

SYLLABUS: FALL 2014

BASIC CHEMISTRY I – CHEM121 AB

HARRY S TRUMAN COLLEGE

“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.”

Faculty Information

Instructor: Roksana Begum, Ph.D.
Office Location: 3832
Office Hours: Monday and Wednesday, 11:00 am –11:30 am (Rm # 3832)
Mailbox Location: Rm # 3824
Phone : (773)-907-4498 (work)
Monday and Wednesday after 12:45 pm
Tuesday and Thursday after 4:15 pm
E-Mail: rbegum@ccc.edu

Class Meets

Monday and Wednesday: 8:00 am to 10:50 am , Rm # 3162
Break: 10-15 minutes will be given when appropriate.

Course Description: CHEMISTRY 073 012 - 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.

Credit hours: 4

Contact hours: 2 lecture hours and 4 lab hours per week.

Course Prerequisites: Eligibility for Math 118 or higher and English 101.

Student Learning Outcomes

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 experimentation.

Course Objectives

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, kilograms/grams/milligrams and meters/centimeters/millimeters;
- Demonstrate the use of significant figures in basic calculations: addition/subtraction, multiplication/division;
- Differentiate between precision and accuracy;
- Calculate one of the three quantities: mass, volume, density given the values for the other two;
- Determine mass by difference;
- Determine volume by difference;
- 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 including Uranium (92) from the inner transition 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;
- 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 thirty-six elements;
- List the number of valence electrons for the first thirty-six elements (main group elements only);
- Construct simple Lewis Dot structures: water, methane, ammonia, boron trichloride, carbon dioxide, the diatomic molecules;
- Identify the alkali metals, alkaline earth metals, transition elements, 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) and combustion;
- Determine if a metal/metal ion in a reaction is being oxidized or reduced;
- 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;
- Identify and classify strong acids, hydroxide bases and neutral salts given the formula e.g. HCl is an acid, KOH is a base, NaCl is a neutral salt;
- 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;
- Give the names of common laboratory glassware: beakers, erlenmeyer flasks, graduated cylinders, test tubes.

Required Textbooks

Introductory Chemistry Essentials Plus MasteringChemistry Access (5th Edition)

Author: Tro, Nivaldo J.

Publisher: Pearson

Year Published: 2014

ISBN: 9780321918734

Please note: Older version book may be useful for the preparation to the exams and quizzes only. For homework assignments on MasteringChemistry you need to have access on 5th edition book. In other words, you need to buy 5th edition's access code separately.

All lab instructions (handouts) will be provided or posted on the blackboard. You are responsible for collecting printout and reading the instructions prior to attend the lab.

Required Supplies

Pen: Blue or Black. No other colors can be used to answer for exams, quizzes and writing lab reports.

Pencil: A 2B pencil is required to shade the scantron form.

Calculator: It should be able to use scientific notation. Phone calculator and Laptop calculator will not be permitted.

You should bring all your supplies with you to every class. The instructor is not supposed to provide your supplies.

Course Evaluation

Mid-term letter grade will be given on the basis of scores earned on the following:

- ◆ Homework , 10% weight
- ◆ Quizzes, 10% weight
- ◆ Labs, 20% weight
- ◆ Exam I , 60% weight
- ◆ Extra credit, 2.5% (may be earned from in-class open-book quizzes and practice exams)

Final letter grade will be given on the basis of scores earned on the following:

- ◆ Homework , 10% weight
- ◆ Quizzes, 10% weight
- ◆ Labs, 20% weight
- ◆ Exams I, II and III, 50% weight
- ◆ Exit Test (10% weight)
- ◆ Extra credit, 5% (may be earned from in-class open-book quizzes and practice exams)

Homework

- ◆ **Assigned in MasteringChemistry with a deadline :**
- ◆ Multiple choices, short answer questions and problem solving.
- ◆ Maximum time limit scheduled **one week** (please always make the deadline!!)
- ◆ Automatically scored
- ◆ Maximum 10 submissions possible
- ◆ Last submitted score added to the Gradebook.
- ◆ Must submit within the deadline for full credit.
- ◆ Partial credit may be earned if submitted after deadline. Each day overdue will deduct 5% points.

Quizzes

- ◆ Multiple choices, short answer questions and problem solving
- ◆ Time limit is Maximum 20 minutes.
- ◆ Usually given at the beginning of the class session
- ◆ Messy and incomplete answer will carry zero point
- ◆ **No make-up quizzes** under any circumstances. Instead, lowest score quiz is dropped.

