

## **CHEMISTRY 111-Spring 2012**

### **For Monday and Wednesday Lectures only**

**Instructor:** Dr. Zewail

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#### **Prerequisites:**

CHEM 110 or equivalent with a grade of Pass or "C" or higher and MATH 80 (or MATH 80B) or equivalent with grades of Pass or "C" or higher. (Satisfactory completion of the Math Placement Process may be substituted for math 80)

Recommendation: It is strongly recommended that all of the preceding prerequisites be completed within four years prior to the date of enrollment in CHEM 111.

#### **Required Material:**

1) Chemistry, *A Molecular Approach*, Second Edition, by Nivaldo J. Tro

You do not need to buy the access code for the online homework (Mastering Chemistry). However, if you are planning to take Chem 112 in Fall 2012 in a lecture taught by **another instructor**, that other instructor will ask you to purchase or to have already purchased the Access Code that comes with the textbook. If you buy a textbook without an Access Code for Chem 111, you can buy the Access Code separately in order to be able to do the required online homework for Chem 112.

Again, I will **not** require you to buy Access Code for my Chem 111 or Chem 112 lectures

2) A simple calculator that handles the four basic calculations, log and antilog. Only non-graphing calculators are allowed for the exams. Calculators in combination with electronic communication devices and/or camera photography are not allowed.

3) Packet, Safety in the Chemistry Laboratory. This material can be downloaded and printed from my webpage listed above, or from [www.cerritos.edu/chemistry](http://www.cerritos.edu/chemistry)

4) Scan-tron # 882 for the Safety Quiz in the lab

5) Safety goggles which have splash protection in compliance with ANSI Z87.1-1989 as required by California State Law.

6) Lab apron.

#### **Lecture Notes and Worksheets**

- All lecture notes and worksheets are posted on line <http://www.cerritos.edu/mzewail> . Download /print all lecture notes and worksheets. Bring the lecture notes to class with you.
- Your lecture professor will announce quizzes and scheduled tests.
- All chapters assigned in the schedule are from the textbook, *Chemistry, A Molecular Approach*, second Edition, by Nivaldo J. Tro

#### **Attendance**

It will be expected that you attend regularly. If you have been or intend to be absent for legitimate reasons, inform the instructor. Roll will be taken at the beginning of the hour. If you are late to class, you will not be accounted for in the roll sheet and will be marked absent. You may be dropped from the class if you are considered absent for three class meetings or more.

**\*\*\* Absolutely no audio/ video recording, or camera photographing is allowed during laboratory or lecture without the instructors permission.**

### **Withdrawal**

If you find it necessary to drop the class, do not just stop attending class. In order to drop the course and receive a "W" grade, you must proceed as follows:

1. Check out of the laboratory and receive a laboratory clearance form. This must be done at your regularly scheduled lab time. If this is not possible, you can make an appointment with the chemistry stockroom personnel at (562)860-2451 ext 2695, however, there is a fee for the stockroom service.
2. Complete the official withdrawal procedure required by the Admissions Office. This can be done online.

If you miss three class meetings, I may drop you from the course. However, you are still responsible for checking out of the laboratory. If you fail to check out, your records will be placed on administrative hold.

NOTE: April 20, 2012 is the last day to withdraw.

### **Examinations**

All examinations and quizzes will be announced. There will be given:

- a) Five exams, each worth 100 points. The lowest exam score will be dropped. All exams will be closed book/closed notes. All books and papers must be out of sight. Complete setups must be given in order to receive credit. (i.e. no credit for answers alone.) You must use the Conversion-factor method (also known as Factor-label method or Dimensional-analysis method) in solving problems. No make-up will be given on exams or quizzes. If you miss one of the five exams, this will count as the exam that is dropped. Exams and quizzes will count as 50% of your course grade.
- b) A two-hour final examination that will count as 15% of the course grade.

### **Missed Exams:**

No make up will be given for missed exams or quizzes. You must take each exam at the time and on the date it is scheduled for your class. **NO EXCEPTIONS**

### **Course Grade**

The course grade will be broken down in the following manner:

|                                     |      |
|-------------------------------------|------|
| Lecture exams, quizzes and homework | 50 % |
| Lecture Final exam                  | 15 % |
| Laboratory                          | 35 % |

### **Grading Scale**

| <u>percent</u> | <u>Letter grade</u> |
|----------------|---------------------|
| 90-100         | A                   |
| 80-89          | B                   |
| 70-79          | C                   |
| 60-69          | D                   |
| 59 and below   | F                   |

To pass CHEM 111 you must pass (D or better, 60% or higher) the lab portion, the lecture portion, and the lecture final exam.

### **Cheating Policy**

If you cheat in lab or in lecture, you will be dismissed from the course with an "F" grade

## CHEMISTRY 111 LECTURE SCHEDULE -Spring 2012

All chapters assigned are from the textbook, Chemistry, A molecular Approach, second Ed. by Nivaldo J. Tro. Those items with a **T** mark are worksheets posted online <http://www.cerritos.edu/mzewail> .

Download and print the worksheets.

