

Chemistry 121- PQR Course Information (Fall 2012)

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Instructor: Lecturer: **Dr. Omana Ansel**; Office: 3834; Phone: 773-907-4093;
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Office Hours: Students are encouraged to meet with the instructor for questions or problems during these hours. (MW- 8:45 - 9:15 p.m.)

Course Catalog Description

CHEMISTRY 073 0121 - Basic Chemistry I

Principles of general inorganic chemistry, including properties of matter, dimensional analysis, fundamentals of stoichiometry, interpretation of the periodic table, nomenclature and introduction to solution chemistry and commonly used concentration units. Writing assignments, as appropriate to the discipline, are part of the course.

Prerequisites: Eligibility for Mathematics 118 or higher.

3 lecture hours and 3 lab hours per week based on sixteen weeks.

Credit Hours: 4

Students may take this course to meet concentration or elective requirements for an associates degree, to fulfill requirements for a career occupational degree, or to prepare for other careers in the physical sciences or healthcare professions.

Note: Chemistry 121 has an IAI code of P1 902L. You can learn more about IAI by visiting [iTransfer](#).

Textbook: **Introductory Chemistry**, Nivaldo J. Tro, 4th Edition, Prentice Hall, 2011.
ISBN 978-0-321-72599-8

Calculator: You must have Scientific Calculator to make arithmetical computations for class work including labs, quizzes and tests very quickly.

Exams: There are three examinations (100 points each), plus a comprehensive final examination (100 points) and a departmental exit examination (90 points). A quiz will be given almost once a week. Each quiz (20 points) covers the past week's work. More than ten quizzes will be given during the semester, but only **ten** of them will be counted towards the final grade.

Make-up Exam: The missed examination **must** be made up **before** the second class section after the missed examination. There is **no** make-up quiz, regardless of any excuse you might have. The make-up for the missed examination will be given **only** to those students who have an acceptable excuse, such as a physician's letter.

Attendance: All classes will begin **on time** and you are expected to be **on time** and attend each entire session. Poor attendance normally reflects poor grades. It should be noticed that if a student is excessively absent, and is not actively pursuing the course, the student will be dropped from the course at mid-term.

Active Pursuit:

Active Pursuit is defined as consistent attendance, communication with the instructor in person or by email about any absences, compliance with all policies, completion of assignments on time, communication with the instructor about any difficulties completing assignments on time, participating in class, taking quizzes and exams and performing laboratory experiments as assigned. Any student who misses two consecutive classes is at risk for being considered as not actively pursuing the class. The best strategy to handle any unforeseen circumstances is to communicate as soon as possible with the instructor.

Academic Integrity

There will be no tolerance for violations of academic integrity (e.g. plagiarism, cheating of any kind). Any violation will result in an "F" for the course.

Grading:

Students must get 17/30 or higher on the departmental exit examination in order to get "C" or better.

Grades will be based on a point system. The total points, 800 points, are accumulated from **2** examinations (200 points), **10** quizzes (200 points), **8** lab reports (160 points), **final exam** (100 points), **exit examination** (90 points) and **10** H.W. assignments (50 points).

1. "A" grade is 90% of the total possible points
2. "B" grade is 80% of the total possible points.
3. "C" grade is 70% of the total possible points
4. "D" grade is 60% of the total possible points.
5. "F" grade is below 60% of the total possible points.
6. "I" designation (Incomplete) are non-grades received by students who have actively pursued the course **and** are doing passing work at the end of the course, but who have not completed the course's final examination and/or other specific course assignments.

FERPA

FERPA (Family Educational Rights and Privacy Act) is a federal law that protects the privacy of student educational records:

<http://www.ed.gov/policy/gen/guid/fpco/ferpa/index.html>. Faculty cannot reveal information about students, or discuss student records over the phone or unsecure e-mail. CCC student e-mail meets FERPA requirements.

