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Office Hours: By appointment only

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See Course for more contact information.

Course Description

This goal of this chemistry course is for the student to gain an understanding of basic chemical concepts and theories. This course is also designed to provide the technical skills and advanced knowledge that will be required of students who are majoring in science, engineering or preprofessional careers.

Course Prerequisites: You must concurrently be enrolled in or have already successfully completed CHEM 1311 General Chemistry I.

Required Materials

- All laboratory assignments will be available on Blackboard. Do not buy a lab manual from the bookstore.
- Laboratory Equipment and Chemicals
 - You can obtain all of these yourself (A list is at the end of this syllabus) OR
 - Obtain a CHEM 1111 Lab Kit from Science Solutions– See Syllabus and Info tab in Blackboard for more info.
- Additional equipment and chemicals as listed in the Equipment List (See below)
- **Digital Camera** – Digital pictures of your work are **required** as part of the lab grades. It is your responsibility to be able to upload the pictures from your device to Blackboard. Cell phone cameras are usually sufficient.
- Students who take distance courses via Blackboard will need to be responsible to have the following capabilities and Software:
 - High Speed (Broadband) Internet access is desirable
 - Computer with at least 512 mb memory
 - Word processor software (Compatible with Microsoft Word)
 - Open Office is a free program that is compatible with Microsoft Office (www.openoffice.org)
 - Adobe Acrobat Reader (<http://www.adobe.com>)

Course Goals

The primary goal of this course is one of great interest to both the faculty in your major and to your future employer. That is for you learn to think critically about new information and to develop transferable problem solving and laboratory skills that will allow you to work independently and efficiently. The goal of your academic career is the development of working expertise in your own area of study. Learning chemistry is a highly structured process and is meant to provide foundational skills for the development of your expertise. The secondary goal of this course is to provide technical students basic information regarding chemical properties, processes, and techniques that commonly dictate how materials are used in those disciplines.

Learning Outcomes

Upon successful completion of this course, students will:

1. Use basic apparatus and apply experimental methodologies used in the chemistry laboratory.
2. Demonstrate safe and proper handling of laboratory equipment and chemicals.
3. Conduct basic laboratory experiments with proper laboratory techniques.
4. Make careful and accurate experimental observations.

5. Relate physical observations and measurements to theoretical principles.
6. Interpret laboratory results and experimental data, and reach logical conclusions.
7. Record experimental work completely and accurately in laboratory notebooks and communicate experimental results clearly in written reports.
8. Design fundamental experiments involving principles of chemistry.
9. Identify appropriate sources of information for conducting laboratory experiments involving principles of chemistry.

Grading

Prelabs	10%
Lab Final	20%
Laboratory Activity/Report	70%

Course Grade: A > 90.00%, B > 80.00%, C > 70.00%, D > 60.00%, F = all other percentages; no rounding

All assignments must be submitted through Blackboard!

Important Dates

August 28, 2017	First Day of Class
September 29, 2017	Last Day to Drop without Academic Penalty
November 3, 2017	Last Day to Drop or Withdraw with Academic Penalty
December 7, 2017	Last Class Day

Attendance and Make-up Work Policy

The Department of Chemistry requires that the Lab portion of this course be completed. ***If more than 2 lab activities are missed for any reason, you will not be able to complete the course!*** You will be forced to drop or will receive an F in the course.

No make-up work will be accepted unless the student initiates prior arrangements that I subsequently approve. Students must show proof of extenuating circumstances, such as a note from a doctor, etc. Active participation is required throughout the fifteen-week course.

Academic Dishonesty

All graded material submitted for this course is required to be your own work and all references used in developing your graded materials must be properly cited. Plagiarizing reports or cheating on exams are examples of academic dishonesty. Collusion is also prohibited on exams and quizzes. Failure to follow this policy will be treated as academic dishonesty and will result in a grade of zero for that assignment or examination. Repeated instances of academic dishonesty will result in a course grade of "F" and other possible additional academic penalties

ON-LINE COURSE SUPPORT

- If you are new to Blackboard, please see the tutorial at <http://dept.lamar.edu/cde/cdepages/students.html>
- Blackboard can be accessed directly at <http://luonline.blackboard.com>
- This course is being offered on-line via Blackboard to facilitate student access.
- The Distance Education Office will provide technical support for the course.
- There is 24 hour access for help through voice mail at the following Center for Distance Education number **(409) 880-7849**.

