

**General Chemistry Laboratory CHE 133L**  
**Laboratory**  
**Spring, 2013**

**Instructor:** Dr. Alyx S. Frantzen

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**Office Hours:** MWF 9:00-10:00 am; W 1:00-4:00 pm; W 5:00-6:00 pm

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**Instructor:** Dr. Darrell Fry

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**Office Hours:** MW 7:30-10am; F 8:30-10am; T 1-4 pm

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**Instructor:** Dr. R.H. Langley

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**Office Hours:**

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**CATALOG DESCRIPTION:** Laboratory techniques and applications. Spectroscopy, quantitative experiments.

**PREREQUISITES:** Passing grade on the math portion of the TASP exam.

**CO-REQUISITES:** CHE 133

**REQUIRED TEXTS AND OTHER MATERIALS:**

A. S. Frantzen, *Chemistry 133 Laboratory Manual Fall 2012/Spring 2013*.

Chemistry Laboratory Notebook with duplicate pages.

TI Graphing Calculator. (Model 82, 83, 83+, 84, 86, 89, 92, 92+)

Brown, T., LeMay, H. E., Bursten, B. E., Murphy, C. J., Woodward, P. M. *Chemistry, The Central Science*, Pearson, Prentice Hall, Boston, NY, 2012.

**PROGRAM LEARNING OUTCOMES:** There are no specific program learning outcomes for this major addressed in this course. This course is a general education core curriculum course and a service course.

**COURSE OBJECTIVE:** The student should learn basic laboratory techniques and be able to apply them in a practical chemistry setting.

**GENERAL EDUCATION CORE CURRICULUM OBJECTIVES:** At the end of the course, the student will have attained and met the following key core skills: Critical Thinking, Communication, Empirical and Quantitative, and Teamwork.

**STUDENT LEARNING OUTCOMES:**

- The student is expected to recognize and apply the following concepts to problem solving : (*critical thinking*)
  1. Basic statistical methods used in chemistry such as significant figures, accuracy/precision, and uncertainty in measurements.
  2. Basic vocabulary used in chemistry such as nomenclature, notations for isotopes, and classification of matter.
  3. Basic calculations used in chemistry such as stoichiometry, gas laws, and thermochemistry.
  4. Basic structure of molecular and atomic systems used in chemistry such as Lewis structures, molecular geometry, bonding theories, and periodic trends.
- Student will communicate effectively scientific concepts through written and visual techniques. (*communication*)
- Students will correctly assemble laboratory equipment, collect appropriate data, and analyze and interpret the results. (*empirical and quantitative*)
- Students will cooperate and communicate orally with each other in achieving successful completion of group experiments. (*teamwork*)

CHE 133L020-028

Spring, 2013

Drs. Frantzen, Fry, and Langley

**COURSE CONTENT:** Please see attached schedule

**COURSE REQUIREMENTS:** Grading is on a 295 point scale. Each experiment counts 10 points. The lowest two experiment grades will be dropped. Reports will count 65 points total. No report grades will be dropped. Quizzes will be given during the recitation. Quizzes are worth 6 points each. The top five quizzes will be counted towards the final grade. The nomenclature quiz is worth 20 points. The Dry Labs are worth 10 points each. The final exam is worth 50 points. The final exam will be given May 1, 2013 from 5-7 pm, location will be announced. Failure to take the final will result in a failing grade for the course.

**METHOD OF EVALUATION:**

Grading scale - A  $\geq$  268; B  $\geq$  227; C  $\geq$  192; D  $\geq$  148; F = below 148

**MAKE-UP POLICY:** There will be no make-ups in this class. This refers to both recitation and laboratory. Please make the instructor aware of any university related absences well in advance.

**ATTENDANCE POLICY:** Attendance is required at both recitation and laboratory.

**ACADEMIC HONESTY POLICY:** Any student found cheating will be subject to the penalties as stated in the Student Code of Conduct handbook; including but not limited to a score of zero on assignment, expulsion from the class or expulsion from the University.

**SEMESTER WITHDRAWALS:** Last day to withdraw from the course without obtaining WP or WF grade is March 20<sup>th</sup>.

**ACADEMIC DISABILITIES POLICY:** Students with Disabilities—To obtain disability related accommodations and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, Room 325, 468-3004/ 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided.

