

CHEM 1290 General Chemistry 2 Laboratory

The University of Toledo
College of Natural Sciences and Mathematics



Instructor: Dr. Nathaniel Coleman Jr.

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Office Hours: Tues, Wed, Thurs: 10:00 am – 12:00 pm in person or online by appointment

Office Location: BO 2086-H

Office Phone: 419-530-2566

Term: Fall 2021

Lab Locations, times, and dates: see the end of the syllabus

Credit Hours: 1

REQUIRED TEXTS AND ANCILLARY MATERIALS

Required Textbook: Laboratory Manual CHEM 1290, Cengage, ISBN for the bookstore: 9780357850626

There is a bundled online component called Lab Skills that comes with the book. This software is required and is part of the weekly lab reports. There is not an online component of the lab manual.

Required Personal Protective Equipment (PPE):

Approved chemistry safety goggles meeting the ANSI Standard Z87.2003 must be worn by every student during each laboratory. A website to this standard is listed below for further explanation.

<https://www.ishn.com/articles/83741-a-clear-view-of-ansi-z87-1-2003>

Goggles may be purchased at the UT bookstore or from the UT Student ACS chapter which is in room BO 2082. You will need to contact the student ACS or go to their office one at a time to obtain goggles to avoid crowding. The student ACS may have a booth on the first floor of Wolfe Hall or Bowmann-Oddy.

Face masks must always be worn. You will not be allowed entry to the lab and will be dismissed from the lab if you do not have a face mask on.

Required Course Access:

A working and stable internet connection is required in order to access and upload assignments in this course. We will predominately work through Blackboard. Blackboard is the learning management system that will be used in this class. This is where your TA and myself will post important information relating to the lab and your grades. Blackboard can be accessed through the myUT webpage or by using the website blackboard.utdl.edu.

You will need access to Microsoft Office software for completing work in this class. If you do not own a copy, you can use Open Office or obtain a copy of Microsoft Office from the IT department.

Required Dress Attire and Etiquette: (includes updates due to the pandemic)

Every student must abide by the following rules. If you are not properly dressed for lab, you will not be admitted into the lab by the TA and will get a 0 for the lab. I would suggest to always have a backup pair of “lab clothing and masks” in your vehicle or backpack if you forget.

1. Face masks **MUST BE WORN AT ALL TIMES EVEN IF YOU ARE VACCINATED!** The face mask must fit firmly over your face, cover the mouth and nose and should not be touched. Touching a mask can contaminate it with chemicals, or make an ideal environment for the coronavirus to live. If you do not comply to wearing a mask at all times, you will be asked to leave and receive a 0 for the lab.
2. Closed toed shoes must be worn. No shoes that expose any part of the foot are allowed. Cloth based shoes are not advised to be worn. No sandals and socks (for safety and moral reasons...).
3. Gloves should be worn when instructed. Do not touch electronics or door handles when wearing gloves. Do not wear gloves outside of the lab.
4. Full shirts/t-shirts need to be worn. Any shirts that expose the upper torso (like V-neck shirts or blouses that expose cleavage) are not allowed.
5. Full, long length pants must be worn. No shorts, ever. Pants should ideally be slightly loose fitting but not baggy. Avoid wearing “leggings” or spandex type of fabrics since there is very little protection between your body and the fabric. These materials burn in a matter of seconds versus jeans that take several minutes to burn for example.
6. Make sure that long hair is pinned up.
7. Avoid wearing contacts to lab. I understand that contact technology has improved greatly for “breathability” but chemicals will still get stuck under them and cause excruciating pain. You have been warned.
8. Avoid wearing expensive clothing to lab since you will spill chemicals. I am not liable to replace your damaged clothing. I suggest devoting some older clothes for lab and have a backup pair in your backpack just for lab.
9. Disruptive behavior is not tolerated in lab. This can be a major safety hazard. You will be asked to leave and receive a 0 for the lab.
10. All backpacks and coats should be stored in the correct receptacles. Receptacles will need to be wiped down with an alcohol solution before leaving the lab.
11. No food or drink in the lab, ever. Also do not taste chemicals.
12. Avoid applying makeup in the lab since chemical vapor can dissolve into these materials.
13. Avoid performing your “own” experiments in the lab. If done, you will receive a 0 for the lab and asked to leave.
14. Do not breathe in chemical vapors. Reactions should be done in the hood. Keep hood sashes down.

