

**Syllabus      Fall 2012 (M&W)**

***"Our Mission dedicates us to deliver high-quality, innovative, affordable and accessible educational opportunities and services that prepare students for a rapidly changing and diverse global economy."***

**CHEMISTRY 121 - 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. 2 lecture hours and 4 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.

**Instructor:** Mrs. L. Kogan

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Phone: (773) 907-4694

Office Hours: Monday, Tuesday, Wednesday and Thursday 5:00 pm to 6:00 pm

**Textbook::**            *Introductory Chemistry*, Fourth Edition by Nivaldo J.Tro  
ISBN-13: 978-0-321-68793-7

**Grading:**      There will be 10 quizzes at 15 points each. They will be given on every Monday unless that Monday has an hourly exam scheduled. There will be a mid-term exam worth 100 points. A final exam of 150 points will be given during the last week of class. Twelve (12) lab reports at 10 points each will also be included in your grade. The maximum number of points from quizzes, exams and labs is 520 points.. Your letter grade will be determined from the following.

- A.....90-100 % of the total points.
- B.....80 - 89 %
- C.....65 - 79 %
- D.....50-64 %

F.....Below 50 %

**Attendance:** The City Colleges require the faculty to take attendance and to keep the records. Poor attendance normally results in poor grades. If you are excessively absent prior to the mid-term you can be dropped at that time and given a grade of F.

<b>Week</b>	<b>Assignments</b>
August 20 1 22	Chapter 1. <i>The Chemical World.</i> Chapter 2. <i>Measurement and Problem .</i>
August 27 2 29	Chapter 3. <i>Matter and Energy</i> Homework:
September 3 3 5	Chapter 4. <i>Atoms and Elements</i> *Lab. Check-In, Laboratory Rules and Techniques Laboratory Techniques - Bending of Glass
September 10 4 12	Chapter 9. <i>Electrons in Atoms and the Periodic Table.</i> *Lab. Measurements - Density of an Unknown Liquid
September 17 5 19	Chapter 10. <i>Chemical Bonding.</i> Lab. Separation of Salt and Sand
September 24 6 26	Chapter 5. <i>Molecules and Compounds.</i> Lab. Identification of unknown metal.
October 1 7 3	Chapter 6. <i>Chemical Composition.</i> Lab. Lewis Structure and Molecular Models
October 8 8 10	Chapter 7. <i>Chemical Reactions</i> Lab. Hydrates
October 15 9 17	Chapter 8. <i>Quantities in Chemical Reactions.</i> *Lab. Preparations and Properties of Oxygen. Method A-1

**Mid-Term Exam:** *October 13 will cover the material presented during up to this date*

October	22	Chapter 8. <i>Quantities in Chemical Reactions.</i>
10	24	Lab. Single Replacement Reactions.
October	29	Chapter 11. <i>Gases.</i>
11	31	Lab. Metathesis Reactions.
November	5	Chapter 11. <i>Gases.</i>
12	7	Lab. Stoichiometric Determination of Formation of Copper (II) Oxide.
November	12	Chapter 13. <i>Solutions</i>
13	14	Lab. Preparation and Properties of Carbon Dioxide.
November	19	Chapter 14. <i>Acids, Bases.</i>
14	21	Lab. Check Out
November	26	Chapter 12. <i>Liquids, Solids, and Intermolecular Forces.</i>
15	28	Review.
<b>December</b>	<b>3</b>	<b><i>Final Exam: The Final Exam will cover all of the material</i></b>
<b>16</b>	<b>5</b>	<b><i>Last day of class</i></b>

***Homework will be assign during the course  
Labs are subject to change.***

***Students must wear safety glasses at all times when in the laboratory.  
There are no make-up labs.***

### **Academic Integrity**

The CCC has no tolerance for violations of academic integrity (plagiarism and cheating of any kind ).Any violations will result, minimally, in the grade of 'F' for the course.