Please use these resources to assist you with any technical problems that may develop.

Students with Disabilities Accommodation

Lamar University is committed to providing equitable access to learning opportunities for all students. The Disability Resource Center (DRC) is located in the Communications building room 105. Office staff collaborate with students who have disabilities to provide and/or arrange reasonable accommodations.

For students: If you have, or think you may have, a disability (e.g., mental health, attentional, learning, chronic health, sensory, or physical), please contact the DRC at 409-880-8347 or drc@lamar.edu to arrange a confidential appointment with the Director of the DRC to explore possible options regarding equitable access and reasonable accommodations. If you are registered with DRC and have a current letter requesting reasonable accommodations, we encourage you to contact your instructor early in the semester to review how the accommodations will be applied in the course.

Federal Policies

Title IV Policy -Each semester, every faculty member will be required to check attendance records, and then indicate any student who is no longer attending the class. The checked rolls will be signed by the faculty member and returned to the Registrar's office. In an online course, this is managed by turned in assignments and dates that the course was accessed.

FERPA (Family Educational Rights Privacy Act of 1972): Due to the privacy laws regarding student grades in FERPA a student's grades cannot be discussed with anyone other than the student – no one else including parents and/or friends.

Netiquette (Online Etiquette) Statement

Please adhere to the same standards of behavior and professional respect online that you would follow in face-to-face communication with others, but most particularly when writing email and when taking part in collaborative and discussion board activities. Lamar provides access to network resources, including the Internet, in order to support learning and to prepare students for the 21st century world. Students, however, are expected to adhere to the *Lamar University Acceptable Use Policies when Using Networks*

- **Acceptable Use**

Students must respect the integrity and security of LU's computer systems and network, and the privacy and preferences of other users. Responsibility for learning about and complying with LU's Acceptable Use Policy ultimately rests with the individual. The network may be used to download, copy, or store any software, shareware, digital media files or freeware, as long as the use complies with copyright law; licensing agreements, and campus policies such as storage space limitations and network bandwidth restrictions. The network may not be used for any activity, or to transmit any material, that violates United States or local laws.

- **Unacceptable use**

The network may not be used for commercial purposes. Advertising and sponsorships on UW web sites is restricted. In addition, students may not permit other persons to use their usernames, passwords, accounts or disk space, or disclose their usernames, passwords or account information to any third party. Students may not log on to someone else's account, internet address, or other network codes, or attempt to access another user's files. Students may not create false or dummy accounts to impersonate someone else. Students may not try to gain unauthorized access ("hacking") to the files or computer systems of any other person or organization. Students may not impersonate another person by forging e-mail, web pages or other electronic media. Students who maliciously access, alter, delete, damage or destroy any computer system, computer network, computer program, or data will be subject to disciplinary action by LU, and criminal prosecution as well. Students may not disrupt or attempt to disrupt network traffic, and they may not attempt to monitor or capture network traffic in any way. Finally, students may not intentionally create, store, display, print or transmit information that violates the university's Sexual

Harassment Policy.

Other Issues

The syllabus and grading policy may be revised if necessary. If a change occurs, you will be notified and a new syllabus will be posted.

Course Outline

For each laboratory, you should read over the activity carefully and note any safety concerns. Below is a list of the laboratories with the materials needed to complete the laboratory. The laboratory activities will give more information on the quantities of chemicals and construction of the apparatuses used. The list below is for your convenience.

