CHE 1052, General Chemistry I
Syllabus, Fall 2022, Aug. 30 – Dec. 16

This is a 4 unit chemistry course taught by the Department of Chemistry at PLNU. Chemistry is a fundamental building block of life since every physiological process ultimately involves chemical reactions. Throughout this semester, I strongly encourage you to review class work regularly, practice problems daily and ask as many questions as necessary in order to succeed. Talk to me one-on-one early and often; helping students like you discover this field is my favorite part of my job.

Dr. Samuel Stoneburner, Assistant Professor
Office: Rohr Science 322 (enter through 330)
Email: sstonebu@pointloma.edu
Phone: 619-849-7230

Lecture location: Taylor Hall 106
Section 1: MWF: 8:30 am – 9:35 am
Section 5: MWF: 12:15 pm – 1:20 pm
Final: Wed., Dec. 14, 4:30 pm – 7:00 pm

Communication: I will post information and announcements via Canvas. You should activate notifications. When I am not available in my office, the best way to reach me is by email. I will attempt to respond within one business day.

Office Hours: Tuesdays, 9:00am – noon
Wednesdays, 2:30pm – 3:30pm (except Sep. 21, Oct. 19, Nov. 9, and Dec. 7)
Fridays, 2:30pm – 3:30pm (except Nov. 18)

You do not need an appointment to meet with me during any of the above hours.
If you would like to meet me outside of the above hours, please email me to schedule an appointment. Please provide suggested meeting times between 9am and 4pm.

Course Description: Study of the basic principles of modern chemistry. Emphasis on atomic and molecular structure, chemical bonding, gas laws, states of matter, and solutions.
Prerequisite(s): Satisfactory high school background or CHE 1003 or PSC 1014
Corequisite(s): CHE 1052L (lab, graded separately)

Course Materials:

- *Textbook:* Tro, Chemistry: A Molecular Approach Plus Modified MasteringChemistry with eText, Pearson, 5th Edition, ISBN-13: 9780135748626 (hardcover text), 9780135748763 (looseleaf text), or 9780134989884 (etext)
- *Online Homework:* MasteringChemistry www.masteringchemistry.com (bundled with text or purchased separately) Course ID: beauvais28683
- *Scientific Calculator:* **Non-graphing**, **non-programmable** calculator required for exams and quizzes. (Acceptable models include, but are not limited to, a TI-30XIIS or a Casio FX-115ES.)
- *iClicker2 Student Remote:* ISBN-13: 9781498603041

About your professor: Dr. Stoneburner earned his associate's degree while renovating a local hardware store, his bachelor's degree while acting in minor roles in college theatre, and his doctorate while getting married and adopting four children. His hobbies include PC gaming (mainly single-player RPGs). It has never been proven that he attempted to steal the moon in order to take over the entire Tri-State Area, but even if he did do that, everything changed when the fire nation attacked and he took an arrow to the knee.

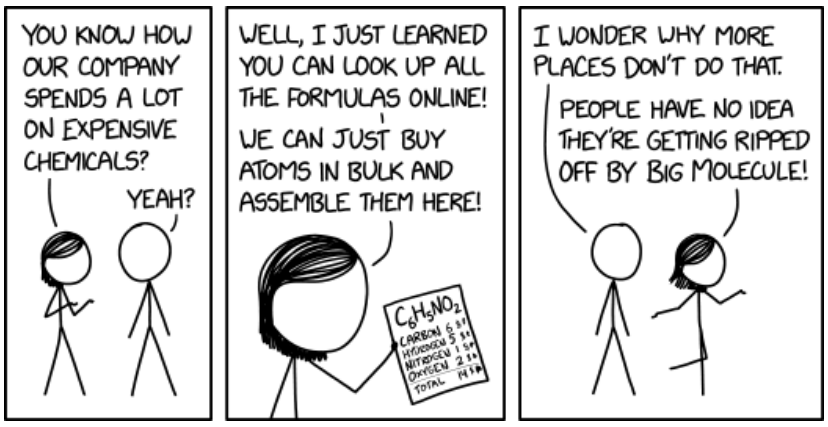
PLNU Mission: To Teach ~ To Shape ~ To Send
Point Loma Nazarene University exists to provide higher education in a vital Christian community where minds are engaged and challenged, character is modeled and formed, and service is an expression of faith. Being of Wesleyan heritage, we strive to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

Foundational Explorations Mission:
PLNU provides a foundational course of study in the liberal arts informed by the life, death, and resurrection of Jesus Christ. In keeping with the Wesleyan tradition, the curriculum equips students with a broad range of knowledge and skills within and across disciplines to enrich major study, lifelong learning, and vocational service as Christ-like participants in the world's diverse societies and culture.