15. Discard chemical waste in the correct containers when needed.
16. Be familiar with the emergency locations in the room (ex. first aid kit, eye shower, body shower, fire extinguisher, phone).
17. Report any unwanted chemical reactions, spills on yourself or surfaces, fires, or glass breakage to your TA immediately.
18. Do not work alone in the lab. If no one is in the lab, do not enter it.
19. No electronic devices except for a calculator should be present during lab.
20. Wash your hands before and after handling chemicals. Residues can be present on your hands that may end up in your food later.

Optional Equipment: A USB flash drive may be useful for taking your data home.

COURSE/CATALOG DESCRIPTION

This course will have experiments that cover topics in CHEM 1240 lectures. Approved chemistry safety goggles meeting the American National Standard Z87.1-1968 must be worn by every student during every laboratory class meeting. Three hours of laboratory per week.

COURSE OVERVIEW

CHEM 1290 is the appropriate lab course to go with CHEM 1240. This sequence is intended for chemistry majors, students who require a physical science towards their degree or that are interested in learning the base knowledge of chemistry.

PREREQUISITES AND COREQUISITES

The prerequisite for CHEM 1290 is CHEM 1240 (may be taken concurrently) with a minimum grade of C.

TEACHING STRATEGIES

The lab is designed to explore experiments that relate to the content learned during lecture. Teaching assistants (TAs) will predominately run the labs and the lab coordinator (Dr. Coleman) will make visits throughout the semester, not to police the TAs and students, but to show that I exist and am also here to help you along the way. You will be responsible for reading through the lab manual to get an idea of how the lab will be done and be prepared to commence the lab. Each lab will require completion of “**pre-lab questions**”. These questions need to be completed and submitted to your TA before entry and starting the lab. Once the lab is completed, you will need to complete the “**post-lab questions**” and turn in your data/calculations to your TA before the beginning of the next lab section. Combining the pre-lab, post-lab, and data/calculations will complete the “**Lab-Report**” for the lab.

IMPORTANT NOTE: We are reverting back to submitting paper documents for lab reports and will not require uploading of lab pages online.

Attendance is mandatory unless you have a valid excuse. You are expected to be on time and ready for lab at the beginning of each lab period. You will not be allowed into the lab if you are substantially late (15 minutes or more), or if your pre-lab is incomplete. If you miss an experiment, you may make it up only by attending another lab section during the week that particular experiment is scheduled, and **if the lab coordinator and TA are notified prior to going to another section.** It is up to you to make these arrangements with your TA, either in person or via e-mail. There are no lab periods designated as make-up labs since each week will only have one lab active. If you need to attend another lab section during the same week as your regularly scheduled lab section, send me an e-mail at nathaniel.colemanjr@utoledo.edu addressing the need to reschedule your lab. If you know in advance you will be absent due to travel, job conflicts, etc., send an e-mail as soon as you can to maximize your chances of getting into another section. It will not always be possible to do so due to lab size limitations.

VIOLATIONS OF THE SAFETY POLICY

If you fail to follow the safety rules and policies, the following actions will be made:

1. The first instance of failure to comply with the safety rules and/or policies will result in an immediate ten-point deduction for that laboratory exercise and a possible 0 for the lab plus removal from the lab.
2. A second violation will result in removal from the laboratory and a 0 being given for the lab.
3. If there are further violations, the instructor can assign a failing grade for the course.

EXCUSED ABSENCE POLICY (includes updates due to the pandemic)

You must fill out and submit an **Excused Absence Request (EAR)** form for each excused absence within two weeks of your return to campus. EAR forms are located on Blackboard in the additional handouts section. Fill out all of the areas on the form, including the experiment number (abbreviated as “*Exp No.*” on the form).

Should you miss a lab for a legitimate reason, submit an EAR form and supporting documentation to the instructor via email. Do not give the documentation to your TA. If you submit an EAR form, you are exempted from doing any work for the missed lab. This will also reduce your maximum points in the class. You also cannot take back a signed EAR form once it is submitted.

