

# CHEM 31A (90366): General Chemistry Fall 2011

## I. Lecture

**Lecturer:** Erik Ruggles, Ph.D.

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**Office Hours:** M T W Th F 11:30-12:30 pm  
or by appointment

**Lecture Time:** M W F 9:35-10:25 am

**Location:** Angell B106

**Lecture:** The lecture each week will be used primarily to cover new material. Included in the syllabus is a tentative schedule covering the topics and timing of the lecture, reading material, and problem sets. Attendance of the lecture is not mandatory, but when you do come please stay through the entire lecture. Most will find it difficult to do well in this class if they do not attend the lecture. My class lecture notes for the entire semester are posted on Blackboard.

**Textbook:** "Chemistry, A Molecular Approach" 2<sup>nd</sup> Ed., by Nivaldo Tro can be purchased at the UVM bookstore. The solutions manual comes with the text and has the complete solutions to all the assigned problems. The study guide while not required can be a great help during problem solving.

**Problems:** Answers to problem sets and exercises are in the solutions manual. I will cover assigned problem sets during scheduled review sessions. I strongly encourage you to do as many problems as possible. The problems combine mathematics with scientific concepts and are challenging, so the more you practice the better you will get. Blank old exams from my 2009 and 2010 General Chemistry classes as well as their answer key will be posted on blackboard. These are a great way to evaluate what you understand and what you do not as the test questions will change but the format and concepts will remain the same.

**Problem Sessions:** Throughout the semester I will hold optional meetings on Tuesdays evenings from 8:00-9:30 pm in Angell B106 to better clarify topics or do problem solving. Also the Sunday before a mid-semester exam I will hold an extra review session from 7:00-9:00 pm in Marsh Life Sciences 235. Also, the class before the exam a review session will be held instead of the standard lecture.

**Exams:** The exams are scheduled to be **Tuesday evenings from 7:00-9:45 pm in Angel B106**. There are no scheduled make up dates. While taking the exams only non-programmable non-graphing calculators are permitted. No other electronic devices are allowed (i.e. no cell phones, mp3 players, ipods, etc.). It is the responsibility of the student to bring a non-programmable non-graphing calculator to the exams, since there will be no extras provided. **Students caught using any other electronic device other than a non-programmable non-graphing calculator will receive a zero for the exam.**

### Exam Dates:

|              |   |
|--------------|---|
| September 20 | Chapters 1, 2, 3, 4 (sections 1-6), electronegativity       |
| October 11   | Chapters 5, 6   |
| November 8   | Chapters 7, 8, 9 (sections 1, 3-10), 10 (sections 1-7)      |
| November 29  | Chapters 10 (sections 8), 11, 9 (sections 4)                |
| December 12  | <b>Final Exam</b> (comprehensive) 10:30am-1:15pm Angel B106 |

## II. Laboratory

**Lab Manuals:** “Chemistry 31, Experiments”, which is sold in the first floor stockroom in Cook (A143) for \$10.00. “Working Safely with Chemicals” 2<sup>nd</sup> Ed., and a carbon-less copy lab notebook are both sold at UVM’s bookstore.

**Lab Notebook:** A notebook with carbon-less copies is required for recording lab data. All data is to be recorded in ink (not pencil).

**Attendance:** Students must attend the lab section they are assigned to. If more than two labs are missed you will receive an **F** for the course. Only the academic dean of your college may grant an incomplete. An unexcused absence will result in a **ZERO** grade for the laboratory experiment. Official documentation of sickness or a family crisis is required for an excused absence. If there is a need to reschedule your lab time to one that is not your assigned time you must obtain permission from me a week in advance.

**Lab Videos:** Prior to attending your lab it is mandatory to view the video that accompanies the lab. These videos demonstrate the proper use of new equipment and the safe handling of chemicals. Videos can be found at <http://www.uvm.edu/~chem/courses/?Page=31Videos.html>.

**Safety Eye Wear:** Everyone in the lab must wear OSHA approved (EZ87stamped) safety glasses or goggles once any experimentation has been started. Students not observing this rule will receive a **ZERO** for the experiment, warnings will not be given. Safety eyewear can be purchased at the UVM bookstore. **Contact Lenses are a potential health hazard and can be worn in the laboratory only if no other types of corrective lenses are available. If you have to wear contact lenses then you must wear goggles and please let your TA know.**

**Footwear:** Only shoes that cover the toes are permitted in lab. Sandals, flip-flops and any other open toed shoes are not permitted. You will be asked to change your shoes or receive a **ZERO** for the experiment.

**Breakage Card:** A breakage card (\$40.00) must be purchased prior to your first lab from the first floor stockroom in Cook A143. It is advisable to purchase this as soon as possible to avoid waiting in yet another line. The \$40.00 is refundable and if you avoid breaking your equipment you will get all of it back. Remember to not leave home without it, as you must have it with you to be admitted into the lab.

