Class Meetings

Lecture: Monday & Wednesday 9:00 am – 10:15 am US MT, VAAS 140

Modality: 100% face-to-face. We hope.

Instructor Contact Information:

Office: VAAS 102A

Phone: 505.925.8611

Drop-in Hours (all times US MT)**:** Tuesdays 10:00 am – 12:00 pm, Wednesdays 10:45 am – 12:45 pm (Zoom only), Thursdays 11:45 am – 12:45 pm and anytime by appointment (either in-person or remote)

Email: jgodbout@unm.edu

COURSE DESCRIPTION #1: The study of stuff, and what it does (2nd of a 2-course sequence)

COURSE DESCRIPTION #2: 3 Credits. This course is intended to serve as a continuation of general chemistry principles for students enrolled in science, engineering, and certain preprofessional programs. The course includes, but is not limited to a theoretical and quantitative coverage of solutions and their properties, kinetics, chemical equilibrium, acids and bases, entropy and free energy, electrochemistry, and nuclear chemistry. Additional topics may include (as time permits) organic, polymer, atmospheric, and biochemistry.

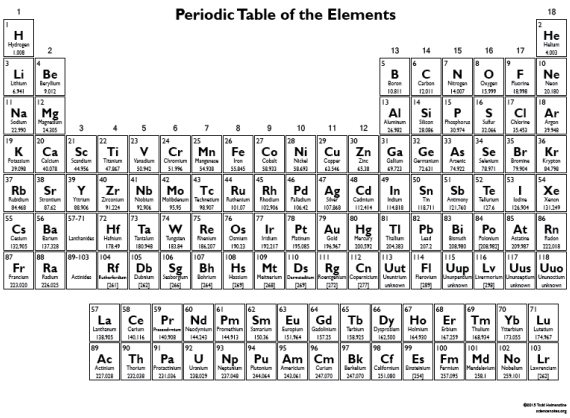
Credit for both this course and CHEM 1227 may not be applied toward a degree program.

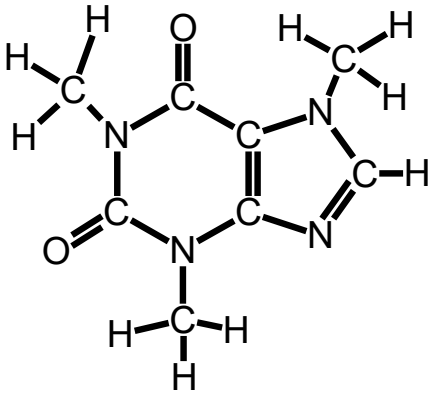
Meets New Mexico General Education Curriculum Area 3: Physical and Natural Sciences.

Prerequisite: (CHEM 1215 or 1217) and 1215L) or ALEKS2 =>50%.

Pre- or corequisite: 1225L.

Now guess which one is the instructor's, and guess which one is has gone through various committees and perhaps a lawyer or two

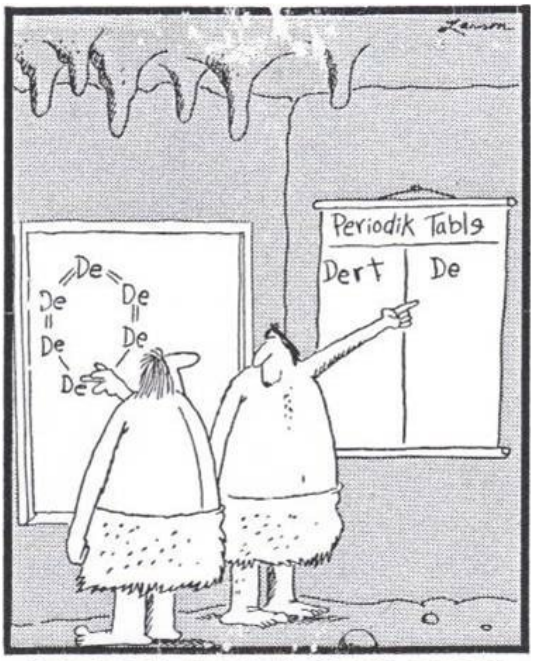




WHAT YOU'LL LEARN

Course-Level 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.



Early chemists describe the first dirt molecule
Larson, Gary, *The Far Side*

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 and calculate the thermodynamic functions, enthalpy, entropy and Gibbs free energy, for a chemical system, and relate these functions to equilibrium constants and reaction spontaneity; balance redox equations, express them as two half reactions and evaluate the potential, free energy and equilibrium *K* for the reaction, as well as predict the spontaneous direction.
8. Construct a model of a galvanic or electrolytic cell; or describe organic reactions.
9. Describe bonding theories, such as valence and molecular orbital theory.