Labs

- ◆ Each experiment is of worth 20 points
- ◆ Report due on the **same day or Next lab day**
- ◆ 50% credit is given for one-week overdue report and 0% credit after that
- ◆ Data & calculation must be written **with a pen (blue or black)**. **No pencil and whiteout can be used**
- ◆ Must HAVE instructor's signature on the final data and calculation before leaving the classroom (Very important!!!)
- ◆ **Points are taken off for messy lab report and using pencil and whiteout**
- ◆ Lowest lab score is dropped.
- ◆ **NO MAKE-UP LABS !** Lab coordinator removes lab material at the end of each lab.

Breakdown of 20 Points of Each Lab Report

- ◆ Prelab & Postlab Questions: 5
- ◆ Data & Calculation & result: 10
- ◆ Active participation: 2
- ◆ Lab Safety & Waste disposal: 1
- ◆ Lab station tidy-up: 2

Exams

- ◆ Two non-cumulative exams (Exams I, II and Exam III), each at worth 50 points
- ◆ **Exit Test** (Cumulative, 30 points) given by the department. **You must pass the Exit Test in order to pass the course.**
- ◆ **NO MAKE-UP EXAM and make-up Exit Test** under any circumstances.

Importance of Exit Test:

- ◆ 30 points, multiple choices, cumulative.
- ◆ Passing score 17 points.
- ◆ Less than 17 points will receive “F” final letter grade. **no matter how good score you receive in class materials.**

Extra Credit

You will earn 5% extra credit towards your final grade from in-class open-book quizzes and take-home practice exams. In other words, you need to collect all extra credit points from the beginning of the semester. **Please do not ask in the end!**

Final Letter Grade

90 %	A
80 %	B
70%	C
60%	D
< 60%	F

Attendance

You are expected to attend all labs and lectures. If you miss any class, you are responsible for knowing all information and material presented in that class. **You must sign-in everyday!**

Truman College Student Learning Outcomes

- The student exhibits social and ethical responsibility and is aware of her or his place in the global community.
- The student performs effectively in the workplace and has the ability to work and make effective use of a wide variety of current technologies.
- The student communicates effectively in both written and oral formats.
- The student demonstrates the ability to think critically, abstractly, and logically.
- The student gathers interprets and analyzes data.

Academic Support Services

Tutoring Center. For students who need help with their assignments: room 177, 773-907-4785, Larry McKeon Administrative Building, www.trumancollege.edu/studentservices/tutoring.

Student Success and Leadership Institute (SSLI). For students who need various other support services to achieve their educational goals: room Larry McKeon Student Services Building Suite 162, (773) 907-4714, www.trumancollege.edu/studentservices/ssli.

TRIO Student Support Services. For low-income students, first generation college students, or students with disabilities who need academic support: Larry McKeon Administrative Building Room 162, (773) 907-4797., 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 (773-907-4725), www.trumancollege.edu/studentservices/dac. Registration is required at the start of each semester.

FERPA

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. Faculty cannot reveal information about students, or discuss student records over the phone or unsecure e-mail. CCC student e-mail meets FERPA requirements.

Classroom Safety

You must obey the instructions of the “**Lab Safety Contract**” during lab sessions. The following are my main concerns:

- Using goggles
- Secured hair
- Proper clothing and shoes

Cell Phone and Other Electronic devices

- If cell phones, pager etc., causes a disruption in the class they will be taken up until the end of the class session.
- Laptop cannot be used for web surfing.
- No text messaging during class session.

Active Pursuit

Students are not actively pursuing the course objectives will be administratively withdrawn (ADW) at midterm if at least two of the following apply:

- Less than 70% of assignments up to the midterm have been completed.
- Less than 70% of quizzes and tests up to the midterm have been attempted.
- Less than 70% of class sessions up to the midterm have been attended.

Academic Integrity

The CCC has no tolerance for violations of academic integrity. The student policy manual states, "Plagiarism and cheating of any kind are serious violations of these standards and will result, minimally, in the grade of 'F' by the instructor" (39). All course work will be checked for Academic Integrity. In this course, the first violation will result in an "F" for the assignment; the second violation will result in course failure. Make-ups and revisions are not available after an infraction of academic integrity.

Reminders!

- ◆ **Blackboard:** <http://ccc.blackboard.edu>.

You must check blackboard announcements very often especially, on **Sunday** nights.

- ◆ **November 17th:** Last day to withdraw from this course

My Hope & Expectations

All students will succeed in the course and meet their goals.

