

Syllabus

CHEM 1311/1111 General Chemistry — Spring 2022
Department of Chemistry and Biochemistry, Angelo State University



Instructor:

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Office hours : M 10:00 am to 12:00 pm, T 12:30 to 01:30 pm, W 12:30 to 02:30 pm
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Lecture times : TR 11:00 – 12:15 AM [in CAV 219]

Course Materials:

Textbook (Required): We would use a free online textbook. The textbook name is *Chemistry 2e* (2nd edition) by Paul Flowers, Klaus Theopold, Richard Langley, and William R. Robinson. You can download the textbook from this webpage: [OpenStax Chemistry Textbook by Paul Flowers](#) and click “Download a pdf”.

ALEKS – McGraw-Hill – Online Homework System Subscription (Required): \$70 for one semester, \$75 for 1 year. You would do the homework assignments on the online platform ALEKS. These assignments will be averaged to 200-points as given on page-3 of this syllabus. To register with ALEKS, follow the instructions given on our Blackboard course. The ten-digit class code that you need for registering with ALEKS is: **PN99N-XWK4L**

LabFlow – Catalyst Education (Required): \$49.99 per semester. You would also need access to LabFlow, a platform that you will use to upload your lab reports and other lab related assignments. For sign-up instructions please follow the instructions given on our Blackboard course.

TopHat App Subscription (Required): You would use TopHat App on your mobile device to answer the everyday classroom quiz. Your participation and performance in the classroom will be averaged to 50 points. Please wait for my email invitation to join the TopHat for this class.

Respondus Lockdown Browser & Respondus Monitor (Required): In some occasions, exams and quizzes may be administered through Respondus Lockdown Browser. It requires a desktop computer or laptop and a webcam and a microphone. Make sure that your computer/laptop is compatible with Respondus software. To download and install the latest version of the software, follow the instructions given on our Blackboard course.

Chemistry Lab Goggles (Required): Available at ASU Bookstore or you can purchase from our general chemistry lab stockroom on your first day of lab (\$15).

Calculator (Required): A scientific calculator capable of performing calculations with scientific notation and logarithms. Bring your calculator to class and to lab every day. Note: You can only use a **non-programmable calculator** for the exam.

ACS Exam Study Guide (Recommended): To prepare for the final exam, you may use the ACS General Chemistry Study Guide, which you buy from our general chemistry lab stockroom.

Course Description:

CHEM 1311 General Chemistry I: An introduction to the fundamental laws and theories of chemistry, chemical nomenclature, stoichiometry, atomic structure, chemical bonding, periodic table, chemical equations and reactions, and the properties of heat flow and gases. **Prerequisites:** Students must have received: a score of 580 or above on the mathematics portion of the SAT if taken before March 2016, a score of 600 or above on the mathematics portion of the SAT if taken in March 2016 or after, a score of 26 or above on the mathematics section of the ACT, completed college algebra with a grade of "C" or better, or completed Chemistry 1305 with a grade of "C" or better in order to enroll in Chemistry 1311/1111. **Corequisite:** Chemistry 1111.

CHEM 1111 General Chemistry I Laboratory: Laboratory experiments that focus on laboratory technique, data collection, and analysis. The experiments will expand upon the concepts and topics presented in Chemistry 1311. **Corequisite:** Chemistry 1311.

Course Delivery:

This course will be delivered in a traditional face-to-face setting with students expected to attend class in person. In the event of the Covid-19 situation, the course may be transferred into a hybrid setting. To maintain academic quality while accommodating social distancing needs in this case, this course will then use a split delivery model that combines face-to-face teaching with remote instruction. The goal is to provide face-to-face instruction to students who want to come to campus, while also allowing students who may need to learn remotely to participate via virtual class sessions. It is also possible that the course might be transferred into a 100% remote setting.

Learning Outcomes:**Learning Goal 1:**

- Students will be able to analyze complex chemical problems and draw logical conclusions.
- Students will be able to use an understanding of atomic structure at the basic and atomic levels to analyze the structure and reactivity of substances and chemical species.
- Students will be able to use an understanding of how energy interacts with matter to predict stable chemical species, and perform thermodynamic calculations describing chemical reactions.

Learning Goal 2a:

- Students will be able to understand and apply scientific reasoning in the chemical sciences.
- Students will be able to use an understanding of ions and molecules at the atomic level to predict the behavior of reactions in aqueous solutions.
- Students will be able to use the basic ideas of quantum mechanics to describe how molecular bonds form and to predict molecular shape and polarity. Molecular structure and polarity will be used to predict the forces between molecules and relate those forces to the states of matter and phase changes.

