Chemistry 31

GENERAL CHEMISTRY

Fall 2017

Instructor Information

Instructor:	Professor Joel M. Goldberg
Office:	W321 Discovery Hall
Phone:	656-4394
Email:	Joel.Goldberg@uvm.edu
Office Hours:	Monday, 2:00 - 3:00 p.m. Tuesday, 10:30 - 11:30 a.m. Thursday, 11:00 a.m. - noon Have a question and cannot make it to one of my office hours? Email me - be sure to include "CHEM 031" in the subject line to ensure that I can give it prompt attention; if this is something we cannot address electromagically, suggest some days and times that you are available to meet and I can email you to confirm an appointment.

Meeting Times

Weekly Problem Session:	Tuesday, 6:00 - 7:00 pm 103 Rowell • Problem sessions will be held every week, except on the three evenings that mid-semester exams are scheduled
Mid-Semester Exams:*	Tuesday, 6-9** pm 103 Rowell *There are three mid-semester exams scheduled on: Sept. 19, Oct. 17, and Nov. 14 **Exams will start at 6 pm - you will have as much time as you care to spend on the exam, but they are designed so that most everyone should be able to complete them in this 3-hour time window
Exam Review Sessions:	On the Sunday before each of the three mid-semester exams, I will hold a review session to answer questions and work problems related to the exam material. These will be held in **Williams 301, 7-9 pm** on the following Sunday nights: Sept. 17, Oct. 15, and Nov. 12.
Final Exam:	Monday, December 11, 10:30 a.m. - 1:15 p.m. 235 MLS Note that the final exam is scheduled by the Registrar at a day and time when you will have no conflicts from other courses. I have no flexibility in the scheduling of this exam and - unless you have four or more final exams scheduled within a 36-hour period - you are expected to take the final exam during this time. See the current catalogue for more information, here: http://catalogue.uvm.edu/undergraduate/academicinfo/examsandgrading/
Supplemental Instruction (S.I.):	**S.I. Leader:** Marlo Zorman Marlo.Zorman@uvm.edu **Tentative Schedule:** **Session 1:** Mondays, 7:30 - 8:30 p.m., Rowell 110 **Session 2:** Wednesdays, 7:30 - 8:30 p.m., Jeffords 127 **Office Hours:** Mondays, 3:30 - 4:20 p.m., L/L Commons (plus one additional hour, TBD)
Lab:	Various times - you must attend the lab section for which you have registered.
Office Hours:	Monday: 2-3 pm Tuesday: 10:30-11:30 am Thursday: 11 am – noon
T.A. Office Hours:	T.A.s for all of the lecture sections staff office hours Monday-Thursday between 8:30 am and 7:30 pm and on Friday morning. They can be found on the 3rd Floor of Discovery Hall, across from the Chemistry Department mailboxes. The Schedule will be posted on the CHEM 031 lab Blackboard site by the end of the first week of classes.

Course Materials

Text and Online Materials ***(REQUIRED):***	Nivaldo J. Tro's *Chemistry: Structure and Properties, 2nd Edition* *Mastering Chemistry* (Pearson HigherEd) Every student enrolled in CHEM 031 *must* be able to access Pearson HigherEd's *Mastering Chemistry* site in order to complete and get credit for the required online quizzes (worth 12.5% of your total course grade). There are many options for gaining access to this online site but, ultimately, it is up to you - the student - to decide what is best for your learning style and financial situation. There are two options that I feel are worthy of your consideration: • **Online Access/Print-Copy Bundle** - This is the package that is available at the UVM Bookstore and provides complete online access to all published materials (the eText version of Tro's textbook, assigned problems and online quizzes via *Mastering Chemistry*, etc.) plus a loose-leaf (i.e., unbound) print copy of Tro and a print copy of the Solutions Manual. For just under $40 more than online-only access, this is the best way to go if you want to have *some* kind of hardcopy of the text and/or solutions to the assigned problems. • **Online Access Only** - This provides you with complete online access to all of the published materials needed for the course. This is available only through the Pearson HigherEd website and will provide you with the access code needed to log onto Pearson's online *Mastering Chemistry* site. If you only want or need electronic access to the text, assigned problems, quizzes, solutions manual, etc., this is the way to go. Please note, however, that you will need to be online in order to access any of these materials. Note that there will be assigned reading in the textbook as well as assigned homework problems and chapter quizzes. You must have online access to *Mastering Chemistry* in order to do the quizzes that are completed online for credit. There is not an option to complete the required online quizzes without paying for online access, so you are not able to share access to the text with a classmate without purchasing your own online access code. The good news, however, is that the cost of the online access package is far far lower than what it used to cost to purchase the hardcopy version of the textbook in years past, and the online homework and quizzes are designed to help guide you as you gain mastery of the material. The same materials are used in CHEM 032 and your online access code is valid for 24 months, so you will not need to pay for online access if you need to take CHEM 032 and enroll by the Spring 2019 semester.

