

Truman College
Chemistry 203-DEN
Fall 2014

Instructor -

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Office Hours: Monday & Wednesday 11:00am – 1:00 pm
Tuesday & Thursday 4:00 – 5:30 pm

Prerequisites:

Grade of C or better in Chemistry 201 and in mathematics 140 or 143.

Course Objectives:

The scientific as well as the industrial communities expect their professionals to not only be able to handle chemical reactions but also predict whether the reaction is feasible to proceed, whether the reaction reaches equilibrium and how to control a reversible reaction. Furthermore, students are expected to be able to determine the rate of any chemical reaction as well as predict its mechanism. Students will meet these expectations through classroom instructions and activities in which basic concepts involving recognizing properties of reacting species, predicting reaction pathways and performing related calculations. In laboratory activities, students are introduced to the basic lab skills, collection and evaluation of experimental results, data analysis, and formulating conclusions.

Student Learning Outcome:

1. Define chemical equilibrium and Le Chatelier's principle and solve variety of chemical equilibrium problems involving equilibrium constant.
2. Define rate law and extract the rate law of a chemical reaction from experimental data as well as from the reactions mechanism. Determine the effect of temperature and catalysts on reaction rates.
3. Recognize, name and identify different isomers of transition metal coordination compounds.
4. Calculate the pH of aqueous solutions of different types of weak acids and bases including indicators. Distinguish between the different types of buffers and identify the method of preparing them.
5. Perform calculation involving solubility product of sparingly soluble salts.
6. Categorize standard functions of enthalpy, entropy, and free energy and their applications to different systems.
7. Recognize and balance redox reactions, identify the different parts of a galvanic as well as electrolytic cells, perform calculations involving Nernst equation and electrolysis.
8. Determine the stability of a nucleus, use isotopic notation to write a nuclear reaction and discuss the kinetics of radioactive decay and the meaning of half-life.

Attendance -

Class meets Monday & Wednesday in room 3162 @ 1:30 – 5:20 pm. Attendance will be taken during class. Regular attendance is expected and is essential for good course performance. Students who will be absent for three class periods, will be administratively withdrawn from the class. Students who arrive 15 minutes, or more, late or leave early (before the class dismissal) will be considered absent.

Course Material:

- 1) Textbook: General Chemistry: Principles and Modern Applications, Chemistry a Molecular Approach: Vol II-by Tro (custom II).
- 2) MasteringChemistry Access Code
- 3) A calculator with scientific and logarithm functions is recommended.
- 4) **No Lab Manual or Notebook is needed. Lab Handouts will be posted on Blackboard**

Examinations - There will be total of four (4) examinations.

Notes:

Students who will not attend the final exam will be given a grade of “F” for the course (fail the course). Those who will have a University recognized excuse will be given an incomplete grade (I), which will be changed to a failing grade (F) if they don’t complete the final exam before the deadline set by the university. Please consult student- handbook and your advisor regarding this matter.

Quizzes -

Quizzes are posted on Blackboard. *There will be no make-up quizzes.*

Problem Sets -

There will be a problem set for each chapter we cover.

Each set consists of selected problems found at the end of each chapter. These sets are web based assignments. Here are the instructions to how you can log into your account:

1. Go to **http://www.masteringchemistry.com**
2. Log in as follows:
 - a. **username: use your student.ccc.edu email address as username**
 - b. **Password: create your own password according to the instructions of masteringchemistry associated with the textbook or sent to you when you purchased masteringchemistry access code.**
 - c. **You will also need the following class code: CHEM203DENF2014**
3. Follow instructions until you are logged in. You would then need to purchase the access code. Once you are able to access the assignment you want to work with, the problems will be displayed when clicking on the corresponding link.
4. When working on numerical problems, you need to keep a close eye on the number of significant figures.

Grading: 90% and up is A, 80-89% is B, 70-79% is C, 60-69 is D, Below 60 is F

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| Exams | 40% |
| Final Exam | 20% |
| Quizzes | 10% |
| Problem Sets | 10% |
| Laboratory | 20% |

Academic Dishonesty

Academic dishonesty is a serious offense, which includes but is not limited to the following: cheating, complicity, fabrication and falsification, forgery, and plagiarism. Cheating involves copying another student’s paper, exam, quiz or use of technology devices to exchange information during class time and/or testing. It also involves the unauthorized use of notes, calculators, and other devices or study aids. In addition, it also includes the unauthorized collaboration on academic work of any sort. Complicity, on the other hand, involves the attempt to assist another student to commit an act of academic dishonesty. Fabrication and falsification, respectively, involve the invention or alteration of any information (data, results, sources, identity, and so forth) in academic work. Another example of academic dishonesty is forgery, which involves the duplication of a signature in order to represent it as authentic. Lastly, plagiarism involves the failure to acknowledge sources (of ideas, facts, charges, illustrations and so forth) properly in academic work, thus falsely representing another’s ideas as one’s own.

- **Examinations:** You are expected to work alone. The instructors will employ statistical software to examine student answer sheets to identify copying on exams – cheating will not be tolerated.
- **Laboratory:** Data collection is a group activity (2 students). All data is expected to be collected in the laboratory. Use of data not collected by the author of the report, use of data not acquired during the lab period, and use of fabricated data will be considered academic misconduct. Case study, pre-lab, and lab questions may be discussed in groups, but must be answered individually.