Students with Disabilities

The [Truman College Disability Access Center \(DAC\)](#) verifies needs pursuant to the American Disabilities Act (ADA), determines student academic accommodations, and issues accommodation letters. The center is located in room 1428 with phone number: (773) 907-4725. Linda Ford is the director.

Tutoring Center

The [tutoring center](#) is located in room 162(new building), 773-907-4785.

TRIO Student Support Services

TRIO is for low-income students, first generation college students, or students with disabilities who need academic support: room 1435, 773-907-4797. Registration is required at the start of each semester.

Student Success and Leadership Institute (SSLI)

SSLI is for students who need various other support services to achieve their educational goals: room 1435, 773-907-4714

Wellness Center Services

Personal, Individual counseling, support groups, stress and time management coaching, referrals to community resources, special support for victims of relationship violence and sexual assault

Location: Currently in room 162 in the Larry Mckeon Building, moving soon to the main building to be more accessible and provide a more confidential space

Current Office Hours: Monday-Thursday 9am-5pm, Friday 9am-12pm, and later appointments available until 7pm at least 2 evenings each week

Contact: (773) 907-4786 for an appointment or information

Class room Assessment Techniques:

1. Problem Recognition Tasks

Given students with a few examples of common problem types, train students to recognize and identify the particular type of problem each examples presents. To make students improve upon problem solving skills and to improve on mathematical skills.

2. Documented Problem solutions

Given students with problems with a particular concept, they need to learn to do more than just get correct answer to the problem given. To make students to keep tract of the steps they take in solving problems – to show and tell how they worked it out. To assess how students solve problems and to assess how well students can understand and describe their problem solving methods.

General Student Learning Outcomes for Chemistry 121

At the completion of this course, the successful student will be able to:

- Compare and contrast the chemical behavior and physical properties of common substances.
- Predict and explain the electronic and molecular structures of common substances using models.
- Determine the qualitative and quantitative relationships between matter and energy involved in chemical or physical processes.
- Classify matter by its state and bonding behavior using the Periodic Table as a reference.
- Solve quantitative problems (stoichiometric) involving chemical formulas and equations.
- Formulate and test hypotheses.
- Perform laboratory experiments demonstrating safe and proper use of standard chemistry glassware and equipment.
- Record, graph, chart and interpret data obtained from experiments.

- **Specific Student Learning Outcomes for Chemistry 121**

At the completion of this course, the successful student will be able to:

- Describe processes and procedures used in the scientific method.
- Differentiate terms such as observation, hypothesis, data, conclusion, theory.
- Explain how the use of the scientific method furthers scientific knowledge.
- Convert numbers in decimal notation to scientific notation and vice versa.
- Convert temperature data to values in three scales: Celsius, Fahrenheit and Kelvin.
- Explain why the Kelvin scale does not use negative numbers.
- Convert quantities using common metric units: liters/milliliters, grams/milligrams and meters/centimeters/millimeters.
- Demonstrate the use of significant figures
- Differentiate between precision and accuracy.
- Calculate one of the three quantities: mass, volume, density given the values for the other two.
- Measure the density of a sample of a solid or a liquid using available laboratory equipment.
- List the names and chemical symbols of at least 44 elements.
- List the names and formulas of common polyatomic ions.
- Given a positive and a negative ion - construct the formula of the ionic compound formed.
- Compare and contrast the difference between covalent and ionic compounds
- Classify bonds in common compounds along the continuum of purely covalent to purely ionic.
- Differentiate between pure substances (elements and compounds) and mixtures (homogeneous and heterogeneous).
- Classify common elements as metals, non-metals and semi-metals and describe the properties of each class.
- Explain how the arrangement of electrons in an atom affects its bonding and chemical properties.
- Explain how the periodic table is arranged and what is indicated by rows, columns and various sections of the table.
- List electronic configurations for the first twenty elements.
- List the number of valence electrons for the first twenty elements
- Construct simple Lewis Dot structures.
- Identify the alkali metals, alkaline earth metals, transition elements, calcogens, halogens and noble gases on the periodic table.

