

SPRING 2019, Chemistry 3220: Organic Chemistry Laboratory

COURSE & INSTRUCTOR DETAILS:

LAB LECTURE CHEM 3220

Sections, Time and Location: Section 001 – Monday – 1.00 to 1.50 pm – SAGE 116

Section 002 – Tuesday – 12.30 to 1.20 pm – SAGE 116

Section 003 – Wednesday – 3.00 to 3.50 pm – GAB 104

INSTRUCTOR: Dr. Sreekar Marpu
OFFICE: Chemistry Building, Room 371
E-MAIL: sreekarbabu.marpu@unt.edu
OFFICE HOURS: 8.30 am to 12.30 pm on Friday's or by appointment.
PHONE: 940-565-4850

A. UNT REQUIREMENTS:

MUST HAVE HAD OR BE CONCURRENTLY REGISTERED IN CHEM 2380. MUST ALSO BE ENROLLED IN CHEM 3220 LAB. MUST HAVE ALREADY COMPLETED CHEM 3210.

B. LEARNING OBJECTIVES:

Objectives of this course include:

Providing a foundation of organic chemistry skills and techniques for students considering advanced studies in chemistry or medical fields or other life sciences.

After completing the course, the students are expected to:

Correlate and apply some of the theoretical concepts learned during CHEM 2380 course.

Able to perform at least five different types of organic reactions and understand the underlying mechanism of these reactions.

Perform medium to complex organic chemical reactions following a written experimental procedure.

Understand the methodology and rules of writing a chemical lab report, able to write a lab report on their own.

Realize the significance of working in groups.

Understand guidelines for working safely in a chemical/organic lab.

C. TEXTBOOK(S):

Optional: "Macroscale and Microscale Organic Experiments," 6th or 7th Edition,

Kenneth L. Williamson and Katherine M. Masters

Any format of the textbook is acceptable for the course.

All the information required for performing the experiments in the lab will be provided by the instructor in the form of handouts and lab lectures. Any missing information can be gained from openly available online resources.

D. LAB LECTURES DESCRIPTION:

	TOPIC	DESCRIPTION
1	Synthesis of Cyclohexanone from cyclohexanol Tests: 2,4-DNP test and oxidation of alcohols.	The lab will allow for the synthesis of cyclohexanone from cyclohexanol. Conversion of secondary alcohol into ketone using a household oxidizing agent will be performed in the lab. The lab will facilitate the identification of organic compounds by using simple-common organic reagents.
2	Grignard Synthesis	The significance of Grignard reagent and Grignard reaction will be demonstrated. Starting from phenyl magnesium bromide, the Grignard reagent will be in situ synthesized in step one. In step two the as-synthesized Grignard reagent will be utilized to synthesize an aromatic compound (benzoic acid).
3	Diels Alder Reaction	The objective is to synthesize a six-membered ring starting from a combination of a diene and dienophile. The lab lecture will emphasize on the mechanism of formation of the six-membered rings and the stereochemistry associated with the reaction.
4	Electrophilic Aromatic Substitution	Synthesis of an electrophilic substitution product is taught in the lab. Mechanism and chemistry associated with electrophilic substitution reactions are emphasized in the lab lecture. The students will perform nitration of methyl benzoate in the lab.
5	Friedel-Crafts Acylation of Ferrocene	Synthesis of acetylferrocene from ferrocene, followed by purification of acetylferrocene. The labs will demonstrate the utility of HPLC technique for the

		purification of organic compounds from a mixture during the course of an organic reaction.
6	Esterification and Hydrolysis (preparation of soap)	The students will have an opportunity to synthesize soap starting from a fatty acid. The as-synthesized soap will be tested for its hardness.
7	Dyes and Dyeing: The coupling of diazonium compounds	The lab will provide an opportunity to the students to learn synthesis of a pH sensitive dye/indicator by following a multi-step organic synthesis procedure. Methyl Orange (MO) will be synthesized starting from sulfanilic acid. The MO will be used for dyeing the fabric.
8	Aldol Condensation.	An Aldol product (Dibenzalacetone) will be synthesized starting from Benzaldehyde. The reaction will explain significance of molar ratios of starting materials in the organic synthesis reactions.
9	Synthesis of Acetylsalicylic acid (Aspirin)	A very famous pain killer, Aspirin (acetylsalicylic acid) will be synthesized starting from salicylic acid.
10	Identification of Unknown	The handout contains a molecular formula, Infrared Spectrum and Nuclear Magnetic Spectrum of an unknown organic molecule. The students are required to identify the molecule and draw the structure from the given information.