Excused absences will be granted when school-related academic or athletic activities, medical problems, or other similar emergencies cause you to be absent. Absences due to work, class schedule conflicts or family vacations will not be excused. No more than **two excused absences per student per semester will be granted.** Excused absence requests that are received more than four weeks after the absence and those with no supporting documentation will not be approved.

IMPORTANT NOTE: If you are concerned about attending lab due to the pandemic due to an illness or virus exposure, you must inform me, Dr. Coleman, about this. Special remote learning will be needed in this case so the sooner I know the better.

COMMUNICATION GUIDELINES

As your instructor, I am here to help, and will do my best to respond to email within 24 to 48 hours during business days. Weekends are very variable, but I am usually on my pc. Students are expected to check their UT email account, Blackboard, and the Lab Skills software frequently for important course information. TA's

should inform you on their email availability, but they should also respond at least once to your emails within a 24 to 48 hour time frame.

LATE WORK POLICY

The pre-lab should be turned in before coming to lab, and the remaining documents must be submitted before the due date of each lab report. All work should be handed to your TA. Each lab report has a 1-week due date time. **Any work that is turned in after the due date will automatically lose 10 points. If you turn in any work after 12 hours have passed after the due date, the work will not be accepted even if it is correct.** If the experiment is made up in another section that week and is approved by the instructor, make sure to still complete your work and hand it in to the lab TA on time. You do not need to fill out an EAR form if you made up the lab in another section.

ACADEMIC DISHONESTY

Academic Dishonesty is defined by the university's policy as specified in the university's catalog. The rules of academic honesty will be strictly enforced. Academic dishonesty includes cheating by copying from any other student — past or present. All work submitted must be the work of the individual submitting it. Academic dishonesty will result in a score of zero for an assignment and/or lab and can further result in a failing grade in the course that cannot be removed from the student's transcript. You will be required to print out an **Academic Honesty Statement** which is located on Blackboard, sign it, and submit the statement to your TA.

LAB STRUCTURE (includes updates due to the pandemic)

The weekly lab is set up as follows:

1. Have your pre-lab ready to turn in to your TA when you come to lab each week. Your TA will not allow you to enter if this is not turned in on time.
2. Upon entry to the lab, you must be properly attired, including safety goggles and masks.
3. Place all backpacks, coats and other items not needed for lab in the appropriate storage.
4. The TA will go over the background, safety, experiment procedures, and hazards of the lab in a brief PowerPoint presentation.
5. Depending on the lab, you will work in pairs to complete the lab steps and have the remainder of the lab time to do so. If you finish early, and have your TA verify that you are done with a signature, then you make sure your hood is clean before leaving the lab.
6. Complete data in black or blue ink only and neatly cross-out or black-out errors. Avoid using white-out.
7. Remember to only remove goggles when leaving the lab and discard gloves in the lab only. Do not wear gloves outside of the lab and do not touch door handles or keyboards with gloves on. Do not touch or remove your mask.

COURSE GRADES

Your grade will be based on your lab reports and assignments. Lab report grades include pre-lab questions, data sheets, graphs, if any, and post-laboratory questions, which include the analysis of the data collected. Labs reports are worth 80 points each. This includes 60 points for your lab manual pages and 20 points for each corresponding Lab Skills assignment.

Students who have a grade of D or below will have a mid-term grade reported during the 5-8th week of the semester. This grade notification does not appear on your transcript but the purpose of this is to notify you of your academic standing in the class. Attendance is also recorded during the midterm grading period. This reporting is done in compliance with state and federal and federal laws regarding financial aid disbursement. Please note that if you are not attending class it could impact your financial aid (scholarships, grants, loans or Federal Work Study). If you decide to not attend this class (or any other class you have registered for), you must formally withdraw (drop) from the course. If you signed the check-in form and then withdrew from the course, you still need to check-out with your TA or you will be charged a “no check-out fee”.

