

# CHEM 31E-ZRE: INTRODUCTORY CHEMISTRY

Fall 2014

Chem 31 E (91464) & ZRE (94303)      Lecture: T-Th 4:00 - 5:15 pm, Angell B106

## 1. GENERAL INFORMATION:

### A. LECTURE:

**Lecturer:** John Sharp      **Office:** A234 Cook

**email:** John.Sharp@uvm.edu

**Office Hours:** TTh 2:00 - 3:30 and 5:30 - 6:15 pm      or by appointment  
Wed: 3:00-6:00

**Recitation:** Wed: 6:15-7:15 in MLS 235

**Lecture:** The lecture each week will primarily be used to cover new material.

Included in this syllabus is a tentative schedule covering the timing of the lecture, text material, and the corresponding problems to be worked from the text.

Attendance at lecture is not mandatory, but if you do attend please stay through the lecture.

**Exams:** Exams are schedule for Wed nights from 6:15 - 9:00 pm in MLS 235. There are no make up dates. As only 3 out of the four exams are used to determine your grade a missed exam is the grade that is dropped.

While taking an exam only non-programable calculators are permitted. It is the responsibility of each student to bring there own non-programable calculator to the exam. Calculators may not be shared. No other electronic devices are allowed (i.e. no cell phones, mp-3 players, ipods etc). Students caught using any electronic device other then a non-programable calculator will receive a zero for the exam.

Wed, 19 SEP	ch: 1, 2, 3, 4 (sec .1-.6), 9.6 electronegativity
Wed, 10 OCT	ch: 5, 6
Wed, 7 NOV	ch: 7, 8, 9 (sec.1,.3-.10 ), 10 (sec .1-.7)
Wed, 28 NOV	ch: 10 (sec .8), 11, 9 (sec .4)
Tues, 11 DEC	4:30 - 7:15 Angell B106 Final Exam

**Problem Session:** Sun 4:30 Angell B112, week of exam only

**Problems:** Answers to the review questions and exercises are in the solutions manual. I will go over assigned problems during the scheduled review and recitation sessions. While it is strongly recommended that you do as many problems as possible, the problems are not collected and do not count towards your grade.

## B. SUGGESTED READING:

**Text:** " Chemistry, A Molecular Approach " 3<sup>st</sup> ed , by Nivaldo Tro is sold at the UVM bookstore. The solutions manual that comes with the text has the complete solutions to all the assigned problems. The study guide while not required can be a help with problem solving.

Login: [jsharp@uvm.edu](mailto:jsharp@uvm.edu) Pass Word: SHARPFALL2014

**Lab Manuals:** "Chemistry 31, Experiments ", which is sold at the first floor stockroom, A-143 Cook, for \$15.00. "Working Safely With Chemicals" 2<sup>nd</sup> Ed, and a carbon-less copy lab notebook. which are sold at the UVM bookstore.

**Class Notes and Old Tests:** My class notes and the tests that were given to my Chemistry 31 class in the fall of 2010 and 2011 are posted on Blackboard. The test questions will change but the format will remain the same.

## C. Laboratory:

**Attendance:** Students must attend the lab section they are assigned to. Official documentation of sickness or family crisis is required if a lab is missed. Unexcused absences will result in a ZERO grade for that laboratory experiment. In order to take a lab at a time other then your assigned time one must obtain the permission of the instructor a week in advance. If more then two labs are missed you will receive an **F** for the course. Only the academic dean of your college may grant an incomplete.

**Lab Safety:** It is of utmost importance that UVM Chemistry students are knowledgeable in basic laboratory safety tenets before beginning the lab portion of any chemistry course offered at UVM. To satisfy this requirement all students are required to take and pass our Lab Safety Quiz before doing any lab work. The LSQ is accessed from Blackboard, and allows for students to retake the quiz (as many times as needed) until they score an 80% or higher. Your score from the LSQ will be recorded on Bb and until you have passed the LSQ you will not be permitted to take part in lab.

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

**Breakage Card:** A breakage card ( \$40.00 ) must be purchased from the first floor stockroom, A-143 Cook, prior to the first lab. It is advisable to purchase this card as soon as possible in order to avoid having to wait in yet another line. The \$40.00 is refundable, and if careful and avoid breaking equipment one should get most of it back. Remember don't leave home without it as you must have it with you to be admitted into lab.