Learning Goal 2b:

- Students will be able to employ mathematics in the analysis of chemical problems.
- The mole concept, chemical formulas and balanced chemical equations will be used to do chemical calculations that relate macroscopic measurements to numbers of atoms, ions or molecules.
- Students will be able to do calculations involving solution concentration and know how to prepare solutions of given concentrations.

- Students will be able to quantitatively predict gas properties using gas law calculations.

Learning Goal 3:

- Students will be able to demonstrate technical and analytical skills in chemistry.
- Students will be able to use the periodic table to determine basic atomic information and to predict trends in atomic properties.
- Students will be able to interconvert between chemical names and formulas to the extent that they can work problems given only one of those pieces of information.
- Students will be able to classify common types of chemical reactions and predict the outcomes of reactions.

Texas Higher Education Coordinating Board Natural Sciences Objectives:

The objective of the study of a natural sciences component of a core curriculum is to enable the student to understand, construct, and evaluate relationships in the natural sciences, and to enable the student to understand the basis for building and testing theories.

Exemplary Educational Objectives:

1. To understand and apply method and appropriate technology to the study of natural sciences.
2. To recognize scientific and quantitative methods and the differences between these approaches and other methods of inquiry and to communicate findings, analyses, and interpretation both orally and in writing.
3. To identify and recognize the differences among competing scientific theories.
4. To demonstrate knowledge of the major issues and problems facing modern science, including issues that touch upon ethics, values, and public policies.
5. To demonstrate knowledge of the interdependence of science and technology and their influence on, and contribution to, modern culture.

Evaluation:

Course grades will be determined as indicated in the table below.

Assessments	Points
Lecture quiz participation	50 points
ALEKS Homework	200 points
Laboratory	200 points
Quizzes (4 x 25 points)	100 points
Exams (3 x 100 points)	300 points
Final Exam	150 points
Total	1000 points

A = 900 to 1000 points; B = 800 to 899 points; C = 700 to 799 points; D = 600 to 699 points; F = below 600 points

Students who are taking both CHEM 1111 and CHEM 1311 for the first time who wish to drop either course **must** drop both courses, because dropping either course would result in the co-requisite requirement no longer being met.

Overall grades in CHEM 1311/1111 will be determined as follows:

- If **BOTH** CHEM 1311 and CHEM 1111 are completed, the letter graded will be based on a total of 1000 points.
- For students who begin and complete **ONLY** CHEM 1311, a percentage will be calculated using only lecture assessments (first four items listed above with 800 points possible) and the letter grade will be assigned based on that percentage.
- For students who begin and complete **ONLY** CHEM 1111, the percentage will be calculated using only lab assessments and that percentage will be used to assign a letter grade.”

Attendance:

You are expected to attend the in-person lectures and labs. You will get points for participating in the lecture quizzes through TopHat. You cannot make-up the missed TopHat points. The student is responsible for making-up any other work missed under the following conditions:

- Unavoidable emergency absences (illness, death in the immediate family, etc.): You must contact the instructor before the absence with a valid, and verifiable excuse.
- Planned absences (university related): You must get the instructor’s approval to make-up the missed work prior to the absence. The reason for the absence should be the participation in university sponsored events.

Quizzes:

There will be a total of 4 online quizzes. Each worth 25 points. The quiz grades will be posted on Blackboard, and students will have three days after receiving the graded quiz to inform the instructor about any error.

Exam	Date	Room	Time
Quiz 1	Thursday, Feb. 3	Virtual	5:30 pm
Quiz 2	Thursday, Mar. 3	Virtual	5:30 pm
Quiz 3	Thursday, Apr. 7	Virtual	5:30 pm
Quiz 4	Thursday, May. 5	Virtual	5:30 pm

Exams:

The exams are mostly in-person, but the instructor may decide to offer them online based on the current situation. Both the in-person and online exams would be given outside of the regular class time on the dates listed below:

Exam	Date	Room	Time
Exam 1	Wednesday, Feb. 16	CAV 200 or virtual	5:30 pm
Exam 2	Wednesday, Mar. 23	CAV 200 or virtual	5:30 pm
Exam 3	Wednesday, Apr. 20	CAV 200 or virtual	5:30 pm

Mostly exams will cover materials since the last exam. However, as some materials overlap with earlier concepts, you are expected to review the calculations and techniques from earlier. **Only non-programmable calculators should be used for the exams (i.e., no graphic calculators are allowed).**

Final Exam:

The final exam will be comprehensive and we would use the multiple-choice standardized exam published by the American Chemical Society (ACS). Study guides for the ACS exam (“General Chemistry - Official Study Guide”) are available for sale in the lab stockroom and from the [ACS web page](#).¹ The schedule for the 1311 final exams is shown below.