Course Learning Outcomes: An understanding of chemistry is a necessary part of an education in the basic and applied sciences, engineering, and medical professions. It also provides insight and increased comprehension regarding current events and proposed policies. Specifically, upon completion of this course, students will be able to:

- Demonstrate a foundational knowledge of the general principles of chemistry including atomic and molecular structure, chemical bonding, states of matter, and behavior solutions.
- Solve problems related to unit conversions, stoichiometry, energy calculations, and gas laws.
- Perform basic chemical laboratory techniques related to the topics listed above.

Foundational Education Learning Outcome 1e Quantitative Reasoning: Students will be able to solve problems that are quantitative in nature. This learning outcome will be assessed directly using problems on the final exam that are quantitative in nature.



xkcd.com/2648/

Academic success: Learning chemistry will require significant effort from all of us. Merely attending lecture will not be enough. Merely reading the textbook will not be enough. Merely completing the assigned homework as a rote exercise will not be enough. You need to *understand* the course material and be able to apply it in new situations. You will be shown concepts, ideals, problem-solving strategies, and examples, but if the end you should be able to use what you have learned in a much wider range of situations than the ones considered in class. Here are some tips to help you get there:

Before each class:
Read the assigned chapter sections and make notes of anything that is confusing or difficult.
Do any assigned prelecture work in Mastering Chemistry.

During each class:
Have your notes from the pre-lecture reading handy. Some questions may be answered (hopefully) throughout the lecture. Ask questions to clarify anything that remains confusing.

After each class:
Look over the textbook again, especially the parts that seemed difficult before. Look over previous textbook sections as much as needed to reinforce relevant ideas and connections.
Attempt assigned homework as early as possible. This will give you more time to come in to office hours or ask questions over email as much as needed.

After you have completed assigned work, ***keep going***. Do additional problems from the end of each chapter and check your answers in Appendix III or with Dr. Stoneburner.

Don't stop practicing when you get it right; keep practicing until you can't get it wrong.

I am aware that you have other demands on your time, but this is what it will take to master General Chemistry. The PLNU Credit Hour Policy states that ***2 hours of preparation per 1 hour of class time is "normal", meaning 6.5 hours per week (besides lecture itself)*** for the CHE 1052 lecture course. If you find chemistry intimidating or find yourself struggling to keep up, you may need additional time. There should be no shame in that. If you put the time in, and do so usefully, you will probably understand chemistry much better than the student who seems to get all the right answers in the first few minutes of trying.

You can maximize the effectiveness of your time by giving yourself a focused environment. Do not try to "multitask" with videos or social media while you are working on chemistry. ("Multitask" is a word that here means "doing a poor job of multiple tasks simultaneously". That is what "multitask" *always* means.) I also recommend caution when consulting other resources on the internet. There is an abundance of misinformation online, much of it intentional.

Most of all, know that I am here to help, and your asking me questions early and often goes a long way towards making sure your precious time is spent as productively as possible. I want to see you succeed, and I look forward to participating in that success.

Grading and Assessment

"The risk I took was calculated, but man, am I bad at math." – The Mincing Mockingbird

Percent	Component
15 %	Mastering Chemistry online assignments
5 %	Participation
5 %	Christian practices
5 %	Quizzes
50 %	4 Exams (12.5% each)
20 %	Final Exam
100 %	Total

Letter grades will be assigned according to the following scheme:

Grade	Percentage
A	93.0-100.0 %
A–	90.0-92.9 %
B+	87.0-89.9 %
B	83.0-86.9 %
B–	80.0-82.9 %
C+	77.0-79.9 %
C	73.0-76.9 %
C–	70.0-72.9 %
D+	67.0-69.9 %
D	60.0-66.9 %
F	< 60 %

Important notes:

- "Points" will vary in significance depending on the total number of points available in a given component. In other words, 2 points on an exam may not have the same effect on your grade as 2 points on a quiz. Total points in a given category may change during the semester (e.g., if a quiz is added or dropped), but the percentage contributions given in the chart to the left will remain the same.