Lab Materials ***(REQUIRED):***	• Written instructions and videos for each of the experiments for the laboratory component of the course are available online on the Blackboard site for your lab section.
	
	• You must purchase, in advance of showing up to the very first laboratory session:
	  ◦ a spiral-bound laboratory notebook with carbon-less copies, and
	  ◦ a pair of OSHA-approved safety glasses or goggles.
	
	Both of these are available for purchase in the UVM Bookstore and you will not be allowed in the lab without them. Note that contact lenses should NOT be worn in the laboratory (they are a safety hazard) but, if you have no other type of corrective lenses, you must wear safety goggles (not safety glasses) and you must inform your laboratory instructor. It is recommended (although not required) that you purchase and wear a labcoat (they are cool and VERY stylish and will protect you and your clothing) when you are in the laboratory (also available at the UVM Bookstore). If you do not wear a labcoat, please do not wear clothes that you care about to lab!

Grading

Your grade for the course will be determined from your point total:

Quizzes (online):	125 points
Exam #1 (Sept 19th):	125 points
Exam #2 (Oct 17th):	125 points
Exam #3 (Nov 14th):	125 points
Final Exam (Dec 11th):	250 points
Laboratory:	250 points
TOTAL:	***1000 points***

Course Grade:	The letter grade that you receive for the course will be determined by the point total that you accrue throughout the semester. N opting not to complete quizzes is equivalent to opting to skip an exam: both will result in a loss of 125 points (12.5% of your fina different way: 10 points from a chapter quiz is equivalent to answering a 10-point question correctly on an exam. I cannot say in advance which point ranges correspond to which letter grades, but I will give approximate correlations throughou the exams. Please note that you are not competing with each other for grades in this course: if everyone scores in the "A-range course (really!). I encourage you all to work together as you study, to help each other learn the material – but do also recognize solely your own, so be prepared to work independently to demonstrate your mastery of the material.
Exams:	There will be three mid-semester exams (worth 125 points each) and one comprehensive final exam (worth 250 points). The th tentatively scheduled for September 19th, October 17th, and November 14th, beginning at 6:00 p.m. in Rowell 103. There are r Only non-programmable non-graphing calculators are allowed to be used during the exams. No other electronic devices are all includes cell phones, music players, game devices, etc. It is the responsibility of each student to bring a non-programmable nor exams – there will not be extras for those who forget. Students found using any other electronic devices will receive a grade of Exams are designed to be completed within about 1.5 hours, however you will be allowed to spend as much time as you need.

