

**TRUMAN COLLEGE**  
**ONE OF THE CITY COLLEGES OF CHICAGO**  
**COURSE SYLLABUS**  
**SPRING 2012**

Instructor Information

**Instructor:** Gideon Ifianayi

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**Office Hours:** Room: 3624

Tuesdays 12:20 PM- 1:20 PM

Course Information

**Course:** Chem.121—Basic Chemistry I

**Section:** ABC and ABCX

**Credit Hours:** 4

Class Meeting Time: Mondays 9:00 AM – 12:10 PM Room 3974

Wednesdays 9:00 AM – 12:10 PM Room 3974

**Course Description:** 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.

**Course Prerequisites:** Eligibility for Mathematics 118

This course is designed for students seeking an introduction to basic inorganic chemical concepts as outlined in the course objectives. This course is a prerequisite for students seeking admission to the Allied Health Programs

**Required Materials:**

**Text:** **Introductory Chemistry Essential by Nivaldo J. Tro (2011 Hardcover) ISBN-10:0321725999 ISBN-13: 978032172599**

**Lab Manual:** **Foundations of College Chemistry in the Laboratory, 13<sup>th</sup> ed Morris Hein/Judith N. Peisen/Robert L. Miner**

**Materials:** Scientific Calculator and safety goggles

**COURSE OBJECTIVES:**

This course will provide the chemical background in inorganic chemistry needed to understand the nature and properties of matter. It will include an examination of the elements and their compounds on the basis of periodic classification, atomic and molecular theory, and the relationship between atomic and molecular structure to chemical behavior. Elementary stoichiometric calculations and solution chemistry will also be introduced.

Specific course objectives are:

1. Introduce basic chemical calculations, specifically with:
  - Scientific notation
  - Measurements of length, volume, mass, and concentration
  - Significant figures in dealing with uncertainty
  - Dimensional analysis
  - Temperature conversions
  - Stoichiometry (calculations involving limiting reagents, theoretical yields, percent yields, and molarity/normality)
2. Present the structure of an atom relative to its subatomic particles

3. Introduce the periodic table and the patterns embedded within it (periodicity), and explain how to use it to write chemical formulas
4. Study the different types of chemical bonds
  - Ionic, covalent, and polar
  - Lewis structures
5. Explain the rules of naming chemical compounds (nomenclature)
  - Binary compounds of representative and transition elements
  - Compounds containing common polyatomic ions
  - Acids and bases
6. Discuss types of chemical reactions (synthesis, decomposition, single displacement, double displacement, combustion, oxidation-reduction, acid-base, and precipitation)
7. Show how to write and balance chemical reactions
8. Present topics in chemical composition (number of atoms, mass percentage, molar ratios, and empirical and molecular formulas)
9. Show how to use the principles of solubility and solution characteristics (solubility, neutralization reactions, and pH) in chemical equations and calculations

**STUDENT LEARNING OUTCOMES:** Upon successful completion of these courses, students will be able to:

1. Apply correct use of significant figures in measurements and calculations
2. Write formulas of inorganic compounds, and name them correctly
3. Identify, compare, and contrast reaction types
4. Utilize the Kinetic-Molecular Theory to understand the properties of solids, liquids and gases
5. Write electronic configurations of all representative elements using periodic table
6. Extrapolate atomic structure in predicting periodicity in chemical and physical properties
7. Draw Lewis structures of covalent compounds
8. Correlate various concentration units
9. Develop information literacy skills and apply them to solving complex problems
10. Organize teams and delegate duties and responsibilities in group projects

