

Syllabus for Chemistry 101, Spring 2015

Instructor: John Milligan, Ph.D., MRSC Office: AHS 322
Office Phone: 818-947-2371 E-mail: milligja@faculty.laccd.edu or
milligja@lavc.edu or
chemclass@ars-chemia.net
Office Hours: 3:00 p.m. – 5:30 p.m. Tu, Th Web Site: http://www.ars-chemia.net

Required Materials

- ✓ Chemistry: A Molecular Approach Plus 3/E, by Nivaldo J. Tro, © 2014 ISBN-13: 9781269342506 with MasteringChemistry™ with full e-text and electronic student solutions manual
MasteringChemistry™ course ID: **MILLIGAN101SPRING2015**
- ✓ Lab Manual for Chemistry 101, Department of Chemistry, Los Angeles Valley College, © 2015.
Download from: http://www.ars-chemia.net/Classes/101/manual/101_manual_index.htm
- ✓ HGS Molecular Model Structure Kit, available at the bookstore (ISBN: 7167-4822-3) or online (at <http://www.maruzen.info/hgs/catalog/index.php?cPath=4&osCsid=n249c4abaukrn902a0q408dk93> look for either 1006 (good for 101/102) or 1005 (really good for 211/212))
- ✓ Safety in Academic Chemistry Laboratories, Vol. 1, Published by the American Chemical Society: ISBN 0-8412-3863-4. Download from:
http://portal.acs.org/portal/PublicWebSite/about/governance/committees/chemicalsafety/publications/WPCP_012294.
This is required reading **before** any laboratory work is started.
- ✓ Scientific Calculator (it must be capable of scientific notation and logarithms)
- ✓ Safety Goggles (they must be the type that completely covers your eyes with the elastic band, **no shop goggles!**).

Student Learning Outcomes

Solve chemical problems involving gases, solutions and energy.

Course grading

There will be no extra credit given! The time to start worrying about your grade is now, not in the 12th week of the semester. The grading in this course is on a straight scale.

90% - 100%	A	60% - 69.9999...%	D
80% - 89.9999...%	B	<60%	F
70% - 79.9999...%	C		

Any or none of these borders may change at the end of the semester at my discretion. **There will be no curve!** First, there are not enough students to have a curve; you need at least 100 students to have any type of bell curve. Second, your grade in this class should **not** depend on the students who are in the class with you.

Distribution of points in the course

During the course of this semester, you will have a daily quiz worth 5 points each that may cover that day's or a previous day's material. You will also have 4-90 minute exams worth 150 points each (a total of 600 points). The final exam is worth 300 points. The labs are worth a total of 747 points. The Reading Journal is worth 200 points (50 points for each submission). The MasteringChemistry™ assignments will be worth 300 points. At the end of the semester, if ½ of your final exam score is larger than the least of your mid-term exam scores, it will replace the lowest mid-term exam score.

Exams	600
Daily quizzes	120
Laboratory	747
MasteringChemistry™	500
Reading Journal	200
<u>Final exam</u>	<u>300</u>
Total	2467

Final Exam

The final exam for this class is on Wednesday, 3 June, 2015 at 4:30 p.m. No make-up finals will be given after this date. **You should start studying for your final exam today!**

NOTE: If you stop attending this class (or wish to drop this class) on or after February 22, 2015 for Spring Semester 2015, you must drop the class yourself – officially – over the Internet or in person at the Admissions and Records Office. Failure to do so may result in a grade of “F” in this class.

Cheating

Cheating, representing someone else’s work as your own or using materials or references that are not allowed, will not be tolerated. Students caught cheating will receive a zero for that assignment and be referred to the Dean of Instruction. If you feel the need to cheat, please do not take this class. Please refer to the Student Code of Conduct in the college catalog.

Attendance

You are expected to attend all class sessions. If you miss more than the equivalent of a week of classes without a valid excuse (illness, etc.) you will be excluded from the class.

Cell Phones

No cell phones will be on while class in session. If your cell phone rings during class you will be asked to leave the class and this will count towards the week of absences as described above.

What is expected of you...

