CHEMISTRY 1810 (FORMERLY 122) F2F

GENERAL CHEMISTRY II

SPRING 2018

I. General Information

Instructor: Clarissa Sorensen-Unruh, M.S. Section: 101 (10:30-11:45am TR in N 116)
Office Hours+: 11:30am-12:30pm Mondays, 8:30am-9:30am Wednesdays, 12-3pm Thursday
Office Number: Main Campus, JS 312B Phone #: 505-224-4000 (ext. 50078)
Email: csorensen@cnm.edu Website: http://learn.cnm.edu
Twitter Handle: @RissaChem YouTube Channel: https://www.youtube.com/user/csoren1
+Office hours are subject to change. Other office hours may be scheduled by appointment.

II. Course Description

General Chemistry II provides the foundation for all your future science and engineering classes as well as the keys to unlocking the secrets of the universe! A good background in Chemistry provides the toolkit and training needed to understand and solve some of the significant challenges we face in the fields of energy, environment and medicine. This section will have special emphasis on biomedical examples in General Chemistry and employs collaborative learning – in class, you will work in teams on hard problems designed to help you apply the concepts you are learning to real world problems. To succeed in this environment, you must shift your classroom persona from listener, observer and note-taker to active problem solver, contributor and discussant. Recommended enrollment in 3-hour lecture (3 credit hours) and 3-hour lab (1 credit hour). **If a student does not meet the prerequisite (or corequisite) for this course, he or she may be dropped from the class at any time during the term.**
Prerequisite: CHEM 1710 and CHEM 1792 (within last 3 years) and MATH 1315
Recommended Pre- or Co-requisite: Chemistry 1892 Laboratory

III. Essential Resources

- **Access to the textbook**: ***Chemistry (5th Ed) by Gilbert, Kirss, Foster, Bretz, and Davies. W.W. Norton and Co., 2018*** new or used or e-book. Building on this, however, I actually don't care if you use an older version of the book (previous editions may, in fact, be more expensive with the access code than the new version is, so double check before you buy!) or even a completely different book, such as the free OpenStax Chemistry book found here: https://openstax.org/details/books/chemistry.
- **Access to CNM Learn and CNM email:** Learning materials are delivered via CNM Learn. Important class announcements will be made via the class communication app (and probably via email too) and you should check both at least 2-3 times a week.
- **Access to Fb closed groups and WordPress blogs:** The learning journal and online discussions will be administered via these websites.
- **Smartwork5 (SW) Access:** SW is a homework grading system that will give you the practice you need to master the concepts in general chemistry. Homework is delivered via SW. **You can access Smartwork5 via the following website:** https://digital.wwnorton.com/chem5
  SW CODE:
- **A scientific calculator** is required for this course as well. Inexpensive models may be purchased at stores such as Wal-Mart, K-Mart, Target, OfficeMax, Staples, etc. Two-line displays, such as those found in the series TI 30X II, tend to work best. If you are taking Gen Chem II, you may want to invest in a TI 36X PRO. **Due to their programmable functions and memory, graphing calculators will not be allowed in the 75-minute or final exams.**
- **Recommended:** Notebook and pen for note-taking before and after watching the video lectures.
- **Recommended:** Smartwork notebook which should be used to record what you have learned in SW and to make note of any problems you need to get help with.
- **Recommended:** From chapter 11 onwards, a printed periodic table (which I have posted to CNM Learn) is VERY helpful in class.

See the appendix of this syllabus for further information about to obtain each resource.

IV. Learning Outcomes

Upon completion of Chemistry 1810 students will be able to:

Student Learning Outcomes:

