

CHM151L-General Chemistry Lab I Syllabus

General Information:

Offered Fall, Spring, and Summer

1-hour of Laboratory Science credit

Instructors: All faculty with appointments in the chemistry department are eligible to supervise CHM151L sections. All sections will utilize graduate or undergraduate teaching assistants.

Course Prerequisites/Co-requisite: CHM151

Distribution Block: If taken with CHM151, student can receive 5 hours of lab science credit.

Course Description:

CHM151L is the first semester of a 1-year lab sequence appropriate for pre-professional, science, and engineering majors. Principles, practices, and applications of contemporary laboratory chemistry will be addressed. As a liberal studies course, CHM151L addresses the essential skills of scientific inquiry and quantitative reasoning and the theme of environmental consciousness. Students will have hands-on experience using the scientific method to describe, quantify, and solve problems of a chemical nature including several chemical processes that have direct impact on the environment (such as chemical reactivity and acid/base reactions).

Course Objectives:

Students will be able to:

1. Demonstrate mastery of basic laboratory skills such as quantitative weighing, pipetting, dilution, and titration. (**Scientific Inquiry**)
2. Describe and demonstrate safe laboratory practice including risk assessment using hazard codes and material safety (MSDS) or safety data sheets (SDS). (**Scientific Inquiry**)
3. Utilize scientific notation, significant figures, and dimensional analysis to solve problems of chemical interest. (**Quantitative Reasoning**)
4. Predict, analyze and test experimentally the chemical and physical properties of matter. (**Environmental Consciousness, Quantitative Reasoning, Scientific Inquiry**)
5. Determine the numerical value of chemical concentrations and physical states with precision and accuracy. (**Environmental Consciousness, Quantitative Reasoning**)
6. Predict, analyze, and experimentally confirm the products of a chemical reaction including the use of net ionic equations. (**Environmental Consciousness, Quantitative Reasoning, Scientific Inquiry**)

Specific Skills:

By the end of this lab you will be expected to be able to accurately use a volumetric or mohl pipet, pipettor, buret, volumetric or erlenmeyer flask, balance, thermometer, and graduated cylinder in safely conducting titrations, dilutions, weighings, and other lab procedures. You must master using molecular mass, moles, molarity, percent-by-mass, density, $M_1V_1=M_2V_2$, unit cancellation, significant figures, and graph preparation and interpretation.

Course Structure and Approach:

CHM151L will address chemistry -- the science of change, through hands-on laboratory exercises. Using standard laboratory practice and equipment, students will measure, quantify and describe chemical properties, and identify chemical unknowns based on the results of their measurements.

Course Outline:

- I. Measurement of mass, volume, and density (1 period) and fermentation (2 periods)
- II. Identification and Quantification of a metal chloride solution concentration (2 periods)
- III. The study of chemical reactivity (1-2 periods)
- IV. Energy and Light (1 period)
- V. Identification of ions in salts (1-2 periods)
- VI. Acid-Base Titration (2-3 periods)
- VII. Extra Credit: Ideal Gas Law & Molar Mass, Household Product Titrations, Thermochemistry

Instruction and Evaluation Methods:

The primary instructional methods utilized in CHM151L are hands-on laboratory exercises. Demonstrations of laboratory methods and techniques will prepare the student to make independent observations of chemical phenomenon and measurements of chemical properties.

Assessment of Outcomes:

A report of experimental observations and results will be completed for each of the six laboratory exercises. Each lab is designed to address the content areas listed in the course outline. Assessment of student learning outcomes is based on the correct identification of the composition or concentration of unknown materials through application of the scientific method by completing pre/post lab analysis (**scientific inquiry, quantitative reasoning**) and on the results of a hands-on practical laboratory examination (**quantitative reasoning**). These assessment tools test the student's competence with basic laboratory methods, techniques, and data analysis.