The course point breakdown is the following:

Assignment	Point Value	% of Total Points
Safety Quiz	20 points	1.96 %
Academic Honesty Form	10 points	0.98 %
Lab reports (10 labs, 60 points each)	600 points	58.8 %
Lab Skills Assignments (10 assignments, 20 points each)	200 points	19.6 %
Lab Final Exam (comprehensive)	190 points	18.63 %

Total points possible **1020 points**

In order to complete this course with a grade of C or higher, you will need to achieve at least 64% of the total points for the course or 652.8 points.

The lab final exam will be an online test administered through Blackboard. It is a 3 hour exam. More details about the final will be provided closer to the time of the exam.

You can monitor your grade throughout the semester via the online grade book in Blackboard and from the Lab Skills gradebook. These are two separate gradebooks that will be merged when final grades are due. It is your responsibility to ensure every entry made by your TA is correct. At the end of the semester a final grade will appear in Blackboard. You will have two days to notify your instructor via e-mail of an error in your final grade. Once the grades are uploaded to the official UT grade system, grade changes can no longer be done quickly.

GRADING SCALE

The following is a general guideline.

A	100% - 88%	A-	87% - 85%	B+	84% - 81%
B	80% - 77%	B-	76% - 73%	C+	72% - 69%
C	68% - 64%	C-	63% - 60%	D+	59% - 57%
D	56% - 53%	D-	52% - 50%	F	< 50 %

Course drop and withdrawal procedures have been set by the University of Toledo. **The deadline for dropping is September 13th, 2021. You may *withdraw* from the course and receive a grade of W. The deadline for withdrawal is November 5th, 2021. W's do not affect your GPA.**

You can also find these deadlines on the UT website, under the Academic Calendar and on the Registrar's page for deadlines.

ACADEMIC POLICIES

As a student at The University of Toledo you should be familiar with the policies that govern the institution's academic processes, for example, academic dishonesty, enrollment status, grades and grading. Please read through the undergraduate academic policies. Students are expected to attend every class meeting of courses in which they are registered. Please read the missed class policy.

Undergraduate Policies: <http://www.utoledo.edu/policies/academic/undergraduate/>

Graduate Policies: <http://www.utoledo.edu/policies/academic/graduate/>

UNIVERSITY POLICIES

The University is an equal opportunity educational institution. Please read The University's Policy Statement on Nondiscrimination on the Basis of Disability Americans with Disability Act Compliance. Students can find this policy along with other university policies listed by audience on the University Policy webpage <http://www.utoledo.edu/policies/audience.html/#students>.

ACADEMIC ACCOMMODATIONS (includes updates due to the pandemic)

The University of Toledo embraces the inclusion of students with disabilities. We are committed to ensuring equal opportunity and seamless access for full participation in all courses. For students who have an accommodations memo from Student Disability Services, let me know as soon as possible so that we can communicate confidentially about implementing accommodations in this course. For students who have not established affiliation with Student Disability Services and are experiencing disability access barriers or are interested in a referral to healthcare resources for a potential disability or would like information regarding eligibility for academic accommodations, please contact the Student Disability Services Office <http://www.utoledo.edu/offices/student-disability-services/> by calling 419.530.4981 or sending an email to StudentDisability@utoledo.edu.

STUDENT SUPPORT SERVICES

Academic Support Services: Please follow this link to view a comprehensive list of Student Academic and Support Services (<http://www.utoledo.edu/studentaffairs/departments.html>) available to you as a student

Course scheduling assistance: Chemistry Department Secretary, Ms. Samples, is in Room BO 2022, telephone 419-530-2698. If you have further questions or if you need assistance, please talk to her. She takes care of all scheduling changes. She does not take care of make-up labs though. Contact me and your TA for missed labs.

Chemistry Help Center, Room BO 2043: During a normal face-to-face semester, this is the room in which TAs hold their scheduled office hours.

Tutoring Support: Tutoring support is available through the **Learning Enhancement Center** located in the Carlson Library.

Safety and health services for UT students: Please use the following link to view a comprehensive list Campus Health and Safety Services available to you as a student (<http://www.utoledo.edu/offices/provost/utc/docs/CampusHealthSafetyContacts.pdf>). If you need to have COVID-19 testing, you can call The University of Toledo Medical Center (UTMC) at 419 383-4545.

