Instructor:  Dr. Michael A. Stemmlski

Office:  171 Brown Lab

Office Hours:  Before class, after class, or by appointment

Phone:  302-239-4090 (H)

e-mail:  mastem@udel.edu

Lectures:  July 9 to August 9, Final Exam - August 10

Time:  8:00 A.M. - 9:30 A.M.

Location:  101 Brown Lab

Texts:  Chang/Goldsby - Chemistry (11th Ed) - Recommended
Chang - Student Study Guide (11th Ed) - Optional
Chang - Student Solution Manual (11th Ed) - Optional

NOTE:  Attendance to class is not mandatory. However, excess absences will severely affect your grade as pertinent information concerning the course is presented in lecture.

Laboratory Assignments

Location:  054 Drake Hall (Section 920L)
070 Drake Hall (Section 921L)

Scheduled Time:  12:30 P.M. - 3:30 P.M., Monday, Wednesday, Friday

Laboratory Manual:  Experiments for General Chemistry - Required

Instructors:  Ayonide Osunkoya (Section 920L) ayados@udel.edu
Shoshana Dickerson (Section 921L) shoshana@udel.edu

NOTE:  Attendance to laboratory is mandatory and it is imperative that the entire experiment be read and the procedure familiarized before each session. Proper dress is required and goggles must be worn at all times in the laboratory.

ADA Reasonable Accommodations

Pursuant to Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, the University provides reasonable accommodations for individuals with documented disabilities. Students registered in this course who need reasonable accommodations should make this known to the instructor and also document the needs with the Office of Americans with Disabilities Act.
# Text Assignment

- Chang, Chap 5, 11, 12
- Chang, Chap 13, 14
- Chang, Chap 15, 16
- Chang, Chap 18, 19, 24

# Exam Assignment

- Exam I, Monday 7/16
- Exam II, Monday 7/23
- Exam III, Monday 7/30
- Exam IV, Wednesday 8/8
- Final Exam - Friday 8/10

## Chapters
- **Ch 5 - Gases**
- **Ch 11 - Intermolecular Forces and Liquids and Solids**
- **Ch 12 - Physical Properties of Solutions**
- **Ch 13 - Chemical Kinetics**
- **Ch 14 - Chemical Equilibrium**
- **Ch 15 - Acids and Bases**
- **Ch 16 - Acid-base Equilibria and Solubility Equilibria**
- **Ch 18 - Electrochemistry**
- **Ch 19 - Nuclear Chemistry**
- **Ch 24 - Organic Chemistry**

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# Proposed Laboratory Schedule

- **Jul 11** Safety and Exp 8 Gas Laws and Volatile Liquids
- **Jul 13** Exp 14 Colligative Properties
- **Jul 16** Exp 21 Kinetics
- **Jul 18** Exp 16 Equilibrium: Determination of the Equilibrium Constant
- **Jul 20** Exp 17 Equilibrium: LeChateller’s Principle
- **Jul 23** Exp 20 pH and Its Applications
- **Jul 25** Exp 23 Qualitative Analysis: Anions
- **Jul 27** Exp 18 Equilibrium: Determination of a Solubility Prod Constant
- **Jul 30** Exp 25 Qualitative Analysis: Cations: Groups I & III
- **Aug 01** Exp 26 Voltaic Cells
- **Aug 03** Exp 22 Organic Synthesis: Preparation of an Ester
CHEM 104 Summer - Grading Policy

The minimum requirements for obtaining a passing grade and credit in CHEM 104, Summer 2012 are:

a. Completion of ten laboratory experiments/reports/meetings
b. Completion of the four scheduled examinations
c. Completion of the final exam
d. Obtaining an average of at least 60% according to the suggested scale

A) Examinations (50%) - Four 100 percentage point examinations will be given and must be taken by all students. An unexcused missed examination will be recorded as a ZERO and may not be made up. All exams will cover material in lecture and from the assigned problems (but not from the laboratory).

B) Laboratory (25%) - Eleven laboratory meetings are scheduled and the best ten (10) laboratory meeting scores will determine the laboratory grade

C) Final Exam (25%) - The final exam will be given at the conclusion of the course and must be taken by all students

Failure to complete any of the above requirements will merit no credit for CHEM 104, Summer 2012

If an examination is missed for whatever reason, it is the responsibility of the student to contact the instructor within a reasonable period of time. If not, it will be assumed that the student does not wish to continue in the course.

The University of Delaware policy on Academic Honesty will be followed in this course. Violations of any parts of this policy could mean your removal from this course with no academic credit.

The Family Educational Rights and Privacy Act of 1974 (FERPA) stipulates that test/lab grades cannot be posted, given over the phone, or by e-mail. These grades, however, can be released to students in person.