- Convert between mass and moles.
- Convert between moles and molecules or atoms.
- Solve empirical formula problems.
- Classify chemical reactions into types: combination (synthesis), decomposition, single displacement (replacement) and double displacement (replacement)
- Perform the balancing of simple chemical reactions.
- Paraphrase the chemical properties of common ionic compounds and common covalent molecules.
- Recognize the formation of a precipitate or the evolution of a gas or heat during a chemical reaction performed in the laboratory.
- Construct chemical formulas for common compounds given the compound's name.
- Identify the name of compounds from its formula.
- Perform basic stoichiometric calculations to determine the quantity of products given various quantities of reactants.
- Solve limiting reactant problems.
- Solve percent yield problems.
- Compare and contrast the properties of the three basic states of matter: gas, liquid and solid.
- Explain the Kinetic Molecular Theory of Gases and list the assumptions of this theory.
- Calculate volume, temperature or pressure of a gas sample that undergoes changes in its initial conditions using the combined gas law.
- Use the ideal gas law in stoichiometric calculations.
- Compare the solubility of various common compounds.
- Define the terms: solution, solute and solvent.
- Calculate the molarity of solutions.
- Perform laboratory experiments that illustrate basic chemical principles.
- Demonstrate the careful recording of observations and data in the laboratory.
- Demonstrate a knowledge of laboratory safety.
- Demonstrate effective laboratory procedures such as transfer of solids, weighing of solids, pouring of liquids, measurement of liquid volume.
- Organize and graph experimental data.
- Interpret experimental data and draw inferences from the data and Summarize the results of experimental observations

Chemistry 121 Course Syllabus

Dr. Omana Ansel

<u>Topic</u>	<u>Chapter/Topic No.</u>
The chemical World	Chapter 1
Measurement and Problem Solving	Chapter 2
Matter and Energy	Chapter 3
Atoms and Elements	Chapter 4
Molecules and Compounds	Chapter 5
Chemical Composition	Chapter 6
Chemical Reactions	Chapter 7
Quantities in Chemical Reactions	Chapter 8
Electrons in Atoms and the Periodic Table	Chapter 9
Chemical Bonding	Chapter 10
Gases	Chapter 11
Solution	Chapter 13
Acids and Bases	Chapter 14

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Laboratory Notebook:

No specific brand is required but the pages **Must Be Bound**. Spiral Notebooks may not be used. Any kind of pages are fine – blank, lined etc. It is important to have a firmly bound book for keeping a permanent record of laboratory observations, data, summaries, analyses and reflections. The Laboratory notebook should not have perforated pages that can be removed.

Note: There is no laboratory textbook to purchase for the class but you will need to print laboratory assignments from Internet (www.justonly.com)

Objectives:

1. To introduce the students to laboratory experimentation.
2. To increase the student's knowledge of the capabilities and limitations of measurements.
3. To familiarize him/her with a variety of chemical reactions and the equations used to describe them.
4. To give him/her experience in collecting and processing data.

Lab Rules:

1. Wear protective goggles of glasses at all times in the laboratory work areas.
2. Children are **not** allowed to stay in the laboratory.
3. No drinking or eating is allowed in the laboratory.
4. Wear a laboratory apron to protect your clothing (optional).
5. After completing the experiment, clean and put away your glassware and equipment. Clean your work area and make sure the gas and water are turned off.
6. Dispose of insoluble waste such as filter paper, litmus paper, matches in the wastebasket, not in the sink. Dispose broken glasses in the broken glasses boxes. Dispose all other solid chemicals as directed by your instructor. Empty nontoxic liquids into the sink and wash them down with water. Pour all the toxic liquids into the waste bottles provided.
7. Do not take reagent bottles to your laboratory work area. Use test tubes, beakers, or paper to obtain chemicals from the dispensing area. Take small quantities of reagents. You can always get more if you run short.
8. Check carefully the label on each reagent bottle to be sure you have the correct reagent. The names of many substances appear similar at first glance.
9. To avoid possible contamination, never return unused chemicals to the reagent bottles.
10. Do not insert medicine droppers into reagent bottles. Instead pour a little of liquid into a small beaker.
11. Be neat in your work; if you spill something, clean it up immediately.
12. Wash your hands anytime you get chemicals on them and at the end of the laboratory period.
13. Keep the balance and the area around it clean. Do not place chemicals directly on the balance pans; place a piece of weighing paper or a small container on the pan first, and then weigh your material. Never weigh an object while it is hot.
14. Do not heat graduate cylinders, burets, pipets, or bottles with a burner flame.
15. Do not look down into the open end of a test tube in which the contents are being heated or in which a reaction is being conducted.
16. Do not perform unauthorized experiments.
17. Students must work alone, unless otherwise indicated by the instructor.

