

CHEM 31A - General Chemistry I - Fall 2014

Prof. Willem R. Leenstra

Lectures on MWF 9:35-10:25 PM, in Angell B-106
Exams/Reviews: Thursdays 7:00-9:00 PM, in Marsh Life Science 235

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General

Professor's Office Hours: Monday, Wednesday, and Friday, 11:00-12:00. But if these times are not suitable for you, we can also set up an appointment at another, mutually convenient time. Occasionally I will have a conflict that prevents me from being in my office at the posted time; if so, just contact me with a request to see me individually, and we'll make it happen as soon as possible. Since your schedule and my schedule are busy ones, we can zero in on a mutually convenient time most efficiently with a phone call (leave me your cell to call back if I'm not picking up), rather than emailing back and forth.

Teaching Assistants' Office Hours: Each Teaching Assistant who is part of Chem 31 will have one office hour per lab that he/she teaches. Since there are more than 40 lab sections in the daytime lecture offerings of Chem 31, there will be more than 40 (non-overlapping) hours throughout the week at which you can receive help. The General Chemistry TA table is in room Cook A-302. During this office hour, the TA will answer questions not only about the lab, but also about the lecture material. The schedule of these hours will be publicized on Blackboard, our course communication platform, in the near future. ***You may utilize ANY of the TA's for help with lab or lecture questions - don't rely on just your lab TA.***

Supplemental Instruction (SI): There is additional course help available through the Supplemental Instruction program. An SI Leader has been assigned to work with the entire Chem 31 course; Julia Torvi did this same job for us last year. She will hold a couple of review sessions during the week, at which she'll go over lecture material (plus hold office hours). When details about the specific time/place become available, they will be posted on the web.

Recitation Sessions: As you know, the Thursday evening time slot is specifically reserved for our three exams during the semester. One way to use the rest of those Thursday evening times will be to hold recitation sessions (mostly focused on doing problems to complement the lectures, which are designed to discuss the concepts). I will only keep holding these if there is demand for them; if only a handful of people show up, we'll go back to using only the regular office hours and appointments. These recitation sessions will be in Cook A-241, not the large exam room (MLS 235) at 7:00 PM, starting on September 5. (I may move the start time up to 6:00 PM if the students prefer it.)

Communication: I will use postings on Blackboard (bb.uvm.edu) and class-email throughout the semester to publicize important information. Blackboard is a course management system where you will find class announcements, this syllabus with updates, lecture notes, sample exams, homework assignments, and a record of your grades as they are earned. You are responsible for checking these communication channels at least once per day so that you won't miss critical messages. In general, I prefer a phone call to me directly instead of umpteen iterative emails so please try that route first [for office phone number, see above]. Leave a contact phone number if I happen to not be in my office.

Lecture Component

Lectures and Schedule: The lectures will be used principally to introduce and explain new material. This sometimes includes working out numerical problems, but going over the assigned homework problems is not the purpose of the lectures (see HW, below, and Recitation Session, above). I will post copies of my actual class notes on Blackboard after each lecture. These are very detailed, and written out – not just skeleton outlines. You can thus choose to take notes, or just listen and absorb. But please, do not interpret my extra effort of posting these notes as an excuse for not attending lecture. There is no substitute for hearing someone explain the many, diverse, and difficult concepts you'll encounter in this course. The tentative outline of material covered in each lecture is as follows. This schedule may be off a day or so in either direction.

