

CHEMISTRY 152 COURSE INFORMATION

Instructor: Dr. Joe Lanzafame - just call me Joe

I. Office Hours:

Office: By appointment only.
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II. Goals

To build upon the understanding of basic chemical concepts and problem solving skills developed in Chem 151. The ultimate goal is the taking of the ACS General Chemistry exam which is cumulative, covering both Chem 151 and 152.

[CHE 152 General College Chemistry II](#)

1. Calculate solution concentrations: percent concentration (mass/mass, volume/volume and mass/volume), mole fraction, molarity and molality.
2. Determine reaction order from graphical and experimental data and make reaction predictions based on the integrated rate equations.
3. Calculate equilibrium concentrations based on: initial concentrations; initial and final concentrations.
4. Predict the direction of an equilibrium reaction based on changes in reaction conditions (concentrations, volume changes and temperature).
5. Write acid base hydrolysis reactions based on the Bronstead/Lowry theory of acids and bases. Calculate the pH of strong and weak acids and bases. Calculate the pH and changes in pH of acid/base buffer systems.
6. Calculate the solubility of sparingly soluble salts.
7. Perform a series of acid/base titrations.
8. Predict the spontaneity of a chemical process based on Free Energy calculations.
9. Write balanced oxidation/reduction reactions.
10. Demonstrate an understanding of electrolytic cells through cell diagrams and cell voltage calculations based on the Nernst equation.

III. Textbooks, etc.

1. Principles of Chemistry; Nivaldo Tro
2. Calculator with scientific functions (Log, ln, y^x , etc.)
3. Chem 152 lab manual (in bookstore)

IV. Homework and in-class assignments

These count as part of your grade as well as giving you valuable practice. Ultimately it is your responsibility to obtain as much practice as YOU need. If that means doing 3x as many exercises as I suggest, do them.

We will also have a few in-class assignments that will be graded to encourage participation and attendance.

V. Grading

3 exams (drop lowest) - 100 points each
Final Exam - 100 points
Laboratory Write-ups- 120 points
Homework & in-class assignments - 80 points
Total possible points - 500

Grading is NOT on a curve: A>90%, B>80%, C>70%, D>60%

NO MAKE-UPS WILL BE GIVEN except in cases of accident or serious illness. In the case of illness, you ABSOLUTELY MUST contact me in advance of the quiz/exam.

VI. Learning Centers

MCC has a number of Learning Centers at Brighton (for example, Accounting, Math, Psychology, Writing, the Electronic Learning Center, etc.) and at Damon (for example, the Integrated Learning Center, Electronic Learning Center, etc.). Learning centers are staffed with instructional personnel and may be equipped with computers and software to assist students.

It is recommended that students use the Learning Centers to get additional help with concepts learned in the classroom and with their homework. Please complete Part A of the Learning Center Referral form attached to this Course Information Sheet and return the form to your instructor.

VII. Emergency Closings

If the College is closed due to inclement weather or some other emergency, all Rochester area radio and television stations will be notified no later than 5:30 a.m. In addition, the homepage on the MCC website (www.monroecc.edu) will display a message indicating the College is closed. Please do not call the College to avoid overloading the telephone lines.

Class cancellation information is available daily on the web or through the telephone. Simply go to the MCC website (www.monroecc.edu) and under the "Quick Links" window on the homepage, click on "Class Cancellations". Additionally, class cancellation information is available by dialing 292-2066, press "1" for the Brighton Campus and "2" for the Damon Campus. If possible, please use the web as there could be delays in the voice recordings based on the number of cancellations.

VIII. Final thoughts

Chemistry is a subject that relies not only on your ability to memorize concepts, but also on your ability to apply these concepts to solving problems. If your algebra is weak, parts of

this course will be difficult. Do not despair, contact me. I will give you as much assistance as you require to not only master chemical concepts but also to develop algebraic skills. The best way to learn is by doing, so do as many problems as you can.

Learning Objectives

12. Intermolecular Forces

- A. Recognize the different types of intermolecular forces
- B. Understand the connection between the intermolecular forces and the corresponding physical properties of molecules.
- C. Be able to predict trends in physical properties based on the relative intermolecular forces involved.

13. Properties of Solutions

- A. Determine the Properties of solutions based on the different intermolecular forces present.
- B. Calculate boiling point elevation, freezing point depression and osmotic pressure.

16. Kinetics

- A. Be able to determine the rate of a reaction.
- B. Based on initial rates and concentrations, be able to determine the order of a reaction.
- C. Be able to calculate a rate constant.
- D. Be able to determine and apply the integrated rate equation based on the order of the reaction.

17. Equilibrium

- A. Be able to write the equilibrium constant expression based on the balanced equation.
- B. Be able to calculate the equilibrium constant for a reaction based on equilibrium concentrations.
- C. Be able to assemble an ice chart and determine the equilibrium concentrations if the equilibrium constant is known.

18. Acids & Bases

- A. Apply equilibrium principles to acids/base reactions.

19. Ionic Equilibria

- A. Apply equilibrium principles to ionic reactions.

20. Thermochemistry

- A. Be able to apply the idea of enthalpy to reactions.
- B. To be able to use Hess's Law to calculate enthalpies of reactions based on known reactions.
- C. To be able to predict spontaneity of reactions using Gibb=s Free Energy
- D. To understand the nature of entropy and enthalpy

21. Electrochemistry

- A. Recognize redox reactions.
- B. Balance redox reactions.
- C. Determine cell potentials using 2 reactions.
- D. Apply the Nernst equation to real systems.

14. Main Group Elements: Applying Principles of Bonding and Structure

- A. Recognize the connection between the bonding of a molecule and its physical properties
- B. To be able to use group properties to predict bonding similarities and rationalize similarities and differences in chemical and physical properties.

15. Introduction to Organic Chemistry

- A. Recognize organic molecules
- B. Identify and name simple hydrocarbons
- C. Recognize structural isomers
- D. Recognize and name alcohols, amines, and carboxylic acids.

Suggested Exercises from the textbook:

Chapter 11: 2, 24, 26, 30, 36, 38

Chapter 12: 14, 24, 26, 30, 44, 50, 54

Chapter 13: 2, 12, 16, 18, 22, 42, 54, 62

Chapter 14: 12, 18, 22, 24, 28, 32, 36, 44, 72

Chapter 15: 2, 6, 8, 10, 18, 26, 40, 52, 66, 72

Chapter 16: 4, 6, 14, 22, 42, 52, 56, 60, 66

Chapter 17: 2, 6, 12, 16, 34, 40, 42

Chapter 18: 2, 6, 8, 10, 30, 32, 38, 40, 58, 70

Chapter 19: 6, 16, 24, 34, 48

Chapter 20: 2, 4, 6, 10, 20