	10:30 a.m. - 1:15 p.m. on Monday, December 11th in MLS 235, and will cover material from the entire semester.
Quizzes:	There will be short quizzes available online (via the *Mastering Chemistry* application) for each of the twelve chapters. These are your knowledge of some of the important material from each chapter and will be worth up to 12.5 points for each quiz, for up to be available only for a limited time following our coverage of the material in class. Your quiz point total will be the sum of the ter - you can earn, then, up to 125 points (ten quizzes at 12.5 points per quiz) by completing these online quizzes.
Labs:	You can earn up to 250 points from the laboratory component of the course. A detailed breakdown of how these points are awa preparation, etc.) is provided in the laboratory syllabus on the Blackboard site for your lab section.
Absences:	You are expected to attend and participate fully in all classes, labs, and exams – they are on your schedule and, so, there shou scheduled obligations. That said, should you be unable to take one of the exams at the scheduled day/time for a valid, documented reason (e.g., illnes must contact me prior to the scheduled exam day/time to see if it is possible to schedule an alternate exam time. Only in extrao will an alternate exam time be provided at a day/time after the originally scheduled exam time. If you miss an exam without a valid, documented reason, you will receive a grade of **ZERO** for the exam. Since the laboratories operate on an extremely tight schedule, it is expected that every student will attend their regularly schedu absolutely impossible for them to do so (e.g., due to a documented illness). Oversleeping, studying for an exam, or just plain no excuses. If you must miss a lab for a valid reason, you must notify the Laboratory Coordinator, Christine Cardillo (Christine.Car procedure detailed in the lab syllabus to see if it is possible to attend another lab section the same week that you must miss yo You may not make-up an unexcused lab! You will receive a grade of **ZERO** for each unexcused lab. ***If you accrue more than*** ***not receive a passing grade for the course!***
Additional Considerations:	You might find that – for any number of reasons – you receive a lower than hoped for score on an exam or quiz or homework a focus on mastery of the material, you will do better on subsequent exams and other assignments. In addition, if your score (as a %) is higher on the final exam than your scores (as a %) on any of the mid-semester exams, *the will be replaced by the equivalent score from your final exam*. For example: if you received mid-semester exam scores (remem 105, 88, and 95 and a final exam score (out of 250) of 230, the lowest exam score (88) will be replaced by 115 (the same %-eq exam). In this way, the actual exam point total of 518 (105+***88***+95+230 = 518) would be increased to 545 (105+***115***+95+230 = worse on the final exam than on any of the mid-semester exams, an adjustment would not be made – only if an adjustment imp be used. Note that while there are twelve chapters (each with assigned problems and quizzes), you will only receive points for up to ten top ten quiz scores for each will be counted towards the quiz total. So, if you do all twelve of the quizzes (one for each chapter) will be used to calculate the total points awarded for quizzes. The more you practice by doing homework assignments (in a time get and the higher the scores will be that you receive on the quizzes as well as exams. Also, remember that number of points p same as the number of points for each one of the mid-semester exams.

Laboratory Information

There is a comprehensive and detailed syllabus just for the laboratory component of the course - this is only a small part of the many, varied, and essential resources you will find on your laboratory section's Blackboard site for CHEM 031.

If you have a question about the lab or need materials for the lab, check the lab section Blackboard site and you will find what you need. If you cannot find what you need, email the Laboratory Coordinator, Christine Cardillo (Christine.Cardillo@uvm.edu) and she can address your question.

Study Guide

General Comments:	CHEM 31 consists of a series of lectures covering the basic principles of elementary chemistry. The course is divided into three sections, and at the end of each there will be an examination to evaluate each student's understanding of the material. Problem solving will be done during the lecture hour and review sessions will be held to go over problems. The lectures are coordinated with a laboratory sequence which relates, in part, to the lecture material. The assigned problems and the reading assignments in the text are summarized in the Course Schedule. Solutions to all of the problems are available online on the Blackboard site for the course. Pay close attention to the Course Schedule and try to read ahead and understand the material relevant to each lecture ahead of time. This will facilitate your understanding and increase your ability to follow closely the development of each topic. If you do not do this, you may find that you cannot assimilate the material properly during the lecture period. Also, I will post on Blackboard the PowerPoint presentation slides that I use in class - you may also find it helpful to look at the slides for a particular subject area prior to attending the associated lecture. There are many ways of learning chemistry. One of the best is problem solving and, while the assigned problems are not collected or graded, I strongly recommend that they be done. Examination questions may come from lecture slide material, assigned problems, lab experiments and a variety of miscellaneous sources. **DO NOT FALL BEHIND!** The course is carefully structured so that you should have no difficulty with the material if you follow the recommended study schedule, attend lectures, do all the assigned problems, and make sure that those problems initially not done correctly are eventually understood . . . before the examination.