**Tutoring Center.** For students who need help with their assignments: room L129, 773-907-4785, [www.trumancollege.edu/student-services/tutoring](http://www.trumancollege.edu/student-services/tutoring).

**Student Success and Leadership Institute (SSLI).** For students who need various other support services to achieve their educational goals: room 1435, 773-907-4714, [www.trumancollege.edu/student-services/ssli](http://www.trumancollege.edu/student-services/ssli).

**TRIO Student Support Services.** For low-income students, first generation college students, or students with disabilities who need academic support: room 1435, 773-907-4797, [www.trumancollege.edu/trio](http://www.trumancollege.edu/trio). Registration is required at the start of each semester.

**Disability Access Center.** The Center verifies needs pursuant to the American Disabilities Act (ADA), determines student academic accommodations, and issues accommodation letters. Room 1428, 773-907-4725, [www.trumancollege.edu/student-services/dac](http://www.trumancollege.edu/student-services/dac). Registration is required at the start of each semester.

**FERPA** (Family Educational Rights and Privacy Act) is a federal law that protects the privacy of student educational records: [www.ed.gov/policy/gen/guid/fpco/ferpa/index.html](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.

## Learning Outcomes and Course Objectives

### General Education Goals Established by Truman College

Taking a course in Chemistry helps a student achieve all of the following general education goals. How this occurs is explained below.

- Communicate effectively in both written and oral forms  
Students will keep a laboratory notebook and learn to record careful observations, draw appropriate conclusions and reflect on what they have learned.
- Gather, interpret and analyze data  
Students will learn to collect data in the laboratory, create graphs, compare quantitative data and draw conclusions about the data obtained.
- Demonstrate the ability to think critically, abstractly and logically  
The Scientific Method is predicated upon deductive and inductive logical reasoning. Students will study applications of the scientific method to information gathered by the scientific community. Students will read articles about chemical discoveries. Abstract thinking is developed in many ways in chemistry from the use of symbols and models to the use of mathematics to solve a variety of problems.
- Work with a variety of technologies  
Students use computers, data acquisition equipment, microscopes, digital

imaging devices, media, the Internet, pod casts, digital balances, all in the pursuit of scientific knowledge.

- Exhibit social and ethical responsibility  
This very serious goal is addressed on many levels in the chemistry course, from the discussion of the importance of careful and precise measurements that could affect the life of a patient to the discussion of what happened when the space ship Challenger exploded or a grain elevator explodes - we examine the role of responsible use of chemical knowledge.
- Perform productively in the workforce  
Because Chemistry education is comprehensive in utilizing the body (kinesiology), the mind (both spatial and analytical reasoning) and the heart (looking at the connection of chemistry to the world) it is an excellent course to prepare individuals for the workforce.
- Demonstrate the ability to learn independently  
Students are given independent projects to complete in the course. They are also given questions to research independently. Reporting these results to the class develops their ability to speak confidently to their peers.
- Gain awareness of their role in the global community  
By discussing the way that chemistry is connected to other occupations and careers we develop student awareness about their career choice and its dependencies on a basic understanding of chemistry.

### **Physical Science and Engineering Departmental Learning Outcomes**

Upon graduation with an Associate degree from Truman College a student should be able to:

- Organize, analyze and interpret information and use the scientific method to make inferences.
- Exhibit knowledge of scientific concepts through written and oral communication.
- Demonstrate excellent laboratory skills and techniques including the proper use of relevant instruments and related technologies.
- Use the lexicon of science to explain abstract scientific concepts.
- Relate concepts learned in Physical Science and Engineering Department classes to real world situations.

### **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 reactions of common substances.
- Convert quantities of mass, volume, temperature and length.

- Classify matter by its state and bonding behavior using the Periodic Table as a reference.
- Solve stoichiometry problems.
- Perform laboratory experiments using standard chemistry glassware and equipment.
- Record, graph, chart and interpret data obtained from experimentation.

### **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.
- Summarize the results of experimental observations and data.