For any year a BC is good from 1 JUL of one year to 30 JUN of the next year.

All students must check-out of lab at the end of each semester or they lose the amount left on their BC.

Students do not need to redeem their BC at the end of the first semester, but if a BC is redeemed they have to purchase a new one for the next Chem course. To keep a BC from one semester to the next they inform the stockroom when they check-out that they will use the BC next semester.

The BC is redeemed after a student checks out of lab and takes their check-out sheet to the first floor stockroom and informs the stockroom they wish the amount left on the card redeemed.

The amount of money left on the BC when it is redeemed is placed in the students Cat Scratch Acc (CSA). The only way a student may access this money is to spend it off their CSA or wait until they graduate or withdraw from UVM. Any monies still residing in their account at this time are refunded. All students are issued a student ID card upon enrolling at UVM and thus automatically have a CSA.

**Safety Eye wear:** OSHA approved safety glasses or goggles must be worn by everyone once any experimentation has started in any area of a lab room. Students not observing this rule will receive a ZERO for that experiment, warnings will not be given. Safety eye wear can be purchased at the UVM bookstore.

**CONTACT LENSES are a potential health hazard and should only be worn in the laboratory if you have no other type of corrective lenses.** If you wear contact lenses you must wear goggles with them, and let your TA know.

**Foot Wear:** Only shoes that cover the toes are permitted in the lab. Sandals and open toed shoes are not permitted

**Lab Notebook :** A notebook with carbon-less copies is required for recording lab data. All data is to be recorded in ink.

## D. COURSE GRADE:

1. Points needed to obtain a specific grade

A ≥ 910	B+ ≥ 860	B- ≥ 780	C ≥ 650	D+ ≥ 610	D- ≥ 540
A- ≥ 890	B ≥ 800	C+ ≥ 740	C- ≥ 630	D ≥ 560	F ≤ 539

2. How to calculate your points

a) **Class = 800pts**

4 hr Exams = 4 grades

1 Final = 2 grades

6 grades - 1 grade = 5 grades x 1.6 = class pts

Only five grades are counted. If the final is your lowest grade it will only count as one unit. If an hour exams is your lowest grade then the final will count as 2 units. The lowest hour grade will be replaced by the grade on the final. The 1.6 factor is because each test was only worth 100 pts, and therefore the maximum number of points obtainable from the tests are 500. In order to raise this to 800 pts you must multiply the 500 x 1.6 = 800.

**Absences** : Official documentation of sickness or family crisis is required if exams are missed. Unexcused absences from exams will result in a ZERO grade on your record. Students with legitimate excuses will be permitted to take an exam early. Except in very unusual circumstances makeup exams will not be administered after the scheduled exam time.

Example 1:

	Ex-1	Ex-2	Ex-3	Ex-4	Final x 2
Actual Scores	85	45	78	77	80 80
Scores Counted	85	80	78	77	80

Total pts = 390 x 1.6 = 624 pts from class

Example 2:

	Ex-1	Ex-2	Ex-3	Ex-4	Final x 2
Actual Scores	67	78	76	69	62 62
Scores Counted	67	78	76	69	62

Total pts = 352 x 1.6 = 563 pts from class

b) **Laboratory = 200 pts**

Notebook / Prelab	18 pts
Lab reports	110 pts
Quizzes	<u>72 pts</u>
	<b>200 pts</b>

Obtained from lab TA, average grade is normally an 80% or 160 pts

3. Determination of course grade.

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

Example 1:

	640 class pts
	+ <u>160 lab pts</u>
	800 total pts = B

Example 2:

$$\begin{array}{r}
 563 \text{ class pts} \\
 + \underline{160} \text{ lab pts} \\
 \hline
 723 \text{ total pts} = C
 \end{array}$$