Laboratories	Materials Needed
Lab 1. Safety	
Lab 2. Significant Figures	
Lab 3. Measurements	Ruler, Scale, A small bag of Skittles, M&Ms or similar candy
Lab 4. Properties of Matter	Safety Glasses, Graduated Cylinder, Beakers, Scale, Pipettes, Table Salt, Baking Soda, Sugar, Distilled Water, Acetone, Isopropyl Alcohol, Vegetable, Baby or Mineral Oil, Vinegar, Polystyrene, Zinc, Steel Wool
Lab 5. Empirical Formulas	Safety Glasses, Graduated cylinder, Beaker, Pipette bulbs, 3 inch pieces of steel wire, Leads with alligator clips, 9V battery clip, 9V battery, Epsom salts, Distilled water, Thermometer, Steel wool
Lab 6. Simple Chemical Reactions	Safety Glasses, Ion Cards, Graduated cylinder, Beaker, Pipette bulbs, 3 inch pieces of steel wire, Leads with Alligator Clips, 9V battery clip, 9V battery, Epsom salts, <i>Cabbage indicator</i> , Washing soda, Distilled water, Vinegar, Baking soda, Chalk, Household Ammonia, Steel Wool
Lab 7. Electrolytes	Safety Glasses, Ion Cards, Table Salt, Baking Soda, Washing Soda, Sugar, Powdered chalk, Epsom salts, Acetone, Vinegar, 9V Battery, Conductivity Probe, Ammonia
Lab 8. Balancing Chemical Reactions	Safety Glasses, Ion Cards, Steel wool, Vinegar, Empty plastic bottle, Balloon, Epsom salts, Household ammonia, Washing soda, Calcium chloride, Acetone
Lab 9. Acids and Bases	Safety Glasses, Red Cabbage, Distilled Water, Pipette, pH paper, Vinegar, Ammonia, Tap Water, Epsom Salt, (5-6 of the following [<i>See Laboratory</i>]: Light-colored Sport Drink, Washing soda, Pickling lime, Crushed Antacid tablet, Bleach, Cream of tartar, Clear Soda Water, Soap, Egg white, Comet Cleaner (or equivalent), Crushed Aspirin, Bar Keeper's Friend, Lemon Juice, Milk of Magnesia, Orange juice, Apple juice, Shampoo, Muriatic Acid, Baking soda, Energy Drinks, Salt)
Lab 10. Limiting Reactants	Safety Glasses, Graduated cylinder, Vinegar, Baking soda, 2 Clear Plastic drink bottles, Stopper and tubing, Container for water (wash bucket or sink with stopper), Small plastic sheets, Scale
Lab 11. Solutions	Safety Glasses, Graduated cylinder, Clear plastic bottles, Beaker, Heat safe containers, Thermometer, Sugar, Distilled water
Lab 12. Titrations	Safety Glasses, Beakers, Pipettes, Baking soda, Ammonia, Vinegar, Fresh Cabbage Indicator
Lab 13. Enthalpy	Safety Glasses, Graduated cylinder, Beakers, Polystyrene cup, Baking soda, Vinegar, Milk of Magnesia
Lab Final	

Grading Rubric: Laboratory Journal (Notebook)

This will be used by the instructor and teaching assistants.

	4	3	2	1	0
Procedures	All procedures were recorded for the lab.	Most procedures were recorded for the lab.	At least half of the procedures were recorded for the lab.	Few but some procedures were recorded for the lab.	No procedures were recorded or the procedures recorded were not relevant to the lab.
Data	All data were recorded for the lab.	Most data were recorded for the lab.	At least half of the data were recorded for the lab.	Few but some data were recorded for the lab.	No data was recorded, were not understandable, or was not relevant to the lab.
Clarity	All entries were clear and understandable.	Most entries were clear and understandable.	At least half of the entries were clear and understandable.	Few but some of the entries were clear and understandable.	None of the entries were clear and understandable.
Grammar	All entries were grammatically correct.	Most entries were grammatically correct.	At least half of the entries were grammatically correct.	Few of the entries were grammatically correct.	None of the entries were grammatically correct.