NOTE: A minor change in the order of the experiments is expected.

E. SAFETY:

Texas State Law and common sense require eye protection in the form of goggles for all persons in academic chemical laboratories. Along with eye protection, all other laboratory safety guidelines that are listed in the item "R"- "**Student Laboratory Safety Agreement, Spring 2019**" will be strictly enforced. TA's and Laboratory Supervisors have the right to ask the students to leave the lab with "0" grade for disobeying or not following any of these rules or guidelines. **PERSISTENT OFFENDERS WILL BE DROPPED WITH "WF"**. Please see the list of guidelines at the end of this document. The instructor will discuss the new rules during the first recitation/lecture.

NOTE: Students will have to sign the "Student Laboratory Safety Agreement, Spring 2019" form before they begin their labs. The "SAFETY TOOL KIT" document that contains additional details on safety and good lab practices is available on Canvas. Please do not hesitate to ask the lab TA or the instructor any questions related to safety and good lab practices.

F. ADA STATEMENT

The University of North Texas makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide you with an accommodation letter to be delivered to the faculty to begin a private discussion regarding your specific needs in a course. You may request accommodations at any time, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information see the Office of Disability Accommodation website at <http://disability.unt.edu>. You may also contact them by phone at (940) 565-4323.

DISABILITY:

The University of North Texas makes reasonable academic accommodation for students with disabilities. **Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility.** If a disability is verified, the ODA will provide you with an accommodation letter to be delivered to the faculty to begin a private discussion regarding your specific needs in a course. You may request accommodations at any time, however, **ODA notices of accommodation should be provided as early as possible in the semester** to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information see the Office of Disability Accommodation website at <http://www.unt.edu/oda>. You may also contact them by phone at 940.565.4323. Please talk to the instructor or the TA for any further questions.

G. ATTENDANCE POLICY:

Lab-Lectures (also called lab recitation) and Labs: Required!

The lab-lectures are designed to help you understand not only the procedural details of the scheduled experiments but also the theoretical principles underlying the experimental design. **You are required to attend all scheduled lab-lectures.** It is your responsibility to contact the instructor for your absence(s).

One excused absence. Please contact the instructor and the TA immediately for more than one excused absence(s).

There are no makeup labs or makeup quizzes. If you miss a lab or a lab lecture due to acceptable reason, it will be excused. Otherwise, a missed laboratory will result in a zero grade. A partial grade can be earned for an unexcused absence, depends on TA's discretion!

Acceptable reasons for missing an experiment or lab lectures are:

1. Active military service, including travel for that purpose
2. Illness or other extenuating circumstances

3. Religious holy day
4. Participating in an official University function
5. Pregnancy and parenting under Title IX
6. When the University of officially closed by the President

Please check the https://policy.unt.edu/sites/default/files/06.049_CourseSyllabiRequirements_2017_0.pdf for more details.

Turn in the documentation for the missed laboratory to the TA or the instructor as soon as possible (within 2 weeks of missed lab).

For individuals with a single excused absence, the total possible points in the laboratory will be adjusted appropriately to reflect the one excused absence. For students with more than one excused absence, please discuss with your TA.

Shifting Lab Section or Making up Labs: Only 20 students are allowed in each laboratory, students are not encouraged to switch or attend a different lab section. Inform your current TA and take required permission from the new TA (the labs that you plan to attend) much earlier before the begin of the lab. The shifting is subjected to availability of open spots and the TA's discretion. Again, there are no makeup labs!!!

H. BEHAVIOR POLICY

- Students cannot come to the lab more than **15 minutes late**, students coming late more than once will be asked to leave with "0".
- You are not allowed to work alone (in the absence of TA) in the lab.
- Disruptive students will be asked to leave and will receive a 0 for that week's lab
- Disruptive behaviors include:
 - Cell phone use (games..)
 - "Horseplay" or running in the lab
 - Not following TA instructions
- Please check the "Safety Rules Agreement" and "Safety Tool Kit" documents for additional details on safety and behavior in the lab.