Homework will be checked at the discretion of the professor.

| Week of        | Topic   | Chapter                | Pages                         | Textbook Assigned Problems  |
|----------------|---|------------------------|-------------------------------|---|
| Jan 9          | Naming (ionic and molecular)                    | Ch 3.5                 | 88-94                         | Ch 3: 39,41,43,47,49  |
|                | Naming acids Equations                          | Ch 3.6<br>Ch 4.6,4.8   | 94-97<br>150-153<br>155-161   | Ch 3: 17,40,64,70,72<br>Ch 4: 71.73.74,85<br><br>Ch 3: 93, 95,99<br><b>T</b> ) Worksheet: Formulas<br><b>T</b> ) Worksheet: Equations |
| Jan 17         | Stoichiometry                                   | Ch 3.7-3.9             | 97-110                        | Ch 3:<br>68,70,72,80,82,88,90,92,112,113,118,119,121,122,<br>123,127,129,132,134  |
|                | <b>Exam I</b>                                   | Ch 4.1-4.3             | 126-139                       | Ch 4: 37,38,41,43,44,45,47,49,50,51   |
| Jan 23         | Chemical Bonding                                | Ch 3.2, 3.4            | 80-82<br>84-87                | Ch 3: 29,30<br><br><b>T</b> ) Worksheet: Lewis Structure.   |
|                | Trends in the periodic table                    | Ch 8.6,8.7             | 330-333<br>337-344            | Ch 8: 71,72,73,75,79,81   |
|                | Intermolecular Forces.                          | Ch 11.3                | 459-466                       | Ch 11: 49,51  |
| Jan 30         | Gases   | Ch 5                   | 178-207<br>212-217            | Ch 5:<br>33,41,45,63,67,69,71,73,75,77,81,89,91,101,103,<br>105,107   |
| Feb 6          | Solids  | Ch 11.10-11.12         | 489-500                       | Ch 11: 99,101,103,105,107<br><br><br><b>T</b> ) Worksheet: Solids Structure.  |
|                |   | Ch 9.4                 | 367-368                       |   |
|                |   | Ch 9.4                 | 364-366                       |   |
|                | Born-Haber cycle.                               | Ch 9.4                 | 364-366                       |   |
| <b>Exam II</b> |   |                        |                               |   |
| Feb 13         | Liquids, Changes of State. Properties of water. | Ch 11.5-11.9           | 470-476<br>479-482<br>484-488 | Ch 11: 67,69,85,86,87   |
| Feb 21         | Colloids.                                       | Ch 12.8, Lecture notes | 550-552                       | Ch 12: 26,27,28   |
| Feb 27         | Electrolytes. Net-Ionic Equations.              | Ch 4.5<br>Ch 4.7       | 147-148<br>153-155            | Ch 4: 67,68,75,77<br><br><b>T</b> ) Worksheet: Molecular and Ionic Equations  |

|        |  |  |         |   |
|--------|--|--|---------|---|
|        | Molarity   | Ch 4.4   | 140-146 | Ch 4: 55,56,57,59,60,61,63,65,66,83   |
|        | Units of concentration                           | Ch 12.5  | 527-534 | Ch 12 : 51,52,53,54,55,59,60,63,64,68   |
| Mar 5  | Colligative Properties.<br><b>Exam III</b>       | Ch 12.6-12.7   | 535-549 | Ch12:18,19,20,21,22,23,24,25,69,70,71,73,75,77,79,81,83,85,87,88,89,91,92,109,110,111<br><b>T) Worksheet: Solutions and Colligative Properties.</b> |
| Mar 12 | Arrhenius Acid, Bronsted-Lowry Acid              | Ch 15.3  | 662-665 | Ch 15: 33,35,37,39,45(a,b)  |
|        | Lewis Acid                                       | Ch 15.11   | 700-701 | Ch 15 : 121,122,123,124   |
|        | pH,pOH,Kw  | 15.5-15.6  | 668-672 | Ch 15;49,51,55,57,77,81,83  |
| Mar 19 | Chemical Equilibria.<br><br><b>Exam IV</b>       | Ch 14 All (except p.622-624; the relationship between Kc and Kp) | 615-648 | Ch 14: 21,23,27,29,33,37,39,41,43,45,51,53,57,61,63,65,67,69<br><br><b>T) Worksheet: Chemical Equilibrium.</b>                                      |
| Mar 26 | Acid-Base Equilibria.                            | Ch 15.4  | 665-668 | Ch 15: 61,65,67,69,73,87,91   |
|        |  | 15.6-15.7  | 673-685 |   |
|        | Polyprotic Acids.                                | 15.9   | 693-697 | Ch15: 109-111   |
| Mar 9  | Common -ion. Buffer.                             | Ch 16.2-16.3   | 714-728 | Ch 16 : 27,29,31,35, (Henderson Hasselbach 37,39) 41,43,45,47,49,53,57,59<br><br><b>T) Worksheet: Buffers</b>                                       |
| Mar 16 | Hydrolysis (Anions of weak acids and weak bases) | Ch 15.8  | 685-693 | Ch 15: 88,93,95,97,99,101,103,105   |
| Mar 23 | Titration<br><b>Exam V</b>                       | Ch 16.4  | 729-743 | Ch 16: 61.63, and other problems that may be assigned by the instructor<br><b>T) Worksheet: Acid-Base Equilibria (Solution Equilibria).</b>         |
| Mar 30 | Solubility Equilibria                            | Ch 16.5  | 743-751 | Ch 16: 87,89,91,93,95,97,99,101,103,105,107   |
| May 7  | Relationship between $K_p$ and $K_c$ .           | Ch 14.4  | 622-624 | Ch 14 : 31<br><br><b>T) Part I- Review for Final 111 Lecture</b><br><b>T) Part II- Review for Final 111 Lecture</b>                                 |

**Final Exam: Monday May 14, 2012 (12:00-2:00 pm).**

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Learning outcomes:

After successfully completing Chem 111, you should be able to do the following:

- a. Apply knowledge of microscopic (molecular) interactions to explain or predict macroscopic properties.
- b. Apply critical thinking strategies in solving algorithmic and conceptual problems in chemistry.
- c. Incorporate chemical principles to explain lab results and vice versa.
- d. Apply laboratory skills to perform chemical analysis including collection of data, computations, and statistical analysis of the results.
- e. Use effective written communication of chemical information.
- f. Make effective use of current technology to collect and analyze data.