Instructor Office Hours: Normally, these are the times when you can stop by my office with questions about the course material, grades, and any concerns with the course. Since we are transitioning back to normal instruction, I will start to have my office hours in person, and I will keep the online option available. My office hour times and location are listed at the top of the syllabus (page 1), are on my schedule in Black Board, and are posted on the outside of my office. If you have a scheduling conflict with all of the listed times, we can schedule a different time to meet.

SPECIAL COURSE EXPECTATIONS DURING COVID-19

Maintaining a safe campus during the ongoing COVID-19 pandemic remains a top priority. UToledo continues to follow the guidance of the U.S. Centers for Disease Control and Prevention and Ohio Department of Health to keep our campus safe.

ATTENDANCE

The University of Toledo has a missed class policy. It is important that students and instructors discuss attendance requirements for the course. Before coming to campus each day, students should take their temperature and complete a self-assessment for symptoms of COVID-19, such as cough, chills, fatigue or shortness of breath. Anyone with a temperature at or above 100.0 degrees Fahrenheit or who is experiencing symptoms consistent with COVID-19 should not come to campus and contact their primary care physician or the University Health Center at 419.530.5549. For more information on the symptoms of COVID-19, please go to <https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html>

COVID-19 testing for sick students is available on both Main Campus and Health Science Campus. Call 419.383.4545 for an appointment. Absences due to COVID-19 quarantine or isolation requirements **are** considered excused absences. Students should notify their instructors and follow the protocols summarized in this document on [Navigating COVID-Related Course Concerns](#).

In the event that you have tested positive for COVID-19 or have been diagnosed as a probable case, please review the [CDC guidance](#) on self-isolation and symptom monitoring, and report the disclosure to the Division of Student Affairs by emailing StudentAffairs@utoledo.edu or by connecting with their on-call representative at 419.343.9946. Disclosure is voluntary and will only be shared on a need to know basis with staff such as in the

Office of Student Advocacy and Support, The Office of Residence Life, and/or the Office of Accessibility and Disability Resources to coordinate supportive measures and meet contact tracing requirements.

FACE COVERINGS

Face coverings are required while on campus, except while eating, alone in an enclosed space, or outdoors practicing social distancing. Students will not be permitted in class without a face covering. If you have a medical reason preventing you from wearing a face covering due to a health condition deemed high-risk by the CDC, submit an [online application](#) to request an accommodation through the Office of Accessibility and Disability Resources. Students will need to provide documentation that verifies their health condition or disability and supports the need for accommodations. Students already affiliated with the Office of Accessibility and Disability Resources who would like to request additional accommodations due to the impact of COVID-19, should contact their accessibility specialist to discuss their specific needs. You may connect with the office by calling 419.530.4981 or sending an email to StudentDisability@utoledo.edu.

VACCINATION

Doctors and other health care professionals agree that the best way to protect ourselves and each other is to get vaccinated. Case data clearly show that vaccines remain highly effective at preventing serious illness from COVID, including the highly contagious delta variant. If you have not yet received your COVID vaccine, the University encourages you do so as soon as possible. No appointment is needed to get the shot at the UTM Outpatient Pharmacy, University Health Clinic or Main Campus Pharmacy. Once you receive the COVID vaccination, please register on the COVID Vaccine Registry site at: <https://utvaccinereg.utoledo.edu/>.

SPECIAL NOTES

It's important to note, that based on the unpredictability of the COVID-19 virus, things can change at any time. So please be patient and understanding as we move through the semester. I also ask that you keep me informed of concerns you may have about class, completing course work/assignments timely and/or health concerns related to COVID.

STUDENT LEARNING OUTCOMES (SLO)

Upon successful completion of this course, you should be able to:

1. Recognize and properly use standard laboratory glassware and analytical equipment
2. Safely work with hazardous substances and reactive chemical systems
3. Perform common laboratory techniques involving solids and liquids
4. Understand and use the scientific method
5. Analyze data and observations to draft a scientifically valid conclusion
6. Use calculations necessary to determine percent content of an unknown
7. Identify an unknown based upon observations
8. Communicate the results of an experiment
9. Communicate ideas related to science in spoken and written word

10. Understand the influence of modern science of our global and diverse culture and society

11. Use the concepts of good scientific method to evaluate issues

EXPERIMENT SCHEDULE

The following table will give you a general idea of our pace throughout the course. **Please refer to the experiment name and NOT the lab number in your lab manual.** I have added the lab manual page ranges for each experiment in the table below as well. Some experiments have been rearranged to match what has been covered in the CHEM 1240 lecture. If any adjustments need to be made, either I or your TA will announce these in Blackboard. Remember, the lab report for each experiment includes the pre-lab, data/calculations, graphs (if needed), and the post lab questions. Submit each page as an image file of the correct file extension for the respective assignment drop box on Blackboard.