Be punctual: If you arrive late, you will miss the instructions given by your TA at the beginning of the lab period, which may lead to unnecessary confusion as well as unsafe work. Reagents will only be available for the indicated week. If you must miss a lab, contact your TA as soon as possible. Reports for missed labs will not be accepted - your TA will explain how you might earn partial credit for completing pre-lab component and post-lab questions for the missed experiment.

The students will receive a “0” if late to the lab by more than 15 minutes. Can turn on the prelab for partial credit during the first incident. Students showing up late for more than one occasion will receive a “0”.

Under special situation cases, TA’s can allow students with partial credit. “Completely under TA’s discretion” depending on the situation of the student.

I. GRADING:

Teaching Assistants will enter grades on Canvas under the course page for labs. The TA’s are expected to update the grades on the Canvas for every 2 weeks. It is the responsibility of the student to regularly check for consistency of grades and report to the TA for any inconsistencies. Students are advised to report to the instructor regarding any delays in the grading of their lab reports. Please wait for at least 2 weeks before complaining to the instructor or talk to your TA first.

Your grade will be determined entirely by your performance in the laboratory and quizzes. This semester 10 laboratory experiments and three quizzes. The 270 total points in the laboratory are broken down as follows:

9 Experiments + 1 Unknown	Possible Points = 10 x 20 = 200
3 Quizzes	Points Possible = 20 x 3 = 60
TA Assessment of Safe Laboratory Practices	Points Possible = 10
Total:	= 270
90 – 100 % of the total points	Grade = A
80 – 89 % of the total points	Grade = B
70 – 79 % of the total points	Grade = C
60 – 69 % of the total points	Grade = D
Below 60 %	Grade = F

Bonus Points: 5 bonus points for TA SPOT evaluation.

The additional bonus points for recitation, labs, and quizzes are at the instructor’s discretion.

QUIZZES: There will be three quizzes. Quiz 1 is a safety quiz that deals with aspects of general lab safety and the location of various safety items in the organic laboratory. You may not begin your experimental work for the course unless you have satisfactorily completed the safety quiz. Quiz 2 and 3 will be handed over to the students in the lab.

J. LAB REPORTS: MANDATORY!

A sample of lab report will be provided, for more details talk to your TA or the instructor.

Read your textbook and/or the handout, placed on Canvas before writing a lab report.

Experiments are performed based on the prelab procedure written by the students.

Lab handouts provide all required information for performing the experiments, but they are *NOT A SUBSTITUTE FOR LAB REPORTS*.

If lab reports appear to be “copies” of the lab reports provided by another student or from another source, this will be considered plagiarism and will be penalized accordingly!

Can use a Lab Notebook or Write on a plain white paper(s), staple and return to TA's

Typed or Handwritten

Must be legible: The TAs will not grade anything that they cannot read!

Late lab reports will be penalized appropriately.

Pre-Labs write-up due at the begin of the lab/experiment.

Post-Lab due at the next scheduled lab class.

Graded reports will be returned by your TA in 1-2 weeks.

K. LAB REPORT GRADE DISTRIBUTION:

The grade distribution for each experiment: **20 points** each

Pre-Lab write-up including prelab questions:	6 points
Observations, Data & Results:	7 points
Conclusions:	2 points
Tidiness & behavior in lab:	1 point
Post Lab questions:	4 points

Lab reports are due at the next scheduled lab class. Late labs will be penalized appropriately. Students with repeated tidiness and behavior issues can get more points deducted. All TA's will follow the same grade distribution for grading the lab reports.

L. LAB REPORT FORMAT:

The format of the lab report is as follows:

Items-1-4 must be completed before you come to the laboratory to do your experiment. Your TA will initial this Pre-Lab exercise before you begin your work.

1. **Heading:**

This includes the title of the experiment, your name, lab section, date, and your lab partner name

2. **Summary or objective of the experiment:**

Give the purpose and important reactions. One or two lines describing what chemical or physical properties are being demonstrated and a chemical equation should be sufficient.

3. **Experimental Procedure (planned):**

Include a reagent table that lists useful information about the chemicals you will use. Such as but not limited to: density and boiling points of liquids, melting points of solids, and pKa of acid-conjugate base pairs.

It must be sufficiently detailed so that any knowledgeable person (including yourself!) can carry out the experiment without referring to the lab manual.