The following grade scheme will be followed with averages rounded to the nearest tenth (0.1) of a point:

<table>
<thead>
<tr>
<th>Average</th>
<th>Grade</th>
<th>Average</th>
<th>Grade</th>
<th>Average</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>93.3 - 100</td>
<td>A</td>
<td>80.0 - 83.2</td>
<td>B-</td>
<td>66.7 - 69.9</td>
<td>D+</td>
</tr>
<tr>
<td>90.0 - 93.2</td>
<td>A-</td>
<td>76.7 - 79.9</td>
<td>C+</td>
<td>63.3 - 66.6</td>
<td>D</td>
</tr>
<tr>
<td>86.7 - 89.9</td>
<td>B+</td>
<td>73.3 - 76.6</td>
<td>C</td>
<td>60.0 - 63.2</td>
<td>D-</td>
</tr>
<tr>
<td>83.3 - 86.6</td>
<td>B</td>
<td>70.0 - 73.2</td>
<td>C-</td>
<td>0.00 - 59.9</td>
<td>F</td>
</tr>
</tbody>
</table>
Suggested Problems for CHEM 104, Chang 11th Ed

Ch 5:  13, 19, 20, 22a, 23, 31, 32, 33, 34, 35, 36, 38, 40, 41, 43, 44, 48, 53, 55, 67, 72, 81, 87

Ch 11: 6, 11, 12, 18a, 21, 23, 27, 34, 49, 57, 62, 68, 71, 84, 87

Ch 12: 1, 8, 13, 15, 17, 27, 40, 42, 46, 49, 51, 55, 56, 63, 73

Ch 13: 1, 6b, 8, 10, 11a,b, 13, 16, 17a,d, 27a, 30, 35a, 46, 48, 51c,e, 52, 55a, 60, 70, 74a,b, 94

Ch 14: 6, 8a,b,d, 9b,c, 10, 15, 17, 18, 20a, 28, 40, 43, 48, 51, 53, 58, 89

Ch 15: 1, 3b,c,e,g, 4a,d, 5a,b,c, 6a,b,c, 8b,g,h,l, 9, 12, 14, 15, 16, 17, 18, 19a,b,c, 20a,c, 22, 23, 27, 33a,b,c,e,g,l, 34a, 43, 45, 46a, 50a, 66, 77a,b, 78a,b, 81, 91, 93b,c,e,g,h

Ch 16: 3, 5, 7, 9, 12a,b, 15, 18, 20, 47, 49a,c, 53a, 54a, 55, 58, 61, 66, 70, 97, 104

Ch 18: 1a,b,c,e, 3, 11, 12, 16a,c, 23, 25a, 26a,d, 29, 30a, 31, 45, 48, 54a,c, 89b

Ch 19: 5, 6, 7, 8, 21a, 22b, 25, 27, 28, 31, 34, 37, 38, 61, 72, 74b

Ch 24: 3, 7, 8, 13, 14, 17, 24, 26a,b,e, 27a,c,e, 28a, 34, 36a,b,c,d,e,f, 42
CHEM 104 Summer Course Learning Goals

After successfully completion of this course, a student should be able to:

1. Calculate answers to fundamental gas law problems
2. Define the characteristics of the kinetic theory of matter as related to phase diagrams
3. Define the properties of solids and liquids and phase changes among the three states of matter
4. Calculate the concentrations of the fundamental solutions used in scientific experiments
5. Solve problems associated with the colligative properties of solutions
6. Determine a rate law equation from experimental data and the value of a rate constant
7. Calculate the activation energy of a typical chemical reaction
8. Write equilibrium constant expressions used to solve problems determining equilibrium constants
9. Apply LeChateliers Principle to explain factors that affect chemical equilibrium
10. Relate the three common acid/base theories to each other
11. Determine the pH of common acid and base solutions
12. Calculate ionization constants of weak acids and weak bases
13. Identify and calculate the pH of buffer solutions
14. Balance oxidation-reduction equations by the ion electron method
15. Diagram an electrolysis cell and write the reactions at each electrode
16. Diagram a Voltaic Cell, determine the cell potential, and write the reactions taking place
17. Determine the products and balance a nuclear equation
18. Calculate the binding energy of a isotopic nucleus
19. Determine the age of a carbon-14 artifact from half-life calculations
20. Name and draw the structures of common organic compounds
21. Determine the products of simple organic reactions
22. Identify the common functional groups used to characterize organic molecules
NAME

ADDRESS

PHONE

E-MAIL

HIGH SCHOOL ATTENDED

IF NOT IN DELAWARE, WHERE LOCATED

WHEN AND WHERE DID YOU TAKE CHEM 103 OR ITS EQUIVALENT?

IF YOU HAVE NOT TAKEN CHEM 103 OR ITS EQUIVALENT, WE MUST TALK.

WHY ARE YOU TAKING THIS COURSE?

WHAT GRADE DO YOU NEED IN THIS COURSE? _______ WANT? _______ EXPECT? _______

TELL ME A LITTLE ABOUT YOURSELF -