**CLASSROOM BEHAVIOR POLICY:**

- 1) Come to lab and recitation prepared and on time.
- 2) Turn off all electronic devices (cell phone, pager, MP-3, etc).
- 3) Come dressed as described in the safety rules that will be given.
- 4) Follow all safety rules and good laboratory practices at all time.
- 5) Do not begin an experiment with out a teaching assistant present.
- 6) Wear safety glasses/goggles when **anyone** in the lab is working on an experiment.
- 7) Be courteous and respectful of other students, laboratory assistants, and stockroom personnel.
- 8) Learn your section number and your laboratory assistant's name.
- 9) Work with assigned lab partner unless otherwise instructed by the lab assistant.
- 10) Stay in assigned sections.
- 11) Students are responsible for any answer they report on a lab, assignment, or quiz. Laboratory teaching assistants are students and sometimes may make an error. You cannot claim the lab assistant told you the wrong answer and expect to get points back.
- 12) Significant figures are required on all answers given in lab.
- 13) When answering questions, complete sentences are expected and points will be deducted for failure to do so.
- 14) No make up quizzes will be given if a student comes in late and misses the quiz.
- 15) Using material from previous semesters is considered cheating and will result in an assigned grade of zero (0) for the assignment in question.
- 16) Questions concerning grades must be asked within **one week** of receiving the graded material. Please present your concerns to Dr. Frantzen, Dr. Fry, or Dr. Langley. They are the **ONLY** people who can change your grade!!

**RECITATION:** During the recitation session the concepts and calculations for the laboratory experiment will be covered. To be prepared for recitation, the student should have an outline of the procedure for the experiment completed in the laboratory notebook. The format for outlining the experiment is given below. The outlines will be checked at recitation. Quizzes will also be given during the first 15 minutes of the recitation period. No make-up quizzes will be given.

**SAFETY:** The student must comply with safety rules at all times in the laboratory. Goggles or approved safety glasses must be worn at all times. Failure to follow the outlined safety rules will result in expulsion from the laboratory for the day and a grade of zero (0) for that experiment. Subsequent infractions can result in removal from this course.

**NOTE:** This course may satisfy certain ExCet/TEKS objectives for chemistry and integrated Physics and Chemistry (Physical Science). The correlation between these objectives and the chemistry courses may be obtained from Dr. John Moore, the chemistry certification advisor.

Instructors reserves the right to change the syllabus at any time.

## LAB NOTEBOOK:

The laboratory notebook must be a permanently bound book with alternating white and yellow quadrille ruled sheets. The yellow sheets will be used to make carbon copies of the original white sheets. The carbon copy sheets are to be handed in as the lab report.

### RULES FOR LAB NOTEBOOK

- a.) ALL DATA IS TO BE RECORDED IN BLACK/BLUE INK DIRECTLY IN THE NOTEBOOK!!!!
- b.) Label and date all entries.
- c.) An error should be lined through with a single horizontal line, initialed and briefly explained.
- d.) A single diagonal line should be drawn across any page that is to be ignored, initialed and briefly explained. This includes completely blank pages.
- e.) The backs of the yellow pages may be used for scratch work BUT, measurements and readings are to be recorded as DATA.
- f.) Number all the pages in the notebook in the upper right hand corner of the page. The yellow carbon copies must bear the same number as the white originals.
- g.) Use page 1 for a TABLE OF CONTENTS. This should be maintained on a current basis at all times.
- h.) Use page 2 for a PREFACE and a table of abbreviations. Include your name, social security number, classification, major, course title, number, section, semester, year, and instructor.
- i.) BE SURE TO WRITE HARD ENOUGH SO THE CARBON SHOWS UP!!!!!! If we can't read it, we can't grade it.

NOTEBOOK FORMAT - Begin each experiment on a new page. – The Format of your laboratory notebook counts two (2) points towards every experiment grade.

