

Cedar Crest College

Chemical Principles Lab

CHE 111
Fall 2009

Instructor: David Raker

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Office Hours: Mon. and Wed. 3:30 – 4:30 P.M.

Thurs. 4:30 – 5:30 P.M.

COURSE OBJECTIVES

- 1.To develop good laboratory technique while observing the application of basic chemical principles, qualitative analysis, and simple quantitative analysis.
- 2.To introduce the basic elements of the statistical approach to experimental data evaluation.

COURSE OUTCOMES

- 1.The students will demonstrate competence in making detailed observations in the laboratory and in the collection and evaluation of experimental data.
- 2.The students will acquire fundamental laboratory and quantitative reasoning skills required in more advanced chemistry and biology courses.

MATERIALS REQUIRED FOR THIS COURSE

All of the following books and supplies are available in the campus bookstore.

Chemistry 111: Chemical Principles Lab Manual, Dr. P. Kistler, Fall 2009 Edition.

Laboratory Notebook, W. H. Freeman and Company.

Scientific hand calculator

Eye protection - safety glasses or goggles

Graph paper - 20 squares to the inch

MEETING TIMES

Laboratories: all held in room SCI 122

Section 1 Tuesday	8:00 AM - 11:00 AM	Dr. Kistler
Section 3 Thursday	8:00 AM - 11:00 AM	Dr. Kistler
Section 4 Thursday	1:00 PM - 4:00 PM	Dr. Sein
Section 5 Friday	1:00 PM - 4:00 PM	Ms. Smith
Section 6 Monday	12:30 PM - 3:30 PM	Mr. Raker
Section 7 Tuesday	3:30 PM - 6:30 PM	Dr. Sein
Section 8 Wednesday	12:30 PM - 3:30 PM	Mr. Raker
Section 81 Monday	7:00 PM - 10:00 PM	Mr. Raker

GRADING SYSTEM

This is a 1-credit laboratory course. It must be taken concurrently with the CHE 111 lecture course unless the student has already earned credit for the CHE 111 lecture with a grade of C- or higher. The student will receive a separate syllabus for the lecture portion of the course.

The grade for the laboratory portion of the course will be based on performance with respect to three items: the actual experiments, a final exam, and an evaluation by the instructor.

There will be 12 laboratory experiments. Each experiment will be graded separately, based on individual grades for pre-lab questions, report sheets (and graphs), and post-lab questions. The grades for each individual experiment will be averaged to produce a single grade for the experiments. This experiments grade will constitute 80% of the final laboratory grade.

Pre-lab questions **CANNOT** be submitted after the start of the laboratory experiment.

Laboratory reports are due at the *beginning* of the period. I will check to make sure all reports are turned in once the pre-lab lecture is finished. For any other laboratory material submitted after that time, a 10% penalty will be deducted from the grade for that experiment. A laboratory report will **NOT** be accepted late unless the carbon copy of your laboratory notes were submitted at the end of the period in which the experiment was completed. Lab reports will also **NOT** be accepted if they are more than 3 weeks late. In addition, no lab reports will be accepted after the student has taken the laboratory final exam.

Policy on returned labs

If there is a concern about a returned lab report, a specific procedure is used:

- 1.) Write your concern on the back of the lab report.
- 2.) Give the report to the instructor within 2 or 3 days of the return date.

The **ENTIRE** lab will be re-graded (at the instructor's convenience), with the possibility of the revised grade being lower than the original. Never change answers on a lab report. Random copies of lab reports may be made before they are returned.

A comprehensive laboratory final exam will constitute 15% of the final laboratory grade.

The remaining 5% of the final laboratory grade will be assigned by your laboratory instructor based on the student's performance with respect to such attributes as:

- Compliance with laboratory safety rules.
- Competence with respect to laboratory techniques.
- Organization and efficiency when performing experiments.
- General attitude in the laboratory and the degree of cooperation and contribution when performing experiments with a partner.

In summary, the laboratory grade will be computed as follows:

$$0.80(\text{Experiments Average}) + 0.15(\text{Lab Exam}) + \text{Instructor Evaluation}[0 - 5 \%$$

The following grading system is strictly adhered to and only very rarely is an exception made. There is **no** extra credit.

A (100-94%)	B- (82-80%)	D+ (69-65%)
A- (93-90%)	C+ (79-77%)	D (64-60%)
B+ (89-87%)	C (76-73%)	F (59-0%)
B (86-83%)	C- (72-70%)	

POLICIES

Attendance

Attendance in the laboratory is MANDATORY. All twelve experiments must be completed as scheduled and reports submitted when due. If, due to circumstances beyond your control, you are unable to do an experiment at your scheduled time, it may be possible to perform the experiment during some other scheduled laboratory period, preferably while another lab section is carrying out the same experiment. ***The missed experiment must be made up within two weeks of the missed period.*** The student should understand that making up missed experiments causes some difficulties, since you may not work in the laboratory alone. Therefore, when a student has missed an experiment, the make-up period must be scheduled in cooperation with the instructor. The laboratory section may be filled on the day and time you wish to make up the experiment.