Textbook and Required/Optional Materials:

Required: *General Chemistry I Laboratory Manual, CHM151L*, for 2016-2017 by Hayden McNeil and indirectly vented goggles. Both items are available in the NAU bookstore or University Text and Tool. The lab manual must be purchased before the second lab period. If there are no manuals in the textbook area ask for help at the textbook desk. You will also need a pen for recording data and pencil for doing calculations. Goggles, closed toed shoes, and appropriate clothing are required starting with exp. 2. **Optional:** lab coat or apron. More information on this course can be obtained at the Chemistry Instructional Laboratories Homepage at: <http://jan.ucc.nau.edu/~jkn/Labs.html> If you enrolled in a chemistry course you find a zero credit course in your Bb Learn space "Chemistry Instructional Labs and Lab Safety" providing general information on NAU chemistry labs and lab safety training.

Course Grade:

The course grade is based on a total of 1000 points. 650 possible points are earned by the proper identification of unknowns and completion of experiments. A lab practical will account for 200 points. The online Loncapa Pre-lab and Post-lab questions are worth 60 points and pre lab quizzes are worth 90 points. Points and grades will be assigned as follows:

<u>Experiment</u>	<u>Pass/ Full Credit Points</u>	<u>Partial Credit Points</u>	<u>Repeat Points</u>	<u>Points off for late unknowns or repeats: Points</u>	<u>Grade Assignment: Percent of Point Total</u>	<u>Final Grade</u>
1 – Mass, Volume, & Density	60	35	20	5		
1 – Fermentation	40			5	90-100	A
2 – ID&Conc. Salt Solution	100	50	20	10	80-89	B
3 – Reactivity	100	60	40	10	70-79	C
4 – Energy and Light	100	80	60	10	60-69	D
5A – ID Cations	50		20	5	<60	F
5B – ID Anions	50	35	25	5		
6 – Acid/Base Titration	150	80	30	10		
Pre Lab Quizzes	90	6x15pts				
Loncapa Pre & Post Lab Points	60	Pre/post labs online				
Lab Performance		Can lose or gain pts				
<u>Lab Practical</u>	<u>200</u>					
<u>Total</u>	<u>1000</u>					

To view your current scores/grades on the web go to: <http://jan.ucc.nau.edu/~jkn/Labs.html>

Experiment Unknowns:

All experimental data and calculations must be completed for the experiment report sheet to be graded, otherwise it may be returned un-graded. When an unknown report sheet is first submitted points will be taken off for poor or missing pre or post lab work such as risk assessment and precautions, experiment outlines, graphs, or calculation checks (no re-grading of this work). The unknown for an experiment will be graded pass (full credit), partial (about half credit), or repeat (about 20% credit). Points will be assigned as noted above. A pass indicates that the experiment was done correctly and the techniques were mastered. Partial credit indicates that there were some technique and/or calculation errors, but no major errors. A repeat indicates that major technique and/or calculation errors were made and the experiment should be repeated. Any experiment with a partial or repeat can be improved by repeating it with a new unknown checked out from your TA but late points (see table above) will be deducted from the score by the deadline listed in the schedule (later in syllabus). **Use a new report sheet to repeat work and be sure to staple any new calculation checks along with the original unknown report sheet to it!**

Report sheets turned in after deadline dates listed later in the syllabus will face a penalty for late work as noted in the table above. Grades will be posted on the web and updated weekly. Before submitting a report sheet for grading make a backup copy and write down key results in your lab manual. Exact due dates are listed later in the syllabus (No exceptions to these deadlines).

There is also a report sheet for the "Fermentation Data, Results, and Post Lab" but no unknown. Group data and a spreadsheet of data for the whole section is created and then the results and post lab questions are completed. The fermentation report sheet is turned in and graded separately from experiment one with no re-grades.

Lab Practical:

The laboratory practical will be given during the next to last lab period and will take 90 minutes. It must be taken in your regular lab section. The practical is an experiment using key techniques covered in this course and instructions and practice problems found on last page of your lab manual will explain more about it (The answer to the practice problems are posted on CHM151L web page). Help session will be given before the lab practical. The lab practical may also include questions covering any other material covered in this lab. Unit analysis must be shown for all calculations.