- Canvas will NOT have many of the current scores throughout the semester (other than Exams), so ***the Canvas total percentage is NOT a reliable indicator*** of your current performance. You can use the "What-If" tool in Canvas to obtain estimated grades, and you are welcome to request clarification as to your current status at any time.

- Extra credit and/or rounding of the final grade should not be expected or requested.

Participation: *Reading surveys on Canvas (2%):* For each reading assignment there will be a survey on Canvas (due 8:00 am on that lecture day). It will typically have (1) an open-ended question designed to highlight a key point in the reading and (2) a place to put down two questions you had about the reading. Credit is based on *whether* you respond, not on whether you get a "right" answer.

iClickers in class (3%): Throughout most lectures there will be questions involving responses using your iClicker remotes. You participation grade will be based on how many questions you answer, ***not*** how many questions you get correct. During lecture, it is okay to take a chance on being wrong (whether in iClicker responses or in asking questions) so long as you try to learn from the experience. Finding out you misunderstand something during class may help you avoid repeating that misunderstanding in an exam.

Mastering Chemistry online homework (Course ID: beauvais28683**):** The Mastering Chemistry content includes assigned homework problems as well as pre-lecture activities. Practicing what you are learning both before and after attending lecture is the most active (and most effective) part of your efforts in the course. Due dates will be found within the Mastering Chemistry system. The deadlines for assignments will be as follows:
Pre-lecture activities: 8am on Mondays, Wednesdays, and Fridays
Homework problem sets: 11:59pm on Mondays, Wednesdays, and Fridays.

If you find yourself struggling with a problem repeatedly (e.g., 5 wrong answers to the same problem), you should come to my office hours and ask for help. I recommend you use a notebook for working out solutions to homework problems. Using a notebook creates a written record that you can consult later as you study or seek assistance, and it can be beneficial in the event of academic integrity questions. A notebook with your work on previous attempts to a problem is especially helpful when you are asking for my assistance.

After completing the assigned work, you can find additional practice in the end-of-chapter problems in the textbook. Doing so is *strongly* recommended and I am happy to help you with any questions that may come from any of those problems.

Christian practices: It may not be obvious how Christian identity can overlap with the study of natural sciences. While that will come up from time to time in lecture, one of the most important aspects is community. This assignment is designed to demonstrate the importance of community and the Christian practice of love of neighbor during our studies.

You will be assigned to a group at the beginning of the semester and you will be asked to pray for members of the group throughout the semester. You will meet as a group at least three times during the semester, with the first meeting occurring in the first two weeks of class. (If your group decides to make your group a chemistry study group and meet more often, you are welcome to do so, but it is not a requirement of this assignment.)

You will be required to fill out a log that includes the times you met as a group, the times you have prayed for group members, as well as times that you have encouraged a classmate or helped them in some way. You will hand this log in at the end of the semester and will be required to have at least 10 entries *in addition* to the three group meetings. In addition, you will be required to write a brief reflection on the overall assignment.

This assignment is worth 100 points. 80 points are for the log, and 20 points for the reflection. If you do not identify as Christian, please do not feel as though you must pretend otherwise for the sake of this assignment. You may replace the “prayer” component with some other mindful exercise that is compatible with your beliefs, but it should still be focused on specific members of your group. The rest of the assignment will remain the same.

Quizzes: There will be quizzes roughly once per week covering content from the most recent few lectures. The day of the week and the delivery method (e.g., in-class vs. online) will likely vary. The quizzes will help you assess your understanding of the material, especially as you are preparing for exams. Look at them as additional opportunities to identify areas where you need my help or additional practice before your next exam. Note that you must use scientific (non-graphing, non-programmable) calculators on all quizzes and exams.