Penalties for Academic Dishonesty

In individual cases of academic dishonesty, sanctions may range from a written warning to a failing grade for the course; the severity of the penalty is left to the discretion of the instructor. Additional sanctions may be imposed up to and including dismissal from the City Colleges when circumstances warrant it.

Standards of Conduct

City Colleges of Chicago students are expected to conduct themselves in a manner which is considerate of the rights of others and which will not impair the educational mission of the College. Specifically, all students assume an obligation to conform to Board Rules, the statement of Student Rights and Responsibilities and the following policies.

“The Standards of Conduct applies and discipline may be imposed for conduct which occurs on College premises, at off campus recreational or instructional sites, at any College-sponsored event, or at any College supervised or provided activity, transportation or facility.”

A copy of these Board Rules governing student conduct is available from the Dean of Student Services. Misconduct for which students are subject to College discipline, up to and including expulsion from the College, falls into the following categories:

1. All forms of dishonesty such as stealing, forgery, alteration or improper use of college documents, records, or identification cards with intent to defraud, and knowingly furnish false information to the college.
2. Intentional obstruction or disruption of teaching, research, administration, disciplinary proceedings or other college activities.
3. “Physical abuse, verbal abuse, threats, intimidation, harassment, hazing, coercion, and/or other conduct which threatens or endangers the health or safety of any person or creates a hostile working or learning environment which includes but not limited to any telecommunication devices.”
4. “Carrying or possession of unauthorized weapons, ammunition or other explosives, or creating a clear and present danger to persons or property by the misuse of combustible or biological materials.”
5. Theft or damage to college premises or damage to property of a member of the college community on institution premises.
6. Unauthorized or inappropriate use of City Colleges facilities and resources.
7. Failure to comply with college officials acting in the performance of their duties.
8. Violations of the following City Colleges of Chicago Policies; (1) Academic Integrity, (2) Policy on Equal Opportunity in Employment (EEO), Programs, Services and Activities, (3) Drug and Alcohol Free Campus Policy, (4) Safety and Security Policy, (5) Responsible Computer Use Policy and (6) Smoke Free Policy, (7) Hat Policy.
9. Retaliation against any students, program participants, employees or other persons who made complaints or who cooperate in the investigation of EEO matters and complaints, Student Grievances and/or Student Disciplinary matters.

For more details about academic dishonesty and student conduct, please consult the Student Policy Manual:

<http://www.ccc.edu/Files/studentpolicymanual.pdf>

Tentative Lecture Schedule

| Dates | Chapter | HW Due Date | Quizzes |
|----------------------------------|-----------------------------------------------------------|----------------------------------------------------------------------|------------|
| Aug 25 M Aug 27 W Sep 03 W | 19. Thermodynamics | Check Masteringchemistry | Blackboard |
| Sep 08 M Sep 10 W Sep 15 M | 15. Chemical Equilibrium | | |
| Sep 22 M Sep 29 M Oct 01 W | 16. Acids and Bases | | |
| Oct 06 M | Exam 1 Chapter 15, 16, 19 | Multiple Choice and Free Response Questions | |
| Oct 06 M Oct 08 W Oct 13 M | 17. Buffers | Check Masteringchemistry | Blackboard |
| Oct 20 M Oct 22 W | 18. Ionic Equilibria | | |
| Oct 27 M | Exam 2 Chapters 17-18 | Multiple Choice and Free Response Questions | |
| Oct 27 M Oct 29 W Nov 03 M | 20. Electrochemistry | Check Masteringchemistry | Blackboard |
| Nov 10 M Nov 12 W Nov 17 M | 14. Rate of Reaction | | |
| Nov 24 M | Exam 3 Chapters 14, 20, 24 | Multiple Choice and Free Response Questions | |
| Nov 24 M Nov 26 W | 24. Coordination Compounds | Check Masteringchemistry | Blackboard |
| Dec 01 M | 25. Nuclear Reactions | | |
| Dec 08 M | Full Year Extra-Credit Exam | American Chemical Society (ACS)- All Multiple Choice Exam | |
| Dec 10 W | Final Exam Cumulative All Chapters covered | American Chemical Society (ACS)- All Multiple Choice Exam | |

Truman College

Laboratory Outline for Chemistry 203

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 or 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.
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: There will be TWO formal Lab reports during the course of the semester. Sample Lab reports will be provided. The experiments for which a formal report to be submitted are indicated below. Each of the Formal Lab reports is worth twice the points of the in class ones.

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. You **must** complete all calculations and problems for the "Advance Study Assignment" section of each experiment before you come to the lab. Your work will be collected before the experiment starts.
 2. Ten (10) points will be deducted if you let someone copy your data or any part of the report. Same deduction will be applied to those who copy someone's report.
 3. The report must be clear, clean, and neat.
 4. The pages must be named and stapled together in a **numerical order**.
- 5. Lab reports are due a week after the completion of the experiment. NO LATE lab reports will be accepted. A zero grade will be entered for every missed lab/lab report. In the case of an absence, on the day the lab is due, arrangements must be made for the report to be handed in on time with consultation with the professor.**

Make-up Experiments: Positively NO missed experiments can be made up!!!

Experiments:

Tentative Date (Fall 2014)

All lab reports must be formal; i.e. typed in the format posted on Blackboard.

** Lab Safety Quiz

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| Equilibrium: Le Chatelier Principle | 09-17 |
| Acid-Base Titration | 09-24 |
| Titration Curves and Buffers | 10-15 |
| Voltaic Cell Measurements | 11-05 |
| Rates of Chemical Reactions | 11-19 |
| Coordination Compounds | 12-03 |