When you miss an experiment, it is my policy that you obtain a valid written excuse from:

- 1.) a doctor or school nurse in case of illness.
- 2.) the Dean of Students' Office in the case of a family emergency.

In addition, you **MAY NOT** just appear unscheduled for a lab period (making up a lab or otherwise). If you chose to switch lab sections, you must obtain a drop/add form from the Registrar and **officially** change sections.

You should also make an effort to arrive on time for your lab period. The lab door will be closed and locked 5 minutes after the period starts if everyone is not present so pre-lab lecture can begin. If you arrive late, you will have to wait outside the lab until I am finished and the door is opened. It is essential that you be present for the entire pre-lab lecture. In addition, you must have sufficient time to complete the experiment. For all late arrivals, I will decide if the student may begin the experiment at that time.

Obtaining Assistance

In addition to myself, the Instructional Assistants for this course are:
Kassie Woodard, Andrea Eberhardt, Christina Matika, and Jennifer Bonetti

DO NOT HESITATE TO SEEK ASSISTANCE OR ADVICE WHEN YOU NEED IT!

Honor Philosophy

"The Cedar Crest College Honor Philosophy states that students should uphold community standards for academic and social behavior in order to preserve a learning environment dedicated to personal and academic excellence. Upholding community standards is a matter of personal integrity and honor. Individuals who accept the honor of membership in the Cedar Crest College community of scholars pledge to accept responsibility for their actions in all academic and social situations and for the effect their actions may have on other members of the College community."

The instructor expects each student to abide by the college's honor code. This honor code applies to all activities associated with this course. The student should realize that the honor code is an important aspect of the educational process at Cedar Crest College.

The following statement concerning Classroom Protocol is supported by Cedar Crest College Faculty and Administration:

"Appropriate classroom behavior is implicit in the Cedar Crest College Honor Code. Such behavior is defined and guided by complete protection for the rights of all students and faculty to a courteous, respectful classroom environment. That environment is free from distractions such as late arrivals, early departures, inappropriate conversations, and any other behaviors that might disrupt instruction and/or compromise students' access to their Cedar Crest College education."

Turn off all cell phones and pagers during the laboratory period.

Community Standards for Academic Conduct:

"Academic integrity and ethics remain steadfast, withstanding technological change. Cedar Crest College academic standards therefore apply to all academic work, including, but not limited to, handwritten or computer-generated documents, video or audio recordings, and telecommunications.

As a student at Cedar Crest College, each student shall:

- Only submit work which is his/her own.
- Adhere to the rules of acknowledging outside sources, as defined by the instructor, never plagiarizing or misrepresenting intellectual property.
- Neither seek nor receive aid from another student, converse with one another when inappropriate, nor use materials not authorized by the instructor.
- Follow the instructions of the professor in any academic situation or environment, including taking of examinations, laboratory procedures, the preparation of papers, properly and respectfully using College facilities and resources, including library and computing resources to ensure that these resources may be effectively shared by all members of the College community.
- Abide by the Cedar Crest Computer Use Policy.
- If a student perceives a violation of the Academic Standards, he/she will go to their instructor.
- If you are unable to resolve the problem with the instructor, you should go to the chair of the department. If you need further assistance after consultation with the instructor and the chair, you should see the Provost."

It is the instructor's policy to deal with violations of these Standards for Academic Conduct by awarding a grade of 0 for the assignment or examination in question.

Students with Learning Disabilities

The instructor supports the Cedar Crest College policy regarding learning disabilities as follows:

"Students with documented disabilities who may need academic accommodations should discuss these needs with their professors during the first two weeks of class. Students with disabilities who wish to request accommodations should contact the Advising Center."

Requirement for Enrolling in Chemistry 112

Completion of the CHE 111 laboratory course with a grade of D or higher is required for enrollment in CHE 112. To be accepted into the Forensic Science concentration, a student must earn at least a C in the CHE 111 laboratory course.