#	Date	Chapter		#	Date	Chapter		#	Date	Chapter
1	8/25	syllabus		15	9/29	4		28	10/29	8
2	8/27	MC, 1		16	10/1	5		29	10/31	8
3	8/29	1		17	10/3	5		30	11/3	9
4	9/3	1		18	10/6	5		31	11/5	9
5	9/5	2		19	10/8	5		32	11/7	9
6	9/8	2		20	10/10	6		33	11/10	9
7	9/10	2		21	10/13	6		34	11/12	10
8	9/12	3		22	10/15	6		35	11/14	10
9	9/15	3		23	10/17	6		36	11/17	10
10	9/17	3		24	10/20	7		37	11/19	10
11	9/19	3		25	10/22	7		38	11/21	11
12	9/22	4		26	10/24	7		39	12/1	11
13	9/24	4		27	10/27	8		40	12/3	11
14	9/26	4								

Course Materials: We will again be using the textbook, “Chemistry - A Molecular Approach”, by Nivaldo Tro, the 3rd edition, which has had positive feedback from students. Once again, we were able to negotiate a special arrangement with the publisher, Pearson. Instead of your having to buy a huge book for the entire year of General Chemistry (31 and 32), the UVM Bookstore now sells the Chem 31 portion in the fall, and the Chem 32 portion in the spring. For those who won't be going on to Chem 32 it means that you will save about 50%, and for those who will go on to take Chem 32, you can spread your costs out over the two semesters.

Chem 31 Package: This package costs \$152.35 at the UVM Bookstore, containing:

- (1) Hard copy of Volume 1 of “Chemistry – A Molecular Approach” by Tro (chapters 1-11).
- (2) Hard copy of the Solutions Manual that shows the worked-out solutions for every end-of-chapter problem in detail (the book itself gives only the answers of odd-numbered problems).
- (3) An individualized Access Code that allows you to use MasteringChemistry, which is an online program tied to our textbook. MasteringChemistry has a lot of resources, including tutorials, an e-Text version of the book and the electronic version of the Solutions Manual. But most importantly, it is the mechanism through which you will do assessed homework that is part of your course grade – therefore obtaining a new Access Code is a must-have. For this program you will need to use the course code LEENSTRAFALL2014 (case-sensitive). You should start right away exploring all of this tool’s capabilities.

Other options: If you do not feel you need to have a hard copy of the textbook, you can buy just the electronic version of the above package at www.pearsoncustom.com/vt/uvm_chemistry/ (don’t forget the underscore after uvm). You can buy the Code with the e-Text of the book (\$87.60) or without the e-Text (\$54.60). These options get you the materials just for Chem 31 (including the Solutions Manual for chapters 1-11); this Access Code is good for only 6 months.

If you are definitely going on to Chem 32 in the spring semester, one other option would be to go to: www.masteringchemistry.com to purchase the full year’s materials. Be sure to find the correct textbook when it is asked for (see title above). In this way you can purchase a full year’s Access Code, with the full e-Text. This electronic package costs only \$110.00. Finally, you can also buy the MasteringChemistry Access Code for one year without the e-Text for \$66.00 (i.e., only to be used if you have access to, for example, a friend’s textbook).

You can, of course, supplement the electronic-only options by purchasing a used earlier edition somewhere. Although the 3rd edition of our textbook is not very different from the previous editions, there are slight variations here and there. If you do use the older version, it is your responsibility to check for variations against a copy of Tro. Caution: do not buy an access code from anywhere else because once it’s used by someone, no one else can use that code.

Homework: First of all, on Blackboard, under the “Suggested EOC HW” tab, you will find 20-30 end-of-chapter problems which I have chosen as being representative of the chapter’s content. Clearly you can add to that list if you feel like you need more practice. Since you should have the Solutions Manual, doing the problems is a painless way of deepening your familiarity with the material. For obvious reasons, homework will not be graded. I will also post this list on MasteringChemistry under “Assignments” so that you can’t miss the point that, while not graded, I consider working the end-of-chapter problems to be a real homework assignment. To access this list via MasteringChemistry, click on “Chapter X EOC Problems”.

Getting the right answers for the assigned homework problems is certainly one way to assess your mastery of the content of each chapter. But you really should think of “homework” as a more encompassing task than just doing problems. It includes following parts: (1) read the textbook ahead of the material covered in class; (2) review the material within a day of having had it presented in lecture but before the next class; (3) use MC tutorials to practice and refine your problem-working skills; (4) do the end-of-chapter HW, and use the Solutions Manual to understand each step in getting to the answer; don’t memorize procedures because it won’t stick.