To accomplish your goal:

- 1) Attend all classes. Be on time and don't leave early.
- 2) Take notes. If I say "*This is very important!*" please learn and practice that material with a special importance.
- 3) Read the corresponding chapter summary before attending the class.
- 4) Work on practice problems & exercises of each chapter.
- 5) Finish Homework assignments regularly.
- 6) Come for extra help from tutors and the instructor.
- 7) Practice, practice and practice!!!!**

Harry S Truman College
Basic Chemistry I - Chem 121, Section AB
Lecture and Lab Schedule - Fall 2014

TEXT BOOK: INTRODUCTORY CHEMISTRY ESSENTIALS WITH ACCESS
(5th Edition), by Nevaldo J. Tro

Date	Monday	Date	Wednesday
Wk-1 Aug 25	First class-meeting: Self-introduction; Class registration document check; Student Information collection ; Syllabus discussion; Math Assessment Test; Lab Safety Contract form handing out	Wk-1 Aug 27	Lecture Ch-1: The Chemical World Lecture Ch-2: Measurement & Problem Solving <u>Lab 1:</u> <i>Getting Started in the Laboratory (Lab-safety rules; Safety Contract; Equipment Inventory; Lab Safety quiz; Equipment quiz)</i>
Wk-2 Sep 1	No Class Labor day holiday	Wk-2 Sep 3	Lecture: Ch-2 (cont'd)
Wk-3 Sep 8 <u>Lab-2:</u>	Quiz-1: Ch-1 &2(Selected) Lecture Ch-3: Matter & Energy	Wk-3 Sep 10	Lecture Ch-4: Atoms & Elements
Wk-4 Sep 15 <u>Lab-3:</u>	Quiz-2:Ch-2(selected) &3 Lecture Ch-4(cont'd) Lecture Ch-5: Molecules & Compounds	Wk-4 Sep 17	Quiz-3:Ch-4&5(selected) Lecture Ch-5(cont'd) <u>Take-home Practice</u> <u>Exam-1</u>
Wk-5 Sep 22	<u>Practice Exam-1 Review</u> <u>Exam-1: Ch 1- 5</u>	Wk-5 Sep 24	<u>Review Exam-1</u> Lecture Ch-6: Chemical Composition
Wk-6 Sep 29 <u>Lab-4:</u>	Lecture Ch-6(cont'd)	Wk-6 Oct 1	Lecture Ch-7: Chemical Reactions
Wk-7 Oct 6 <u>Lab-5:</u>	Quiz-4:Ch-6 Lecture Ch-7(cont'd)	Wk-7 Oct 8	Lecture Ch-8: Quantities in Chemical Reactions

Wk-8 Oct 13 <u>Lab-6:</u>	Quiz-5:Ch-7 Lecture: Ch -8 (Cont'd)	Wk-8 Oct 15	Lecture Ch -9: Electrons in Atoms and the Periodic table.
Wk-9 Oct 20	Quiz-6:Ch-8 Lecture Ch-9 (cont'd) <u>Take-home Practice Exam-2</u>	Wk-9 Oct 22	<u>Review Prctice Exam-2</u> <u>Exam-2: Ch 6 - 9</u> <i><u>Mid-term grade is given on the materials covered so far.</u></i>
Wk-10 Oct 27 <u>Lab-7:</u>	<u>Review Exam-2</u> Lecture Ch-10: Chemical Bonding	Wk-10 Oct 29	Lecture Ch-10 (Cont'd)
Wk-11 Nov 3 <u>Lab-8:</u>	Quiz-7:Ch-10 Lecture Ch -11: Gasses	Wk-11 Nov 5	Lecture Ch-11 (Cont'd)
Wk-12 Nov 10 <u>Lab-9:</u>	Quiz-8:Ch-11 Lecture Ch-12: Liquids, Solids & Intermolecular forces (selected)	Wk-12 Nov12	Catching up! In case of falling behind.
Wk-13 Nov 17 <u>Lab-9:</u>	<u>Reminder: Last day of withdrawal.</u> Lecture Ch-13: Solutions	Wk-13 Nov 19	Lecture: Ch-13 (cont'd)
Wk-14 Nov 24 <u>Lab-10:</u>	Quiz-9 : Ch-13 Lecture Ch-14: Acids & Bases	Wk-14 Nov 26	Lecture: Ch-14 (cont'd)
Wk-15 Dec 1	Review all Chapters <u>Take-home Practice Exam-3</u>	Wk-16 Dec 3	<u>Review Prctice Exam-2</u> <u>Preparation for Final Exam</u>
Wk-16 Dec 8	<u>Exam-3: Ch 10 -14</u> <u>Check-out</u>	Wk-16 Dec 10	Review Exam-3 <u>Exit Test (Cumulative)</u> <u>Good luck</u>

Please Note:

- **This is a tentative schedule. There might be some changes depending on the need and progress of the material. Please keep posted.**
- **Open book quizzes not scheduled which will be given in every class session for extra credit points.**
- **All lab instructions (handouts) will be provided or posted on the blackboard. You are responsible for collecting the printout and read the instructions prior to attend the lab.**
- **All homework will be posted on MasteringChemistry.com. You are responsible to register and login the website before the second class meeting. Also, you are responsible to submit the homework within the deadline.**

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