- This is a college level course. As such, it requires 2-3 hours of work outside of class for every hour in class. This class meets approximately 10 hours a week so you need to study at least 20 to 30 hours a week outside of class (this is a minimum, you will require more time if you are having difficulty with the material).
- I expect the students in my class to put forth the effort required for them to learn the material. I am here to help you learn the material. I cannot and will not learn it for you.
- I expect you to ask me any questions you have or to further explain what it is you don’t understand.
- I expect you to use the office hours to your advantage. I have office hours scheduled (see the first page) so that you can have the opportunity to ask me questions outside of class. You can also ask questions during lab periods or via e-mail.
- I expect you to do the suggested study problems listed at the end of this syllabus. If you do not do all of the suggested problems, you cannot expect to do well on the exams. See also the explanation of the method for studying with the suggested problems at the top of that page.
- I expect you to treat me with respect.
- I expect you to follow the rules set forth in this class and on this campus.

What you can expect from me...

- You can expect me to do the best I can to explain the material to you. If you do not understand it the way I am presenting it, challenge me to use my creativity to explain it in a different way so that you do understand it.
- You can expect me to be clear in what my grading policies are. They are laid out for you in this syllabus.
- You can expect me to get assignments graded and back to you in a timely manner. I will try to get them back to you within a week.
- You can expect me to be fair in grading your assignments. If you think something is unfair, ask me about it and I will explain my reasoning to you.
- You can expect me to treat you with respect. If I appear to be disrespectful to you, let me know so I can rectify the problem.

If you are a student with a disability requiring classroom accommodations, and have not contacted SSD, do so in a timely manner. SSD is located in the Student Services Annex, Room 175 or call SSD at (818) 947-2681 or TTD (818) 947-2680 to meet with a SSD counselor. If SSD has already sent the memo to instructor confirming accommodations required by student for this class, please meet with me to discuss arrangements.

Reading Journal

You should make the most of your textbook; you paid a lot of money for it. Some ways to get the most out of it include reading the text, working the recommended end-of-chapter problems and using the end-of-chapter study guides. My former students will tell you that you have to read the book and you have to work the problems (especially the suggested ones at the end of this document).

Keeping a journal is a new (to you) approach to reading your textbook. Buy a 100-page composition notebook and divide the book into three sections. Use roughly half the notebook for section one and then divide the other half about equally. Set aside a couple of pages at the very front for a table of contents. Use one of the smaller sections to keep a vocabulary list; use the other smaller section for a list of equations. As for the big section, this is your Reading Journal.

This is how to read a chemistry text book. You probably already know that a chemistry text is not the same as a history text and you definitely can't read it like you would your favorite novel. Before you begin to read a new chapter do the following:

- Look at the chapter outline on the first page of each chapter to get an idea of the major topics the chapter covers.
- Flip through the chapter page-by-page looking at the section labels, which should be the same as in the chapter outline, the figures and the figure legends. Read the figure legends.
- When you get to the end, briefly study the "Chapter Perspective" noting in particular the Concepts that you should understand and Skills that you should master by the time you finish studying the chapter. This should give you a good idea of what to look for while you are reading.
- For your very first entry make a list of your personal goals for this course. Check them throughout the semester just to see if you are staying on track with what you set out to do.
- The entries that follow will be your "reading notes." Begin a new page in your Reading Journal. Make sure you have some label to show which chapter the notes refer to.
 - After skimming the chapter you should be able to sketch an outline of your own. Write your outline in the Reading Journal.
 - As you read the first section write a one-sentence summary of each paragraph. When you finish the section write a single sentence that summarizes the whole.
 - Remember that equations, data tables, graphs, figures and most pictures are almost always related to the words in the paragraphs on the same page. So for each equation, data table, graph, figure or picture, write a sentence or two that explains how it is related to the text.
 - As you begin to read the second section, do the same. Keep doing this for each section.
 - When you finish the whole chapter, write a brief paragraph summary. Please do not paraphrase the section summary!
 - Create a section in your Reading Journal where you keep a list of vocabulary words.
 - Set aside a few pages for a list of important formulas.
- As your last entry, assess how well you met your goals. At the end of the term you should have 14 entries, one for each chapter, plus your goals and self-assessment.
- A word of advice, this Reading Journal will be more beneficial if you write your own paragraph (in your own words summarizing what you thought was most important) than if you copy or paraphrase the section summaries found in the text.
- Make a habit of reading a bit each day and record your entries as you go (daily or weekly). **Do not** wait until the night before it's due; it is not time well-spent and will defeat the purpose of the journal.

I will collect journals at each quiz, skim them for completeness and assign points (a maximum of 20 points each time) for each entry!