### **Topical Content / Schedule**

Week	Mondays	Activity (Lecture)	Wednesdays	Activity (Lecture and Laboratory)
1	1/30/12	Course Policy Lecture 1: The Chemical World Discussion: chapter problems Assignment 1: #2, 4, 5, 7, 9, 10, 13, 14, 17, 18 <b>Due: 2/6/12</b>	2/1/12	Intro to Sig figs in Measurement Arithmetic Exercises Lab 1: Equipment Inventory; getting Started in the laboratory; Drawing Laboratory Apparatus; Measurement
2	2/6/12	Lecture 2 Measurement and Problem Solving Discussion: Chapter Problems <b>Problem Set I due on 2/13/12</b>	2/8/12	Intro to Matter and Energy Lab 2: Accuracy and Precision; Temperature; Density
3	2/13/12	<b>Quiz I: Chapters 1 and 2</b> Lecture 3: Matter and Energy Discussion: Chapter Problems Assignment II: 33, 34, 38, 51, 52, 63, 65, 70, 74, 75, 76 due <b>2/15/12</b>	2/15/12	Exam Review <b>Exam 1 (Chapters 1, 2 and 3)</b> Discussion: Exam Review
4	2/20/12	Feb 20, 2012	2/22/12	<b>Symposium</b>

		President's Day Holiday		Lab 3: Exp. 6: Freezing Points— Graphing of data
5	2/27/12	Lecture 4: Atoms and Elements Discussion: Chapter Problems Assignment III: 27, 30, 36, 42, 47, 48, 51, 54, 71, 72, 80 Due: 3/5/12	2/29/12	Problems on Subatomic Particles Lab 4: Experiment 5: Calorimetry and Specific Heat
6	3/5/12	Lecture 5: Molecules and Compounds Discussion: Chapter Problems <b>Problem Set 2 due 3/8/12</b>	3/7/12	Lecture 5 cont'd: emphasis on nomenclature <b>Quiz 2 (chapters 4 and 5)</b>  Lab 5: Identification of Selected Anions
7	3/12/12	Lecture 6: Chemical Composition Discussion: Chapter Exercises Assignment 4: #23, 25, 26, 30, 3 7, 48, 54, 79, 89, 98 due: 3/19/12	3/14/12	Lecture 6 cont'd: Emphasis on empirical formula. Review (Chapters 4, 5, and 6)
8	3/19/12	<b>Exam 2 (Chapters 4, 5, and 6)</b> Exam Review	3/21/12	<b>No Lab Symposium</b>
9	3/26/12	Lecture 7: Chemical Reactions  Discussion: Chapter Exercise Assignment 5: 33, 34, 47, 48, 63, 65, 79, 81, 86, 94 Due: 4/9/12	3/28/12	Lecture 7 Cont'd: Rxn types  Lab 6: Single Displacement Reactions
10	4/9/12	Lecture 8: Quantities in Chemical Reactions Discussion: Chapter Exercises <b>Problem Set 3 Due: 4/18/12</b>	4/11/12	Lecture 8 Cont'd: Emphasis on stoichiometry <b>Quiz 3 (Chapters 7 and 8)</b>  Lab 7: Double Displacement Rxn
11	4/16/12	Lecture 9: Electrons in Atoms and the Periodic Table Discussion: Chapter Exercises Assignment 6: 97, 98, 99, 89, 90, 85, 86, 59, 60, 58 Due: 4/18/12	4/18/12	<b>Symposium</b> <b>Quiz 3 (chapters 7, and parts of 9)</b> <b>Symposium</b>
12	4/23/12	<b>Exam 3 (chapters 7, 8 and 9)</b> Lecture 10: Chemical Bonding Assignment 7: 23, 24, 25, 29, 32, 36, 38, 53, 54, 56 Due: 4/30/12 Lecture 10 cont'd <b>Lab 8: Molecular Model and Lewis Dot Structure</b>	4/25/12	Lecture 11: Gases <b>(Problem Set 4)</b>  Lecture 11: Gases cont'd <b>Lab 9: Molecular Model cont'd</b>
13	4/30/12	<b>Quiz 4 (chapters 10 and 11)</b> Lecture 12: Liquids, solids and Intermolecular forces Assignment 8: 59, 60, 61, 62, 78, 80, 93, 96, 91, 97 Due: 5/7/12	5/2/12	<b>Exam 4 (chapters 10, 11 and 12)</b> <b>Symposium</b>
14	5/7/12	Chapter 14: Acids and Bases Lab 10 and 11: Properties of soln	5/9/12	<b>Final Exam</b>

## **Definition of Active Pursuit of the Course:**

Active pursuit of this course constitutes participation in:

- \* 50% of lectures
- \* 50% of homework
- \*50% of quizzes and exercises
- \*50% of Tests

\*80% of laboratory experiments that must be completed. Successful completion refers to submission of a report resulting from attendance and full participation in the corresponding laboratory experiment.

