

# CHEM 1215L: General Chemistry I for STEM Majors Laboratory

Spring 2023 – Section 501 – CRN 50458

**Instructor:** Judy Andrews

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**Phone:** (505)864-7906

**Drop-in Hours:** Wednesdays 10:00 – 10:30 and after class 1:15-2 or by appointment

By phone or email (9 am -9:30 pm) weekdays

**Meeting Time:** Wednesday 10:30 am – 1:15 pm, VAAS 128

**Course Description:** This course provides practice in laboratory measurements, using laboratory glassware and instrumentation, communicating scientific information, and in performing chemical calculations.

**Catalog Description:** Introduction to basic chemical laboratory principles and techniques. Meets New Mexico Lower Division General Education Common Core Curriculum Area III: Science. Prerequisite: MATH 1220 or MATH 1230 or MATH 1240 or MATH 1250 or MATH 1430 or MATH 1440 or MATH 1512 or MATH 1522 or MATH 2530 or ACT Math=>25 or SAT Math Section =>590. Pre- or corequisite: 1215 or 131.

**Periodic Table of the Elements**

1 H Hydrogen 1.008	2 He Helium 4.003											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	18 Ne Neon 20.180																		
3 Li Lithium 6.941	4 Be Beryllium 9.012											19 K Potassium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.882	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 84.796						
11 Na Sodium 22.990	12 Mg Magnesium 24.305											37 Rb Rubidium 84.466	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 98.907	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 121.760	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 195.085	79 Au Gold 196.967	80 Hg Mercury 200.592	81 Tl Thallium 204.383	82 Pb Lead 207.2	83 Bi Bismuth 208.980	84 Po Polonium [209]	85 At Astatine [209]	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 [265]	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 [294]	118 Uuo Ununoctium [294]
57 La Lanthanum 138.905	58 Ce Cerium 140.116	59 Pr Praseodymium 140.908	60 Nd Neodymium 144.242	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 162.500	67 Ho Holmium 164.930	68 Er Erbium 167.259	69 Tm Thulium 168.934	70 Yb Ytterbium 173.055	71 Lu Lutetium 174.967																					
89 Ac Actinium 227.028	90 Th Thorium 232.038	91 Pa Protactinium 231.036	92 U Uranium 238.029	93 Np Neptunium 237.048	94 Pu Plutonium 244.064	95 Am Americium 243.061	96 Cm Curium 247.070	97 Bk Berkelium 247.070	98 Cf Californium 251.080	99 Es Einsteinium [252]	100 Fm Fermium [257]	101 Md Mendelevium [258]	102 No Nobelium [259]	103 Lr Lawrencium [260]																					



### COURSE/INSTRUCTOR COMMUNICATIONS

- Email is the most effective. Electronic communication for this course **MUST** be through your UNM email. {judyandrews@unm.edu}
- It is the responsibility of the student to keep up with course announcements. **Check your UNM email and CANVAS daily!**

### COURSE REQUIREMENTS (Resources and Conduct)

- Chemistry text book or on line text
- Safety goggles, Lab Coat/apron, Lab Notebook
- Calculator (non-graphing) with log/antilog and exponential functions
- Internet Access: *CANVAS* and *UNM email address must be checked daily!*
- Mandatory laboratory clothing: **GOGGLES**, closed toed flat **shoes** (no high heels, no exposed toes, no exposed heels) are **REQUIRED FOR CHEM LABS. Students without proper personal protective equipment will not be allowed in lab**
- Laboratory **SAFETY AND CLEANLINESS WILL BE CLOSELY MONITORED.** (*Safety Rules may be found in the first lab worksheet.*) Safety violations will lower your grade (food in lab, not wearing goggles properly, improper disposal of chemicals, etc.) and for improper treatment of lab equipment .