Additional Safety Rules:

- 1.) Broken glass is disposed of in the “broken glass” container, **NOT** the waste bucket! Do not handle broken glass with your bare hands; use a dustpan and brush.
- 2.) Do not return chemicals to their original containers. This avoids contamination.
- 3.) Know the locations of the eyewashes, safety showers, fire extinguishers, fire blankets and 1st aid kits.
 - a.) Burning of the eyes should be treated by flushing with copious amounts of water for at least 15 minutes. It is necessary to hold open the eyelids during the flushing process.
 - b.) If there is an extensive chemical spill on a person, use the safety shower. Remove all contaminated clothing. There is no room for embarrassment in emergency situations. It could be the difference between life and death.
- 4.) Never leave a reaction or glassware setup unattended.
- 5.) Never pipet any liquids by mouth. Use a pipet bulb instead.
- 6.) Do not use the sink to discard filter paper or insoluble solids.
- 7.) Never point the open end of a test tube being heated at yourself or others.
- 8.) Never place a hot object on a balance or on a paper towel. Hot glass looks like cold glass. Place your hand 1 – 2 inches away from the object to feel if heat is coming off.
- 9.) Individuals (including children), who are not enrolled in the course, are prohibited from entering the laboratory.
- 10.) No student is allowed in the stockroom unless told to do so by an instructor.
- 11.) Place all book bags, coats, etc. in the designated area(s). These objects are trip hazards!

Misc.

- 1.) Carbon copies of lab data, etc. are to be turned in at the end of EVERY lab period (originals written in pen) unless otherwise instructed or **5 points** will be deducted from that particular lab grade. Obtain the instructor’s signature in the notebook before turning in the carbon copy. I must have the carbon copy, **EVEN IF IT IS LATE**. Points will be deducted for late carbon copies ***with or without*** the instructor’s signature.

2.) All report sheets are to be written in non-erasable **PEN**. Five points will be deducted for any report sheets that are written in pencil, “Xerox” copies of pencil, or where white-out is used. Also, do not have multiple cross-outs on the report sheet (otherwise, points will be deducted). Acquire an extra blank copy from the instructor, etc.

3.) When completing pre- and post-lab questions:

a.) Briefly restate the question being asked in your answer. Assume the reader does not have the question in front of them. Do **NOT** use non-descriptive words, phase, etc. such as:

it

is when

they

is because

the stuff, the substance, etc.

another material

the numbers are off

step # or equation # (show the equation!)

I read the color wrong

It was experimental/human error (such as?)

the solution was used to tell the meter (solutions cannot talk)...

unless you have mentioned what you are talking about in a previous sentence. In other words, “It reacted with the acid,” does not tell the reader anything.

b.) Write neatly and with complete English sentences, grammar and spelling. If I cannot read your work or there are numerous grammatical errors, etc., I will mark it wrong!

c.) Show your work for any questions requiring calculations (and equations as needed). Include **UNITS** and watch your significant figures (sig figs).

4.) Pay attention and write down whatever is written on the chalkboards or overheads. This information is useful to you for completing the experiment or report sheets. The information may appear on the final exam as well.

5.) When performing calculations, double-check your answers to see if they make sense (“the giggle test”). Negative volumes and masses, high values for molecular weights (1000’s or millions of grams/mole), extreme percent yields (10^{-5} or 175%), etc. should be red flags that a calculation error occurred!

Laboratory Experiments Schedule

<u>2009 Date</u>	<u>Laboratory</u>
8/24, 8/25, 8/26, 8/27, or 8/28	Introduction: safety regulations, procedures, math review, and statistics Check-in
8/31, 9/1, 9/2, 9/3, or 9/4	Experiment #1: Determination of Density
9/8, 9/9, 9/10, 9/11, or 9/14,	Experiment #2: Identification of a Chemical Substance Using Its Physical Properties
9/15, 9/16, 9/17, 9/18, or 9/21	Experiment #3: Quantitative Analysis of a Hydrate And Experiment #4: Percentage Composition and Formula of a Compound
9/22, 9/23, 9/24, 9/25, or 9/28	Experiment #5: Flame Tests for Cations and the Qualitative Analysis of Halides
9/29, 9/30, 10/1, 10/2, or 10/5	Experiment #6: Reactions of Inorganic Compounds
10/6, 10/7, 10/8, 10/9, or 10/19	Experiment #7: The Ten Test Tube Mystery
10/14 and 10/15	No Labs
10/16, 10/20, 10/21, 10/22, or 10/26	Experiment #8: Preparation of an Iron Oxalate Complex
10/27, 10/28, 10/29, 10/30, or 11/2	Experiment #9: Vinegar Analysis
11/3, 11/4, 11/5, 11/6, or 11/9	Experiment #10: The Reduction of Potassium Permanganate and Its Dependence Upon pH
11/10, 11/11, 11/12, 11/13, or 11/16	Experiment #11: The Geometrical Structure of Molecules
11/17, 11/18, 11/19, 11/20, or 11/23	Experiment #12: Molecular Weight of a Condensable Vapor

11/24	No Labs
11/30, 12/1, 12/2, 12/3, or 12/4	Check-out and Laboratory Exam
12/7 and 12/8	No Labs

Note: *The laboratory syllabus is only a plan and may be subject to change. Any changes will be explained in class.*