Exams: Exam days are on the course schedule at the end of the syllabus. Exams will not be moved outside of truly extraordinary circumstances. In keeping with PLNU policy, make-up exams will not be offered unless you get my permission before the exam ***and*** you must miss the scheduled exam time due to illness or similar circumstances beyond your control. If you are requesting to reschedule an exam due to illness, please obtain written verification from the Wellness Center (or some other relevant medical professional). Note that you must use scientific (non-graphing, non-programmable) calculators on all quizzes and exams.

Final Exam: The final exam will be on Wednesday, December 14th, 4:30pm-7:00pm. PLNU policy is that the final exam is required and that it must be given at the scheduled time. No change of final exam schedule will be approved for CHEM 1052. Travel arrangements are *not* a valid reason to request a change to the final exam (or any other exam or assignment).

Additional Notes and Policies

"Good men don't need rules. Today is not the day to find out why I have so many." – Doctor Who

Incompletes and late assignments: All assignments are to be submitted/turned in by the beginning of the class session when they are due, including assignments posted in Canvas. Incompletes will only be assigned in extremely unusual circumstances. Late work will not receive credit. Quizzes and exams will not have make-up opportunities without my prior approval (see "Exams" under "Grading and Assessment" for more details).

PLNU Attendance and participation policy: Regular and punctual attendance at all class sessions is considered essential to optimum academic achievement. If the student is absent for more than 10 percent of class sessions, the faculty member will issue a written warning of de-enrollment. If the absences exceed 20 percent, the student may be de-enrolled without notice until the university drop date or, after that date, receive the appropriate grade for their work and participation.

PLNU copyright policy: Point Loma Nazarene University, as a non-profit educational institution, is entitled by law to use materials protected by the US Copyright Act for classroom education. Any use of those materials outside the class may violate the law.

Spiritual care: PLNU strives to be a place where students grow as whole persons. To this end, we provide resources for our students to encounter God and grow in their Christian faith.
If you have questions, a desire to meet with the chaplain, or if you have prayer requests, you can contact the Office of Student Life and Formation.

State authorization: State authorization is a formal determination by a state that Point Loma Nazarene University is approved to conduct activities regulated by that state. In certain states outside California, Point Loma Nazarene University is not authorized to enroll online (distance education) students. If a student moves to another state after admission to the program and/or enrollment in an online course, continuation within the program and/or course will depend on whether Point Loma Nazarene University is authorized to offer distance education courses in that state. It is the student's responsibility to notify the institution of any change in his or her physical location. Refer to the map on State Authorization to view which states allow online (distance education) outside of California.

Sexual misconduct and discrimination: Point Loma Nazarene University faculty are committed to helping create a safe learning environment for all students. If you (or someone you know) have experienced any form of sexual discrimination or misconduct, including sexual assault, dating or domestic violence, or stalking, know that help and support are available through the Title IX Office at pointloma.edu/Title-IX. Please be aware that under Title IX of the Education Amendments of 1972, it is required to disclose information about such misconduct to the Title IX Office.