You may use **flow charts**. These are very helpful in saving space and giving a clear plan of action.

DO NOT JUST COPY THE TEXTBOOK or THE HANDOUTS!

During the course, there may be some changes to the procedures in the text. You will be informed about these during lab-lecture. Make sure that you incorporate these changes in your procedure.

In the final report – any changes in the actual experimental procedure should be included. For example: If the handout mentions - 3 grams of benzoquinone was added to the flask. It was then stirred at 100 °C for 1 hour; However, during the experiment, if the student weighed only 2.5 g and heated to 90 °C, all the change(s) from the actual procedure should be included in the experimental procedure in the final report.

4. **Pre-lab Questions:**

These will be assigned at the time of the lab lecture. The assigned questions must be answered in sufficient detail to demonstrate your understanding of the posed question(s).

THE ABOVE ITEMS MUST BE SEEN BY YOUR TA BEFORE YOU WILL BE PERMITTED TO BEGIN YOUR EXPERIMENTAL WORK IN THE LAB.

Your pre-lab preparation is the major factor in determining the success of your experiments: this includes attending lab-lectures, carefully reading through the assigned reading material, planning your experimental work in detail, and writing up the pre-lab (the items 1-4 listed above). It is also a major factor in having a SAFE LAB.

5. Observations, Data, and Results:

This is the information obtained during the lab while you are carrying out the experiment.

Record your observations during the experiment, (*i.e.*, what you actually see) even if everything goes as expected according to the procedure (*e.g.*, temperature changes, color changes, phase changes, precipitation, the evolution of gas, etc.).

Record if there is any change in the procedure for some unexpected reasons.

Also record relevant data such as melting points, boiling points, mass/vol of product, and deviations (if any) from the original procedure.

Show all your calculations as needed or as requested by your TA.

6. Conclusions:

This is the last section and is done after the lab. It should include a brief summary of your conclusions. If your experiment did not turn out as planned or expected, comment briefly on why you think that might have happened.

Writing a scientific explanation for a "FAILED" experiment is MANDATORY. CANNOT JUST WRITE -EXPERIMENT FAILED.

7. Post-Lab Questions:

These will be assigned during the lab lecture. The assigned questions must be answered in sufficient detail to demonstrate your understanding of the posed question(s). In order to do so, you will likely need to refer to the lab book, as well as a more comprehensive organic chemistry textbook (like Jones/Fleming). You may occasionally have to explore a little further for information pertaining to the question.

IMPORTANT NOTE: *For most of the experiments, the prelab and postlab questions are made available to the students only during the lab lectures. The questions are not available on the lecture presentation or handouts that are posted on Canvas. Sharing these questions with the students absent for the recitation is not allowed.*

NOTE: In the final report – the experimental procedure should address for any changes that are implemented during the actual lab work. For example: If the handout mentions - 3 grams of benzoquinone was added to the flask. It was then stirred at 100 °C for 1 hour; However, during the experiment, if the student weighed only 2.5 g or heated to 90 °C, the change(s) should reflect in the experimental procedure – either by rewriting the procedure or by highlighting the actual changes in the procedure.

NOTE: Your TA will likely have his/her own particular requirements and/or expectations concerning additional details about punctuality, lab behavior, how lab reports must be written and submitted, etc. If you are not sure about anything, **just ask.**

Grading For Each Section Continued (IMPORTANT!!!!!!!!!!!!!!!!!!!!)

The **Heading, Summary, Procedure and Pre-lab questions** are a part of the **Pre-Lab write-up**, and should be completed and will be checked before you conduct the experiment. Your TA will write their initials on your paper if you did this Pre-lab write-up. Include this in the report you submit; if the TA's initials are not included somewhere on the lab report you turn in, **5 points will be deducted** since it will be assumed you didn't do the Pre-lab write up by the time of the experiment. Even if you include the Pre-lab in your final report, if the TA's initials are not present, you will not receive credit for this section. You can rewrite the report if you so choose, just include whatever papers that have your TA's initials on it. You can still receive credit for the other sections you complete. **2 points will be deducted** if the questions themselves are not included in the pre-lab questions portion of the pre-lab. This also applies to the post-lab questions as well.

