

CHEM-1120C Introduction to Chemistry for Non-Majors

Spring 2020 – Section 501 – CRN 50411

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Office Hours:

TBD

TBD,

and anytime by appointment, either in-person or online

Meeting Times:

Lecture: Tuesday & Thursday 10:30 – 11:45 am, VAAS 140

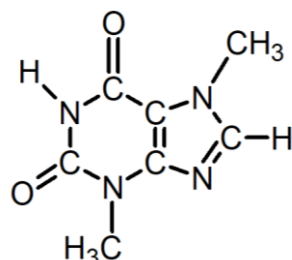
Lab/Recitation: Thursday 12:00 – 2:00 pm, VAAS 128

COURSE DESCRIPTION:

The study of stuff, and what it does

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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.



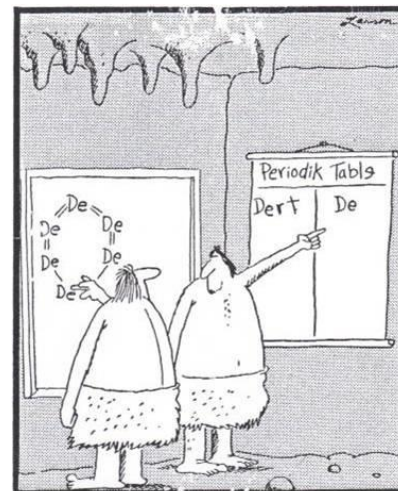
What is this molecule? Tell me (email) for some extra credit!

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 guess which one is has gone through various committees and perhaps a lawyer or two?

Periodic Table of the Elements

1 H Hydrogen 1.008																	18 He Helium 4.003											
3 Li Lithium 6.941	4 Be Beryllium 9.012											13 B Boron 10.811	14 C Carbon 12.011	15 N Nitrogen 14.007	16 O Oxygen 15.999	17 F Fluorine 18.998	19 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 32.06	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 47.88	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 58.69	29 Cu Copper 63.546	30 Zn Zinc 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.61	33 As Arsenic 74.922	34 Se Selenium 78.971	35 Br Bromine 79.904	36 Kr Krypton 84.798											
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 102.906	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	57-103 La 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 204.384	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 Ac Actinides	104 Rf Rutherfordium 261	105 Db Dubnium 262	106 Sg Seaborgium 263	107 Bh Bohrium 264	108 Hs Hassium 265	109 Mt Meitnerium 266	110 Ds Darmstadtium 267	111 Rg Roentgenium 268	112 Cn Copernicium 269	113 Nh Nihonium 270	114 Fl Flerovium 271	115 Uu Ununpentium 272	116 Lv Livermorium 273	117 Uus Ununseptium 274	118 Uuo Ununoctium 276											
89 La Lanthanum 138.905	90 Ce Cerium 140.12	91 Pr Praseodymium 140.908	92 Nd Neodymium 144.24	93 Pm Promethium 144.913	94 Sm Samarium 150.36	95 Eu Europium 151.964	96 Gd Gadolinium 157.25	97 Tb Terbium 158.925	98 Dy Dysprosium 162.50	99 Ho Holmium 164.930	100 Er Erbium 167.259	101 Tm Thulium 168.934	102 Yb Ytterbium 173.054	103 Lu Lutetium 174.967	104 Th Thorium 232.038	105 Pa Protactinium 231.036	106 U Uranium 238.029	107 Np Neptunium 237.048	108 Pu Plutonium 244.064	109 Am Americium 243.061	110 Cm Curium 247.070	111 Bk Berkelium 247.070	112 Cf Californium 251.08	113 Es Einsteinium 252.083	114 Fm Fermium 257.10	115 Md Mendelevium 258.10	116 No Nobelium 259.10	117 Lr Lawrencium 262



Early chemists describe the first dirt molecule

WHAT YOU'LL LEARN

COURSE TEACHING & LEARNING OUTCOMES

Relevant sections are given in [brackets] after each SLO

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 UNM email or UNM 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.
- **Safety glasses/goggles for lab:** please purchase those in the bookstore to avoid any question of their safety rating
 - **A NON-PROGRAMMABLE scientific calculator** with log/antilog and exponential functions: TI-30Xa TI-30X IIS TI-30XS Casio or Sharp equivalents (**cell phones and graphing calculators are not acceptable**). Visit <http://www.vrcworks.net/blog/how-to-identify-calculator-is-programmable-or-nonprogrammable-calculator/> will help you tell the difference, or ask your instructor.
 - **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, Homework, and the Like)

	How Many**	Points Each	Points Total
Final Exam	1	150	150
In-class Exams	4	130	520
Homework	16	14	224
Quizzes	24	7	168
Attendance	28	8	224
Labs/Rec	14	18	252
Total			1500*

*If you do the math, you will notice that this adds up to 1538 points. The scale however, is based in 1500 points, so there 38 points of extra credit. In addition, the 130-point in-class exams will actually have 140 points. This means that there are actually a total of 78 points of extra credit possible.

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 three types of questions: multiple-choice, short-answer, and multiple part. To help you figure out how well you understand the material, approximately a week in before each exam, a Practice Exam with the Answer Key will be published for students' use

There are 4 scheduled in-class 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.