Report Grading Rubric

This is the rubric to be used for grading laboratory reports. This will be used by the instructor and teaching assistants. Categories not relevant to the report requirements will not be used and the total required points reduced according.

	<i>4</i>	<i>3</i>	<i>2</i>	<i>1</i>	<i>0</i>
Questions	The answers were all correct and understandable.	The answers were substantially correct and understandable.	The answers were partially correct and understandable.	The answers were relevant to the questions and understandable but were incorrect.	No answers were given, were not understandable, or were not relevant to the questions asked.
Problems[^]	The solutions to all problems were correct and all problems were completely documented.	The solutions to all problems were correct but the problems were only partially documented.	The solutions to all problems were correct but the problems were only minimally documented.	Some of solutions to the problems are incorrect but the problems were completely documented.	No solutions or documentation was given for the problems or the solutions and/or documentation was not relevant to the problem.
Data Plotting*	All required plots of data were provided and correctly presented.	All required plots of data were provided but had a few errors in presentation.	All required plots of data were provided but had a many errors in presentation.	Some required plots of data were provided and correctly presented.	No required plots of data were provided.
Clarity	All entries were clear and understandable.	Most entries were clear and understandable.	At least half of the entries were clear and understandable.	Few but some of the entries were clear and understandable.	None of the entries were clear and understandable.
Grammar	All entries were grammatically correct.	Most entries were grammatically correct.	At least half of the entries were grammatically correct.	Few of the entries were grammatically correct.	None of the entries were grammatically correct.

[^]Documentation includes as appropriate: setting up equations, showing all units for calculations, giving reasons for choices made, and demonstrating how answers were checked. Your documentation should clearly lead someone in your professional field to your answer without having to guess what you have done.

*Data Plotting includes plotting the independent and dependent variables on the correct axes, properly labeling the axes, adding an appropriate title to each data plot, and providing a fit of the data if specified in the laboratory expectations.

Equipment and Chemicals List

A prepackaged lab kit can be purchased from Science Solutions at www.LUlabkits.com.

You may also choose to acquire the equipment and chemicals yourself. Many of these can be found online (Amazon) and in grocery stores, retail stores (WalMart, Target) and hardware stores (Lowes, Home Depot, Harbor Freight). You may have many of the chemicals in your home. You can buy the smallest packages unless noted.

Items	
9V battery	Graduated cylinder (10mL)
9V battery clip	Iron (steel wool)
Acetic Acid (White Vinegar)	Isopropyl alcohol (rubbing alcohol)
Ammonia	Magnesium hydroxide (milk of magnesia)
Balance (At least 500 g x 0.1g)	Magnesium sulfate (Epsom salts)
Bottles (plastic x 2)	One hole stopper to fit bottle
Calcium carbonate (chalk)	pH paper
Calcium chloride (de-icer)	Plastic Disposable Transfer Pipets x 5
Candy (Small bag of Skittles, M&Ms, etc.)	Safety Glasses
Conductivity Tester	Sodium bicarbonate (baking soda)
Digital Thermometer	Sodium carbonate (washing soda)
Distilled Water – 1 gallon	Sodium chloride (table salt)
Electrical leads with Alligator clips	Steel Wire (2 pieces at 3” length or Paper clips unfolded)
Flexible Tubing to fit through Stopper	Sucrose (table sugar)
	Zinc metal
Funnel	
Oil	Baby oil, Mineral oil, Vegetable oil, Canola oil, Peanut oil – Any of these will work
Polystyrene (Styrofoam cups)	
Pure Acetone	Do NOT buy finger nail polish remover. You need to make sure the bottle says Pure or 100% Acetone. You can buy this at Wal-Mart, etc. in the beauty section or you can go to Sally Beauty Supply.
Red Cabbage	You only need a few leaves, so buy the smallest amount, refrigerate the unused portions.
Small Beakers	You can make your own beakers by cutting the top off of water bottles (Ozarka, etc). You can also buy beakers at Hobby Lobby or on Amazon.