Pre Lab Quizzes:

A quiz will be given promptly at the start of lab periods when a new experiment begins. The quiz will include questions similar to ones in the Loncapa module including 3-4 pre-lab questions for the current experiment and 1-2 post lab questions for the previous experiment. Each quiz will be worth 15 points for each of the six experiments and a 7th cumulative quiz with the low score dropped for a total of 90 points. Some questions on the practical may come from quizzes. **No late or makeup quizzes will be given.**

Loncapa Pre & Post Question, Outlines of Experimental Procedures, and Risk Assessment:

In order to effectively and safely complete an experiment, students must prepare in advance. Before starting an experiment students must therefore read the experiment, outline the experimental procedures, and do a safety risk assessment noting hazards and precautions. This is done at the start of the report sheet provided at the end of each experiment or on an attached paper if you need more room. It will be checked during the prelab quiz with 5 points taken off for each missing item. Starting with the third lab period you must do a web-based pre-lab on Loncapa by 7:30am the day your lab is scheduled to start an experiment (see lab schedule). Loncapa will be available after the add deadline and will open by 3pm on Friday, 9/9/16. Starting with the pre lab module for exp. 3 you will be doing post labs. Loncapa and the calculation checks are online resources that will be introduced by your TA.

Extra Credit:

When you have passed all of the experiments, you can earn extra credit points by doing some or all of the following experiments worth up to 25 points each: Bonus Titration, Molar Mass by Gas Law (7), & Thermochemistry (8). These extra credit experiments are available on the CHM151L homepage. Be sure to read the requirements carefully. You must do all the experimental work, calculations (and calc. checks for 7,8), and writing yourself – do not use another student's work. **For the Bonus Titration TA must sign and date the piece of paper used to collect the data. Attach this data sheet to mini report.**

Academic Dishonesty: The Department of Chemistry and Biochemistry strictly enforces the University's policy on academic dishonesty. Sanctions imposed for academic dishonesty include having to redo the work, receiving partial or no credit on the item in question without the chance to improve the score, receiving an F for the course, or expulsion from the University. **All work in this lab is done individually except for fermentation in exp. 1 and the solar oven in exp. 4 and then only raw data is shared, not calculated values. Using another student's unknown, unknown #, observations, data, results, calculations will be treated as academic dishonesty and is counter to one of the prime objective of this course, mastering lab techniques. In addition, if you repeat the unknown for an experiment you must check out a new unknown from your TA.** Using the same unknown number twice will be considered academic dishonesty. If other offenses are found in department or university records for other courses repeat cases of academic dishonesty will have serious consequences.

Safety:

Safety in the laboratory is of great concern to the chemistry department. You are expected to be familiar with and adhere to the chemistry department safety policy noted in the lab manual at all times while in the laboratory. Be informed about the hazards of chemicals and what precautions are needed (goggles, gloves, etc.) before you use them by doing a risk assessment for each experiment. Every chemical in the laboratory is labeled with a hazard code to assist in this process. If you would like additional information, safety data sheets (SDS) or material safety data sheets (MSDS) are available for every chemical used in this lab:

- Any needed SDS is in the lab's Chemical Hygiene Plan binder in the Right-to-Know-Station by the safety shower.
- **You will do a web based SDS tutorial-quiz to become more familiar with using them.** This website is another source of any MSDS. The tutorial can be accessed through the link provided by your TA. Another location of information is found through the instructional labs homepage under the link "Safety Information". There is much useful information on this site, such as SDS and MSDS information.
- You can also Google the chemical name with SDS or MSDS on the web and quickly find them.

There is a remote possibility that medical issues such as respiratory conditions, allergies (esp. to gloves), pregnancy, etc. may be aggravated by chemicals used in this lab. Please talk to your instructor and TA if you have any questions about taking this lab class with special medical conditions. Phones will be located in the lab or stockroom for contacting campus security at 3-3000 in the event of an emergency or dial (928) 523-3000 if you use a cell phone. You will also be expected to immediately clean up any small spills you make and clean your work area with a damp sponge and rinse out the sponge then wash your hands at the end of every lab period to avoid losing lab performance points. Always wear goggles after the 2nd lab period.

