Instructor: Dr. Michael A. Stemiski

Office Hours: Before class, after class or by appointment

Phone: 302-239-4890

e-mail: mastem@udel.edu

Lectures: Tuesday and Thursday

Time: 2:15 PM - 3:30 PM

Location: Room 416

Texts: Chang/Goldsbey - Chemistry (11th Ed) - Required
       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: 064 Drake Hall (Newark)

Scheduled Time: 7:00 PM - 10:00 PM Friday

Laboratory Manual: Experiments for General Chemistry, 3rd ed - Required

Instructor: TBA

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 Office of Disability Support Services and with the Wilmington Associate in Arts Office.
CHEM 104 - Fall 2015 - Tentative Class/Examination Schedule

Text Assignment
Chang, Chap 12,13
Chang, Chap 14,15
Chang, Chap 16,17
Chang, Chap 18,19,24

Exam Assignment
Exam I, Thursday 9/17
Exam II, Thursday 10/08
Exam III, Thursday 10/29
Exam IV, Tuesday 12/08
Final Exam - 12/15

CHEM 104 - Fall 2015 - Proposed Laboratory Schedule

Sept 18  Safety and Exp 8  Gas Laws and Volatile Liquids
Sept 15  Exp 9  Trends in the Periodic Table
Oct 02   Exp 14  Colligative Properties
Oct 09   Exp 21  Chemical Kinetics
Oct 16   Exp 16  Equilibrium: Determination of the Equilibrium Constant
Oct 23   Exp 30  Titration of Acids and Bases
Oct 30   Exp 20  pH and Its Applications
Nov 06   Exp 18  Equilibrium: Determination of a Solubility Product Constant
Nov 13   Exp 23  Qualitative Analysis: Anions
Nov 20   Exp 25  Qualitative Analysis: Cations: Groups I and III
Dec 04   Exp 26  Voltaic Cells
The minimum requirements for obtaining a passing grade and credit in CHEM 104, Fall 2015 are:

a. Completion of the 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 material from the assigned problems (but not from the laboratory).

B) Laboratory (25%) - From the laboratory meetings that are scheduled an average of the scores on the laboratory reports 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

Note: Failure to complete any of the above requirements will merit no credit for CHEM 104, Fall 2015

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, a grade of zero will be assigned and/or 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 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, 59

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, 48a, 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, 68, 70, 97, 104

Ch 17: 1, 2, 4, 5, 9a,c,f, 11a, 12b,c, 13a,b, 14a,b, 15, 17a,c, 18b, 19, 20a, 23, 26, 28a

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 Course Learning Goals

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

1. Calculate the concentrations of the fundamental solutions used in scientific experiments
2. Solve problems associated with the colligative properties of solutions
3. Determine a rate law equation from experimental data and the value of a rate constant
4. Calculate the activation energy of a typical chemical reaction
5. Write equilibrium constant expressions used to solve problems determining equilibrium constants
6. Apply LeChatelier's Principle to explain factors that affect chemical equilibrium
7. Relate the three common acid/base theories to each other
8. Determine the pH of common acid and base solutions
9. Calculate ionization constants of weak acids and weak bases
10. Identify and calculate the pH of buffer solutions
11. Determine the spontaneity of various physical and chemical processes
12. Calculate the entropy and free energy of chemical reactions
13. Relate the free energy, enthalpy, and entropy of chemical reactions
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
CHEM 104 QUESTIONNAIRE

NAME ______________________________________

ADDRESS __________________________________

___________________________________________

PHONE _____________________________________

E-MAIL ______________________________________

HIGH SCHOOL ATTENDED _______________________

IF NOT IN DELAWARE, WHERE LOCATED ___________

PREVIOUS CHEMISTRY COURSES
INCLUDING HIGH SCHOOL _______________________

WHY ARE YOU TAKING THIS COURSE?

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

TELL ME A LITTLE ABOUT YOURSELF -