

CHEM-1120C Introduction to Chemistry for Non-Majors

Spring 2021 – Section 501 – CRN 50410

Instructor: Dr. Jerry Godbout

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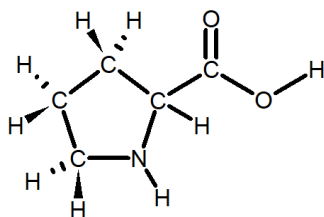
Phone: 505.925.8611

Office (student meeting) Hours: Mondays 10:45 am – 11:45 am and Tuesdays 9:00 – 10:00 am, *via* Zoom. and other times by appointment

Class Meeting Time: Zoom Classroom: Tuesday & Thursday 10:30 – 11:45 am. Link provided in UNM Learn

COURSE DESCRIPTION: The study of stuff, and what it does

COURSE DESCRIPTION: This course covers qualitative and quantitative areas of non-organic general chemistry for non-science majors and some health professions. Students will learn and apply principles pertaining, but not limited to, atomic and molecular structure, the periodic table, acids and bases, mass relationships, and solutions. The laboratory component introduces students to techniques for obtaining and analyzing experimental observations pertaining to chemistry using diverse methods and equipment.



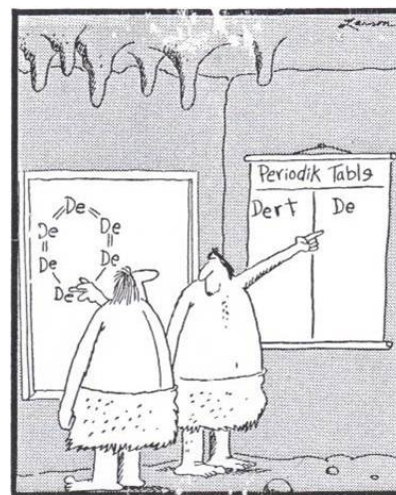
What is this molecule? Tell me (email) for 5 class points!

Credit for both this course and CHEM 1215 may not be applied toward a degree program. Credit for both this course and CHEM 131 may not be applied toward a degree program. Meets New Mexico Lower Division General Education Common Core Curriculum Area III: Science (NMCCN 1114). Prerequisite: MATH 1215Z or MATH 1220 or MATH 1240 or MATH 1430 or MATH 1440 or MATH 1512 or MATH 1522 or MATH 2530 or ACT Math =>22 or SAT Math Section =>540.

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

Periodic Table of the Elements

1 H Hydrogen 1.008																	2 He Helium 4.002
3 Li Lithium 6.941	4 Be Beryllium 9.012											5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999	9 F Fluorine 18.998	10 Ne Neon 20.180
11 Na Sodium 22.990	12 Mg Magnesium 24.305											13 Al Aluminum 26.982	14 Si Silicon 28.086	15 P Phosphorus 30.974	16 S Sulfur 32.065	17 Cl Chlorine 35.453	18 Ar Argon 39.948
19 K Potassium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.867	23 V Vanadium 50.942	24 Cr Chromium 51.996	25 Mn Manganese 54.938	26 Fe Iron 55.845	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.631	33 As Arsenic 74.922	34 Se Selenium 78.971	35 Br Bromine 79.904	36 Kr Krypton 83.798
37 Rb Rubidium 85.468	38 Sr Strontium 87.62	39 Y Yttrium 88.906	40 Zr Zirconium 91.224	41 Nb Niobium 92.906	42 Mo Molybdenum 95.94	43 Tc Technetium 98.906	44 Ru Ruthenium 101.07	45 Rh Rhodium 102.905	46 Pd Palladium 106.42	47 Ag Silver 107.868	48 Cd Cadmium 112.414	49 In Indium 114.818	50 Sn Tin 118.710	51 Sb Antimony 121.757	52 Te Tellurium 127.6	53 I Iodine 126.905	54 Xe Xenon 131.29
55 Cs Cesium 132.905	56 Ba Barium 137.327	57-71 Lanthanides	72 Hf Hafnium 178.49	73 Ta Tantalum 180.948	74 W Tungsten 183.84	75 Re Rhenium 186.207	76 Os Osmium 190.23	77 Ir Iridium 192.222	78 Pt Platinum 195.084	79 Au Gold 196.967	80 Hg Mercury 200.59	81 Tl Thallium 204.383	82 Pb Lead 207.2	83 Bi Bismuth 208.980	84 Po Polonium [209]	85 At Astatine [210]	86 Rn Radon [222]
87 Fr Francium [223]	88 Ra Radium [226]	89-103 Actinides	104 Rf Rutherfordium [261]	105 Db Dubnium [262]	106 Sg Seaborgium [266]	107 Bh Bohrium [264]	108 Hs Hassium [277]	109 Mt Meitnerium [268]	110 Ds Darmstadtium [271]	111 Rg Roentgenium [272]	112 Cn Copernicium [285]	113 Nh Nihonium [284]	114 Fl Flerovium [289]	115 Uu Ununpentium [288]	116 Lv Livermorium [293]	117 Uus Ununseptium [289]	118 Uuo Ununoctium [294]
57 La Lanthanum 138.905	58 Ce Cerium 140.12	59 Pr Praseodymium 140.908	60 Nd Neodymium 144.24	61 Pm Promethium [145]	62 Sm Samarium 150.36	63 Eu Europium 151.964	64 Gd Gadolinium 157.25	65 Tb Terbium 158.925	66 Dy Dysprosium 162.50	67 Ho Holmium 164.930	68 Er Erbium 167.259	69 Tm Thulium 168.934	70 Yb Ytterbium 173.054	71 Lu Lutetium 174.967			
89 Ac Actinium [227]	90 Th Thorium 232.038	91 Pa Protactinium 231.036	92 U Uranium 238.029	93 Np Neptunium [237]	94 Pu Plutonium [244]	95 Am Americium [243]	96 Cm Curium [247]	97 Bk Berkelium [247]	98 Cf Californium [251]	99 Es Einsteinium [252]	100 Fm Fermium [257]	101 Md Mendelevium [258]	102 No Nobelium [259]	103 Lr Lawrencium [262]			