The **Observations, Data, and Results** will be looked at closely when grading. Here, include only the data itself; numbers, figures, etc. and any observations you made. **DO NOT interpret** your results here, you will explain what the data and observations you made might be in the conclusions section. Show the data you have (melting point, distance moved on TLC, mass, mols etc.), including any calculations (percent yield/ percent recovery, molarity/molality, retardation factors etc.). Put this data in a list or table, it is easier and nicer to read this way, and more professional. Your observations you made (color change, smell, heat/cold/temperature, reactivity, boiling/freezing/melting etc.) should be made in a small paragraph or list within this section as well. If you are missing data or didn't see much, include this in your report, and then look at another lab groups experiment and report what you see from them, or what they saw. If you do not include results **3 points will be deducted**. If you do not include observations, **2 points will be deducted**.

The **Conclusions** sections will be scrutinized the most in your report. Here *interpret* what the data you collected means, and what your observations mean. Answer the How and Why of the experiment, even if it might be wrong, write down what you might think.

Examples: Why did something move very fast on TLC?, Why did something move slowly on TLC?

How many spots did you get on TLC? What does this mean? Is it purely based on TLC?

Is it purely based on melting point? , How do you know? What is the literature melting point?

What can you do to purify it further if you could?

Why do recrystallization?, What is happening during the experiment?

Why did you do the experiment the way you did?
Did you do any chemical tests? What did they tell you? How do you know?
What went wrong during the experiment? What can be done to fix it next time?
What was the percent yield? Is this good/bad? How could you improve it?

You should be answering these questions and others. Not all of them, but explain what is happening, and why. **DO NOT** rewrite the procedure, the summary/heading, or explain *what* you did. This is not a conclusion and you will not receive credit. If you made a mistake, or if you are explaining how or why you didn't get perfect or good results, **DO NOT** say it was due to "human error" or "nature mistakes" or "since humans aren't perfect" or "since nothing is perfect". I know this, you don't need to include it. If you have bad results, there is a reason why besides being not perfect, explain it. Also, **DO NOT** write in anything expect in 3rd person singular, and **DO NOT** include "I, He, She, We, the students, Us, Our, His, Her" etc. When writing a report, you include "It".

For example: "3 grams of benzoquinone was added to the flask. It was then stirred at 100 C for 1 hour; A purplish-red color appeared after 15 minutes of stirring."

For example, DO NOT: "We added 3 grams of benzoquinone to the flask. Sarah then stirred it at 100 C, and we waited an hour; our contents changed colors after 15 minutes of stirring".

Finally, the conclusion section must be a medium-sized paragraph. It should include 5-6 sentences at least, and if you are following the guidelines above, you should get full credit, even if its wrong information. If the conclusion section is too short, **1-4 points will be deducted**. If the conclusions include the procedure or the results sections rewritten, **3-4 points will be deducted**, and no credit if the conclusions contain only this. **1 point will be deducted** if "I, He, She..." etc. is used anywhere in the paper.

Finally, the **Post-Lab Questions** should be answered appropriately; in a full sentence/ sentences, including drawing, if needed. **Points will be appropriately deducted** for each wrong answer provided in this section, it depends on how many questions there are. **2 points will be deducted** if the question itself is not included in the report, *this includes the pre-lab questions as well*. If the question is not included in the pre-lab questions, **2 points will also be deducted**.

FINAL IMPORTANT NOTES!

Write both your name and your lab partner's name on your report. Make it obvious to me however which is you, and which is your partner. You will **Receive a ZERO** if any type of plagiarism is found. **DO NOT** copy from any other person taking the course. The experimental section, results and conclusions sections could be similar because everyone is doing the same experiment, but needs to be

written in your own words. In other words, write the report on your own. **DO NOT COPY OR PHOTOCOPY**. Each student must write their own unique report, do not print off two copies of the same report and turn in it for two people, this is considered plagiarism. Plagiarism is a very serious offense, do not take it lightly. Please **“ASK”** your TA if you are not sure about anything!!!