Lab Performance:

Proper lab technique, safety, and work station cleanup procedures are required in this lab. Poor technique such as using the balance or pipettors incorrectly, unsafe behavior such as not wearing goggles, or leaving a dirty/incomplete workstation locker can result in the loss of 1-30 points per incident. Extra points may also be given for excellent lab performance above and beyond. You will be completing a contract on issues regarding lab performance. Please be aware of the following requirements:

- You are required to clean any used glassware and your work station areas at the end of every lab period. To clean glassware, rinse with hot tap water several times and once with pure water (PW, or RO, distilled) or from your wash bottle. Fill your wash bottle from the PW carboy. Don't use the PW tap for rinsing glassware unless the carboy is empty. If the glassware is still dirty use soap before rinsing with tap water then PW. Wash glassware before putting it away.
- If you break or lose any glassware or equipment you must replace it (see your TA). Your workstation must be clean and complete on the locker outline at the end of each lab period for the next student or you will lose lab performance points.
- Store any solutions you prepare in your assigned "Student Material Bin".
- Make sure chemicals are labeled with your name and workstation #, chemical name and concentration, and hazard code or hazard. Do not remove or modify wash bottle or plastic bottle labels.
- Keep the balance and your workstation clean (points will be deducted for spilled chemicals not cleaned up).
- Always check the calibration of a pipettor before using it!
- All data and observations must be recorded in pen while pencil can be used for calculated values.
- Use correct significant figures to record all data and use 3-4 significant figures for most calculated values.

- Show an example using unit cancellation (dimensional analysis) for each type of calculation you do.

Typical Lab Preparation, Experiment, and Workup:

Before every lab:

1. Read the experiment, briefly outline the experimental procedures on the report sheet or a sheet of paper, do a risk assessment (hazards and precautions), and watch videos suggested in the lab schedule.
2. Complete the Loncapa pre-lab before 7:30am on the same day your lab section is scheduled to start an experiment (see dates noted lab schedule listed later in this syllabus).
3. Complete any special work due as noted in the lab schedule.

Every lab period will have a similar format:

4. A pre-lab quiz will be given at the start of lab on days you start an experiment (see schedule on the previous page).
5. The TA will provide information on the experiment and do demonstrations.
6. Put on goggles and other safety gear, such as gloves, as needed. Remove gloves before you exit the lab or using personal electronic devices to prevent cross contamination. Avoid the use of cell phones or electronic devices in lab.
7. Collect all required data using good technique. Use a pen to record data directly onto your report sheet.
8. When you are done with work cleanup by; washing glassware, putting stuff away correctly, making sure your workstation is complete, cleaning the balance, and wiping down your work areas with a damp, clean sponge. Points may be deducted for not cleaning up on time, not working safely, and not making sure your workstation drawer is clean and complete on outline (nothing missing/extra). Put extra equipment in the lost & found. Put goggles and any solutions you prepared into the vials (label them) provided in your student storage area into your workstation and section.
9. Wash your hands at the sink in exit area and exit the lab.

After the experiment is completed:

10. Complete all the calculations when the experimental work is completed and printout any graphs (points deducted for missing work).
11. Complete any web based calculation checks to insure your calculations are correct and print copies. Please be aware that the calculation checks can only verify that based on the data you enter, your calculations are correct. If your technique was poor you will likely get a partial or repeat score even if your calculation check worked.
12. Answer any post-lab questions on the report sheet and staple the experimental procedure outline (if on separate sheet), risk assessment, graphs, spreadsheet, or calculation checks as required to the report sheet. (for repeats of unknowns staple this old work on back of the new report sheet).
13. **Copy the key information from your report sheet into the blanks at the end of the experiment in the lab manual and/or make a copy of any work submitted (take a picture). If your report sheet is lost and this information is not copied down you may have to repeat the experiment again! Do not remove this page from your lab manual as it serves as a data backup! The chemistry department is not responsible for lost work so backup your work!**
14. Turn in the report sheet to the TA for your lab section. They will check to make sure the report sheet is complete.
15. Finally complete the Loncapa post-lab questions before the deadlines noted in the syllabus.