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

- **Instructor:** Office hours, STEM Center Hours, email, phone
- **STEM Center:** Tutors\*, molecular modelling kits, Laptops, textbooks

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

### WHAT DO I NEED FOR AN A? (What's the grading scale?)

Earn This Percentage	Get This Grade
100-97	A+
96-93	A
92-90	A-
89-87	B+
86-83	B
82-80	B-
79-77	C+
76-73	C
72-70	C-
69-67	D+
66-63	D
62-60	D-
59-57	F+
56-0	F

The exam will consist of three components: a question/answer component, basic measurements, and developing a procedure based on previous labs.

### HOW IS YOUR GRADE DETERMINED?

(Exams, Quizzes, Homework, and the Like)

	%Weight
Lab Reports	30
Quizzes	10
Infographic Rough Draft	10
Final Infographic	20
Final Exam	30
	100

## Student Learning Objectives

By the end of the course, students will be able to...

1. Demonstrate and apply 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 with the correct units, 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. Prepare solutions with an acceptable accuracy to a known concentration using appropriate glassware.
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. Demonstrate mastery in experimental techniques, such as pressure measurements, calorimetric measurements, and spectrophotometric measurements.
7. Draw conclusions based on data and analyses from laboratory experiments.
8. Present experimental results in laboratory reports of appropriate length, style and depth, or through other modes as required.
9. Relate laboratory experimental observations, operations, calculations, and findings to theoretical concepts presented in the complementary lecture course.
10. Design experimental procedures to study chemical phenomena.



## Tentative Schedule – Check UNM Learn and email for updates

Meeting	CHEM 1215L Schedule 1030-1315 MT	Required
1 18 Jan 2023	<b>Laboratory Introduction</b> (Schedule, Syllabus, Safety, Lab Notebook, Measurements, Unit Conversion Activity)	Nothing yet
2 25 Jan 2023	<b>It's All About the Weight</b> (Density, Precision, Accuracy, Significant Figures) <b>Friday, Feb 3rd – Last day to drop with full refund</b>	CVS Quiz PreLab: Sci Method Lab coat, goggles, closed-toe shoes
3 01 Feb 2023	<b>Popcorn Theories</b>	CVS Quiz PreLab: Sci Method Lab coat, goggles, closed-toe shoes
4 08 Feb 2023	<b>Pottery and Pigments</b> (Reactivity of Ionic Compounds)	Lab coat, goggles, closed-toe shoes Lab Notebook (no prelab)
5 15 Feb 2023	<b>Chemical Reactions of Copper</b> (Reaction Stoichiometry and Percent Yield)	Lab coat, goggles, closed-toe shoes Lab ntbk with completed pre-lab Turn in Pottery & Pigments Lab
6 22 Feb 2023	<b>Acid Base Titration</b> (Reaction Stoichiometry)	Lab coat, goggles, closed-toe shoes Lab ntbk with completed pre-lab
7 01 Mar 2023	<b>Synthesis of Biodiesel</b>	Lab coat, goggles, closed-toe shoes Lab ntbk with completed pre-lab
8 08 Mar 2023	<b>The Automobile Airbag</b> (Gas Stoichiometry)	Lab coat, goggles, closed-toe shoes Lab ntbk with completed pre-lab
15 Mar 2023	<b>Spring Break</b>	
9 22 Mar 2023	<b>Calorimetry Lab – Heat of Combustion of Biodiesel</b>	Lab coat, goggles, closed-toe shoes Lab ntbk with completed pre-lab
10 29 Mar 2023	<b>Infographic: Background</b> <ul style="list-style-type: none"> <li>• Assign topics to lab groups</li> <li>• Discuss infographic requirements</li> <li>• Begin research and background information</li> </ul>	Bring laptops if you have them (not required).
11 05 Apr 2023	<b>Atomic Spectra</b> (instrument calibration) <b>Atomic Trend Activity</b>	Lab coat, goggles, closed-toe shoes Lab ntbk no prelab due Turn in Atomic Spectra Lab before leaving.
12 12 Apr 2023	<b>Electron Configuration Activity</b>	<b>Infographic First Draft due via email</b>
13 19 Apr 2023	<b>LDS/VSEPR/IMF Activity</b>	Lab ntbk with completed pre-lab <b>Infographic Final Draft due via email</b>
14 26 Apr 2023	<b>Lab Practical and Final Exam</b>	Lab coat, goggles, closed-toe shoes Lab ntbk for reference.
15 03 May 2023	<b>Infographic Presentations and Practical Make-Ups</b>	