M. TENTATIVE SCHEDULE FOR LAB LECTURES AND LABORATORY EXPERIMENTS

<i>Recitation Dates for all sections (week) –M,T, W</i>	<i>TOPIC/EXPERIMENT (Page numbers on both editions)</i>	<i>Experiment Dates for M, T and W Sections (301/302/303/304/305/309/310/311/312/315/316/319/320/321/326)</i>	<i>Experiment Dates for TR and F Sections (306/307/308/313/314/317/322/323/324)</i>
Week of Jan 14th	No Lab Lecture	No Labs	No Labs
Week of Jan 21 st	No Lab Lecture	No Labs	No Labs
Week of Jan 28 th (28, 29, 30)	Check In, Safety and EXP 1: Cyclohexanone from cyclohexanol Williamson, Ch. 22 22.3: Cyclohexanone Tests: 2,4-DNP test and oxidation of alcohols p.361-363 / p.363-365.	Week of Feb 4 th (Feb 4, 5 and 6) <i>Quiz #1, Safety Quiz- Return to TA on the same day.</i>	Week of Jan 28 th (Jan 31 and Feb 1) <i>Quiz #1, Safety Quiz- Return to TA on the same day.</i>
Week of Feb 4th	EXP 2: Grignard Synthesis Williamson, Ch. 38 38.1: Phenylmagnesium bromide 38.3: Benzoic acid p.495-497 / p. 498 -500 and p. 500 / p. 503	Week of Feb 11 th (Feb 11, 12 and 13)	Week of Feb 4 th (Feb 7 and 8)

Week of Feb 11th	EXP 3: Diels Alder Reaction Williamson, Ch. 48 48.2: Reaction with Maleic anhydride p.623-624 / p.625-626	Week of Feb 18 th (Feb 18, 19 and 20)	Week of Feb 11 th (Feb 14 and 15)
Week of Feb 18th	EXP 4: Electrophilic Aromatic Substitution Williamson, Ch. 28 28.1: Nitration of Methyl Benzoate p.402-403 / p.405-406	Week of Feb 25 th (25, 26 and 27) <i>Quiz #2, TA will hand over the paper copy of the quiz in the lab.</i>	Week of Feb 18 th (21 and 22) <i>Quiz #2, TA will hand over the paper copy of the quiz in the lab.</i>
Week of Feb 25th	EXP 5: Friedel-Crafts acylation of ferrocene Williamson, Ch. 32 32.1: Acetylferrocene Column chromatography p. 440 -441 / p. 443 - 444	Week of Mar 4th (4, 5 and 6)	Week of Feb 25th (Feb 28 and Mar 1)
Week of Mar 4th	EXP 6: Esterification and Hydrolysis (preparation of soap) Williamson, Ch. 40.5 The preparation of soap p. 525 – 526 / p. 527 - 528	Week of Mar 18 th (18, 19 and 20) <i>Quiz #2, DUE: Hand over to your TA in the lab.</i> Late returns without prior permission will be penalized.	Week of Mar 4 th (7 and 8) <i>Quiz #2, DUE: Hand over to your TA in the lab.</i> Late returns without prior permission will be penalized.
Week of March 11th (Spring Break) – NO LECTURE/LABS			
Week of Mar 18th	EXP 7: Dyes and Dyeing, the coupling of diazonium compounds Williamson, Ch. 46 46.1: Diazotization of sulfanilic acid p. 592/ p. 594	Week of Mar 25th (25, 26 and 27)	Week of Mar 18th (21 and 22)

	46.4: Methyl Orange p. 596/ p. 598 46 Direct dyes, with methyl orange p. 599/ p. 601		
Week of Mar 25th	EXP 8: Aldol Condensation Williamson, Ch. 37 37.1: Synthesis of dibenzalacetone. p.485 -486 / p.488 -489	Week of Apr 1st (1,2 and 3)	Week of March 25th (28 and 29)
Week of Apr 1st	EXP 9: Acetylsalicylic acid (Aspirin) Williamson, Ch. 41 41.1: Synthesis of Acetylsalicylic acid (Aspirin) p. 531-532 / p. 533-534. Unknown: Handout Checkout	Week of Apr 8 th (8, 9 and 10) <i>Quiz #3, TA will hand over the paper copy of the quiz in the lab.</i>	Week of Apr 1st (4 and 5) <i>Quiz #3, TA will hand over the paper copy of the quiz in the lab.</i>
Week of April 15th or Week of 22nd: Exp 9 Lab Report, Unknown handout and quiz#3 are due. TA's will inform the exact due date. Late returns without prior permission will be penalized.			

