CHEM 31 - General Chemistry I - Section D - Fall 2011
Prof. Willem R. Leenstra

Section B
Lectures on MWF 3:00-3:50 PM, in Angell B-106
Exams on Thursdays 7:00-9:00 PM, in Billings Lecture Hall

Contact Information
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General

Professor's Office Hours: Monday, Wednesday, and Friday, after class during 4:00-5:00 PM. 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 that time; if so, just email me with a request to see me individually.

TA's Office Hours: Each Teaching Assistant who is part of Chem 31 will have one office hour per lab that he/she teaches. During this office hour, the TA will answer questions not only about the lab, but also about the lecture material. 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 schedule of these hours will be publicized 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: There is additional course help available through the Supplemental Instruction program. There will be several SI Leaders assigned to the entire Chem 31 course. These persons will hold a number of review sessions during the week, at which they will go over lecture material. When details become available, they will be posted on the web.

Communication: I will use mass-email often throughout the semester to communicate important information. You are responsible for checking your UVM email at least once per day so that you won't miss critical messages. For general communication with me, I prefer a phone call instead of umpteen iterative emails so please try that route first [for office phone, see above].

Blackboard: We will be using the UVM course management system called "Blackboard" through which 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. It is your responsibility to check Blackboard daily for announcements.

Lecture Component

Lectures: The lectures will be used principally to introduce and explain new material. Sometimes this includes working out numerical problems, but going over the assigned homework problems is not the purpose of the lectures (see HW, below).

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.

Textbook: This year we will again be using the textbook, "Chemistry - A Molecular Approach", by Nivaldo Tro, now in its 2nd edition, which is sold at the UVM Bookstore. We will be covering, in order, Chapters 1 through 11. The "Solutions Manual" containing the worked-out solutions to all of the end-of-chapter problems is packaged with the text. The Bookstore charges $242.55 for a new set of books, which also includes a MasteringChemistry access code and a CD; as part of the package, you get an electronic version of the textbook! MasteringChemistry (MC) is the publisher's electronic teaching tool that includes tutorials, and via which you will be taking the graded chapter quizzes (i.e., your own personal access code to MC is required for our section D of Chem 31).

The UVM Bookstore also sells packaged sets of used versions of the two books for $106.45. However …… it does NOT include an access code for MC because the previous owner of the textbook used it, and it's not transferable. This is also true if you purchased a used copy of the text from a friend, or online. But fortunately, you can buy an access code for MC from the publisher. It costs $56.30. You can also choose to purchase the MC access code plus the electronic version of the text for $ 97.80. To purchase either of these options online, go to masteringchemistry.com; click on Students under the Register window; answer No to the access code question; find our textbook, which is the 16th frame to the right; then make your purchase.

The previous edition of Tro (1st) is also usable since the content is essentially identical. The homework problems, however, have been reworked and reordered, so you'll somehow have to get access to the second edition's HW problems and solutions. Even more importantly, if you purchase a used copy of this older version of our text, be aware that it almost certainly will not contain a working access code for MasteringChemistry. And as was mentioned earlier, having access to MC is critical because you will be doing your graded quizzes through that medium.

Homework: 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 this is a painless way of deepening your familiarity with the material. For obvious reasons, homework will not be graded.

Each chapter's MC homework assignment will be worth 10 points. I will drop your lowest score so the total from this category contributes 100 points towards your overall course score.

Quizzes: At the end of the last lecture during which a particular chapter is discussed, I will open up a quiz, administered via MasteringChemistry, that consists of 10 problems. Most of these are questions similar to the EOC problems. 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. There are 11 chapters, therefore 11 quizzes. You get to drop the lowest of these scores, for a total of 100 possible points that you can earn towards your course grade.

To access MC, just type "masteringchemistry" into your browser's address line. The course code you will need is LEENSTRAFALL2011 (case-sensitive). In the second class lecture, you will get an introductory tutorial on MC.

Schedule of Lectures: The tentative outline of material covered in each lecture is as follows.

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

Successful Performance: You have an excellent chance to be successful if you follow the following process: (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 problems seriously, i.e., don't give up early and look at the answers which are, of course, worked out in detail in the Solutions Manual; and (5) diligently do the graded quizzes via MC.

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 will be dropped; this way you will not be

penalized if you had a bad day or didn't feel 100%. Our assigned examinations room is the Billings Lecture Hall. Note: I will not answer any questions on the days of the exams.