COURSE/INSTRUCTOR COMMUNICATIONS

- Please use the messaging feature in UNM Canvas for course correspondence. UNM email (Lobo Mail) should be used only when there are issues with Canvas messaging.
- When requesting meeting, please propose three (3) times that work for you in your initial request, and I'll choose from those if possible. This makes scheduling much more efficient
- It is the responsibility of the student to keep up with course announcements. ***Check Canvas and your UNM email and daily!***

WHAT YOU'LL NEED (Required Resources)

- Chemistry: A Molecular Approach (any edition 2nd through 5th)
- Mastering Chemistry Access Code (link on UNM Canvas, course ID is godbout79115
- Calculator (non-graphing) with log/antilog and exponential functions
- Internet Access: *Canvas* and *UNM email address* ***must be checked regularly (daily)!***

WHAT IF YOU NEED HELP? (UNM-Valencia Resources)

- **Instructor**: Drop-in hours, STEM Center Hours, email
- **Learning Commons/STEM Center**: Tutors*, molecular modelling kits, Laptops, textbooks

* Reminder: when using tutors, it is the **students'** responsibility to make sure they understand well enough to complete the problems on **their own**.

HOW IS MY GRADE DETERMINED?

(Exams, Quizzes, Homework, and the Like)

	How Many	Weight
Class Points	1	10 %
Quizzes	15*	10 %
Homework	10*	15 %
Exams	4**	50 %
Final Exam	1	15 %
Total		**100 %**

* Approximate values

** Each equally weighted, 12.5 % each

WHAT YOU'LL FIND USEFUL (Recommended Resources)

- Binder for lecture notes, handouts, group activities
- Mastering Chemistry notebook (or place in binder to keep track of problem solving, identify patterns, record areas of difficulty
- Periodic table (on paper): Download your favorite from the internet! Having a paper copy available while you are working will be very useful
- Small markerboard to share your work with classmates

WHAT DO I NEED FOR AN A?

(What's the grading scale?)

Earn This %	Get This Grade
98	A+
92	A
90	A-
88	B+
83	B
80	B-
78	C+
73	C
69	C-
67	D+
62	D
60	D-
55	F+
0	F

What Will Your Routine Be Like?

- **Before Class**: Complete any preparatory assignment (quiz, reading, video, etc.)
- **During Class:** Work with your group to master concepts. The more you put in, the more you'll get out
- **After Class:** work on homework assignment relevant to that day's topic (review notes, **WORK ON PROBLEMS**, think of questions for drop-in hour visits, **WORK ON PROBLEMS,** etc.
- **Repeat 29 times!**

What Will Each Class Be Like?

- **Quiz**: (complete on Canvas before class) covering material recently covered and any assigned preparation (reading, video, etc.)
- **Course Business**
- **Group Activity:** collaborative activities to help master that day's topic
- **Reflection:** an opportunity to put the day's lesson into larger perspective, and formulate/ask questions

Attendance Policy

- **Be There** Attendance in lecture and lab/recitation should be considered mandatory. Students are expected to attend all meetings of the classes in which they are enrolled, barring extenuating circumstances.
  - A student with 4 total absences may be dropped from a course by the instructor with a grade of WP or WF or the student may receive a grade of F at the end of the semester.
  - I will exercise my discretion without notice to drop any student who: misses the first two meetings; or has not completed any assignments in Canvas and/or Mastering Chemistry by the end of the 2nd week; after 2 consecutive unexcused absences; or after 4 total absences.
- **Be on time.** Lectures and labs/recitations will begin promptly. After 10 minutes, a student will be counted absent. Late arrival or early departure is disruptive and unacceptable.
- **Your job begins when class ends:** Electronic homework will be assigned regularly. Your answers are to be submitted and scored on Mastering Chemistry. Late homework will not be accepted.

Of course, absences and late assignments due to illness or any mitigating circumstance are unavoidable but must be documented or approved in advance when possible. If you must miss a lecture or lab, email me ASAP in order to get your absence excused and discuss when you will turn in or make up any allowable assignments. Students are responsible for all assignments regardless of attendance.

Selected Dates, Deadlines & Holidays[1]	
Fri, 02 Sep 2022	Last day to register, ADD sections and change credit hours Enrollment cancellation for non-payment
Mon, 05 Sep 2022	University Holiday – Labor Day
Fri, 09 Sep 2022	Last Day to DROP without "W" grade and 100% tuition refund
Thu, 13 Oct 2022	University Holiday – Fall Break (through Fri, 15 Oct, 2021)
Fri, 11 Nov 2022	Last Day to DROP **WITHOUT** Dean's Permission
Thu, 24 Nov 2022	University Holiday – Thanksgiving (through Sun, 27 Nov 2022)
Fri, 09 Dec 2022	Last day to withdraw **WITH** Dean's Permission and change grading options
Wed, 14 Dec 2022	Final Exam (for this section)

[1] These are only selected deadlines! For a complete and up-to-date calendar, please see https://registrar.unm.edu/semester-deadline-dates/fall-2022.html

WHEN WILL WE LEARN THIS STUFF?

