

PHYSICAL SCIENCE 14 LAB

Ticket Number 3348
6:50 – 8:55 P.M. Thursdays

Room: Instr-2014

Instructor: Professor Charles Mallory

Email: charles.mallory@ieee.org

Web Address: <http://www.TheMalloryFamily.net>
This location will contain laboratory experiments, handouts and study guides.

Office Hours: 6:30 – 8:00 PM Mondays & by arrangement

Required Materials:

- Scientific Calculator (**YOU WILL NEED THIS!!!**)
- Laboratory Notebook – Comp Book
- Laboratory Manual for Physical Science 3rd Edition, Said Pazirandeh (Available for download on the web at <http://profpaz.com>, <http://www.themalloryfamily.net> and at the bookstore)

SLO: Student Learning Outcomes (SLO).

1. Apply the scientific method to identify a hypothesis and perform experimental procedures to prove or disprove the hypothesis.
2. Construct graphs based on given data, describe the trend and predict other data points from the graph.
3. Perform laboratory techniques safely and accurately and maintain a laboratory notebook according to standard scientific guidelines.

Laboratory Reports: Laboratory reports are **due one week after the completion** date of the experiment. Late reports will be subject to a 25% per class meeting late penalty.

Laboratory Exams: Two exams will be given on the scheduled date only. These laboratory exams will be closed book, closed notes with the *only resource being your laboratory composition book!* Failure to take the **Final Exam will result in an automatic fail in the course.**

Laboratory Notebook: .. The laboratory notebook is used for your data and it is your best friend. **Anyone not having the laboratory notebook before the second day of class will be excluded from the laboratory.** All notes MUST be taken down in the laboratory notebook.

Safety Goggles: During the Chemistry experiments, unless specifically told by your instructor, you must ALWAYS wear safety goggles while in the laboratory. Failure to wear safety goggles will dismiss you from the laboratory.

Safety Rules: Failure to follow the safety rules will result in your dismissal from the laboratory. Safety is the responsibility of all persons within the laboratory. Make sure you read the Safety Rules and Regulations and follow all guidelines.

Attendance: This will be taken each class and will count for 5% of your final grade. Please be aware that if you stop coming to class it will be your responsibility to drop the class. **If you stop coming to class and do not take the final you will have earned an “F” in the class.**

Grade Breakdown:..... Your final grade is based upon the following breakdown:

Laboratory Reports	55%
Laboratory Notebook	20%
First Laboratory Exam	5%
Second Laboratory Exam	15%
Attendance	5%

Grading: The grading will be performed on a semi-modified curve. The grade you will earn will be based on the following scale:

A	90% - 100%
B	75% - 89%
C	60% - 74%
D	45% - 59%
F	0% - 44%

I guarantee that you will receive at least the above grade if not higher due to class performance. You will be provided with the grades periodically during class through the email address you provided during registration.

Tentative Lecture Schedule

Date	Day	Experiment	Material
September 1, 2011	Thursday	Handout	Introduction, Review of Safety Rules, Review of Notebooks, Significant Digits & Graphing handout
September 8, 2011	Thursday	1	Using Graphs
September 11, 2011	Friday	<i>Last day to add classes</i>	
September 15, 2011	Thursday	2	Density of Liquids and Solids
September 22, 2011	Thursday	3	Velocity and Acceleration
September 23, 2011	Friday	<i>Last day to drop classes without receiving a "W"</i>	
September 29, 2011	Thursday	4	Vectors and Equilibrium
October 6, 2011	Thursday	5	Simple Pendulum
October 13, 2011	Thursday	First Laboratory Exam (experiments 1, 2, 3 & 4) Notebooks due for grading	
October 20, 2011	Thursday	-- 6	(Notebooks Returned) Energy of Falling Bodies
October 27, 2011	Thursday	9	Comparing Indices of Refraction
November 3, 2011	Thursday	Handout	Paper Chromatography
November 10, 2011	Thursday	7	Specific Heat and Calorimetry
November 17, 2011	Thursday	11	Physical and Chemical Properties and Changes
November 18, 2011	Friday	<i>Last day to drop classes with a "W" (Letter grade is required from this date forward)</i>	
November 24, 2011	Thursday	<i>Thanksgiving Holiday – College Closed</i>	
December 1, 2011	Thursday	13	Identification of Unknowns
December 8, 2011	Thursday	Final Laboratory Exam (experiments 5, 6, 7, 9, handout & 11) Notebooks due for grading	

Laboratory Notebooks

(Note: Your Notebooks will be graded using this criterion.)