Sec	Instructor	Final Exam Date	Time
050	Dr. Dharmarajan	Tuesday, May 10	10:30-12:30 am

Blackboard:

Grades will be posted on our [Blackboard Gen Chem course page](#).² Information, handouts, homework assignments, and other course documents will be on Blackboard. Use the left side navigation panel on our Blackboard course page.

Drop Dates:

The last day to drop the course with a grade of “W” is **Thursday, April 28, 2022**

CHEM 1111 — GENERAL CHEMISTRY LABORATORY SYLLABUS

Laboratory Meeting Times:

The lab classes that accompany the CHEM 1311 lecture course are shown in the table below. The labs will meet first for pre-lab lectures in the Class Room listed in the table.

Section	Day	Meeting Time	Instructor	Class Room	Lab Room
06Z	M	11:00 am-01:50 pm	Mr. Rilling	CAV 211	CAV 216
07Z	W	11:00 am-01:50 pm	Dr. Zehnder	CAV 211	CAV 216
08Z	T	11:00 am-01:50 pm	Dr. Zehnder	CAV 211	CAV 216
09Z	R	11:00 am-01:50 pm	Dr. Zehnder	CAV 211	CAV 216
10Z	M	02:00 pm-04:50 pm	Dr. Dharmarajan	CAV 211	CAV 216
11Z	T	02:00 pm-04:50 pm	Dr. Dharmarajan	CAV 223	CAV 216

The CHEM 1111 General Chemistry laboratory class accompanies this lecture class. The lab is designed to illustrate some of the principles involved in performing scientific measurements, handling chemicals, and performing chemistry experiments. In some cases, the experiments in the lab will introduce you to concepts before you cover them in the lecture course, and in some cases, the experiments will reinforce concepts already covered in the lecture course. Bring your calculator!

Laboratory Attire:

Beginning on the first day of lab, everyone **MUST** have **approved goggles, long-sleeved shirts** which cover the midriff, **long pants**, and **shoes with closed toes and heels** (no sandals, slides, etc.). (Basically, you should have as little exposed skin as possible.) Anyone not wearing the appropriate attire will not be allowed into lab.

Lab Procedures and Lab Reports:

We will be using the platform LabFlow by Catalyst Education for lab procedures and reports. You will have to register and to create an account with LabFlow by following instruction given on Blackboard. While you sign up you will be prompted to pay a fee of \$49.99. The procedures for the labs will be posted within the LabFlow platform. The procedures will provide a description of the background for each experiment. You will be asked to complete pre-laboratory questions prior to the lab meeting within the LabFlow platform.

Your instructor will communicate to you at what time the prelab assignments are due. The lab report itself will be uploaded to LabFlow and must be turned in by whichever due date your instructor requires. Each lab will be worth up to 100 points (up to 20 points for the prelab questions, and up to 80 points for the lab report).

Labs will begin meeting in the second week of the semester. Bring your calculator!
During the first week there are a few dry activities you must complete online.

Cleaning Up After Lab:

Make sure that your lab area is clean and that all glassware and hardware has been cleaned and returned to the appropriate drawers before leaving the lab.

Make-Up Lab Policy:

If you have to miss a lab you will be turning in a lab report based on virtual data LabFlow will generate for you. You will have to seek permission from your instructor to be eligible to turn in a 100% virtual lab report. Your instructor will first work with you to attend another face-to-face lab section if that is feasible.

Lab Safety Training:

All students enrolled in lab courses are required to take a Mandatory Laboratory Safety Training and Quiz on Blackboard. Instructions for completing the quiz are given below:

1. Login to Blackboard, and choose the course entitled: "Lab Safety and Chemical Hygiene."
2. Under the left-hand menu, choose: "Get Started Here".
3. Click on "Get Started Here" in the left-hand column.
4. Follow the instructions under "Welcome to Lab Safety and Chemical Hygiene Training!"
5. You must score 90% or higher on the lab safety quiz.

The Lab Safety Training must be completed by the evening of **Sunday, January 23**.

Lab Midterm and Final Exams:

There will be a 100-point lab midterm (week of 3/7) and a 100-point lab final exam (week of 5/2).