(Schedule is approximate and subject to change by the instructor)

Meeting	Date	Topics/Events
1	Mon 22 Aug	Syllabus, Review: Lewis Structures, VSEPR, Polarity
2	Wed 24 Aug	Intermolecular Forces, Phase Changes, Relative BP (11.4 – 11.8)
3	Mon 29 Aug	Solutions and Solubility (13.1 – 13.5)
4	Wed 31 Aug	Colligative Properties (13.6 – 13.7)
5	Mon 05 Sep	Labor Day – No Meeting
6	**Wed 07 Sep**	**Exam 1: CHEM 1215 Review, Chapters 11, 13**
7	Mon 12 Sep	Kinetics: Introduction (14.1 – 14.3)
8	Wed 14 Sep	Kinetics: Integrated Rate Laws (14.4)
9	Mon 19 Sep	Kinetics: Temp Dependence and Mechanisms (14.5 – 14.7)
10	Wed 21 Sep	Kinetics: Review
11	Mon 26 Sep	Equilibrium: Intro (15.1 – 15.5)
12	Wed 28 Sep	Equilibrium: ICE Tables (15.1 – 15.8)
13	Mon 03 Oct	Equilibrium: Q and LeChâtelier's Principle (15.7 – 15.9)
14	Wed 05 Oct	Equilibrium: Review
15	**Mon 10 Oct**	**Exam 2: Kinetics and Equilibrium (Chapters 14, 15)**
16	Wed 12 Oct	Acids/Bases: Definitions, K_a, K_w, pH scale (16.1 -16.5)
17	Mon 17 Oct	Acids/Bases: Weak acid/base equilibria (16.6 – 16.7)
18	Wed 19 Oct	Acids/Bases: Weak acid/base equilibria (cont) (16.6 – 16.7)
19	Mon 24 Oct	Acids/Bases: Salts, Polyprotic Acids, Lewis Definition
20	Wed 26 Oct	Equilibrium: Buffers (17.1 – 17.3)
21	Mon 31 Oct	Equilibrium: Weak A/B titrations (17.4)
22	Wed 02 Nov	Equilibrium: Solubility
23	**Mon 07 Nov**	**Exam 3: A/B Equilibria, Solubility (Chapters 16, 17)**
24	Wed 09 Nov	Thermodynamics: Entropy (18.1 -18.5)
25	Mon 14 Nov	Thermodynamics: Gibbs Free Energy (18.6 – 18.9)
26	Wed 16 Nov	Thermodynamics: GFE and Equilibrium and Review (18.10)
27	Mon 21 Nov	Electrochemistry: Intro and Balancing (19.1 – 19.2)
28	Wed 23 Nov	Electrochemistry: Galvanic and Electrolytic Cells (19.3 – 19.6)
29	Mon 28 Nov	Electrochemistry: Batteries and Corrosion
30	Wed 30 Nov	Thermodynamics and Electrochemistry Review/Catch Up
31	**Mon 05 Dec**	**Exam 4: Thermodynamics and E-Chem (Chapters 18, 19)**
32	Wed 07 Dec	Review of CHEM 1225 Topics and Learning Objectives
	Wed 14 Dec	**Final Exam (9:00 – 11:00 a.m.)**

So that molecule on the front page – send me a message with its name for 5 quiz points. Offer expires after exam 1 is distributed. Hint – you may go through a fair bit of the stuff before the semester is over!.

Academic Integrity

Having academic integrity is paramount to your success in any class. Plagiarism or cheating is not tolerated. Any instance of this will result in a grade of zero for that assignment. Here is the link to the UNM Academic Dishonesty Policy:

Academic Integrity Policy

https://policy.unm.edu/regents-policies/section-4/4-8.html. or scan the QR code above:

The policy states: *Each student is expected "to maintain the highest standards of honesty and integrity in academic and professional matters. The University reserves the right to take disciplinary action, up to and including dismissal, against any student who is found guilty of academic dishonesty or who otherwise fails to meet the expected standards. Any student judged to have engaged in academic dishonesty in course work may receive a reduced or failing grade for the work in question and/or for the course.*

Academic Dishonesty is defined as: "Academic dishonesty" includes, but is not limited to, dishonesty in quizzes, tests, or assignments; claiming credit for work not done or done by others; hindering the academic work of other students; misrepresenting academic or professional qualifications within or without the University; and nondisclosure or misrepresentation in filling out applications or other University records.