1. Explain the intermolecular attractive forces that determine physical properties and phase transitions, and apply this knowledge to qualitatively evaluate these forces from structure and to predict the physical properties that result.
2. Calculate solution concentrations in various units, explain the effects of temperature, pressure and structure on solubility, and describe the colligative properties of solutions, and determine solution concentrations using colligative property values and vice versa.
3. Explain rates of reaction, rate laws, and half-life, determine the rate, rate law and rate constant of a reaction and calculate concentration as a function of time and vice versa, as well as explain the collision model of reaction dynamics and derive a rate law from a reaction mechanism, evaluating the consistency of a mechanism of a given rate law.
4. Describe the dynamic nature of chemical equilibrium and its relation to reaction rates, and apply Le Chatelier's Principle to predict the effect of concentration, pressure and temperature changes on equilibrium mixtures as well as describe the equilibrium constant and use it to determine whether equilibrium has been established, and calculate equilibrium constants from equilibrium concentrations and vice versa.
5. Describe the different models of acids and base behavior and the molecular basis for acid strength, as well as apply equilibrium principles to aqueous solutions, including acid/base and solubility reactions, and calculate pH and species concentrations in buffered and unbuffered solutions.
6. Explain titration curves and speciation diagrams, as well as calculate concentrations of reactants from the former and determine dominant species as a function of pH from the latter.
7. Explain thermodynamic functions of enthalpy, entropy and Gibbs free energy for a chemical system, calculate values for these terms, and relate them to equilibrium constants and reaction spontaneity.
8. Construct a model of a galvanic or electrolytic cell, express them as two half reactions, and balance redox equations. Evaluate the potential, free energy and equilibrium constant for the reaction, as well as predict the spontaneous direction.
9. Describe bonding theories, such as valence bond and/or molecular orbital theory as applied to organic and/or transition metal chemistry.
10. Correlate organic structure with functional groups, properties, and reactivities. Utilize IUPAC nomenclature system to name simple alkanes.
11. Apply chemical concepts to sustainability.

V. Course Policy

1. **Cell-phones, computers pagers, iPods, and PDA's of any type must have limited usage during class unless we are engaging in a learning tool that needs it (such as PollEverywhere or Socratic) or you'd like to ask me a question via email**. Text-messaging or use of social media for non-class related material is **not permitted**. ***Respect the learning environment*** and make sure your conversations are related to the course material.
2. **Attendence expectations**: **I will exercise my discretion to drop you from the class after you miss 15% of class time (either online or in class or both).** Classes will begin promptly and late arrival to class or leaving early is disrespectful of your classmates. If you need to do either, please do so respectfully and discretely.
3. **Final grades**: After the drop date (**3/30/18**), you will no longer be able to drop the class and you will be assigned a letter grade A-F. Grade boundaries are set by CNM and cannot be changed. I WILL NOT change final grades unless there has been a legitimate error in my grading.
4. **Exam policy**: You will need your CNM id, a calculator, a scantron (from the CNM bookstore), and at least one #2 pencil – ALL exams will be mostly multiple choice. Exams are given in class during the allotted times in the Schedule (see below); make-up exams are given in the Distance Learning Testing Center (http://www.cnm.edu/depts/testing/testingcenter.html). You will be provided with a periodic table and as much scratch paper as you need as well as a paper copy of the exam. To each midterm test, you may bring a 3" x 5" notecard with whatever information you chose handwritten on it. No material may be stuck to the card.

5. Cheating is taken very seriously and will result in automatic and immediate consequences.
6. **Withdrawal and Grading Options Policy:** You may only change your grading option to Credit/No-Credit if the course does not apply to your major OR your minor. You should check the CNM and your possible transfer university regulations regarding Credit/No-Credit if you are considering this option.
7. **PaperCut:** PaperCut is an element of the sustainability effort at CNM. Its purpose is to reduce paper usage. Each student has an online account with an allotment of 150 free printer pages per term. If this allotment runs out, additional pages may be purchased by the student. For more information, go to the PaperCut website: http://cnm.edu/papercut.

VI. Class Structure

The key components of the class are:

- **BEFORE CLASS:** Detailed pre-class reading assignments and/or video lecture assignments. Additional preparation using the 1st attempt on your SW homework is HIGHLY recommended. **If you don't do the reading and/or video watching, you will be lost in class!** Material in the reading assignments and video lectures will **NOT** necessarily be reviewed in class unless I am asked a question about it.
- **IN CLASS:** I will ask for questions at the beginning of class to give further explanation and clarification on the pre-class material. You will then work in small groups on assignments applying the material from the pre-class reading. You will be graded on your small group work individually and collectively throughout the semester via collected group work.
- **AFTER CLASS:** To deepen and fix your learning, you'll have an after-class homework assignment on Smartwork and/or on paper. **Get into the habit of doing your homework within 24 hours of watching the lecture on the topic while it is still fresh in your mind.** This will save you time and contribute to better understanding and higher grades. Use the resources available (office hours, study groups) when you get stuck with a problem after you have given it your best effort. Expect weekly deadlines on regularly throughout the semester. You should expect to spend **at least 3-4 hours per week** on your homework.