LECTURE AND LAB SCHEDULE — Spring 2022

Week #	Week Of	Lecture	Lab
1	01/17	<i>Monday, Jan 17 - MLK day – No classes</i> Chapter 1: Essential Ideas — Composition of Matter, States of Matter, Measurements, SI Units, Significant Figures, Unit Conversions	<i>Labs do not meet</i> Safety videos and Quiz, Chemistry Math and Labware videos and Quiz Mandatory Lab Safety Training and Quiz — instructions given in <i>Lab Safety Training</i> section
2	01/24	Chapter 2: Atoms, Ions, and Molecules — Nuclear Model, Atomic Mass, Periodic Table, Molecular and Ionic Compounds, Naming Compounds and Writing Formulas	Conversion Factors and Problem Solving (dry lab)
3	01/31	Chapter 2, cont. Quiz 1 – Thurs., Feb. 3	Basic Laboratory Techniques
4	02/07	Chapter 3: Composition of Substances and Solutions — The Mole Concept, Empirical and Molecular Formulas, Molarity, Percent Composition	Density and Specific Gravity
5	02/14	Chapter 3, cont. Exam 1 – Wed., Feb. 16 (Ch. 1, 2,3)	Empirical Formulas
6	02/21	Chapter 4: Stoichiometry — Balancing Equations, Classifying Reactions, Stoichiometry, Limiting Reactants, Reaction Yield	Chemistry of Copper and Percent Yield
7	02/28	Chapter 4, cont. Quiz 2 – Thurs., Mar. 3	Solutions, Electrolytes, and Concentrations
8	03/07	Chapter 5: Thermochemistry — Energy, Systems, Enthalpy, Heat Capacity, Calorimetry, Hess's Law, Standard Enthalpies of Formation	Oxidation Reduction Reactions Lab Midterm Exam (covering the lab material from week 1 through week 7)
9	03/14	<i>Spring Break – No classes</i>	<i>Spring Break – No Labs</i>
10	03/21	Chapter 6: Electronic Structure and Periodicity — Electromagnetic Radiation, Bohr Model, Quantum Theory, Electronic Configurations, Periodic Trends of Elements Exam 2 – Wed., Mar. 23 (Ch. 3, 4, 5, 6)	Titration: Determining the Concentration of an Acid
11	03/28	Chapter 6, cont.	Energy and Specific Heat
12	04/04	Chapter 7: Chemical Bonding and Molecular Geometry — Ionic and Covalent Bonding, Lewis Structures,	Constant Pressure Calorimetry

		Formal Charges/Resonance, Strengths of Bonds, VSEPR Theory, Structure and Polarity Quiz 3 – Thurs., Apr. 7	
13	04/11	Chapter 8: Covalent Bonding — Valence Bond Theory, Hybrid Orbitals, Multiple Bonds, Molecular Orbital Theory <i>Friday, April 15 – Spring holiday – No classes</i>	Atomic Spectra
14	04/18	Chapter 9: Gases — Pressure, Temperature, Volume, Ideal Gas Law, Gas-Phase Stoichiometry, Effusion/Diffusion, Kinetic-Molecular Theory Exam 3 – Wed., Apr. 20 (Ch. 6, 7, 8, 9)	Modeling Geometry and Polarity
15	04/25	Thursday, April 28: Last Day to Drop Chapter 9, cont.	Analysis of KClO ₃ /KCl using the Ideal Gas Law
16	05/02	Chapter 10: Intermolecular Forces — Intermolecular Forces, Vapor Pressure, Phase Diagrams, Water Quiz 4 – Thurs., May 5	Lab Final Exam
17	05/09	Final Exams	

Course and University Policies:

All students are required to follow the policies and procedures presented in these documents:

- [Angelo State University Student Handbook](#)³
- [Angelo State University Catalog](#)⁴

Office Hours / Email Communication: Students can walk-in to the regular office hours. If you cannot make it during those hours, please make an appointment by email. Students are expected to frequently check their Angelo State email account and the Blackboard course website announcements for important communication from the instructor. Use CHEM1311 in the subject line of your emails to enable proper filtering. The instructor will only answer e-mails that are sent from an ASU e-mail account. The instructor will respond to legitimate e-mails within 24-48 hours during the week and may not respond until after weekends or holidays if messages are received on any of such days. More general questions will be addressed in the following lecture.

Academic Integrity: Students are expected to maintain complete honesty and integrity in all work. Any student found guilty of any form of dishonesty in academic work is subject of disciplinary action and possible expulsion from ASU.

The College of Science and Engineering adheres to the university's [Statement of Academic Integrity](#).⁵

Accommodations for Students with Disabilities: ASU is committed to the principle that no qualified individual with a disability shall, on the basis of disability, be excluded from participation in or be denied the benefits of the services, programs or activities of the university, or be subjected to discrimination by the university, as provided by the Americans with Disabilities Act of 1990 (ADA), the Americans with Disabilities Act Amendments of 2008 (ADAAA) and subsequent legislation.