Quizzes: At the end of the last lecture during which a particular chapter is discussed, I will open up a Quiz, administered via MasteringChemistry, which comprises 10 problems, each worth 1 point. These will consist of some combination of tutorials and EOC exercises. For many of these, the actual input values you get will be randomly generated so that everyone gets different answers. The MasteringChemistry software grades each question based on a protocol that assigns value on how much help you need in the form of hints, etc. These quizzes are open-book, and I don't mind if you work with others on understanding the relevant concepts, and how to attack problems. However, filling in an answer that was almost entirely obtained by someone other than yourself constitutes cheating. There are 11 chapters, therefore 11 quizzes. I will drop the lowest of these scores, for a total of 100 possible points that you can earn towards your course grade.

Not all of the valuable tutorials will appear on the graded Quiz. So, in order that you can benefit from them, for each chapter I will set up an Assignment called "Chapter X Tutorials". Do them!

Semester Exams: Three exams, worth 100 points each, will be given on Thursday evenings, from 7:00 PM till 9:00 PM. They are designed to be one-hour exams, but you can take the full two hours if you like. Your lowest exam score from the first two will be dropped; this way you will not be penalized if you are having a slow start to the course. Our assigned examinations room is Marsh Life Science 235. I will not answer any material questions on examination days.

We will be crowded, but the half-dozen proctors will keep everyone honest. Put away all cell phones, iPods, etc. No papers are to be in your vicinity. The only calculator that is allowed to be used is the simple scientific type (non-graphing), like the Sharp Model EL-501 that is for sale in the UVM Bookstore for less than \$10. We have had unpleasant cheating incidents with graphing calculators in the past, so there will be no exceptions granted. In general, offenses against the Code of Academic Integrity are not tolerated. Any suspected violations of the Code are taken very seriously and will be forwarded to the Center for Student Ethics and Standards (more details can be found at their website www.uvm.edu/cses).

The Thursday evening exams will cover material up to and including the previous Monday's lecture (or perhaps Wednesdays if there is a more natural break in the content). We will take them in Marsh Life Sciences 235. They will occur at approximately equal intervals on the following days:

Exam 1 — September 25 (first 12± lectures)

Exam 2 — October 23 (next 12± lectures)

Exam 3 — November 20 (next 12± lectures)

I will not give make-up exams. If you miss an exam for illness or any other reason, your zero will be thrown out as your lowest score. If your illness is of an extremely serious nature, you may get individual dispensation, but we must have a private, face-to-face conversation in my office before the exam in order for you to receive any consideration. If you have a bona fide conflict with the time of the exam, you must contact me prior to the exam to get my permission to take it at another time. [You must furnish me with contact information such as, for example, your coach, lawyer, parole officer, etc. so I can verify your request. If you work in the evenings, it is your responsibility to reschedule with your supervisor right away.] The exams will be returned to you in your laboratory the following week. If you want it sooner than your lab meeting, you must contact your TA first and arrange a pick-up time that is convenient for the both of you.

Course Withdrawal: The last day to withdraw from the course with a W is Monday, October 27. You will have had 2 exams by then, giving you a good idea of where you stand. (Along these same lines, course add/drop must be done by Monday, September 8.)

Final Exam: The Final Exam is comprehensive, counts for 200 points, and will be a multiple-choice format. Since the three semester exams do not test the content of Chapter 11, this material will be emphasized somewhat on the Final. The entire Final Exam is designed to be a two-hour test. Our Final will be given on Monday, December 8 at 8:00 AM in your lecture room, Angell B-106. *Please make your travel arrangements now, with this obligation in mind.*

Attendance: During the lecture, the concepts are being presented in a different way from how you probably were reading/studying them in the textbook. Thus, coming to lecture and absorbing the material is enormously important. Logistically, I cannot take attendance, however, I can also tell you that in the past when I did administer attendance quizzes, I found, as one would expect, that there is a very strong correlation between attendance and grade earned. If attendance drops below what I perceive as an acceptable level, I reserve the right to administer a “pop” quiz.