	Please do not hesitate to see me if you are having difficulties or have questions which were not answered during the lecture hour. I have reserved and posted specific office hours for individual and small group discussions. If you cannot come at those times, I will be pleased to make an appointment for a more convenient time. In addition, feel free to stop by my office at any other time, although I cannot guarantee that I will be there or that I will not be busy. I also appreciate any anonymous comments, questions, etc., which may be left in the cardboard box at the exit of the lecture room. I will pick these up at the end of each lecture and will answer them at the following lecture, or individually, as is necessary. On the course Blackboard site, you will find an "electronic BOX" that will allow you to submit your anonymous comments electromagically.
Assigned Homework Problems:	The assigned problems are for your benefit and are not to be handed in. You are strongly encouraged to do not only the assigned problems, but also any additional problems in the text that you desire. Chemistry is not a spectator sport. Do not be fooled into believing that passive activities (e.g., reading the text and listening to the lectures) are sufficient to learning chemistry - they are not! The best way to learn chemistry is to reinforce conceptual material introduced in class and in the textbook with engaged problem-solving. There are assigned questions associated with most every chapter section in the text. Try to find a time every day (really!) to read one or two sections (a few pages) and then work on the associated homework problems (a few problems per section). These problems will draw on the material you have just read and will help reinforce that material. Often, the assigned problems draw on example problems in the text (that you have just read), helping you think through and solve the assigned problems. By breaking up your studying into daily, short (30-60 minutes) reading/problem-solving sessions, you won't feel as pressured (or discouraged!) as you would had you saved this for a weekly marathon session (and, educational research shows, you will learn and retain more of the material this way). Get into a habit of doing some chemistry every day - then, when time comes to study for one of the exams (or quizzes), you will be reviewing and reinforcing the material, instead of grappling with it for the first time. **WARNING:** Procrastination may be hazardous to your health! There are A LOT of assigned problems! While we provide solutions to the assigned problems, don't confuse your familiarity with how the problems are solved in the solutions manual (or in class, or in a review session) with your understanding and ability to solve the problems yourself (particularly on a quiz or exam!).
The Box:	Because of the size of CHEM 31, active discussion during lectures is quite difficult. If you do have a question or comment, please speak loud enough so that everyone can hear you. Near the exit to the lecture room is a cardboard box for anonymous comments, questions, criticism or whatever else you wish (please, no trash or recycling!). You may put items there as you leave the lecture and, if they are of general relevance, I will try to answer or comment at the beginning of the next lecture. Comments on any aspect of the course (lab, lecture, etc.) are welcome. There is also an "E-Box" for submission within Blackboard of anonymous course comments (for those suggestions or questions that may pop up outside of class).
The Laboratory:	Laboratories will begin the week of September 11th. The laboratory is a necessary adjunct of this course, designed to both introduce you to some new material, reinforce other material, and give you some idea of the distinction between reading about and actually doing chemistry. More details can be found in the laboratory syllabus on the Blackboard site for your lab section.
Review - Problem Solving Sessions:	***Every Tuesday evening from 6-7 pm in MLS 235, I will hold a review/problem-solving session.*** The purpose of these sessions is to go over specific details of the lecture material, work problems, and general review, all based on questions from those attending. *No new material will be introduced in these sessions and your attendance is strictly optional*, but if you have questions and/or would like to see me work solutions to problems in real-time, you are encouraged to attend. In addition, ***the Sunday prior to each of the mid-semester exams, I will hold a review session to address any final questions you might have on the material to be covered in the upcoming exam.*** These sessions will be in Williams 301, from 7 pm to 9 pm.
The Course Website:	This course will make extensive use of electronic and web-based materials. ALL course materials (lecture presentation slides, assignments, lecture and lab schedules, handouts, old exams and answer keys, grades, etc.) will be available online at the course Blackboard site. In addition, I will provide a direct link to the Pearson *Mastering Chemistry* site where you can access the online textbook and all homework problems as well as the Chapter quizzes. If you are looking for ANY information regarding this course, please look on the Blackboard site first; if it is important, it will probably be there!
Quizzes:	"Did he say online quizzes?" Yes, on the Pearson *Mastering Chemistry* site, you will be able to access the Chapter quizzes which, in aggregate, are worth the same number of points as an entire mid-semester exam. These quizzes count for a total of 125 points throughout the semester (10 quizzes at 12.5 points apiece). Their purpose, however, is mostly diagnostic; i.e., they are a mechanism by which you and I can track what material you understand and what material you need to work on. They are a motivational tool to encourage you to keep up with the material covered by the class (they are available only around the time when we are covering the Chapter material in class). They are NOT a substitute for studying and working problems; it is entirely possible to ace every quiz and still FAIL the exams. You must practice doing chemistry problems if you are to be able to do well on the exams. Keep up with the class material and do the readings and the problems and you will likely do well on both the quizzes and the exams. I hope that these quizzes will serve as a motivational reminder to work on the assigned problems every day, regularly, instead of procrastinating and waiting until just before the exam. Please note that each quiz will not be available throughout the entire semester to take for points but, rather, will be available (for points) only until a few days following our coverage of the material in class. There will be no extensions of the access time nor will there be an option to take a quiz (for points) at a later day/time. Remember that your quiz total will be the sum of the ten highest quiz scores, so if you forget or are ill or are otherwise unable to take a quiz while it is still available, you will not be penalized (unless you miss more than 2 quizzes, of course). You will still be able to access the quizzes after they are no longer active for earning points, so that you can use them to help review for exams and to serve as a diagnostic for the material covered in each chapter.