Student Disability Services is located in the Office of Student Affairs, and is the designated campus department charged with the responsibility of reviewing and authorizing requests for reasonable accommodations based on a disability. It is the student's responsibility to initiate such a request by contacting an employee of the Office of Student Affairs, in the Houston Harte University Center, Room 112, or contacting the department via email at ADA@angelo.edu. For more information about the application process and requirements, visit the [Student Disability Services website](#).⁶ The employee charged with the responsibility of reviewing and authorizing accommodation requests is:

Dr. Dallas Swafford
Director of Student Disability Services
Office of Student Affairs
325-942-2047
dallas.swafford@angelo.edu
Houston Harte University Center, Room 112

Incomplete Grade Policy: It is policy that incomplete grades be reserved for student illness or personal misfortune. Please contact faculty if you have serious illness or a personal misfortune that would keep you from completing course work. Documentation may be required. See ASU Operating Policy 10.11 [Grading Procedures](#)⁷ for more information.

Plagiarism: Plagiarism is a serious topic covered in ASU's [Academic Integrity Statement](#)⁸ in the Student Handbook. Plagiarism is the action or practice of taking someone else's work, idea, etc., and passing it off as one's own. Plagiarism is literary theft.

In your discussions and/or your papers, it is unacceptable to copy word-for-word without quotation marks and the source of the quotation. It is expected that you will summarize or paraphrase ideas giving appropriate credit to the source both in the body of your paper and the reference list.

Papers are subject to be evaluated for originality. Resources to help you understand this policy better are available at the [ASU Writing Center](#).⁹

Student Absence for Observance of Religious Holy Days: A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. See ASU Operating Policy 10.19 [Student Absence for Observance of Religious Holy Day](#)¹⁰ for more information.

Title IX at Angelo State University: Angelo State University is committed to providing and strengthening an educational, working, and living environment where students, faculty, staff, and visitors are free from sex discrimination of any kind. In accordance with Title VII, Title IX, the Violence Against Women Act (VAWA), the Campus Sexual Violence Elimination Act (SaVE), and other federal and state laws, the University prohibits discrimination based on sex, which includes pregnancy, and other

types of Sexual Misconduct. Sexual Misconduct is a broad term encompassing all forms of gender-based harassment or discrimination and unwelcome behavior of a sexual nature. The term includes sexual harassment, nonconsensual sexual contact, nonconsensual sexual intercourse, sexual assault, sexual exploitation, stalking, public indecency, interpersonal violence (domestic violence or dating violence), sexual violence, and any other misconduct based on sex.

You are encouraged to report any incidents involving sexual misconduct to the Office of Title IX Compliance and the Director of Title IX Compliance/Title IX Coordinator, Michelle Miller, J.D. You may submit reports in the following manner:

Online: [Incident Reporting Form](#)¹¹

Face to Face: Mayer Administration Building, Room 210

Phone: 325-942-2022

Email: michelle.miller@angelo.edu

Note, as a faculty member at Angelo State, I am a mandatory reporter and must report incidents involving sexual misconduct to the Title IX Coordinator. Should you wish to speak to someone in confidence about an issue, you may contact the University Counseling Center (325-942-2371), the 24-Hour Crisis Helpline (325-486-6345), or the University Health Clinic (325-942-2171). For more information about resources related to sexual misconduct, Title IX, or Angelo State's policy please visit the [Title IX website](#).¹²

Information about COVID-19: Please refer to ASU's [COVID-19 \(Coronavirus\) Updates](#)¹³ web page for current information about campus guidelines and safety standards as they relate to the COVID-19 pandemic.

Modifications to the Syllabus: This syllabus, including grade evaluation and course/lab schedule, is subject to modification on potentially short notice based on developing circumstances.

¹ <http://uwm.edu/acs-exams/students/student-study-materials/>

² <http://blackboard.angelo.edu> (or access Blackboard from RamPort)

³ <https://www.angelo.edu/current-students/student-handbook/>

⁴ <https://www.angelo.edu/academics/catalog/>

⁵ <https://www.angelo.edu/live/files/27603-student-handbook-2020-21#page=96>

⁶ <https://www.angelo.edu/current-students/disability-services/>

⁷ <https://angelo.policystat.com/policy/10659448/latest/>

⁸ <https://www.angelo.edu/live/files/27603-student-handbook-2020-21#page=97>

⁹ https://www.angelo.edu/current-students/writing-center/academic_honesty.php

¹⁰ <https://angelo.policystat.com/policy/10659368/latest/>

¹¹ <https://www.angelo.edu/incident-form>

¹² <https://www.angelo.edu/title-ix>

¹³ <https://www.angelo.edu/covid-19/>