A student who is not actively participating in any one of the items listed above can be dropped at the mid-term and receive a grade of **ADW**.

## Additional Course Policies

**1. Quizzes and Problem Sets:** During the semester, usually two weeks before each exam, there will be in-class quizzes and take home problem sets. You should anticipate about 4 quizzes, 4 take home problem sets, and 5 exams during the course. The quizzes and problems sets will be specifically designed to prepare you for the exams. You will be allowed a chance to drop an exam, a quiz, and a lab during the course. However, your best quiz will count twice towards your grade

## **2.) Labs**

You will be able to apply what you will learn in the lecture portion of the course to hands-on laboratory experiments. There will be a total of 11 experiments, each pertaining to a specific topic covered in the course. You will be graded primarily on your performance, your results, and the answers you submit. Other factors, such as clean-up and safety measures will also be taken into consideration.

## **3) Exams**

There will be four unit exams and a cumulative final exam during the course. Each unit exams will cover a specific portion of the course—usually three consecutive chapters. All exams and quizzes will be closed books and expected to be strictly independent and of maximum integrity. All electronic devices are prohibited on all exams and quizzes.

## **4) Symposium Peer Instruction (a 45 point Extra Credit)**

You are expected to design a 15 minute power point presentation on any chapter of your choice from the assigned text. The presentation must be in a lecture format. You will be graded on your presentation style, knowledge of the material and on your responses to the four questions you will be asked at the end of your presentation. The four questions will be based chiefly on the information you present and it will be designed specifically to assess your knowledge of the material. There will usually be a symposium every Wednesdays, on days we won't be doing lab; we will accept about 8 presentations during the symposium. This is highly encouraged because this is the only curve that will ever be administered during the course!!!

## Final Evaluation

At the end of the semester, cumulative numerical values from all assignments/exams will be translated into letter grades. Juxtaposed numerical values are as follows:

Problem sets @ 15 points each = 60 points

Homework Assignments @ 10 points each = 40

In Class quizzes @ 25 points each = 100 points

Laboratories: 11 @ 10 points each = 100 points, the lowest grade earned will be dropped

Exams: 4 @ 100 points each = 300 points, you will be allowed to drop an exam

Exit Exam (Cumulative Exam): = 100 points (*No one shall be allowed to drop the final exam*)

**Tentative letter** grades will be determined based on the scores earned on a scale of **700**:

A = 90%-100% B = 79.5%-89.4% C = 69.5%-79.4% D = 59.5%-69.4% F = 59.4% -0.0%

**Note: If missed, there will be no make-up exams, quizzes, in-class activities, or laboratory experiments given for any reason whatsoever.**

## XI. Other Course Information

As a college student, you are expected to adhere to certain basic policies and guidelines.

Please be aware of the following:

1.) **Class attendance:** Every student is expected to attend every scheduled class. As labs and quizzes can only be completed in a staffed lab, attendance is mandatory. There is a point value associated with the work accomplished in most class meetings, and you will not be able to earn points for classes that you do not attend. If the College is open, you are expected to attend class and to be on time. If you arrive to lab after the conclusion of the pre-lab lecture, you will not be allowed to perform the lab.

2) **Academic Integrity:** Each student is expected to do her/his own work. **All work submitted for a grade must be an individual effort.** Anyone caught in an act of academic dishonesty will receive a zero on the assignment in question and may be assigned a failing grade in the course depending on the gravity of the offense. The incident will also be reported to the Department Chair or the Lead Instructor of the chemistry department and, at their discretion, to the Office of the Dean—where additional sanctions, including expulsion from the College may also be imposed.

3) **Safety:** Students are expected to adhere to strict safety guidelines at all times while in the laboratory. These include (but are not limited to) wearing appropriate eye protection and clothing, no eating or drinking in the lab, properly handling chemicals, and exhibiting appropriate behavior. If you are found in violations of any safety protocols after repeated warnings, you may be asked to leave the lab at a cost of 10 points.

***\*\*\*All parts of this syllabus are tentative and should not be misconstrued as a contract. You will be notified of any modifications, periodically, as they become available.***