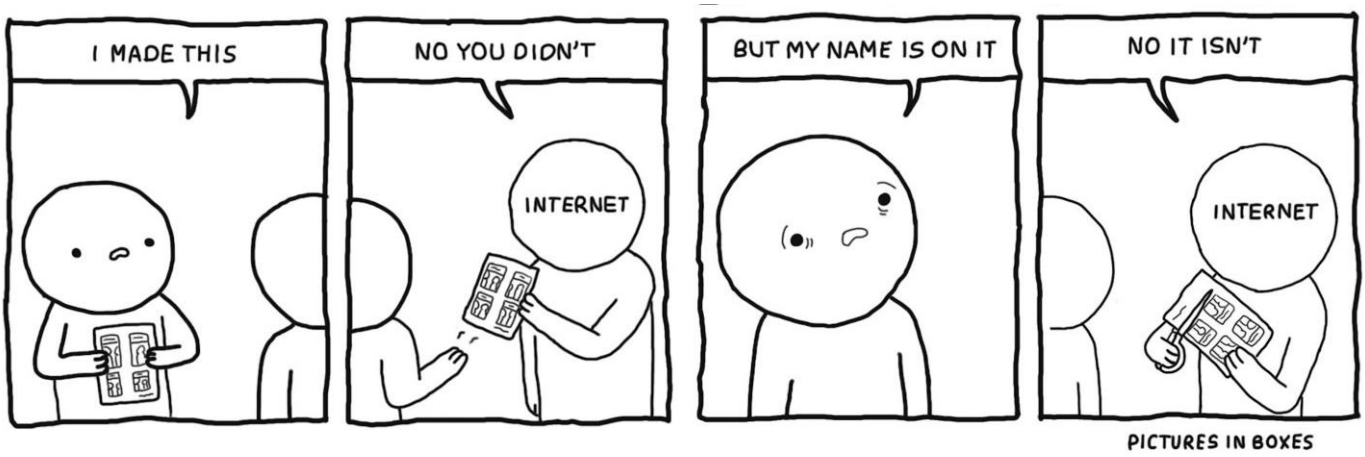
If you wish to speak to a confidential employee who does not have this reporting responsibility, you can contact Counseling Services at counselingservices@pointloma.edu or find a list of campus pastors at pointloma.edu/title-ix

PLNU academic accommodations policy
PLNU is committed to providing equal opportunity for participation in all its programs, services, and activities. Students with disabilities may request course-related accommodations by contacting the Educational Access Center (EAC), located in the Bond Academic Center (EAC@pointloma.edu or 619-849-2486). Once a student's eligibility for an accommodation has been determined, the EAC will issue an academic accommodation plan ("AP") to all faculty who teach courses in which the student is enrolled each semester.

PLNU highly recommends that students speak with their professors during the first two weeks of each semester/term about the implementation of their AP in that particular course and/or if they do not wish to utilize some or all of the elements of their AP in that course.

Students who need accommodations for a disability should contact the EAC as early as possible (i.e., ideally before the beginning of the semester) to assure appropriate accommodations can be provided. It is the student's responsibility to make the first contact with the EAC.

PLNU academic honesty policy: Students should demonstrate academic honesty by doing original work and by giving appropriate credit to the ideas of others. Academic dishonesty is the act of presenting information, ideas, and/or concepts as one's own when in reality they are the results of another person's creativity and effort. A faculty member who believes a situation involving academic dishonesty has been detected may assign a failing grade for that assignment or examination, or, depending on the seriousness of the offense, for the course. Faculty should follow and students may appeal using the procedure in the university Catalog. See Academic Policies for definitions of kinds of academic dishonesty and for further policy information.



(Ironically, it took me a long time to find a copy of this comic that hadn't had the author's name deleted.)

CHE 1052: General Chemistry I: Tentative schedule

The schedule may change during the semester. Watch Canvas for updates. *NOTE: Almost all class days have prelecture assignments due 8am and homework assignments that are due 11:59pm.

Day		Topics	Pre-Read	Lab
T	Aug 30	Atoms, Molecules, Scientific Approach, Classification of Matter, Physical/Chemical Changes and Properties	1.1-1.4	No Lab
W	Aug 31	Energy, Units/Reliability of Measurements and Solving Chemical Problems	1.5-1.8	
F	Sep 2	Atoms, Modern Atomic Theory and Laws, Electrons, Atomic Structure and Subatomic Particles	2.1-2.6	
M	Sep 5	***No class due to Labor Day***	—	1: Scientific Measure-ments
W	Sep 7	Periodic Law, Periodic Table, Atomic Mass and Molar Mass	2.7-2.9	
F	Sep 9	Chemical Bonds, Chemical Formulas, Formula Mass, Composition of Compounds (Sep. 9 last day to add)	3.1-3.4, 3.8-3.9	
M	Sep 12	Chemical Nomenclature and Molar Mass of Compounds	3.5-3.7	2: Zinc Iodide
W	Sep 14	Composition of Compounds, Determining Chemical Formulas	3.9-3.10	
F	**Sep 16**	**EXAM 1: Ch. 1-3**	**1.1-3.10**	
M	Sep 19	Writing & Balancing Chemical Equations; Reaction Stoichiometry	4.1-4.3	3: Copper Cycle
W	Sep 21	Limiting Reactant; Theoretical and Percent Yield; Examples of Chemical Reactions	4.4-4.5	
F	Sep 23	Solution Concentration and Stoichiometry; Types of Aqueous Solutions	5.1-5.4	