Lab Reports:

1. Study the experiment carefully before coming to class, so that you don't have to spend a lot of time finding out what the experiment is all about.
2. On the day of each exam, you **must** submit the lab notebook with each experiment you performed. Only eight reports will be counted towards the final grade.
3. No report will be accepted after the deadline.
4. Points will be deducted if you let someone copy your data or any part of the report. Same deduction will be given to those who copy someone's report.

5. The report must be clear, clean, and neat.
6. All pages must be numbered
7. Lab report must be written only with pen (blue or black ink)

Outline for a laboratory Experiment:

- An Introduction
- Experimental plan
- Observations and Data
- Graphs and diagram
- Analysis of Results
- Discussion and Conclusions

Make-up Experiments:

Positively **NO** missed experiment can be made up!!!

Experiments:

Tentative Date(Fall 2012)

*Lab safety and Check – In	08-22(Wednesday)
1. Laboratory Equipment Inventory	09-05
2. Measurements	09-12
3. Separation of Salt and Sand	09-19
4. Identification of an Unknown Metal	09-26
5. Observing Chemical and Physical changes	10-10
6. Double Replacement Reactions	10-17
7. Single Replacement Reactions	10-31
8. Molecular Geometry and shapes	11-07
9. Stoichiometric Determination of Copper (II) oxide	11-21
10. Acid Base Titration	11-28

Refer to <http://www.justonly.com> for experimental procedure.

CHM 121 - PQR**Fall - 2012****Lecture:** Monday 6:00 – 8:45 p.m. Room 3162**Laboratory:** Wednesday 6:00 – 8:45 p.m. Room 3162**Schedule (tentative)**

Week	Date	Lecture	Quiz-Exam-Laboratory
1	8/20 8/22	Math Review	Lab safety
2	8/27 8/29	Chapter 2	Quiz-1
3	9/03 9/05	Labor day-Holiday	Quiz-2; Experiment -1
4	9/10 9/12	Chapter 1&3	Quiz-3; Experiment -2
5	9/17 9/19	Chapter 4	Quiz-4; Experiment-3
6	9/24 9/26	Chapter 5	Quiz-5; Experiment -4
7	10/01 10/03	Chapter 6	Exam-I (chap.1-4)
8	10/08 10/10	Chapter 6&7	Quiz-6; Experiment -5
9	10/15 10/17	Chapter 7&8	Mid- term: 10-12-12 Quiz-7; Experiment-6
10	10/22 10/24	Chapter 8&9	Exam-II (chap.5-7)
11	10/29 10/31	Chapter 9&10	Quiz-8&9; Experiment-7
12	11/05 11/07	Chapter 10&11	Quiz-10; Experiment -8
13	11/12 11/14	Chapter 11	Last day student initiated withdrawal-11-12-12 Exam III (chapter 8-10)
14	11/19 11/21	Chapter 13	Quiz-11; Experiment -9
15	11/26 11/28	Chapter 14	Quiz-12;Experiment-10
16	12/03 12/05	Review Exit Exam	Final Exam (chap. 1-14)