General Directions

1. Always write in ink. (NO PENCIL!)
2. Write only on the right-hand side of the page. (The left-hand side of the page should be used for calculations, notes, etc...)
3. Number all right-hand pages in the upper right-hand corner.
4. Just beneath the page number indicate the date on which the laboratory work was done. When the experiment work is done on two different dates, indicate the second date (right-hand margin) at the point where the second day's work begins.
5. The laboratory notebook is an **original permanent record**. This means several things:
 - a. You must write down all data directly (in ink) in the lab notebook. There will be a grade penalty when a student disregards this rule. (The rule means: no writing in pencil; no writing on the lab report sheet, on pieces of paper, etc...)
 - b. There will be no erasures, no "white out", and no missing pages. One thin line may be used to cross out offending material. (Later you may discover that you need this information and this way you can retrieve it!)
 - c. **Never Remove a Pager from the Laboratory Notebook.** (At some points this practice could have legal implications; patent fights are won and lost on the legitimacy of lab notebooks.) If you do make a dreadful error and would like to remove a page, do the following: draw a diagonal line across the entire page.
 - d. Holes and spots from chemical spills are legitimate artifacts; do not worry about them.

Format for the Laboratory Notebook

1. Leave one or two pages at the beginning for a **Table of Contents**. On this, list each experiment title (as you perform the experiment) and in a column at the right of the page, give the page number where the experiment write-up starts.
2. Begin each experiment on a fresh right-hand page. Each write-up includes:
 - a. **Title:** At the top of the page give the title of the experiment.
 - b. **Page number and date:** At the top right-hand of each page.
 - c. **Purpose:** Describe what you are doing and why. Describe what information you are attempting to gain by doing this experiment.
 - d. **Procedure:** Give references to the location of the procedure in the text and any deviations from the procedure in the text.
 - e. **Data:** This includes all the observations, measurements, etc... that you make in the laboratory. The data should be presented in tabular form. Check the report sheet to get ideas from the types of tables that are helpful for presenting data for that particular experiment.
 - f. **Results:** These include all the things that you have calculated from the data. Note: results are not calculations, but calculations based on data give results.
 - g. **Discussion & Conclusions:** A short paragraph discussing the results of the experiment. This section should answer the questions from the "Purpose" above. This is the place to mention significant sources of error and the effect they have on the results

SAFETY RULES AND REGULATIONS

LABORATORY SAFETY IS NOT JUST THE RESPONSIBILITY OF THE INSTRUCTOR.
IT IS THE RESPONSIBILITY OF EVERYONE.

WHILE WORKING IN THE LABORATORY,
YOU ARE EXPECTED TO BE FAMILIAR WITH THE SAFETY RULES
AND TO CONDUCT YOUR LABORATORY WORK IN A SAFE MANNER AT ALL TIMES.

The Laboratory Instructor will review the following Safety rules and regulations with you and will point out the location and operation of the fire extinguisher, safety shower, eyewash, and other laboratory safety equipment available.

1. While in the chemistry laboratory, you must wear approved safety goggles, wear shoes, confine long hair, and confine combustible clothing at all times. You will be working with chemicals that will stain clothing if you or your classmates are not careful, you may want to invest in a lab jacket.
2. You are not allowed to eat, drink, or smoke in the laboratory.
3. Before beginning work in the laboratory you should be familiar with the procedures you will be following as well as any special precautions or changes that the instructor may note. Report any unexpected events to the instructor immediately.
4. No unauthorized experiments may be performed. Violators will be subject to disciplinary action. Do **NOT** begin any experiment without the instruction in the classroom.
5. Before leaving the chemistry laboratory, be sure to wash your hands carefully.
6. In the event of an accident, the laboratory instructor should be immediately notified.
 - a. If you receive a chemical burn, immediately flood the area with cold water while another student summons the instructor.
 - b. Treatment for injuries may be obtained only from qualified medical personal.

Significant Figures

	Example	Sig. Digits	Sci-Notation
1 All non-zero digits are significant			
	1.589	4	1.589E+00
	0.897	3	8.97E-01
	36000	2	3.6E+04
2 Significant Zero's			
a All sandwiched zero's			
	13.02	4	1.302E+01
	1.0002	5	1.0002E+00
	10.5	3	1.05E+01
b All trailing zero's preceded by a digit to the right of the decimal point.			
	5.000	4	5.000E+00
	20.000	5	2.00000E+01
	15.00	4	1.500E+01
3 Non significant Zero's			
a Leading Zeros			
	0.0200	3	2.00E-02
	0067	2	6.7E+01
b Trailing Zero's to the left of the decimal point in a number without a decimal point			
	56000	2	5.6E+04
	1360	3	1.36E+03

*NOTE: Write the numbers in exponential notation if you have any doubt. All zeros used to indicate the power of 10 (order of magnitude) are not significant.

Rounding Off

1 If the last digit to be retained in a number is followed by a number less than 5 (<5),

ROUND DOWN.