First Lab Period:

The first lab period has a slightly different format with special requirements that must be completed before you can work with chemicals in experiment 2. The focus will be on learning basic lab safety and techniques by “doing” them in experiment 1. If you miss this lab period, you will need to make up the work on your own time. Videos and handouts can be found on the “Instructional Labs Homepage” and on the Bb Learn zero credit course “Chemistry Instructional Labs and Lab Safety” zero credit course which you will find on your Bb Learn account.

First lab period activities include:

1. Lecture on the course objectives and highlights, the syllabus, safety, etc.
2. Videos on lab safety, SDS/MSDS, the balance, and pipettor will be shown.
3. The TA will demonstrate the use of the SDS Tutorial, videos, calculation checks, checking your grades, and other resources as accessed on the Instructional Labs web site and “Chemistry Instructional Labs and Lab Safety” course.
4. All lab safety features will be reviewed (safety tour of lab and 3rd floor), assignment one completed and turned in to the TA, and complete the SDS tutorial/quiz.
5. TA will demo use of balance, graduated cylinder, pipettor, and pump dispensers and then students do a lab exercise.

Homework Due at Start of 2nd Lab Period:

1. Read the introduction and experiment one in the lab manual.
2. Outline the experimental procedures and do a risk assessment for experiment one.
3. Complete, initial where required, and sign the lab performance contract.
4. Do the web based SDS tutorial/quiz described above in the safety section.
5. The TA will demonstrate the use of calculation checks and Loncapa online that will open after the add deadline.

CHM151L Fall 2016

Lab Schedule:

Below is a detailed schedule of lab activities and due dates for each week (see website for any changes):

Letters:				Experiments or Activities and Work to be	Loncapa Modules
A-D	E&F	G-K	L-N	Completed by the End of the Lab Period	Due This Week At
Tues	Wed	Thurs	Fri	(Including Unknown Report Sheets)	7:30am Lab Days
8/30	8/31	9/1	9/2	First day activities (see previous page), Adds.	
9/6	9/7	9/8	9/9	Quiz-Experiment 1 , Experiment 1 and start fermentation. Assignment 1, Lab Performance Contract, and MSDS Tutorial Certificate due. Must add the lab by Thursday. Prep: view video on exp.2 procedure, pipettor, and weighing. TA will demo the calculation checks.	
9/13	9/14	9/15	9/16	Quiz-Experiment 2 Quantization, Obtain an unknown packet & label unk.2 in your packet and goggles (required this week) with your name, section, & workstation number (store in section's drawers), Exp. 1 report sheet due. TA will demo the Loncapa system. Finish fermentation.	Start loncapa
9/20	9/21	9/22	9/23	Experiment 2 flame test (view video), Finish Exp. 2, calculation check, fermentation report sheet due. TA will introduce exp. 3 and 4. Start work on exp. 4 (test oven if sunny weather)	Intro, 1 & 2 pre
9/27	9/28	9/29	9/30	Quiz-Experiment 4 , Prep: see TA. Complete Exp. 4, Exp. 2 Unk. Due	4 pre & 1 post
10/4	10/5	10/6	10/7	Quiz-Experiment 3 – Prep: view videos on volumetric flask & exp. 3.	
10/11	10/12	10/13	10/14	Experiment 3 , Complete experiment, do graph and report sheet. Exp. 4 report sheet due (graph & questions). Introduction to experiment 5 (start exp.)	3 pre & 2 post
10/18	10/19	10/20	10/21	Quiz-Experiment 5 , Prep: See TA Exp. 3 Unknown Due (graphs & report sheet)	5 pre & 3 post
10/25	10/26	10/27	10/28	Quiz-Experiment 6 , Prep: watch videos on titration and weighing-by-difference, Finish Experiment 5 and complete the net ionic equations.	6 pre
11/1	11/2	11/3	11/4	Experiment 6 , Exp. 5 Unknown Due.	4&5 post
11/8	11/9	11/10		Quiz 7– Extra Credit , Exp. 6 Unk. Due.	6 post
11/15	11/16	11/17	11/18	Lab Practical Help Session, Makeup, Extra Credit, Review videos on weighing by difference, volumetric flask, and titration before lab, On last page of lab manual read the practical instructions and do the practice problem (answer post on web).	Friday labs only- 6 post
				Friday Labs only- Quiz 7-extra credit and 6 Unk due.	
11/22	11/23			Makeup Lab for all lab sections, 8a-5p 11/22-11/23	
11/23	11/23	11/23	11/23	Final Deadline for all Unknown Report Sheets & Extra Credit at 5pm Nothing accepted after 5 pm, last day for makeups.	
11/28				Lab Practical Help Sessions in room 433 at 5:30pm, 6:30pm, and 8pm	Lab Practical Pre lab due at 11pm
11/29	11/30	12/1	12/2	Lab Practical, Check-in student storage area & workstation (must be complete), Online Lab Evaluation.	
12/6	12/7	12/8	12/9	Review final grade & lab practical score.	