UVM Policies

	In keeping with University policy, any student with a documented disability interested in utilizing accommodations should contact the Student Accessibility Services (SAS) office on campus. SAS works with students and faculty in an interactive process to explore reasonable and appropriate accommodations, which are communicated to faculty in an accommodation letter. All students are strongly encouraged to meet with their faculty to discuss the accommodations they plan to use in each course. A student's accommodation letter lists those accommodations that will not be implemented until the student meets with their faculty to create a plan. Student Accessibility Services A170 Living/Learning Center 802-656-7753. access@uvm.edu http://www.uvm.edu/access
Policy on Disability Certification and Student Support:	http://www.uvm.edu/policies/student/disability.pdf
Religious Holiday Policy Statement:	*Students have the right to practice the religion of their choice. If you need to miss class to observe a religious holiday, please submit the dates of your absence to me in writing* ***by the end of the second full week of classes****. You will be permitted to make up work within a mutually agreed-upon time.*
Academic Integrity:	This policy addresses plagiarism, fabrication, collusion, and cheating. http://www.uvm.edu/policies/student/acadintegrity.pdf
Code of Student Rights and Responsibilities:	http://www.uvm.edu/policies/student/studentcode.pdf
Center for Health and Well-Being:	http://www.uvm.edu/~chwb/
Counseling and Psychiatry Services (CAPS):	http://www.uvm.edu/~chwb/psych/ If you are concerned about a UVM community member or are concerned about a specific event, we encourage you to contact the Dean of Students Office (802-656-3380). If you would like to remain anonymous, you can report your concerns online by visiting the Dean of Students website at http://www.uvm.edu/~saffairs/