Exam Schedule (90 minutes each)

1. Exam 1 covers the first four chapters of the text, redox and the relevant lectures and will be on Wednesday, 25 February 2015. **This exam is a review of the concepts in Chemistry 60/68. I expect all of you to do well on it.** For this exam you will be expected to be expected to:
 - Solve problems using dimensional analysis
 - Use the ideas of the isotopes and nuclear structure to solve problems
 - Name compounds and write formulas for ionic and binary covalent compounds
 - Balance chemical equations
 - Calculate molecular and formula masses
 - Determine mass percentages from chemical formulas
 - Determine empirical and molecular formulas from mass percentages and combustion analysis data
 - Use the concept of moles to solve chemical problems
 - Write molecular, ionic and net ionic equations
 - Use concentration unit definitions to solve chemical problems
2. Exam 2 covers chapters 5 through 6 (remember that chemistry is a cumulative subject) and will be on Wednesday, 15 April 2015. For this exam you will be expected to do all of the above and:
 - Balance oxidation-reduction reactions
 - Deduce the properties of a gas after changes in conditions
 - Use the Ideal Gas Law to solve chemical problems
 - Determine the partial pressure of a gas in a mixture of gases
 - Determine the total pressure of a mixture of gases
 - Calculate the heat of reaction under constant pressure and constant volume
 - Use thermochemistry to solve chemical problems
3. Exam 2 covers chapters 7 through 10 (remember that chemistry is a cumulative subject) and will be on Wednesday, 6 May 2015. For this exam you will be expected to do all of the above and:
 - Calculate the difference in energy levels given the wavelength of light emitted by a hydrogen atom or hydrogenic ion
 - Write the electron configuration of an atom or ion
 - Construct the orbital diagram of an atom or ion
 - Determine the quantum numbers of an electron in an atom
 - Construct the Lewis Electron Dot Diagrams for ionic and covalent compounds
 - Calculate the bond order of a molecule
 - Calculate the approximate heat of reaction from bond energies
 - Analyze the molecular and electron group geometries of molecules
 - Determine the hybridization of the central atom of molecules
 - Determine the polarity of molecules
 - Construct the molecular orbital diagram of the second row diatomic molecules
 - Determine bond order and magnetism from the molecular orbital diagram
4. Exam 4 will cover chapters 11 and 12 (remember that chemistry is a cumulative subject) and will be on Wednesday, 27 May 2015. For this exam you will be expected to do:
 - Interpret the phase diagram of a substance
 - Use intermolecular forces to determine relative boiling points of substances
 - Perform calculations using unit-cell dimensions
 - Calculate the effects of temperature and pressure on solubility
 - Calculate the colligative properties of solutions (vapor pressure lowering, freezing point depression, boiling point elevation and osmotic pressure)
 - Use amounts of substances to calculate the vapor pressure of solutions and the composition of the vapor
 - Use any of the colligative properties to determine the molar mass of solutes

Laboratory Work

The laboratory work for this class is worth a total of 747 points of your overall grade (see lab schedule above). In the laboratory, when any lab work is being performed, everyone is expected to wear eye protection. If I have to remind anyone of this rule more than twice in a given lab period they will be removed from the lab with the loss of points for that lab. **You are expected to come to lab prepared.** This means that you are to have read the introduction to the lab and the directions for the lab. If you have any questions about the lab, feel free to ask me. **Do not ask me what you are supposed to do in the lab.** That is why you have a lab manual. I will, however, answer any questions clarifying the instructions in the lab manual. Labs are due at the beginning of the next class period when you walk in. Late labs will be accepted with a loss of points according to the following schedule:

Late on day due	-50% of report value
Past the day due	No Credit

If you are going to miss class on the day a lab is due make sure that you e-mail the lab to me by the beginning of class.

SECTIONS COVERED AND SUGGESTED STUDY PROBLEMS – Tro Text

Chemistry 101 is the second class in the three semester (Chem 68, 101, 102) series. Students are expected to come into Chemistry 101 with a solid foundation in algebra, geometry, and basic chemistry. For each chapter, you should always study the key terms and do as many exercise and practice problems from each assigned section of the chapter as is needed to learn the material. This would be a good time to also review and perhaps revise and supplement your class notes. When you think you have mastered the chapter, give yourself practice quizzes using test format (timed, no notes) using 6 to 7 problems from the list below. Your last self-quizzes should contain a mixture of problems from all the chapters. **At least one problem from the following list will be on each exam and final exam.**

