Review, Chemical Arithmetic Review <i>Monday labs-no class today due to Martin Luther King Holiday</i>	-Purchase lab coat, goggles, lab manual, lab notebook with duplicate copy pages, put \$20 on Titan Card
Week 2	January 31	Excel Workshop	<u>Due Today:</u> Bring personal laptop to lab today
Week 3	February 7	Lab Report Writing Workshop	<u>Due Today:</u> Excel Workshop submitted online to Titanium link Bring personal laptop to lab today Bring your lab notebook and lab manual to class
Week 4	February 14	Kinetics Activity Peer Review of Standardization Report	<u>Due Today:</u> You will complete this worksheet and turn in at end of class period. <u>Due Today:</u> Upload completed rough draft of Standardization Report to Titanium prior to class and bring a printed copy of report to lab for peer review
Week 5	February 21	Equilibrium and Le Chatelier's Principle	<u>Due Today:</u> You will complete this worksheet and turn in at end of class period. Upload Final Draft of Standardization Report to Titanium
Week 6	February 28	Kinetics of Bleaching MO Data Analysis	<u>Due Today:</u> Bring your lab notebook, lab manual and laptop and USB drive which contains your data from Kinetics experiment
Week 7	March 7	Equilibrium Activity	<u>Due Today:</u> Equilibrium Activity at end of class period -Upload completed Kinetics Report Results section to Titanium link prior to start of lab
Week 8	March 14	LNL-Titration of Strong and Weak Acids (Day 1)	<u>Due Today:</u> Finish Day1 data collection and complete calculations by end of lab period.
Week 9	March 21	LNL-Titration of Strong and Weak Acids (Day 2)	<u>Due Today:</u> Complete data collection and complete calculations by end of lab period
Week 10	March 28	Acid-Base Activity	<u>Due Today:</u> Acid-Base Activity at end of class period. -Completed Titration of Strong and Weak Acids Worksheet Due
	April 1-4	Spring Break	
Week 11	April 11	LNL-Enthalpy of Reactions Peer Review Preparation and Properties of Buffers	<u>Due Today:</u> Upload completed rough draft of Buffers Report to Titanium prior to class and bring a printed copy of report to lab for peer review <u>Due Today:</u> Complete data collection and complete calculations by end of lab period
Week 12	April 18	Thermodynamics Activity	<u>Due Today:</u> Thermodynamics Activity at end of class period Upload Final Draft of Buffers Report to Titanium Completed Enthalpy of Reactions Worksheet due
Week 13	April 25	Aspirin Peer Review	<u>Due Today:</u> Upload completed rough draft of Synthesis Report to Titanium prior to class and bring a printed copy of report to lab for peer review
Week 14	May 2	Electrochemistry Activity	<u>Due Today:</u> Electrochemistry Activity at end of class period Upload final draft of Synthesis report to Titanium
Week 15	May 9	ACS Exam	

**Schedule subject to changes*