- 1.) **Purpose: (done before recitation)**  
Give the title of the experiment and a 1 or 2 sentence description of the purpose of the experiment. This should be written in a complete sentence in 3<sup>rd</sup> person (that means not using I, we, you). Your purpose should also describe the technique used to accomplish the experiment. This should be done in your own words -- do not copy from the manuals. Important chemical reactions and mathematical equations should also be included here.
- 2.) **Procedure: (done before recitation)**  
Outline the procedure of the experiment. This can be as simple or as extensive as you wish. Remember, this procedure should be complete enough so that you could complete the experiment without your laboratory manual. If you don't include a direction, how will you finish the experiment?
- 3.) **Questions/Data Tables: (done before recitation)**  
You should have any data tables that are in your lab manual reproduced in your notebook. All you should have to do is gather data and put it in the table. If there are questions or calculations to be completed, make sure you write these out before you come to class. Be sure to leave enough room on the paper to answer the questions.
- 4.) **Calculations**  
Give one example of each type of calculation used in the experiment that has not been included in the previous section. In general, this section will deal with the calculation of the final results. Be sure to include a set-up with all appropriate units. Whenever multiple samples of the unknown are analyzed, the average and the average and standard deviation (s) should be calculated.
- 5.) **Conclusion**  
Report your final results. Final results will be graded on quantitative/qualitative basis, depending on the experiment. You should include your results and state if you accomplished the purpose of the experiment. Your results should support your conclusion. This should also include an error analysis/problems associated with the experiment.

**COURSE CONTENT:**

Month	Date	
January	<b>15-16</b>	<b>NO LAB</b>
	16	Recitation for Significant Figures Science Building, room 137, Wednesday, 5-6 pm Begin Nomenclature Practice (Appendix A)
	22-23	Significant Figures Laboratory Meet in Chemistry Room 106 Tuesday 12:30-3:30 pm, 4:30-7:30 pm, Wednesday 1-4 pm Orientation and Safety
	23	Recitation for The Factor Label Method
	29-30	Factor Label Method Meet in Chemistry Room 106 Check In Chemistry Building room 101, 102, or 105
	30	Recitation for Experiment 1 Science Building, room 137, Wednesday, 5-6 pm
February	5-6	Experiment 1, Identification of an Unknown Solid
	6	Recitation for Experiment 2 Must have Purpose Statement for Experiment 2 in Lab Notebook
	12-13	Experiment 2, Chromatography of M&M Candies Turn in Written Report #1
	13	Recitation for Experiment 3 Must have Purpose Statement for Experiment 3 in Lab Notebook
	19-20	Experiment 3, Measuring Liquid Volumes
	20	Recitation for Experiment 4 Must have Purpose Statement for Experiment 4 in Lab Notebook Must have Procedure for Experiment 4 in Lab Notebook
	26-27	Experiment 4, Formula of a Hydrate Turn in Written Report #3
	27	Recitation for Experiment 8 Must have Purpose Statement for Experiment 8 in Lab Notebook Must have Procedure for Experiment 8 in Lab Notebook
March	5-6	Experiment 8, Endothermic and Exothermic Reactions
	6	Recitation Nomenclature
	<b>12-13</b>	<b>SPRING BREAK</b>
	<b>13</b>	<b>SPRING BREAK</b>
	19-20	Nomenclature Meet in Chemistry Room 106
	20	Recitation for Experiment 9 Must have Purpose Statement for Experiment 9 in Lab Notebook Must have Procedure for Experiment 9 in Lab Notebook
	26-27	Experiment 9, Gas Laws
	27	Recitation for Experiment 5 Must have Purpose Statement for Experiment 5 in Lab Notebook Must have Procedure for Experiment 5 in Lab Notebook Nomenclature Quiz
April	2-3	Experiment 5, Preparation and Standardization of NaOH Solution
	3	Recitation for Experiment 6 & 7 Must have Purpose Statement for <b>BOTH</b> Experiment 6 & 7 in Lab Notebook Must have Procedure for <b>BOTH</b> Experiment 6 & 7 in Lab Notebook Treat these as two separate experiments
	9-10	Experiment 6, Acid/Base Titration

		Experiment 7, Vinegar Analysis
	10	Recitation for Experiment 10/11 Must have Purpose Statement for <b>BOTH</b> Experiment 10 & 11 in Lab Notebook Must have Procedure for <b>BOTH</b> Experiment 10 & 11 in Lab Notebook Treat these as two separate experiments
	16-17	Experiment 10, Heat of Fusion of Ice Experiment 11, The Enthalpy of Neutralization of Phosphoric Acid Turn in Written Report #3
	17	Recitation for Experiment 12 Must have Purpose Statement for Experiment 12 in Lab Notebook Must have Procedure for Experiment 12 in Lab Notebook
	23-24	Experiment 12, Water Hardness Check-Out
	24	Recitation for Final Exam Review
May	30-1	
	1	CHE 133 Lab Final Exam, 5-7 pm, location to be announced
	6-10	Final Exam Week