Where to get help:

- **Ask questions** at any time, of your classmates or of me through the **class communication,** including the social media extension.
- **Attend office hours**.
- **Consider forming a study group.**
- **Tweet me at @RissaChem.** Be sure to read the Twitter handout first, and **always use the hashtag #CNMCHEM1810** when you tweet so that all in the class can see your tweets. I will not respond to tweets without the appropriate hashtag.
- **Email me at csorensen@cnm.edu.** If you do not name the class you are in (i.e. CHEM 1810 Blended) within the email, I will not respond to it. Period. If I have not responded within 2 business days, or sooner if urgent, please check the class communication app as I have probably responded there and then feel free to email me again to remind me. In busy times, emails sometimes get buried.
- **Disability Resource Center:** if you have a psychological or medical condition that may affect your performance in the class, please consider enrolling here as soon as possible. They can provide a quiet place to take the tests, additional time, as well as the possibility of a note-taker and additional services, if there is a medically documented need. For more information, go to http://www.cnm.edu/depts/disability-resource-center
- **ACE Tutoring** (the Assistance Centers for Education) is a great resource if you cannot meet me during my office hours. Many options are available and most tutoring hours are offered as a first come first served service. Please visit the website for further information: http://www.cnm.edu/depts/tutoring/ACE_Tutoring_Home.html
- **Web resources:** There is an incredible library of resources on the web (including the Khan Academy, etc.). USE THEM!

- **Textbook**: the end of chapter problems in blue have answers at the back of the book. This is a great free resource.

VII. Grading

Students' grades will be calculated out of a 100 point total:

Learning Journal and Attendance (15%)

- In an effort to help students become digital citizens with appropriate professionalism online, six reflection papers detailing each student's learning journey (approximately one at the beginning and end of the semester and one for each exam) will be collected throughout the semester. Reflection papers will in a blog format, will be a minimum of 400 words, and will be submitted through a free account on WordPress. **Constructive and thoughtful comments on other students' blogs and/or answers for questions on the class social media can count for up to 5% of the in-class group work.**
- Class attendance also counts within this percentage.
- In terms of the participation in any online discussion forums, including blog commentary and the classroom social media site, you are expected to conduct yourself professionally as well as with respectful and thoughtful behavior. Quality counts! Your postings must have correct sentence structure and must be spell-checked. **Learning Journals are graded mostly on a participation basis; if you post or submit the journal with correct grammar and spelling on time having discussed your learning journey in this class, then you will receive full credit for that posting or submission.**

Smartwork Homework (20% + up to 5% extra credit)

- For tutorial 'learning mode' questions, infinite attempts per question, no deductions made for incorrect answers until all attempts are used up. No penalty for using 'hints'.
- Late submissions accepted, subject to 10% penalty per day late, up to a maximum of 50% penalty. After the due date, homework assignments revert to practice problems for the rest of the semester.
- The SmartWork gradebook will be downloaded at 8am on Thursday April 27th, so no further credit can be obtained after this.

Examinations (45%)

- Four major exams will be given throughout the semester during a 4-5 day period at the Academic Testing Center (in the SSC 204: **http://www.cnm.edu/depts/ac/testingcenter.php)**
- **There are NO make up exams.**
- The lowest exam will be dropped.
- All class tests will be cumulative (with up to 5 questions adapted from previous tests).

Final Exam (20%)

- It is a Math, Science, and Engineering policy that all courses require final evaluations.
- If you do not take the final exam, you will not be able to make up the missing credit for the class.
- The final exam in Chemistry 1810 is based on a national standard exam prepared by the American Chemical Society, which covers all material presented during the semester and will be given during the 14th and 15th week on Main campus at the Academic Testing Center (SSC 204).
- The final exam has 40 multiple choice questions.
- If Finals Week is cancelled by the school (snow day, etc.), then final grades for students will be calculated based on all work completed and assessed up to that point in the course.