	Chapters	Date
Exam 1	1 - 3	11 Feb
Exam 2	4, 6 - 7	10 Mar
Exam 3	9 - 11	09 Apr
Exam 4	13 - 16	5 May
Final***	1 - 4, 6 - 11, 13 - 17	12 May (10:30 - 12:30 p.m.)

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

WHAT WILL EACH CLASS BE LIKE?

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

WHAT WILL MY ROUTINE BE LIKE?

- **Before Class:** complete any preparatory assignment (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 office hour visits, etc.
- **Repeat 29 times!:**

WHEN WE LEARN THIS STUFF?

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

Mtg	Date	Lecture Topics
1	Tue 21 Jan	
2	Thu 23 Jan	
3	Tue 28 Jan	Math you'll need to know(1.4 – 1.6, Appendix B)
4	Thu 30 Jan	Atoms, Molecules, and Ions (2.1 – 2.4)
5	Tue 04 Feb	Electronic Structure and Periodic Properties of Elements (3.1 – 3.7)
6	Thu 06 Feb	
7	Tue 11 Feb	Exam 1 (Chapters 1 – 3)
8	Thu 13 Feb	
9	Tue 18 Feb	
10	Thu 20 Feb	Chemical Bonding and Molecular Geometry (4.1 – 4.6)
11	Tue 25 Feb	Composition of Substances and Solutions (6.1 – 6.4)
12	Thu 27 Feb	Stoichiometry of Chemical Reactions (7.1 – 7.4)
13	Tue 03 Mar	
14	Thu 05 Mar	
15	Tue 10 Mar	Exam 2 (Chapters 4, 6, 7)
16	Thu 12 Mar	
17	Tue 24 Mar	Gases (8.1 – 8.5)
18	Thu 26 Mar	Thermochemistry (9.1 – 9.4)
19	Tue 31 Mar	Liquids and Solids (10.1 – 10.6)
20	Thu 02 Apr	Solutions and Colloids (11.1 – 11.4)
21	Tue 07 Apr	
22	Thu 09 Apr	Exam 3 (Chapters 9 – 11)
23	Tue 14 Apr	
24	Thu 16 Apr	Kinetics (17.1 – 17.7)
25	Tue 21 Apr	Fundamental Equilibrium Concepts (13.1 – 13.4)
26	Thu 23 Apr	Acid-Base Equilibria (14.1 – 14.7)
27	Tue 28 Apr	Equilibria of Other Reactions Classes (15.1 – 15.2)
28	Thu 30 Apr	
29	Tue 05 May	Exam 4 (Chapters 13 – 16)
30	Thu 07 May	Electrochemistry (16.1 – 16.3)
	Tue 12 Dec	Final Exam (10:30 – 12:30 pm)

Other Things That Aren't Chemistry, But Are Still Important (Class Policies and Important Dates)

- **Be There** Attendance in lecture and lab/recitation is mandatory. Students are expected to attend all meetings of the classes in which they are enrolled.
 - A student with excessive 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 lectures and first lab/recitation;
 - has not completed any assignments by the end of the 2nd week;
 - after 2 consecutive unexcused absences;
 - after 4 total absences.
 - An excused absence must be communicated.
 - Students are limited to 2 excused absences BUT they may not be used for days of Exams
- **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 unacceptable. Absences due to illness or any mitigating circumstance are unavoidable but must be documented or approved in advance. 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.
- **Your job begins when class ends:** Practice problems (homework) will be assigned for each chapter. Homework for each chapter will be collected on the day of the exam for each chapter. It is the responsibility of the student to keep up with the assignments as the material is covered in class. **DO NOT WAIT UNTIL THE NIGHT BEFORE THE EXAM TO START THE PRACTICE PROBLEMS!**

Important Dates & Holidays	
Mon, 20 Jan 2020	University Holiday – Martin Luther King Day
Fri, 31 Jan 2020	Last day to register, ADD sections, and change credit hours on LoboWeb Enrollment cancellation for non-payment
Fri, 07 Feb 2020	Last Day to DROP without “W” grade and 100% tuition refund on LoboWEB,
Fri, 14 Feb 2020	Last Day to CHANGE grade option
Sun, 15 Mar 2020	University Holiday – Spring Break (through Sat, 22 Mar 2020)
Fri, 17 Apr 2020	Last Day to withdraw WITHOUT Dean’s Permission
Fri, 08 May 2020	Last Day to withdraw WITH Dean’s Permission
Wed 12 Dec 2018	Final Exam (for this section)

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

Equal Access Services

If you have a documented disability or psychological/medical condition that may affect your performance in this class, please register with Equal Access Services as soon as possible so I can provide your accommodations 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

<http://www.unm.edu/~vcadvise/equalaccess.htm>, or scan the following QR code:



Equal Access Services

A complete list of student services available in the UNM Valencia campus may also be found on the course UNM-Learn page.

Academic Honesty

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, including dismissal, against any student who is found responsible for academic dishonesty. Any student who has been judged to have engaged in academic dishonesty in coursework may receive a reduced or failing

grade for the work in question and/or for the course. 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; and misrepresenting academic or professional qualifications within or outside the University. Depending on the severity of the offense, students caught cheating may receive a zero on the assignment, be dropped from the course, or receive an 'F' in the course. Don't cheat.

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. 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 following QR Code:



Title IX Policy