Course Schedule

Approximate Dates	Chapter/Topic	Problems	Experiment (Week of)	Exam
August 28, 30	Chapt. E: *Essentials - Units, Measurement, and Problem Solving*	#19, 21, 23, 25, 27, 29, 33, 37, 39, 41, 45, 47, 49, 51, 53, 55, 59, 61, 65, 71, 73, 75, 79, 81, 87, 89, 91, 95, 99	-	-
Sept. 1, 6, 8	Chapt. 1: *Atoms*	#35, 39, 43, 45, 49, 53, 55, 57, 59, 61, 63, 65, 67, 71, 75, 77, 79, 83, 85, 87, 89, 91, 93, 97, 103, 105, 107, 109, 117	***Expt. 1:*** *Measurements and Density* (Sept. 11)	-
Sept. 11,13, 15, 18	Chapt. 2: *The Quantum-Mechanical Model of the Atom*	#35, 37, 39, 41, 43, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 79, 85, 89, 91, 99	***Expt. 2:*** *Flame Emission Spectra of Metals* (Sept. 18)	**EXAM #1** ***Sept. 19th***
Sept. 20, 22, 25	Chapt. 3: *Periodic Properties of the Elements*	#41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 87, 89, 91, 95, 97, 101, 103, 109, 115, 127, 135	***Expt. 3:*** *Periodic Trends* (Sept. 25)	-
Sept. 27, 29 Oct. 2, 4	Chapt. 4: *Molecules and Compounds*	#29, 31, 33, 35, 37, 39, 43, 45, 47, 49, 51, 53, 55, 57, 61, 63, 65, 67, 69, 71, 75, 77, 79, 83, 87, 93, 95, 97, 101, 103, 105, 109, 111, 117, 119, 121, 123, 125, 127, 137	***Expt. 4:*** *Determination of a Chemical Formula* (Oct. 2)	-
Oct. 6, 11, 13	Chapt. 5: *Chemical Bonding I*	#23, 25, 27, 29, 31, 35, 37, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 69, 71, 73, 75, 79, 81, 83, 85, 91, 95, 97, 99, 101	***No Labs This Week Due to Fall Recess*** (Oct. 9)	-
Oct. 16, 18, 20, 23	Chapt. 6: *Chemical Bonding II*	#25, 29, 31, 33, 35, 39, 41, 43, 45, 49, 51, 53, 55, 57, 59, 61	***Expt. 5:*** *Molecular Models* (Oct. 16)	**EXAM #2** ***Oct. 17th***
Oct. 23, 25	Chapt. 11: *Liquids, Solids, and Intermolecular Forces (sections 11.1 -*	# 35, 37, 39, 41, 43, 45, 47, 49, 51	***Expt. 6:*** *Evaporation and Intermolecular Forces*	-

	11.5 only)		(Oct. 23)	
Oct. 27, 30 Nov. 1, 3	Chapt. 7: *Chemical Reactions and Chemical Quantities*	#15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 53, 55, 57, 61, 63, 65, 67, 69, 71, 75, 81, 85	***Expt. 7:*** *Chemical Reactions of Copper* (Oct. 30)	-
Nov. 3, 6, 8, 10	Chapt. 8: *Introduction to Solutions and Aqueous Reactions*	#21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 87, 91, 93, 99	***Expt. 8:*** *Determination of the Acid Content in a Food Product* (Nov. 6)	**-**
Nov. 10, 13, 15, 17, 27	Chapt. 9: *Thermochemistry*	#31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 99, 101, 107, 111, 113, 117, 119, 123	***Expt. 9:*** *Heat Capacity and Heat of Formation* (Nov. 13)	**EXAM #3** ***Nov. 14th***
Nov. 27, 29 Dec. 1, 4, 6	Chapt. 10: *Gases*	#25, 29, 31, 33, 35, 37, 39, 41, 43, 47, 49, 51, 53, 55, 57, 59, 61, 63, 67, 69, 71, 73, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 99, 101, 105, 107, 113, 123, 125, 127	***Expt. 10:*** *Gas Law Determination of Molecular Weights* *(Nov. 27)*	**-**
Dec. 6, 8	Chapt. 11: *Liquids, Solids, and Intermolecular Forces* (sections 11.5 - 11.9 only)	#53, 57, 59, 61, 63, 65, 67, 69, 71, 73, 77, 81, 85, 87, 93	-	**-**
-	-	-	-	***FINAL EXAM*** ***Monday Dec. 11th 10:30 am***

Last Updated: August 24, 2017