Early chemists describe the first dirt molecule

WHAT YOU'LL LEARN

COURSE TEACHING & LEARNING OUTCOMES

By the end of this course, a successful student will be able to:

Lecture Component SLOs

1. Use the different systems of measurements and perform conversions within the same system of measurement and between different systems of measurements
2. Identify elements from their name or symbol, use the periodic table to describe reactivity patterns of elements and to predict compound formation.
3. Describe the basic structure of an atom using subatomic particles, and apply these concepts to nuclear reactions.
4. Describe ion formation and the difference between covalent and ionic compounds. Name and write formulas for ionic and simple molecular compounds.
5. Write and balance chemical reactions. Use balanced reactions in stoichiometric calculations.
6. Describe the differences between the solid, liquid and gas phases. Use the gas laws in calculations, and apply these laws to everyday situations.
7. Explain different types of energy, and how energy is released or absorbed in a reaction
8. Describe acid and base behavior and the nature of buffer solutions

Laboratory Component SLOs

1. Practice concepts associated with laboratory safety, including the possible consequences of not adhering to appropriate safety guidelines.
2. Demonstrate the computational skills needed to perform appropriate laboratory

related calculations to include, but not be limited to determining the number of significant figures in numerical value, solving problems using values represented in exponential notation, solving dimensional analysis problems, and manipulating mathematical formulas as needed to determine the value of a variable.

3. Perform laboratory observations (both qualitative and quantitative) using sensory experience and appropriate measurement instrumentation (both analog and digital).
4. Record quantitatively measured values to the correct number of significant figures and assign the correct units.
5. Master basic laboratory techniques including, but not limited to weighing samples (liquid and solid), determining sample volumes, measuring the temperature of samples, heating and cooling a sample or reaction mixture, decantation, filtration, and titration.
6. Draw appropriate conclusions based on data and analyses.
7. Present experimental results in laboratory reports of appropriate length, style and depth, or through other modes as required.
8. Determine chemical formulas and classify different types of reactions.
9. Relate laboratory experimental observations, operations, calculations, and findings to theoretical concepts presented in the complementary lecture course.

**If none of these make any sense to you at the beginning of the semester – Fret Not!
We're literally here so you can learn this stuff!**

COURSE/INSTRUCTOR COMMUNICATIONS

- Email is the most effective. Electronic communication for this course **MUST** be through your Learn Messaging.
- When requesting an appointment (which I am always happy to schedule), please propose three (3) times that work for you in your initial request. This will simplify and quicken the process
- It is the responsibility of the student to keep up with course announcements. ***Check your UNM email and Blackboard Learn daily!***

WHAT YOU'LL NEED (COURSE MATERIALS)

- **Text** Atoms First from OpenStax, Print ISBN 1-947172-64-6, Digital ISBN 1-947172-63-8, <https://openstax.org/details/books/chemistry-atoms-first-2e> Go to the following web address or scan the QR code on the left. This textbook is available for free online! If you prefer, you can also get a print version at a very low cost. The text is available in web view and PDF for free. You can also choose to purchase on iBooks or get a print version via from OpenStax on Amazon.com. You can use whichever formats you want. Web view is recommended -- the responsive design works seamlessly on any device. If you buy on Amazon, make sure you use the link on your book page on openstax.org so you get the official OpenStax print version.