Laboratory Component

Laboratory Schedule: You have already selected a section when you registered for the course. If you want to change your laboratory day/time selection, you should do so by Monday, September 8, the add/drop deadline, but can only be done if there is space available.

Labs will not be conducted in the first two weeks of classes. They will start the week of September 8, and follow the schedule below:

Week	Dates	Labs
1	Aug 25 – Aug 29	No Labs Purchase your Breakage Card, Lab Manual, and Safety Glasses; Review the Online Safety Presentation, and complete the Safety Quiz. Complete the above BEFORE your first laboratory period.
2	Sept 1 – Sept 5	
3	Sept 8 – Sept 12	Safety Quiz Due, Laboratory Check-In , & Experiment 1: Measurement and Density
4	Sept 15 – Sept 19	Experiment 2: Determination of a Chemical Formula
5	Sept 22 – Sept 26	Experiment 3: Chemical Reactions
6	Sept 29 – Oct 3	Experiment 4: Determination of Acid Content in a Food Product
7	Oct 6 – Oct 10	Experiment 5: Synthesis and Identification of a Coordination Compound
8	Oct 13 – Oct 17	Experiment 6: Gas Law Determination of Molecular Weight
9	Oct 20 – Oct 24	Experiment 7: Determination of Heat Capacity

10	Oct 27 – Oct 30	Experiment 8: Heat of Formation of Magnesium Oxide
11	Nov 3 – Nov 7	Experiment 9: Qualitative Analysis, Week 1
12	Nov 10 – Nov 14	Experiment 9: Qualitative Analysis, Week 2
13	Nov 17 – Nov 21	Experiment 10: Flame Emission Spectra of Metals Laboratory Clean-up & Laboratory Check-Out
<i>Fall Break</i>	Nov 24 – Nov 28	Experiment 11: How Much Turkey Can You Eat without Getting Sick.
14	Dec 1 – Dec 3	No Labs

Attendance: Attending the lab section you were assigned is mandatory. Chemistry is an experimental science. We consider the laboratory experience of paramount importance to the discipline of chemistry. Thus, if you miss more than two labs (even for legitimate reasons), you will get a failing grade for the entire course!

If there is a serious issue such as, for example, a debilitating sickness, a family crisis, a scheduled sports competition, or a similarly unavoidable situation, you may ask for a switch to another lab for that week. Permission to attend another lab will only be given by our Laboratory Coordinator, Christine Cardillo. If this should be necessary, you need to contact her at Christine.Cardillo@uvm.edu and she will then contact you with your options for a switch. Such switches can only happen within the week that a particular lab is running because experimental set-ups are prepared by the stockroom only on a week-to-week basis. Be forewarned that the later in the week your lab meets, the more limited your options for a switch become.

Lab Manual/Notebook: The manual “Chemistry 31 Experiments” is sold at the first-floor stockroom, Cook A-143, for \$15 (what a deal!). Finally, you will have to buy a spiral-bound, duplicating-page lab notebook from the UVM Bookstore (~\$16). Consistent with requisite practice in all science research, your experimental data must be recorded in ink.

Breakage Card: Prior to the first lab, you must purchase a breakage card from the first-floor stockroom, Cook A-143, for \$40.00. This amount will be refunded to your CAT\$cratch account if you do not damage any equipment. Do not leave your card at home on lab days because you can not start the experiment without it. In order to avoid long lines, stop by the stockroom in the weeks before your first lab.