Week	Experiment	SLO	Notes
Aug 30 th – Sept 3 rd	Check in, Safety Video		Watch the safety video at home, complete the safety quiz, and upload your results online to the assignment drop box.
Sept 6 th – Sept 10 th	Exp 1: Density, Accuracy, Precision, and Graphing (pgs. 1 - 11)	1	Last day to drop: Sep 13 th
Sept 13 th – Sept 17 th	Exp 2: Molar mass Determination by Freezing Point Depression (pgs. 13 - 30)	1, 3, 4, 5	Labskills assignment 1 due Sept 12th
Sept 20 th – Sept 24 th	Exp 3: Spectrophotometric Determination of Copper in Brass (pgs. 31 - 44)	1-5, 6	Labskills assignment 2 due Sept 19th
Sept 27 th – Oct 1 st	Exp 4: Blue Bottle Experiment (pgs. 45 – 52)	1-5, 8, 9	Labskills assignment 3 due Sept 26th
Oct 4 th – Oct 8 th	Exp 5: Determining the Rate Law for the Crystal Violet-Hydroxide Ion Reaction (pgs. 53 - 70)	1-5, 8, 9	Labskills assignment 4 due Oct 3rd
Oct 11 th – Oct 15 th	NO LAB		Fall Break Oct 14 th -15 th (no lab for the week) Labskills assignment 5 due Oct 10th
Oct 18 th – Oct 22 nd	Exp 6: Estimating the Acid-Neutralizing Capacity of Antacids (pgs. 71 - 86)	1-5, 8 - 11	
Oct 25 th – Oct 29 th	Exp 7: Identifying a Weak Acid by Titrimetry (pgs. 87 - 102)	1-5, 7 - 9	Labskills assignment 6 due Oct 24th
Nov 1 st - Nov 5 th	Exp 8: Studying the pH of a Strong Acid, Weak Acid, Salt, and Buffer Solutions (pgs. 103 - 122)	1-5, 7 - 9	Last day to withdraw: Nov 5 th Labskills assignment 7 due Oct 31st

Nov 8 th – Nov 12 th	Exp 9: Qualitative Analysis of Cations (pgs. 123 - 140)	1-5, 8-10	Labskills assignment 8 due Nov 7th
Nov 15 th – Nov 19 th	Exp 10: Electrochemistry (pgs. 141 – 162)	1-5, 6, 8, 9	Labskills assignment 9 due Nov 14th
Nov 22 nd – Nov 26 th	NO LAB		Thanksgiving Break: Nov 24 th – 26 th (no lab for the week) Labskills assignment 10 due Nov 21st
Nov 29 th – Dec 3 rd	Clean up and Checkout		Attend your normal lab section to clean the lab and checkout your drawer.
Dec 6 th – Dec 10 th	Lab Final Exam	1-11	This is different from finals week for lectures. You must take the final during your normal lab day during this week.

Lab Locations, times, and dates

Below are the lab sections for the Fall 2021 semester. Make sure that you write down your section, room, lab time and day.

Section	Room	Meeting Time	Meeting Day
1	BO 1097	8:30 am – 11:20 am	Tuesday
2	BO 1097	11:30 am – 2:20 pm	Tuesday
3	BO 1097	2:30 pm – 5:20 pm	Tuesday
4	BO 1097	5:45 pm – 8:35 pm	Tuesday
6	BO 1097	11:30 am – 2:20 pm	Thursday
7	BO 1097	2:30 pm – 5:20 pm	Thursday
8	BO 1097	5:45 pm – 8:35 pm	Thursday