Course Text

- Access to UNM Valencia networks, UNM Learn and UNM email:** Network access is necessary for some lab activities. Course materials will be posted on UNM Learn and important class announcements will be made to your UNM email address. Please check your email regularly. Valencia campus provides internet and computer access at the library, Learning Resource Center, and STEM center.
- Homework: Access to CHEM 101 system (<http://chem101.co>, course code P2U98G)
 - **A scientific calculator** with log/antilog and exponential functions: TI-30Xa TI-30X IIS TI-30XS Casio or Sharp equivalents.
 - **A notebook (or space in a binder) to**
 - write down, space out the problems/questions, and to show your work before you submit answers electronically; (3) have it readily available when working with fellow classmate(s), tutor(s) and/or instructor; (4) use as review/study material.

How Do I Earn All Those Points?

(Exams, Quizzes, and the Like)

	How Many**	Points Each	Points Total
Final Exam	1	150	150
In-Semester Exams	4	130	520
Unit Quizzes	16	15	240
Homework	16	20	320
Labs/Rec	14	25	350
Total			1500*

The unit assignments and the Lab/Recitation assignments should be low-stakes, which means that you can expect most of the possible points available if you complete the assignment. They represent 57% of the course points.

*If you do the math, you will notice that this adds up to 1580 points. The scale however, is based in 1500 points, so there 80 points of extra credit. This means that there are actually a total of 80 points of extra credit possible.

WHAT WILL EACH WEEK BE LIKE?

We will cover approximately 1 unit per week, with a unit roughly corresponding to a chapter in the text. Each unit will have:

- Group activity(ies) to be worked on in the Zoom class meeting
- A series of lecture videos
- A graded quiz covering the unit material
- A lab/recitation activity that will reinforce key lecture concepts or introduce other concepts not covered in the "Lecture" material.

The exact nature of the activities for each unit will vary from unit to unit.

WHAT WILL MY ROUTINE BE LIKE?

This is really up to you! My recommendation, however, is **KEEP UP WITH THE MATERIAL!** This class covers a lot of material in a short period of time. Expect for this class to require 8-10 hours per week if you want to do well.

How Many Points Do I Need For an A?

(What's the grading scale?)

Earn This Many Points	Get This Grade
1425	A+
1350	A
1320	A-
1275	B+
1200	B
1170	B-
1125	C+
1050	C
1020	C-
975	D+
900	D
870	D-
825	F+

EXAMS

Think of these as opportunities for you to show just how much you have learned. The exam format consists of two types of questions: multiple-choice, and partial credit. A Practice Exam with the Answer Key will be published to help you prepare.

There are 4 scheduled exams tentatively on the dates below, although the instructor reserves the right to alter course schedule as the semester progresses. Students will be given advance notice of any change.

Exam	Units	Date
1	1 - 4	9 Feb
2	5 - 7	9 Mar
3	8 - 12	6 Apr
3	13 - 16	4 May
Final**	1 - 16	11 May

**The final exam must be taken to pass the course, regardless of points accumulated to that point

WHEN WE LEARN THIS STUFF?

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

Unit	Topics
1	Math you'll need to know(1.4 – 1.6, Appendix B)
2	The Mole
3	Atoms, Ions, Periodic Table: 2.1 – 2.5
4	Electronic Structure and Periodic Properties of Elements (3.1 – 3.7)
Exam 01: Units 1 – 4	
5	Chemical Bonding and Molecular Geometry (4.1 – 4.6)
6	Composition of Substances and Solutions (6.1 – 6.4)
7	Stoichiometry of Chemical Reactions (7.1 – 7.4)
Exam 02: Units 5 – 7	
8	Gases (8.1 – 8.5)
9	Thermochemistry (9.1 – 9.4)
10	Liquids and Solids (10.1 – 10.6)
11	Solutions and Colloids (11.1 – 11.4)
Exam 03 Units 8 – 12	
12	Kinetics (17.1 – 17.7)
13	Fundamental Equilibrium Concepts (13.1 – 13.4)
14	Acid-Base Equilibria (14.1 – 14.7)
15	Equilibria of Other Reactions Classes (15.1 – 15.2)
16	Electrochemistry (16.1 – 16.3)
Exam 04 Units 13 – 16	
Final Exam (Tuesday 11 May)	