Any changes to the syllabus will be updated by the instructor

N. EMERGENCY NOTIFICATION & PROCEDURES

UNT uses a system called Eagle Alert to quickly notify you with critical information in the event of an emergency (i.e., severe weather, campus closing, and health and public safety emergencies like chemical spills, fires, or violence). The system sends voice messages (and text messages upon permission) to the phones of all active faculty staff and students. Please make certain to update your phone numbers at <http://www.my.unt.edu>. Some helpful emergency preparedness actions include: 1) know the evacuation routes and severe weather shelter areas in the buildings where your classes are held, 2) determine how you will contact family and friends if phones are temporarily unavailable, and 3) identify where you will go if you need to evacuate the Denton

area suddenly. In the event of a university closure, labs scheduled during that time are excused absences in addition to the one dropped lab.

O. ACADEMIC INTEGRITY EXPECTATIONS AND CONSEQUENCES (UNT POLICY 06.003)

UNT promotes the integrity of learning processed and embraces the core values of trust and honesty. Academic integrity is based on educational principles and procedures that protect the rights of all participants in the educational process and validate the legitimacy of degrees awarded by the university. In the investigation and resolution of allegations of student academic dishonesty, the university's actions are intended to be corrective, educationally sound, fundamentally fair, and based on reliable evidence. Please see the document for more details. <https://policy.unt.edu/sites/default/files/06.003.pdf>

P. STUDENT PERCEPTION OF TEACHING (SPOT)

Student feedback is important and an essential part of participation in this course. The Student Perception of Teaching (SPOT) is a requirement for all organized classes at UNT. This short survey will be made available at the end of the semester to provide you with an opportunity to evaluate how this course is taught.

Extra credit: TA may give up to 5 points extra credit for completing the SPOT online evaluation form.

Q. SUCCEED AT UNT

UNT endeavors to offer you a high-quality education and to provide a supportive environment to help you learn and grow. And, as a faculty member, I am committed to helping you be successful as a student. Here's how to succeed at UNT: **Show up. Find Support. Get advised. Be prepared. Get involved. Stay focused.** To learn more about campus resources and information on how you can achieve success, go to <http://success.unt.edu/>

R. STUDENT LABORATORY SAFETY AGREEMENT, SPRING 2019

Effective January 14, 2019, this document will replace all previous Laboratory Safety Guidelines and Agreements in all chemistry labs at UNT.

1. Never enter the laboratory unless your Teaching Assistant (TA) is present and has authorized entry into the laboratory. Accidents are more likely to occur when students are left unsupervised in the chemistry laboratory.
2. Cell phone usage in the laboratory is prohibited. Cell phones can be used in the laboratory under emergency situations or if required by the experiment. Check with your TA if cell phones are allowed for an experiment.
3. Do not sit on the floors or benchtops in the laboratories. There may be spilled chemicals that have not been cleaned up properly on those surfaces that can contaminate your clothing.