### III. Course Grade

#### Percent Ranges for Grades:

|         |         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|---------|
| A+ ≥ 96 | A ≥ 90  | A- ≥ 88 | B+ ≥ 85 | B ≥ 80  | B- ≥ 77 | C+ ≥ 72 |
| C ≥ 65  | C- ≥ 63 | D+ ≥ 60 | D ≥ 56  | D- ≥ 53 | F ≤ 51  |         |

#### How to Calculate Your Points:

1) Class = 500 points

Four Hour Exams = 4 grades

+ One Final Exam = 2 grades

6 grades

6 grades – 1 grade = 5 grades = **500 class points**

Only five grades are counted for your class points. If your final is your lowest grade it will count only as one unit. If one of the hour exams is your lowest grade then your final will count as two units. The lowest hour exam grade will be replaced by the grade on the final. The tests being only worth 100 points each, would only give you 500 obtainable exam points. If you are absent from an exam official documentation of sickness or family crisis is required or you will receive a **ZERO** for the exam. Students with legitimate excuses will be permitted to take the exam early. Except in very unusual circumstances makeup exams will not be administered after the scheduled exam time.

Example 1:

|                | Exam 1 | Exam 2 | Exam 3 | Exam 4 | Final X2 |
|----------------|--------|--------|--------|--------|----------|
| Actual Scores  | 85     | 45     | 78     | 77     | 75 75    |
| Scores Counted | 85     | 75     | 78     | 77     | 75       |

Total Points = 390 points from class

Example 2:

|                | Exam 1 | Exam 2 | Exam 3 | Exam 4 | Final X2 |
|----------------|--------|--------|--------|--------|----------|
| Actual Scores  | 67     | 78     | 76     | 69     | 62 62    |
| Scores Counted | 67     | 78     | 76     | 69     | 62       |

Total Points = 352 points from class

2) Laboratory = **200 lab points**

|                     |                  |
|---------------------|------------------|
| Notebook and Prelab | 30 points        |
| Lab Reports         | 80 points        |
| Quizzes             | 65 points        |
| Technique           | <u>25 points</u> |
|                     | 200 points       |

(Obtained from the lab TA, the average grade is normally an 80% or 160 points)

3) Course Grade Determination

Add up your points from class and lab and then use the chart at the beginning of this section to determine your course grade.

Example 1:

$$\begin{array}{r} 390 \text{ class points} \\ + \quad \underline{160 \text{ lab points}} \\ \hline 550 \text{ total points} \div 700 \text{ possible points} = 78.6\% \text{ B-} \end{array}$$

Example 2:

$$\begin{array}{r} 352 \text{ class points} \\ + \quad \underline{160 \text{ lab points}} \\ \hline 512 \text{ total points} \div 700 \text{ possible points} = 73.1\% \text{ C+} \end{array}$$

## Academic Integrity

**Offenses against the Code of Academic Integrity (i.e. cheating) are deemed serious and insult the integrity of the entire academic community. Any suspected violations of the code are taken very seriously and will be forwarded to the Center for Student Ethics and Standards for further investigation.**

## IV. Tentative Lecture Schedule

| <u>Date</u> | <u>Chapter</u>           | <u>Description</u>  |
|-------------|--------------------------|---|
| Aug 29      | 1                        | Ch1: 9,12,16,21,26,28,30,41,46,53,55,59,67,69,83,87,93,95,98,106,110,117,122,125                                |
| Aug 31      | 1                        |   |
| Sept 2      | 1 and 2                  | Ch2: 6,13 thru 24,6,10,13,15,21,31,39,41,47,50,53,57,61,69,72,77,81,85,98,106,111                               |
| Sept 5      | <b>LABOR DAY HOLIDAY</b> |   |
| Sept 7      | 2                        |   |
| Sept 9      | 2 and 3                  | Ch3: 2,2,4,8,14,32,34,37,44,47,49,52,57,61,67,69,72,77,81,85,89,91,97,101,113,117,121,126                       |
|             | 9 pp372-373              | Ch9: 19   |
| Sept 12     | 3                        |   |
| Sept 14     | 3 and 4                  | Ch4: 2,5,10,11,13,26,27,31,33,37,43,46,50,53,55,57,60,63,65,71,75,98,101,107,111,114,117,120                    |
| Sept 16     | 4                        |   |
| Sept 19     | 4 and REVIEW             |   |
| Sept 20     | <b>EXAM 1</b>            | <b>Chapters 1, 2, 3, 4.1-4.6, and electronegativity 9.6</b>   |
| Sept 21     | 5                        | Ch5: 2,5,10,11,13,26,27,31,33,37,43,46,50,53,55,57,60,63,65,71,75,98,101,107,111,114,117,120                    |
| Sept 23     | 5                        |   |
| Sept 26     | 5                        |   |
| Sept 28     | 6                        | Ch6: 6,10,11,13,15,19,21,25,32,35,39,42,44,46,49,53,56,58,61,64,67,71,74,77,80,.83,85,87,91,97,102,106,110,113, |
| Sept 30     | 6                        |   |