Other Important Dates and Deadlines:

1. **The last day to add a class or drop without a "W" is Thursday, 9/8/16.**
2. **The last day to withdrawal from a class and/or lab is Friday, 11/4/16.**
3. Labor Day - Monday (9/5/16), Veteran's Day – Friday (11/11/16), Thanksgiving ThF (11/24/16-11/25/16).

The following CHM 151L laboratory sections are offered Fall 2016 in building 36, Science-Health Bld (SHB):

Section		Laboratory		Lab	Lab Instructor	Teaching Assistant	
Letter	#	Day	Time	Rm#	Name/Office#/Phone#*	Name	Email
A1	1779	T	8:00-10:30	314	Kruse/36-425/3-2451	Wolanin, Kyle	kw778@nau.edu
A2	1780	T	8:00-10:30	315	Kruse/36-425/3-2451	Jeffers, Karen	kij93@nau.edu
A3	5315	T	8:00-10:30	316	Kruse/36-425/3-2451	Ellis, Jacob	ice84@nau.edu
B1	1781	T	11:10-1:40	314	Hutchison/36-426/6296	McNeil, Anthony	am3567@nau.edu
B2	1782	T	11:10-1:40	315	Hutchison/36-426/6296	Patterson, Sarah	smp359@nau.edu
B3	5316	T	11:10-1:40	316	Hutchison/36-426/6296	Pigg, Hannah	hcp22@nau.edu
C1	1783	T	2:20-4:50	314	Kruse/36-425/3-2451	McNeil, Anthony	am3567@nau.edu
C2	1784	T	2:20-4:50	315	Kruse/36-425/3-2451	Waynick, Rebecca	rad263@nau.edu
C3	5317	T	2:20-4:50	316	Kruse/36-425/3-2451	Ellis, Jacob	ice84@nau.edu
C4	8403	T	2:20-4:50	501	Dishong/36-325/3-7379	Petro-Turnquist, Erika	emp254@nau.edu
D1	1785	T	5:30-8:00	314	Kruse/36-425/3-2451	Petro-Turnquist, Erika	emp254@nau.edu
D2	1786	T	5:30-8:00	315	Kruse/36-425/3-2451	Waynick, Rebecca	rad263@nau.edu
D3	5342	T	5:30-8:00	316	Kruse/36-425/3-2451	Wisniewski, Adam	apw24@nau.edu
E1	1787	W	1:50-4:20	314	Hutchison/36-426/6296	Connors, Julia	jkc227@nau.edu
E2	1788	W	1:50-4:20	315	Hutchison/36-426/6296	Jeffers, Karen	kij93@nau.edu
E3	5344	W	1:50-4:20	316	Hutchison/36-426/6296	Wisniewski, Adam	apw24@nau.edu
F1	1789	W	5:00-7:30	314	Hutchison/36-426/6296	Connors, Julia	jkc227@nau.edu
F2	1790	W	5:00-7:30	315	Hutchison/36-426/6296	Rodriguez, Derek	dr458@nau.edu
F3	5345	W	5:00-7:30	316	Hutchison/36-426/6296	Clark, Michele	mrc366@nau.edu
G1	1791	Th	8:00-10:30	314	Kruse/36-425/3-2451	Wolanin, Kyle	kw778@nau.edu
G2	1792	Th	8:00-10:30	315	Kruse/36-425/3-2451	Rodriguez, Derek	dr458@nau.edu
G3	5347	Th	8:00-10:30	316	Kruse/36-425/3-2451	Ellis, Jacob	ice84@nau.edu
H1	1793	Th	11:10-1:40	314	Hutchison/36-426/6296	Patterson, Sarah	smp359@nau.edu
H2	1794	Th	11:10-1:40	315	Hutchison/36-426/6296	Rodriguez, Derek	dr458@nau.edu
H3	5348	Th	11:10-1:40	316	Hutchison/36-426/6296	Pigg, Hannah	hcp22@nau.edu
I1	1795	Th	2:20-4:50	314	Hutchison/36-426/6296	Steed, Matthew	mls655@nau.edu
I2	1796	Th	2:20-4:50	315	Hutchison/36-426/6296	Thompson, Timothy	tbq38@nau.edu