4. Always wear eye protection, safety glasses or goggles for chemicals, when in the laboratory. Even if you aren't working on the experiment someone else may be. If you refuse to wear your safety glasses or goggles, or forget to bring them, you will be ejected from lab and could receive no credit for that lab. Regular eye glasses do not provide proper protection from chemical spills. Safety glasses must include side shields to be acceptable for laboratory use.
5. Students must wear long pants or skirts. Pants or skirts must be long enough to protect the entire leg. Remember that these clothes only offer protection against dirt and weak solvents. Leggings are not considered proper attire for the laboratory environment.
6. Students must wear shirts that provide coverage of the chest, abdomen, shoulders, and upper arm. A good rule is to wear a shirt such that minimal skin is visible below the neck.
7. Students must wear socks and shoes that cover the entire foot, and are sturdy enough for standing in for 2-3 hours at a time. **Open shoes and sandals are prohibited in the laboratory.**
8. If you attend laboratory wearing the prohibited clothing, it will result in your being ejected from the laboratory and you may receive a zero for the experiment.
9. Nitrile gloves are to be worn as directed by your TA. These may not be necessary in every case, but it is never wrong to wear clean and uncontaminated gloves. Gloves must be removed before exiting the laboratory.
10. Do not wear contact lenses in the laboratories, they prevent the flushing of chemicals from the eye and absorb organic vapors from the air. Students must obtain a pair of prescription glasses for working in the laboratory. Students must notify the laboratory instructor/supervisor if they wear contact lenses.
11. Long hair should be tied back. Neckties, scarves, etc. should be removed before beginning an experiment. Headwraps must be secured.
12. Never eat or drink inside of the laboratory. If you must get a drink, it must be removed from the laboratory before consumption. Never open a drink container while wearing gloves. Remove gloves and wash hands thoroughly before opening a drink container.
13. Do not apply makeup inside of the laboratory.
14. Horseplay and unauthorized experiments are forbidden in the laboratory. This includes unauthorized use of the laboratory computers. The TAs have been instructed to send anyone home who does not abide by this rule.
15. Always wash your hands with soap and water before leaving the laboratory.
16. Place all bags, coats, jackets, and other loose items in the shelves located at the front of the laboratory. The only items allowed on the laboratory benches are your laboratory manual, a calculator, and a pencil. Cluttered aisles and laboratory benches are dangerous.
17. All chemicals, glassware, and instrumentation should be treated with the utmost respect.
18. Do not pour anything back into reagent bottles. Pour a sample into an appropriately sized smaller container first and dispose of the left over material afterwards. Contamination can ruin an experiment or cause an explosion. Replace the lid to the proper reagent bottle to avoid further contamination.
19. Only take an appropriate amount of each reagent from the reagent bottle for your experiment. Reagent bottles cannot be refilled during a laboratory class period and if you take too much, that may mean there is not enough reagent for other students. Do not share reagent between groups unless instructed by your TA since this may cause contamination and false data in your experiment.
20. Carefully read the label on reagent bottles for the identity and concentration of a substance before using the chemical. Using the wrong concentration or wrong substance at the wrong time in an experiment can be dangerous.

21. Do not pipette by mouth. Pipette bulbs are provided in each student station for this purpose.
22. Never smell or touch chemicals unless specifically instructed to do so. When instructed to smell chemicals, hold the container level with your nose but removed by several inches. Waft the vapors towards you by waving your hand over the top of the container. Never put the container directly under your nose.
23. Chemical waste must be disposed of in the correct fashion. There are three different types of chemical waste that are collected at the back of every laboratory. The chemical waste containers will be carefully labeled with the chemicals that can be disposed in that container. Read the label on the waste container carefully before disposing of waste. Many chemicals must be disposed of in separate containers. Your TA will provide more detailed instruction on waste disposal at the beginning of every experiment.
24. Broken glassware must be reported to your TA. Your TA will assist in the collection the broken glassware. Broken glassware must be disposed of in the proper container and cannot be discarded in the regular trash.
25. Report any chemical spills to your TA. Your TA will instruct you on the proper way to clean up any spills.
26. Report any accidents or injuries to your TA, no matter how small you feel the injury is. A small amount of any chemical in an injury may pose serious health risks if left untreated.
27. Familiarize yourself with the locations of all safety showers and eye wash stations. Sometimes the least obvious location is the closest in the event of an emergency.
28. Glassware should not be considered clean unless you have just cleaned it. Never trust the previous student who used your glassware to have properly cleaned it. Using dirty glassware may have unexpected and dangerous results.
29. Always clean your glassware and laboratory stations before leaving the laboratory. Glassware that is left unclean may contain chemicals that can react while in storage and cause major accidents.
30. Wash hands frequently when handling chemicals and before leaving the laboratory. Beware of contamination of clothing or on door knobs, frames, etc. Remove any gloves before leaving the laboratory. Safety glasses or goggles should only be removed when outside of the laboratory.

Printed Student Name: _____

Date: _____

Student Signature: _____ Student ID Number: _____

S. HELPFUL VIDEO DEMONSTRATION LINKS

https://chem.libretexts.org/Core/Inorganic_Chemistry/Chemical_Reactions/Limiting_Reagents

For TLC: <https://www.youtube.com/watch?v=CmHFVxTxkGs>

<https://www.youtube.com/playlist?list=PL03C01E9EB4EF6B45>

https://www.youtube.com/watch?v=sq_LFsVlaq8
<https://www.youtube.com/watch?v=VtkwBLTd0rA>

For Diels-Alder Reaction: <https://www.youtube.com/watch?v=HdvrTQpzfjc>

For Formation of Cyclohexanone from cyclohexanol: <https://www.youtube.com/watch?v=2adECwZdH80>