Round to 3 significant figures:

28.23	rounds to	28.2
578.1	rounds to	578

2 If the last digit to be retained in a number is followed by a number greater than 5 (>5),

ROUND UP.

Round to 2 significant figures:

5.998	rounds to	6.0
0.00258	rounds to	0.0026
3.6502	rounds to	3.7

3 If the last digit to be retained in a number is followed by 5 (0000000... implied),

ROUND the last digit retained to an **EVEN NUMBER.**

Round to 2 significant figures:

1.75	rounds to	1.8
1.050	rounds to	1.0
1.45	rounds to	1.4

Round to 4 significant figures:

67.835	rounds to	67.84
67.885	rounds to	67.88

Calculations

Uncertainty and Significant Figures

The **Least Accurate Number (LAN)** determines the number of digits to which the answer is expressed.

Addition and Subtraction

1. The LAN is the number with the least number of digits following the decimal point.
2. The answer (*sum* or *difference*) can have no more digits *following the decimal point* than the LAN.

Example:

What is the total mass of a mixture made by mixing the following substances?

212	g water (LAN)
1.8	g salt
1.88	g sugar
<hr/>	
215.98	g (incorrect)
216	g (correct)

Multiplication and Division

1. The LAN is the number with the least number of significant figures.
2. The answer (*product* or *quotient*) can have no more significant figures than the LAN.

Example:

Calculate the volume of a rectangular solid that has a length of 4.16 cm, a width of 2.2 cm, and a height of 2.00 cm.

$$\text{Volume} = \text{Length} \times \text{Width} \times \text{Height}$$

$$\text{Volume} = (4.16\text{cm}) (2.2\text{cm}) (2.00\text{cm})$$

LAN

$$\text{Volume} = \del{18.304} \text{ cm}^3 \text{ (incorrect)}$$

$$\text{Volume} = 18 \text{ cm}^3 \text{ (correct)}$$

Code of Academic Honor and Integrity

Los Angeles Mission College
Departments of Physical and Life Sciences

Students at Los Angeles Mission College, because they are members of an academic community dedicated to the achievement of excellence and the pursuit of honor, are expected to meet high standards of personal, ethical, and professional conduct. These standards require personal integrity and a commitment to honesty. Without the ability to trust in these principles, an academic community and a civil society cannot exist. Los Angeles Mission College students and faculty are as committed to the development of students with honesty and integrity as they are to the academic and professional success of its students.

The **Academic Code of Honor and Integrity** is an undertaking of the students, both individually and collectively, that they will:

1. Not give or receive unpermitted aid during exams, quizzes or assignments
2. Not give or receive unpermitted aid in assignments, reports or any other course work that is to be used by the instructor as a basis for grading.
3. Do their share and take an active part in upholding the spirit and letter of the Code of Academic Honor and Integrity.

Some examples of conduct that are regarded as being in violation of the Academic Honor Code include:

- Copying from another's examination or quiz, or allowing another to copy from one's own papers
- Using any unpermitted source of information, human or other, during an exam, quiz or assignment that influences the grade; this includes the use of technological devices
- Any student-to-student collaboration that is unpermitted
- [Plagiarism](#) (plagiarism is defined as the use, without giving reasonable and appropriate credit to, or acknowledging the author or source, of another person's original work)
- Representing as one's own work as the work of another
- Giving or receiving aid on an academic assignment under circumstances in which a reasonable person should have known that such aid is not permitted

As a part of the effort to promote and instill an environment of honesty and integrity during quizzes and examinations, the following guidelines will apply for any courses in the Departments of Physical and Life Sciences:

1. Students will leave all books and all other non-essential items (e.g. paper, electronic devices) on the floor or inside their backpacks so that they are not useable nor block the sight line between professor and student. No electronic devices will be in reach.
2. Students will not communicate in any way that will dishonorably assist themselves or another student.
3. Students will leave the room during an exam only if permitted by the professor's policy. If permitted, only one student may leave the room at any time and be gone for only the average length of time needed for the stated purpose. Students will leave all purses, bags, books, phones, jackets, etc., in the classroom during the absence.
4. Students will promote the spirit and letter of the **Code of Academic Honesty and Integrity** by dissuading fellow students from dishonest activity and, when such casual persuasion does not work, informing the professor of the possible dishonest activity, either anonymously, or otherwise.
5. Students will make every effort to avoid the appearance of dishonesty or lack of integrity

Violation of this policy will not be tolerated and violators will be subject to penalties. The success of the **Code of Academic Honor and Integrity** is based upon the collective desire of students, faculty and the community to live in an environment that embraces respect for that which is right – both in the college and in society as a whole.

I have read and understand the Code of Academic Honor and Integrity and will abide by both its intent and its spirit:

Name (print) _____ Signature _____ Date _____