	Day	Topics	Pre-Read	Lab
M	Sep 26	Solubility; Precipitation Reactions; Representing Aqueous Reactions	5.5-5.6	4: Acid-Base Titration
W	Sep 28	Acid–Base and Gas Evolution Reactions; Oxidation–Reduction Reactions	5.7-5.9	
F	Sep 30	Pressure; Gas Laws	6.1-6.4	
M	Oct 3	Applications of the Ideal Gas Law, Gas Mixtures and Gas Stoichiometry	6.5-6.7	5: Ideal Gas Law
W	Oct 5	Kinetic Molecular Theory, Diffusion, Effusion, and Real Gases	6.8-6.10	
F	**Oct 7**	**EXAM 2: Ch. 4-6**	**4.1-6.10**	
M	Oct 10	Energy Definitions, Internal Energy, Heat and Work	7.1-7.4	6: Molar Volume
W	Oct 12	Calorimetry and Enthalpy	7.5-7.6	
F	Oct 14	Calorimetry and ΔH_{rxn}	7.7-7.8	
M	Oct 17	Enthalpy of Reaction, Nature of Light	7.9, 8.1-8.2	7: Calorimetry
W	Oct 19	Atomic Spectroscopy; Bohr Model	8.3	
F	Oct 21	***No class due to Fall Break***	—	
M	Oct 24	Wave Nature of Matter, and Quantum Mechanics	8.4-8.5	8: Hess's Law
W	Oct 26	Quantum Mechanics; Atomic Orbitals; Electron Configurations	8.6, 9.1-9.3	
F	Oct 28	Periodic Table, Electron Configurations, and Valence Electrons; Quantum Mechanical Model	9.4-9.5	
M	Oct 31	Periodic Trends and Ions	9.6-9.7	9: Absorption and Emission Spectroscopy
W	Nov 2	Electron Affinities, Metallic Character and Periodic Chemical Behavior, Exam Review	9.8-9.9	
F	**Nov 4**	**EXAM 3: Ch. 7-9** (Nov. 4 last day to drop)	**7.1-9.9**	
M	Nov 7	Types of Chemical Bonds, Lewis Structures, and Ionic Bonding	10.1-10.4	10: Conductivity
W	Nov 9	Covalent Bonding, Electronegativity, Bond Polarity and Lewis Structures	10.5-10.7	
F	Nov 11	Resonance and Formal Charge	10.8	
M	Nov 14	Exceptions to Octet Rule, Bond Energies, and Bond Lengths	10.9-10.10	11: Lewis Structures
W	Nov 16	VSEPR Theory and Molecular Geometries	11.1-11.4	
F	Nov 18	Molecular Shape, Polarity and Valence Bond Theory	11.4-11.7	
M	Nov 21	Valence Bond Theory and Molecular Orbital Theory	11.7-11.8	No Lab
W	Nov 23	***No class due to Thanksgiving Break***	—	
F	Nov 25	***No class due to Thanksgiving Break***	—	
M	Nov 28	Molecular Orbital Theory and Intermolecular Forces	11.8, 12.1-12.3	12: Enthalpies of Fusion and Vaporization
W	Nov 30	Intermolecular Forces, Vaporization and Vapor Pressure	12.4-12.5	
F	Dec 2	Sublimation, Fusion, and Heating Curves	12.6-12.7	
M	Dec 5	Phase Diagrams; Water; Exam Review	12.8-12.9	13: Crystal Structures
W	Dec 7	**EXAM 4: Ch. 10-12**	—	
F	Dec 9	Final Exam Review		
W	Dec 14	**COMPREHENSIVE FINAL EXAM** **All Sections Wednesday 4:30 – 7:00 pm** ***(See Final Exam Schedule)***	**Ch. 1-13**	No Lab