

# CHEM-1120C Introduction to Chemistry for Non-Majors

Summer 2020 – Section 501 – CRN 28875

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**Office Hours:**

Monday & Wednesday 10:15 – 11:00 am via Zoom, and other times by appointment. Link provided in UNM Learn.

**Meeting Times:**

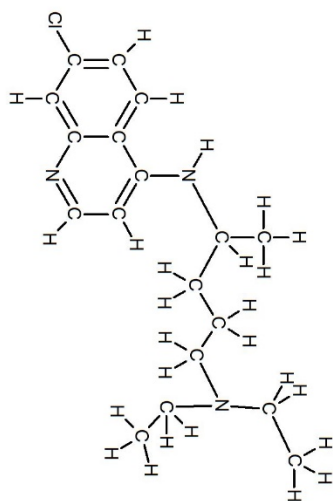
Zoom Classroom: Monday & Wednesday 9:00 – 10:15 am. Link provided in UNM Learn

**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.



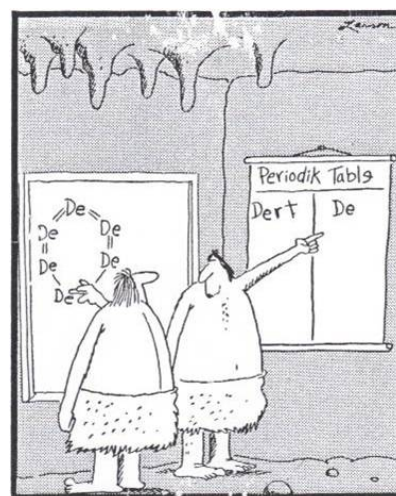
What is this molecule? Tell me (email) for some extra credit!

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																	18				
H Hydrogen 1.008																	He Helium 4.002				
3	2											10									
Li Lithium 6.941	Be Beryllium 9.012											Ne Neon 20.180									
11	12											18									
Na Sodium 22.990	Mg Magnesium 24.305											Ar Argon 39.948									
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36				
K Potassium 39.098	Ca Calcium 40.078	Sc Scandium 44.956	Ti Titanium 47.887	V Vanadium 50.942	Cr Chromium 51.996	Mn Manganese 54.938	Fe Iron 55.845	Co Cobalt 58.933	Ni Nickel 58.693	Cu Copper 63.546	Zn Zinc 65.38	Ga Gallium 69.723	Ge Germanium 72.631	As Arsenic 74.922	Se Selenium 78.971	Br Bromine 79.904	Kr Krypton 84.738				
37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54				
Rb Rubidium 85.468	Sr Strontium 87.62	Y Yttrium 88.906	Zr Zirconium 91.224	Nb Niobium 92.906	Mo Molybdenum 95.94	Tc Technetium 98.906	Ru Ruthenium 101.07	Rh Rhodium 101.07	Pd Palladium 106.36	Ag Silver 107.868	Cd Cadmium 112.414	In Indium 114.818	Sn Tin 118.710	Sb Antimony 121.760	Te Tellurium 127.6	I Iodine 126.905	Xe Xenon 131.29				
55	56	57-71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86				
Cs Cesium 132.905	Ba Barium 137.327	Lanthanides					Hf Hafnium 178.49	Ta Tantalum 180.948	Re Rhenium 186.207	Os Osmium 190.23	Ir Iridium 192.225	Pt Platinum 195.084	Au Gold 196.967	Hg Mercury 200.59	Tl Thallium 204.384	Pb Lead 207.2	Bi Bismuth 208.980	Po Polonium 209	At Astatine 210	Rn Radon 222	
87	88	89-103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118				
Fr Francium 223	Ra Radium 226	Actinides					Rf Rutherfordium 261	Db Dubnium 262	Sg Seaborgium 266	Bh Bohrium 264	Hs Hassium 265	Mt Meitnerium 268	Ds Darmstadtium 271	Rg Roentgenium 272	Cn Copernicium 285	Uut Ununtrium 288	Fl Flerovium 289	Uup Ununpentium 295	Lv Livermorium 293	Uus Ununseptium 294	Uuo Ununoctium 294
57	58	59	60	61	62	63	64	65	66	67	68	69	70	71			72				
La Lanthanum 138.905	Ce Cerium 140.12	Pr Praseodymium 140.908	Nd Neodymium 144.24	Pm Promethium 145	Sm Samarium 150.36	Eu Europium 151.964	Gd Gadolinium 157.25	Tb Terbium 158.925	Dy Dysprosium 162.50	Ho Holmium 164.930	Er Erbium 167.259	Tm Thulium 168.934	Yb Ytterbium 173.054	Lu Lutetium 174.967			73				
89	90	91	92	93	94	95	96	97	98	99	100	101	102	103			104				
Ac Actinium 227	Th Thorium 232.038	Pa Protactinium 231.036	U Uranium 238.029	Np Neptunium 237.048	Pu Plutonium 244.064	Am Americium 243.061	Cm Curium 247.07	Bk Berkelium 247.067	Cf Californium 251.08	Es Einsteinium 252.083	Fm Fermium 257.10	Md Mendelevium 258.10	No Nobelium 259.10	Lr Lawrencium 260			105				



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.
- **Safety glasses/goggles for lab:** please purchase those in the bookstore to avoid any question of their safety rating
  - **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)

	<b>How Many**</b>	<b>Points Each</b>	<b>Points Total</b>
Final Exam	1	300	300
In-Semester Exams	2	175	350
Unit Assignments	15	35	525
Labs/Rec	14	25	350
<b>Total</b>			<b>1500*</b>

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 1525 points. The scale however, is based in 1500 points, so there are 25 points of extra credit. In addition, the 175-point in-semester exams will actually have 185 points. This means that there are actually a total of 45 points of extra credit possible. And there are actually 16 units, so there's really 80.

### **WHAT WILL EACH WEEK BE LIKE?**

We will cover approximately 2 units per week, with a Unit roughly corresponding to a chapter in the text. Each unit will have:

- A series of lecture videos
- A graded assignment 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 to you, however, is **KEEP UP WITH THE MATERIAL!** This class covers a lot of material in a short period of time, especially in the compressed summer term. 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?)

<b>Earn This Many Points</b>	<b>Get This Grade</b>
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 2 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.

	<b>Chapters</b>	<b>Date</b>
Exam 1	1 - 4, 6 - 7	Mon, 24 Jun
Exam 2	8 - 11, 17	Mon, 15 Jul
Final**	1 - 4, 6 - 11, 13 - 17	Wed, 22 Jul

\*\*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, but expect to cover 2 units/week)*

<i>Unit</i>	<i>Topics</i>
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)
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)
Exam1	
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)
12	Kinetics (17.1 – 17.7)
Exam 2	
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)
Final Exam (Wed 22 Jul)	

<b>Important Dates &amp; Holidays</b>	
Fri 05 Jun 2020	Last day to register, ADD sections, and change credit hours Enrollment cancellation for non-payment
Fri 12 Jun 2020	Last Day to DROP without “W” grade and 100% tuition refund on LoboWEB,
Sat 04 Jul 2020	University Holiday – Independence Day
Fri 24 Jul 2020	Last Day to CHANGE grade option
Fri 10 Jul 2020	Last Day to withdraw <b>WITHOUT</b> Dean’s Permission
Wed 22 Jul 2020	Final Exam (for this section)
Fri 24 Jul 2020	Last Day to withdraw <b>WITH</b> Dean’s Permission

## 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