We will be crowded, but the half-dozen proctors will keep everyone honest. If you wear a baseball cap, turn the brim of your cap backwards. 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 Sharp Model EL-501 that is for sale in the UVM Bookstore for about $7. We have had unpleasant cheating incidents with graphing calculators in the past, so there will be no exceptions granted.

The Thursday exams will cover material that includes the previous Monday's lecture. They will occur at approximately equal intervals on the following days:

Exam 1 — September 29 (first 12 lectures, covering Chapters 1-3)
Exam 2 — October 27 (next 12 lectures, covering Chapters 4-6)
Exam 3 — December 1 (next 12 lectures, covering Chapters 7-9)

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 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 one week prior to the exam to get my permission to take it at another time that day. [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, please try to reschedule with your supervisor right away.] The exams will be returned to you in your laboratory the following week (but you may retrieve it from your TA outside of the lab as soon as they are graded). The last day to withdraw from the course with a W is Monday, October 31. You will have had 2 exams by then which will give you a good idea of your standing.

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 Chapters 10 and 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 Thursday, December 15 at 1:30 PM 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. I will not take attendance, however, nor give on-the-spot quizzes that are designed to check who is in class - it has become unmanageable with the growing size of the Chem 31 lecture course. Having said this, 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. Enough said .....

Laboratory Component

Dates: You have selected a section when you registered for the course. If you want to change your laboratory day/time selection, you should do so by September 13, the add/drop deadline, if available. The last day to withdraw from a course is Monday, November 1.

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 Undergraduate Laboratory Coordinator, John Sharp. If this should be necessary, you need to contact him at john.sharp@uvm.edu and he 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.

Lab Manual/Notebook: The manual "Chemistry 31 Experiments" is sold at the first-floor stockroom, Cook A-143, for $10 (what a deal!). "Working Safely with Chemicals" is a small, required booklet, also available at the UVM Bookstore for $17.50. Finally, you will have to buy a spiral-bound, duplicating-page lab notebook from the UVM Bookstore (~$15.95). 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 is refundable 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 Eyewear: OSHA-approved safety glasses or goggles (available for sale in 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 should not be worn in the lab. Prescription glasses may be worn under the safety goggles.

Forbidden in the Lab: 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. Also, open-toed shoes (sandals, flip-flops, etc.) are not permitted to be worn in the laboratory.

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) at and then clicking on "Courses" in the left-side panel, after which you'll find the CHEM 31 Laboratory Instructional Videos.

Laboratory Schedule: Labs will not be conducted in the first two weeks of classes. They will start the week of September 12.

Week of	Experiment	Description
Sep 12	1	Check-In, Lab Safety I, and Density of Metals
Sep 19	2	Lab Safety II, and Investigation of a Hydrated Salt
Sep 26	3	Mole Ratio
Oct 3	4	Determination of Acid Content in Food Product
Oct 10	5	Synthesis and Identification of Coordination Compounds
Oct 17	6	Gas Law Determination of Molecular Weights
Oct 24	7	Determination of Heat Capacity
Oct 31	8	Heat of Formation of Magnesium Oxide
Nov 7	9	Flame Emission Spectra of Metals
Nov 14	10	Qualitative Analysis - Part I
Nov 21		Turkey Eating
Nov 28	10	Qualitative Analysis - Part II, and Check-Out

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:	65 points, or 32.5% of the lab grade
Pre-Lab / Notebook:	30 points, or 15% of the lab grade
Laboratory Report:	80 points, or 40% of the lab grade
Laboratory Technique:	25 points, or 12.5% 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
4) The lab score (details above) can generate a possible	200 points
Thus, the total points possible for the entire course is	1000 points

Grade Distribution: 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, with a slight compression at the high end and at the low end of the distribution. I will use the explicit result from a prior year to illustrate below.

Using an earlier year's Chem 31 results as an example, out of 1000 points, the average score was 675. This thus became the border between a C and a C+. With 45, 40, and 35 points as the incremental steps, we had the following grading scheme:

above the average		*below the average*	
range / increment	grade	range / increment	grade
675-720 [45]	C+	630-675 [45]	C
720-765 [45]	B-	585-630 [45]	C-
765-805 [40]	B	545-585 [40]	D+
805-840 [35]	B+	510-545 [35]	D
840-875 [35]	A-	475-510 [35]	D-
>875	A	<475	F

With this distribution the course grade average was found to be around 2.2. To be clear, ***the above is only a guideline*** based on last year's class performance. I reserve the right to adjust the grade divisions as the class performance dictates. 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 in Blackboard.