Important Dates & Holidays

(for the most current information, check <http://valencia.unm.edu/academics/calendar/spring.html>)

Mon, 18 Jan 2021	Instruction Begins University Holiday – Martin Luther King Day (campus closed)
Fri, 29 Jan 2021	Last day to register, ADD sections, and change credit hours Enrollment cancellation for non-payment
Fri, 05 Feb 2021	Last Day to DROP without “W” grade and 100% tuition refund
Fri, 12 Feb 2021	Last Day to CHANGE grade option
Sun, 14 Mar 2021	University Holiday – Spring Break (through Sat, 20 Mar 2021)
Fri, 16 Apr 2021	Last Day to withdraw WITHOUT Student Services Permission
Fri, 07 May 2021	Last Day to withdraw WITH Student Services Permission
Tue 11 May 2021	Final Exam (for this section)

Things That Aren't Chemistry, But Are Still Important (Campus and University Policies)

Respect the UNM Community by Preserving Health

This may not apply to this class specifically, but will apply for any in-person class, or if you have in-person business/appointments, etc. on any UNM campus

You have the ability to prevent the spread of COVID-19 and to preserve the health of fellow students, your instructor, staff and the community by following UNM health protocols. The UNM Provost Administrative Directive on Mandatory Student Face Covering and Symptom Reporting of July 9, 2020 requires that **all students on UNM-Main and UNM branch campuses wear face masks in the face-to-face classroom and on campus unless they have a specific mask accommodation (confidentially documented with the Accessibility Resource Center)**. UNM Provost Administrative Directive is consistent with Governor Lujan Grisham's Public Health Emergency Order as amended, and the Public Health Order of the New Mexico Health Secretary. It also requires daily participation in symptom screening through covidscreen, which will be sent via UNM e-mail.

Acceptable masks and mask wearing in class: A two-layer mask that covers the nose and mouth and that is cleaned regularly is acceptable. A face shield is not sufficient protection. It is vital that you wear your mask correctly, covering your nose and mouth. Removing your mask for an extended period to eat or drink in class violates the Provost Administrative Directive and endangers others.

Mask Wearing Accommodation: Individuals with a documented disability or diagnosis may seek accommodation with the UNM Accessibility Resource Center (ARC) (<https://arc.unm.edu/>). Individuals do not need to reveal private information to an instructor. ARC will require documentation of health requirements, which will be kept confidential. The instructor will be informed only of any need for accommodation.

Consequences of not wearing a mask properly: Unless you have an ARC-approved accommodation, if you don't wear a mask, or if you do not wear a mask properly by covering your nose and mouth, you will be asked to leave class. If you fail to wear a mask properly on more than one occasion, you can expect to be dropped from the class. If you insist on remaining in the classroom while not wearing a mask (without an ARC-determined accommodation), class will be dismissed for the day to protect others and you will be dropped from the class immediately.

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:

<https://policy.unm.edu/regents-policies/section-4/4-8.html>, or scan the QR code at right:

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 other-*



Academic Integrity Policy

wise 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.

Equal Access Services (Valencia Campus)

If you have a documented condition that may affect your performance in this class, please register with Equal Access Services as soon as possible so accommodations can be arranged in a timely manner.

EAS can provide a quiet place to take exams, additional time, and additional services if there is a documented need. For more information, please see their website at <https://valencia.unm.edu/students/advisement/equal-access-services.html>, or scan the QR code at above:



Equal Access Services

Sexual Misconduct and Gender Discrimination

In an effort to meet obligations under Title IX, UNM faculty, teaching assistants, and graduate assistants are considered “responsible employees.” by the Department of Education (see page 15 - <http://www2.ed.gov/about/offices/list/ocr/docs/qa-201404-title-ix.pdf>).

This designation requires that any report made to a faculty member, TA, or GA regarding sexual misconduct or gender discrimination must be reported to the Office of Equal Opportunity and the Title IX Coordinator. For more information on this policy, <https://policy.unm.edu/university-policies/2000/2740.html> or scan the QR Code at right:



Title IX Policy

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.

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