|        |                           |  |
|--------|---------------------------|--|
| Oct 3  | 6                         |  |
| Oct 5  | 6                         |  |
| Oct 7  | 6                         |  |
| Oct 10 | REVIEW                    |  |
| Oct 11 | <b>EXAM 2</b>             | <b>Chapters 5 and 6</b>  |
| Oct 12 | 7                         |  |
| Oct 14 | 7                         | Ch7: 2,5,7,9,12,16,20,26,32,34,39,42,45,52,60,63,68,<br>71,73,76,78,82,86,92,                                    |
| Oct 17 | 7                         |  |
| Oct 19 | 7 and 8                   | Ch8: 7,11,15,16,23,25,28,32,35,37,42,43,47,48,51,<br>55,58,61,64,65,68,72,75,78,80,83,85,89,91,93,99,<br>105,110 |
| Oct 21 | 8                         |  |
| Oct 24 | 8                         |  |
| Oct 26 | 8 and 9                   | Ch9: 3,15,19,21,26,28,32,37,51,55,60,63,65,70,<br>72,73,76,79,81,84,87,95,98,105,110,112                         |
| Oct 28 | 9 (9.1-9.3, 9.5, 9.7-9.9) |  |
| Oct 31 | 9 (9.1-9.3, 9.5, 9.7-9.9) |  |
| Nov 2  | 10 (10.1-10.7)            | Ch10: 1,5,9,14,16,31,34,36,39,42,46,50,53,<br>57,63,86,92,95   |
| Nov 4  | 10 (10.1-10.7)<br>9.10    | Ch9: 73,75,78,98   |
| Nov 7  | REVIEW                    |  |
| Nov 8  | <b>EXAM 3</b>             | <b>Chapters 7, 8, 9.1-9.3, 9.5-9.10, 10.1-10.7</b>   |
| Nov 9  | 10.8                      | Ch10: 23,25,28,71,75,77  |

|        |                             |   |
|--------|-----------------------------|---|
| Nov 11 | 10.8, 9.11, 11.13           |   |
| Nov 14 | 9.11, 11.13                 |   |
| Nov 16 | 11                          | Ch11: 5,9 thru 35,46,48,50,53,56,55,61,66,68,71,74,<br>78,81,84,86,89,102,104,109,114,117,119,122,125,<br>128,137 |
| Nov 18 | 11, 9.4                     | Ch9: 9,11,33,40,46,48,89,114  |
| Nov 21 | <b>THANKSGIVING HOLIDAY</b> |   |
| Nov 23 | <b>THANKSGIVING HOLIDAY</b> |   |
| Nov 25 | <b>THANKSGIVING HOLIDAY</b> |   |
| Nov 28 | REVIEW                      |   |
| Nov 29 | <b>EXAM 4</b>               | <b>Chapters 10.8, 11, 9.4</b>   |
| Nov 30 | REVIEW                      |   |
| Dec 2  | REVIEW                      |   |
| Dec 5  | REVIEW                      |   |
| Dec 7  | REVIEW                      |   |
| Dec 12 | <b>FINAL EXAM</b>           | <b>Comprehensive (Angell B106; 10:30am-1:15pm)</b>  |

## V. Tentative Laboratory Schedule

| <u>Date</u>  | <u>Experiment</u>           | <u>Description</u>                                  |
|--------------|-----------------------------|---|
| Sept 12-15   | 1                           | A. Lab Safety I (I-IV in WSWC)<br>B. Density        |
| Sep 19-22    | 2                           | A. Lab Safety II (V-XI in WSWC)<br>B. Hydrated Salt |
| Sep 26-29    | 3                           | Mole Ratio  |
| Oct 3-6      | 4                           | Acid Content of a Food Product                      |
| Oct 10-13    | 5                           | Syn and Ident of Coordination Cmpd                  |
| Oct 17-20    | 6                           | Gas Law Determination of MW                         |
| Oct 24-27    | 7                           | Heat Capacity of a Calorimeter                      |
| Oct 31-Nov 3 | 8                           | $\Delta H^\circ$ of MgO                             |
| Nov 7-10     | 9                           | Flame Emission Spec of Metals                       |
| Nov 14-17    | 9                           | Qualitative Analysis                                |
| Nov 21-25    | <b>THANKSGIVING HOLIDAY</b> |   |
| Nov 28-Dec 1 | 10                          | Qualitative Analysis<br>Checkout                    |