Safety: OSHA-approved safety glasses or safety goggles (available for sale in the Chemistry Stockroom or the UVM Bookstore) must be worn by everyone once an experiment has started in any portion of laboratory room. Students not observing this rule will be given a zero for that experiment. Warnings will not be given. It is felt that contact lenses may be a serious health hazard, and so should not be worn in the lab. Prescription glasses may be worn under the safety goggles. Food is absolutely not allowed to be consumed in the lab. If you need to snack on something you brought, you must eat/drink it outside the room. Finally, open-toed shoes (sandals, flip-flops, etc.) are not permitted to be worn in the laboratory.

Before you can come to the first day of lab, you **MUST** have completed the Student Lab Safety Quiz. This will be posted on Blackboard. You have to score 80% to obtain a “pass”.1103

Lab Videos: Before coming to laboratory you must view the video that goes over each step you will be doing during that lab. It is an excellent way to prepare you for the pre-lab writing in your notebook, as well as for any questions on the day’s activities that may come up in the quiz. The link for the videos can be found by going onto the Chemistry Department’s web page (uvm.edu/~chem) and then clicking on “Courses” in the left-side panel, after which you’ll find the CHEM 31 Laboratory Instructional Videos.

Laboratory Grading Categories: For each laboratory experiment you can earn 20 points (for a total of 200 points). At the start of each laboratory, you will take a quiz administered by the Teaching Assistant, for which you can earn points. Your TA will check whether you wrote the pre-lab outline before the experiment is started, and will also check whether you are entering data into your notebook; these accomplishments are worth points. One week after the experiment you must turn in the calculations and associated questions on the lab report form; this is worth points. Finally, your technique (care in collecting data, safe handling of chemicals, etc.) will be assessed by the TA, and can earn you additional points.

The exact number of points for each category will be determined by each TA, but follows a set of guidelines given to them. The approximate weight percent assigned to each category has been set as follows, as contributions to the overall total of 200 points:

Start-of-Lab Quiz:	82 points, or 41% of the lab grade
Pre-Lab / Notebook:	18 points, or 9% of the lab grade
Laboratory Report:	80 points, or 40% of the lab grade
Laboratory Technique:	20 points, or 10% of the lab grade

Normalizing Sections: Even though each TA has the freedom to make up their own quizzes, and design their own grading scheme, at the conclusion of the semester we will standardize all of the points earned in each lab section to the same average of 80%. This will erase differences in grading standards among the large number of TA’s that we have for the course.

Course Grade

Categories: The entire course will be graded on 1000 points that you are able to garner from lecture (800 points) and from lab (200 points). You can earn the 1000 points as follows:

- | | |
|---|------------|
| 1) Three exams at 100 points, dropping the lowest score, for a total of | 200 points |
| 2) One final exam valued at 200 points, for a total of | 200 points |
| 3) Ten best homework assignments at 10 points each, for a total of | 100 points |
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These 500 points from exams will be multiplied by 1.6, to generate a possible 800 points

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|--|------------|
| 4) The lab score (details above) can generate a possible | 200 points |
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Thus, the total points score possible for the entire course is 1000 points

Grading Scale: Assuming a large sample and a Gaussian distribution of scores, I am assigning the average grade to be between a C and a C+. Grade cutoffs will come at approximately equal intervals from the average. Using last year's Chem 31 results as an example, out of 1000 points, the average score was a bit above 700. This number was used as the border between a C and a C+. With 40 points as the incremental step, we had the following grading scheme:

<u>above the average</u>		<u>below the average</u>	
range	grade	range	grade
700-740	C+	660-700	C
740-780	B-	620-660	C-
780-820	B	580-620	D+
820-860	B+	540-580	D
860-900	A-	500-540	D-
>900	A	<500	F

If the average is higher, the whole class benefits with more high grades. If the average is much lower than 700, I will scale all individuals' point totals up by adding the difference between 700 and the average. To be clear, the above is only a guideline based on last year's class performance. The ultimate grading scheme that will be used will be constructed after the Final has been graded, and all lab grades are in. Your scores will be posted on Blackboard.