Grading In Summary:

Smartwork Homework	20% + up to 5% EC
(SW = Smartwork average * 0.20)	
Learning Journal and Attendance	15%
(LJ = Final learning journal and attendance grade * 0.15)	
Exams (3 75-minute, the lowest exam is dropped)	45%

(E = Exam average (best 3 of 4) * 0.45)

Final Exam 20%

(F = Final exam grade * 0.20)

To estimate your grade at any point during the course, use the following formula:

SW + LJ + E + F = Course grade

A = 90-100% B = 80-89.9% C = 70-79.9% D = 60-69.9% F = 59% or below

VIII. Basic Needs Statement

Any student who has trouble with basic needs (including, but not limited to, food, housing, clothing, supplies) and believes this may affect their grade in the course is urged to contact CNM Connect Services (https://www.cnm.edu/student-resources/connect-services/about-us) ASAP. Also, please notify the professor if you are comfortable in doing so because this will enable her to access any alternative resources she knows of.

IX. Tentative Lecture Schedule for Chemistry 1810, Spring 2018 (Specific Due Dates Game Plan)

Week	Gilbert Chapters	Lecture Topic
1	Syllabus, Review of Chemistry 1710	Chapters 1-10
	11	Solutions: Properties and Behavior
2	11	Solutions: Properties and Behavior
	12	Solids: Structures and Applications
3	13 (from 4th edition)	Organic Chemistry: Fuels, Pharmaceuticals, Etc.
4	**Review for Exam 1**	**Exam 1 will be administered in class on Thursday, 2/8/18. NOTE: Exam 1 will also include General Chemistry I Review Questions.**
	Exam 1 [11, 12, and 13]	
5	14	Chemical Equilibrium: How Much Product, etc.
6	15	Acid/Base Equilibria
7	16	Additional Aqueous Equilibria
8	**Review for Exam 2**	**Exam 2 will be administered in class on Thursday, 3/8/18.**
	Exam 2 [14, 15, and 16]	
9	17	Thermodynamics: Spontaneous and Nonspontaneous Reaction Processes
10	18	Electrochemistry
11	**Review for Exam 3**	**Exam 3 will be administered in class on Thursday, 3/29/18.**
	Exam 3 [17 and 18]	
12	13	Chemical Kinetics: Reactions in the Air We Breathe
13	19	Nuclear Chemistry: Applications to Energy and Medicine
14	**Review for Exam 4**	**Exam 4 will be administered in class on Thursday, 4/19/18.**
	Exam 4 [13 and 19]	
15	**Review for Final Exam**	**The Final Exam will be administered in class on Thursday, 4/26/18.**
	Final Exam	

1st Note: The last day to drop without a grade of F or to change your grading option (letter grade, CR/NC, Audit) is **March 30th.** If you have any questions, please discuss them with your advisor. **Some changes may occur in the schedule as we proceed through the course. Changes will be announced in class and through class communication. 2nd NOTE:** COB = close of business (please refer to Distance Learning Testing Center schedule as needed: **http://www.cnm.edu/depts/ac/testingcenter.php)**

X. Appendix

1. How to get started with CNM Learn:

- Point your web browser to http://learn.cnm.edu
- Log-in using your CNM Net ID and Password.
- You *must enable pop-up windows* in order for CNM Learn to function on the computer.
- You will also *need Adobe Acrobat Reader* in order to read a lot of the files on the web site. Acrobat Reader is already installed on CNM pod computers and if you do not have it on your home computer it is a free download.
- All materials in this course fall under copyright laws and should not be downloaded, distributed, or used by students for any purposes *outside* of this course.

CNM Learn automatically records student activities, including but not limited to: your first and last access to the course, number of times you have accessed the course, and pages you have accessed. This data may be accessed by the instructor to evaluate class participation and to identify students having difficulty using Bb Learn features.

2. Calculators:

You need a scientific non-programmable calculator for exams (not a graphing calculator). IN EXAMS, YOU MAY NOT USE CALCULATORS ON CELLPHONES OR COMPUTERS. If your calculator has any of the following buttons -- PROG, PGM, CLEAR, CLR -- it is probably programmable **and will not be accepted**. If your calculator has a large screen and can graph functions, it is programmable and will not be accepted. If you are unsure, please bring your calculator into my (or the SI's) office hours before the 1st exam and I will check it for you.