Exam 1

Class time will not be spent specifically on material from chapter 1 from the Tro text. However, students will be expected to know (and will be tested on) the following topics from that chapter

significant figures, derived units, SI units and conversions, key terms, metric prefixes

Students are expected to be skilled in and routinely use the dimensional analysis method of problem solving

- Chapter 1: 103, 107, 115, 127, 133, 135
- Chapter 2: All sections – 95, 105, 111, 113, 115, 117
- Chapter 3: All sections except 3.12 – 119, 121, 125, 129, 133, 137, 139, 143, 147, 151, 153
- Chapter 4: All sections – 99, 103, 105, 113, 121, 127

Exam 2

Redox: all the redox equations on pages 24 and 26 of the lab manual

- Chapter 5: All sections no problems from section 5.10 (just know theory) – 95, 99, 105, 109, 115, 119, 125, 129
- Chapter 6: All sections – 99, 101, 103, 113, 121, 129

All the Internal Energy Problems on pages 57 through 59 of the lab manual

Exam 3

- Chapter 7: All sections – 73, 79, 89, 91, 93, 95, 99, 101
- Chapter 8: All sections – 91, 93, 97, 103, 105, 107, 113, 119
- Chapter 9: All sections – 85, 87, 89, 91, 95, 101, 105, 113
- Chapter 10: All sections – 83, 87, 91, 93, 95, 107

Exam 4

- Chapter 11: All sections – 119, 121, 125, 133, 137, 139, 147, 149
- Chapter 12: All sections – 103, 107, 109, 111, 113, 115, 117, 119, 121, 123, 131

FINAL EXAM

Cumulative (includes all 12 chapters)

Lecture and Laboratory Schedule for Chemistry 101, Spring 2015

Week of	Lecture Chapters	Quizzes and Holidays	Monday Lab	Wednesday Lab
9 Feb	2,3		Lecture	Graphs (50 pts)
16	3, 4	Monday Holiday 20 th last day to add	Monday Holiday	Balances (5 pts)
23	Redox	Wednesday, Exam 1 22 nd Last Day To Drop (LDTD) w/o fees or getting a "W"	Metathesis Reactions (108 pts)	Safety and Check-in (5 pts)
2 Mar	Redox, 5		Nickel(II) Salt (Day 1)	Nickel(II) Salt (Day2)
9	5		Nickel(II) Salt (Day 3) (42 pts)	Copper Chemistry and Redox Reactions (Day 1)
16	5,6		Copper Chemistry and Redox Reactions (Day 2)	Copper Chemistry and Redox Reactions (Day 3) (53 pts)
23	6		Determination of the Gas Constant (24 pts)	Molecular Mass of a Volatile Liquid (25 pts)
30	7, 8	Tuesday Holiday	Lecture	Bomb Calorimetry (31 pts) Internal Energy Problems (21 pts)
6 Apr	Spring Break			
13	9	Wednesday, Exam 2	Hess' Law of Heat Summation (49 pts)	Lecture
20	9, 10		Atomic Emission Spectroscopy (69 pts)	Lecture/Prepare NaOH
27	10		Molecular Models (81 pts)	Determination of Percent KHP and Equivalent Mass (Day 1)
4 May	11	Wednesday, Exam 3	Determination of Percent KHP and Equivalent Mass (Day 2)	Determination of Percent KHP and Equivalent Mass (Day 3)
11	11, 12	10 th Last Day to Drop Class w/ a "W"	Determination of Percent KHP and Equivalent Mass (Day 4)	Determination of Percent KHP and Equivalent Mass (Day 5) (65 pts)
18	12		Unit Cell Geometry (61 pts)	Freezing Point Depression (53 pts)
25	12, Review	Monday Holiday Wednesday, Exam 4	Monday Holiday	Check Out (5 pts)
FINAL EXAM – Wednesday, 3 June, 2014 at 4:30 p.m.				

The capacity to learn is a gift. The ability to learn is a skill. The willingness to learn is a choice.

Declaration of Understanding

I hereby declare that I have read the syllabus for this class and understand the rules of this class. I also understand that any failure on my part to follow the rules of this class will result in the above mentioned penalties.

Print Name	Sign Name	
	Chemistry 101	3068
Date	Class	Section #
E-mail address (required in order to receive grade updates)		

** Failure to complete and turn in this page by 18 February 2015 will result in a deduction of 20 points from your overall grade. These points are forfeit and cannot be made up at a later time. **