## 2. TENTATIVE LABORATORY SCHEDULE

<u>Date</u>	<u>Experiment</u>	<u>Description</u>
10 - 13 SEP	1	A. Lab Safety I (I-IV in WSWC) B. Density
17 - 20 SEP	2	A. Lab Safety II (V-XI in WSWC) B. Hydrated Salt
24 - 27 SEP	3	Mole Ratio
1 - 4 OCT	4	Acid Content of a Food Product
8 - 11 OCT	5	Syn and Ident of Coord Cpd
15 - 18 OCT	6	Gas Law Determination of MW
22 - 25 OCT	7	Heat Capacity of a Calorimeter
29 OCT - 1 NOV	8	$\Delta H^\circ$ of MgO
5 - 8 NOV	9	Flame Emission Spec of Metals
12 - 15 NOV	10	Qualitative Analysis
19 - 23 NOV	<b>THANKSGIVING</b>	
26 - 29 NOV	10	Finish Qual Analysis Check-out

## 3. TENTATIVE LECTURER SCHEDULE

<u>DATE</u>	<u>CHAPTER</u>	<u>SUGGESTED PROBLEMS</u>
28 AUG	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

30 AUG	Finish Ch1 Start 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
4 SEP	Finish 2	
6 SEP	Start 3	Ch 3: 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
		electronegativity from Ch 9 (Sec 9.6) p372-373) Ch 9: 19
11 SEP	3	
13 SEP	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
		Will cover acid-base titrations but not the relative strength of acids-bases from sect 4.8. Will not cover REDOX reactions from 4.9
18 SEP	Finish 4	
19 SEP	<b>EXAM 1 ch: 1, 2, 3, 4(sec .1-.6), electronegativity 9(sec.6)</b>	
20 SEP	5	ch5: 1,9,12,15,17,21,24,32,34,36,38,42,45,47,49, 52,58,63,66,71,77,80,82,83,86,89,95,98,101, 104,106,111,115,121,127,129
25 SEP	5	
27 SEP	Finish 5 Start 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
2 OCT	6	
4 OCT	6	
9 OCT	Finish 6	
10 OCT	<b>EXAM 2 ch: 5, 6</b>	
11 OCT	7	ch7: 2,5,7,9,12,16,20,26,32,34,39,42,45,52,60,63,68, 71,73,76,78,82,86,92,
16 OCT	Finish 7	

	8	ch8: 7,11,15,16,23,25,28,32,35,37,42,43,47,48,51, 55,58,61,64,65,68,72,75,78,80,83,85,89,91, 93,99,105,110
18 OCT	Continue 8	
23 OCT	Finish 8 Start 9	ch9: 3,15,19,21,26,28,32,37,51,55,60,63,65,70, 72,73,76,79,81,84,87,95,98,105,110,112
		(ch 9 sec .5,.7-.9 uses Lewis Dot Theory to develop bonding in molecular compounds. I will use VSEPR Theory and hybridization theory from ch 10 to develop bonding in molecular compounds.)
		will cover 9.10 after VSEPR in Ch 10, Problems: 73,75,78,98 will cover 9.4 Lattice Energy, with solids in ch11 will cover 9.11 Electron Sea model with band theory in ch11.13
25 OCT	Finish 9 Start 10 (sec.1-.7)	ch10: 1,5,9,14,16,31,34,36,39,42,46,50,53, 57,63,86,92,95 MO Theory, 10.8, will be on exam 4
30 OCT	10	
1 NOV	10	
6 NOV	Finish 10	
7 NOV	<b>EXAM 3</b>	<b>ch: 7, 8, 9(sec .1-.3, .5-.10), 10(sec .1-.7)</b>
8 NOV	10.8 (MO Theory)	ch10: 23,25,28,71,75,77
13 NOV	Finish MO Theory 9.11 Electron Sea Model 11.13 Band Theory	
	Start 11	ch 11: 5,9 thru 35,46,48,50,53,56,55,61,66,68,71,74, 78,81,84,86,89,102,104,109,114,117,119, 122,125,128,137
15 NOV	11	
20-22 NOV	<b>Thanksgiving</b>	
27 NOV	Finish 11, and 9.4 Lattice Energy	ch9: 9,11,33,40,46,48,89,114

28 NOV	<b>EXAM 4</b>	<b>ch: 10(sec .8), 11, 9(sec .4)</b>	
29 NOV	Review		
4 DEC	Review		
11 DEC	Final (Comprehensive)		4:30 - 7:15 in Angell B106