COVID-19 Health and Awareness: UNM is a mask friendly, but not a mask required, community. To be registered or employed at UNM, Students, faculty, and staff must all meet UNM's Administrative Mandate on Required COVID-19 vaccination. If you are experiencing COVID-19 symptoms, please do not come to class. If you have a positive COVID-19 test, please stay home for five days and isolate yourself from others, per the Centers for Disease Control (CDC) guidelines. If you do need to stay home, please communicate with me via email (jgodbout@unm.edu) or Canvas course messaging; I can work with you to provide alternatives for course participation and completion. UNM faculty and staff know that these are challenging times. Please let us know that you need support so that we can connect you to the right resources and please be aware that UNM will publish information on websites and email about any changes to our public health status and community response.

Vaccine Requirement

Support:

Student Health and Counseling (SHAC) at (505) 277-3136. If you are having active respiratory symptoms (e.g., fever, cough, sore throat, etc.) AND need testing for COVID-19; OR If you recently tested positive and may need oral treatment, call SHAC.

LoboRESPECT Advocacy Center (505) 277-2911 can offer help with contacting faculty and managing challenges that impact your UNM experience.

Accommodations: UNM is committed to providing courses that are inclusive and accessible for all participants. As your instructor, it is my objective to facilitate an accessible classroom setting, in which students have full access and opportunity. If you are experiencing physical or academic barriers, or concerns related to mental health, physical health and/or COVID-19, please consult with me after class, via email/phone or during office/drop-in hours (I am not legally permitted to inquire about the need for accommodations). We can meet your needs in collaboration with UNM Valencia Campus community (505) 925-8910 and/or the Accessibility Resource Center (https://arc.unm.edu/) at arcsrvs@unm.edu or by phone (505) 277-3506.

Equal Access Services

Support: Contact me via email (jgodbout@unm.edu) or Canvas messaging or in office/drop-in hours.

Credit-hour Statement: This is a three credit-hour course. Class meets for two 75-minute sessions of direct instruction for sixteen weeks during the Fall 2022 semester. Please plan for a minimum of six hours of out-of-class work (or homework, study, assignment completion, and class preparation) each week.

Support:

UNM Valencia Learning Commons (tutoring).

Center for Academic Program Support (CAPS). Many students have found that time management workshops can help them meet their goals (consult (CAPS) website under "services").

Title IX: Our classroom and our university should always be spaces of mutual respect, kindness, and support, without fear of discrimination, harassment, or violence. Should you ever need assistance or have concerns about incidents that violate this principle, please access the resources available to you on campus. Please note that, because UNM faculty, TAs, and Gas are considered "responsible employees" by the Department of Education, any disclosure of gender discrimination (including sexual harassment, sexual misconduct, and sexual violence) made to a faculty member, TA, or GA must be reported by that faculty member, TA, or GA to the university's Title IX coordinator. For more information on the campus policy regarding sexual misconduct, please see: https://policy.unm.edu/university-policies/2000/2740.html.

Title IX Policy

Support: LoboRESPECT Advocacy Center and the support services listed on its website, the Women's Resource Center and the LGBTQ Resource Center all offer confidential services and reporting.

Land Acknowledgement: Founded in 1889, the University of New Mexico sits on the traditional homelands of the Pueblo of Sandia. The original peoples of New Mexico Pueblo, Navajo, and Apache since time immemorial, have deep connections to the land and have made significant contributions to the broader community statewide. We honor the land itself and those who remain stewards of this land throughout the generations and also acknowledge our committed relationship to Indigenous peoples. We gratefully recognize our history.

Resource: Division for Equity and Inclusion.

Citizenship and/or Immigration Status: All students are welcome in this class regardless of citizenship, residency, or immigration status. Your professor will respect your privacy if you choose to disclose your status. As for all students in the class, family emergency-related absences are normally excused with reasonable notice to the professor, as noted in the attendance guidelines above. UNM as an institution has made a core commitment to the success of all our students, including members of our undocumented community. The Administration's welcome is found on our website: http://undocumented.unm.edu/.

Citizenship/Immigration status

Respectful and Responsible Learning: We all have shared responsibility for ensuring that learning occurs safely and equitably. UNM has important policies to preserve and protect the academic community, especially policies on student grievances (Faculty Handbook D175 and D176), academic dishonesty (FH D100), and respectful campus (FH CO9). These are in the *Student Pathfinder* (https://pathfinder.unm.edu) and the *Faculty Handbook* (https://handbook.unm.edu). Please ask for help in understanding and avoiding plagiarism or academic dishonesty, which can both have very serious consequences.

Support: Center for Academic Program Support (CAPS). Many students have found that time management workshops can help them meet their goals (consult (CAPS) website under "services").

Connecting to Campus and Finding Support: UNM-Valencia has many resources and centers to help you thrive, including opportunities to get involved, mental health resources, academic support including tutoring, resource centers, free food at Valencia Campus Food Pantry, and jobs on campus. Your advisor, staff at the resource centers and I can help you find the right opportunities for you.