<b>Selected Important Dates &amp; Holidays<sup>1</sup></b>	
Mon, 16 Jan 2023	University Holiday – Martin Luther King Day Campus closed.
Fri, 27 Jan 2023	Last day to register, ADD sections, and change credit hours, grade mode on LoboWeb Enrollment cancellation for non-payment
Fri, 03 Feb 2023	Last Day to DROP without “W” grade and 100% tuition refund on LoboWEB,
Fri, 11 Feb 2023	Last Day to CHANGE grade option
Sun, 12 Mar 2023	University Holiday – Spring Break (through Sat, 18 Mar 2023)
Fri, 14 Apr 2023	Last Day to withdraw <b>WITHOUT</b> Dean’s Permission
Fri, 05 May 2023	Last Day to withdraw <b>WITH</b> Dean’s Permission

<sup>1</sup> For a complete and up-to-date calendar, please see <https://registrar.unm.edu/semester-deadline-dates/>

## Respect the UNM Community by Preserving Health

### UNM Administrative Mandate on Required Vaccinations

UNM requires COVID-19 vaccination and a booster for all students, faculty, and staff, or an approved exemption (see: [UNM Administrative Mandate on Required Vaccinations](#)). Proof of vaccination and booster, or a [medical, religious, or online remote exemption](#), must be uploaded to the [UNM vaccination verification site](#). Failure to provide this proof may result in a registration hold and/or disenrollment for students and disciplinary action for UNM employees.

**Booster Requirement:** Individuals who received their second dose of a Pfizer or Moderna vaccine on or before June 15, 2021, or their single dose of a Johnson & Johnson vaccine on or before October 15, 2021, must provide documentation of receipt of a booster dose no later than January 17, 2023.

Individuals who received their second dose of a Pfizer or Moderna vaccine after June 15, 2021 or who received their single dose of Johnson & Johnson after November 15, 2021 must provide documentation of receipt of a booster within four weeks of eligibility, according to the criteria provided by the FDA (6 months after completing an initial two-dose Moderna vaccine, 5 months after completing the Pfizer sequence, and 2 months after receiving a one-dose Johnson and Johnson vaccine).

International students: Consult with the [Global Education Office](#).

**Exemptions:** Individuals who cannot yet obtain a booster due to illness should request a [medical, religious, or online remote exemption](#) (which may have an end date) and upload this to the [vaccination verification site](#).

Medical and religious exemptions validated in Fall 2021 (see your email confirmation) are also valid for Spring 2023 unless an end date was specified in the granting of a limited medical exemption. Students must apply for a remote online exemption every semester.

### UNM Requirement on Masking in Indoor Spaces

All students, staff, and instructors are required to wear face masks in indoor classes, labs, studios and meetings on UNM campuses, [see the masking requirement](#). Students who do not wear a mask indoors on UNM campuses can expect to be asked to leave the classroom and to be dropped from a class if failure to wear a mask occurs more than

once in that class. Students and employees who do not wear a mask in classrooms and other indoor



public spaces on UNM campuses are subject to disciplinary actions. **Medical/health grade masks are the best protection against the omicron variant and these masks should be used, rather than cloth.**

### COVID-19 Symptoms and Positive Test Results

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 email or phone me. 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 me, an advisor, or another UNM staff member know that you need support so that we can connect you to the right resources. Please be aware that UNM will publish information on websites and email about any changes to our public health status and community response.

### Communication on change in modality

The university may direct that classes move to remote delivery at any time to preserve the health and safety of the students, instructor and community. Please check your email and your UNM Learn site regularly for updates about our class, and please check <https://bringbackthepack.unm.edu> regularly for general UNM updates about COVID-19 and the health of our community.

## 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.

## 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.



Equal Access Services

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 above:

## 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

<http://www2.ed.gov/about/offices/list/ocr/docs/q-a-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 above:



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