I3	5349	Th	2:20-4:50	316	Hutchison/36-426/6296	Clark, Michele	mrc366@nau.edu
J1	1797	Th	5:30-8:00	314	Kruse/36-425/3-2451	Wolanin, Kyle	kw778@nau.edu
J2	1798	Th	5:30-8:00	315	Kruse/36-425/3-2451	Thompson, Timothy	tbq38@nau.edu
J3	5351	Th	5:30-8:00	316	Kruse/36-425/3-2451	Wisniewski, Adam	apw24@nau.edu
K1	1799	F	8:00-10:30	314	Hutchison/36-426/6296	Carrillo, Carmen	clc564@nau.edu
K2	2204	F	8:00-10:30	315	Hutchison/36-426/6296	Grout, Madison (Madi)	mrg344@nau.edu
K3	5353	F	8:00-10:30	315	Hutchison/36-426/6296	Anfinson, Justin	jga37@nau.edu
L1	2205	F	11:30-2:00	314	Hutchison/36-426/6296	Gardiner, Julia	jaq644@nau.edu
L2	2206	F	11:30-2:00	315	Hutchison/36-426/6296	Grout, Madison (Madi)	mrg344@nau.edu
L3	5354	F	11:30-2:00	316	Hutchison/36-426/6296	Schubert, Kylie	kas779@nau.edu
M1	2285	F	2:20-4:50	314	Dishong/36-325/3-7379	Patterson, Sarah	smp359@nau.edu
M2	2286	F	2:20-4:50	315	Dishong/36-325/3-7379	Somers, Caitlin	crs388@nau.edu
M3	5355	F	2:20-4:50	315	Dishong/36-325/3-7379	Connors, Julia	jkc227@nau.edu
N2	2314	F	5:30-8:00	315	Dishong/36-325/3-7379	Somers, Caitlin	crs388@nau.edu

*All offices given are by building number first and then room number; building 36 (Science and Health Building). The instructor will be available during normal lab times either in the lab room or in their office. They can also provide help during their office hours. Instructor office hours will be announced the first day of lab and will be posted. The TAs will be available to help before, during, and after the laboratory.

***Syllabus or schedule subject to change at instructor's discretion and circumstances.**

Makeup Labs: You may attend another section of CHM151L (see previous list) to makeup a missed lab if you have been sick with a doctor's note or miss a lab with an institutional excuse. To attend another lab section you must get your regular TA's approval to attend a makeup lab:

1. Your normal lab TA will fill out a "Make up lab slip".
2. Take this slip to the TA of the lab you wish to attend to complete the makeup work.
3. If there is enough space (less than 24 students) and equipment, you will be allowed to work in the lab at the instructor's or TA's discretion. If you are allowed to work, you must sign in on the makeup lab log.
4. The TA for the makeup lab will complete the slip and give it back to your regular TA.
5. This process can also be done by an exchange of emails.

You may not attend makeup labs if you fail to attend your normal lab section regularly. If you work in a makeup lab without permission of the TA or instructor you will lose lab performance points, and the work done will not count.