

Chemistry 1A, Fall 2017 Course Syllabus

Reedley College, SCCCD

Course Info:

Course #: 56666 – Lecture Mon/Wed 1:00-2:15pm in PHY-82; Lab Mon/Wed 2:30-5:20 in PHY-77

Instructor and Contact Information:

Instructor: Kurtis Thiesen
Office: ANX 5 (Faculty Annex)
Office Hours: Mon 8:30-10:30am; Wed 8:30-10:30am; Fri 8:30-9:30am (virtual)
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Prerequisites:

To become enrolled in CHEM 1A students need to have passed high school chemistry or CHEM10 or CHEM3A AND basic algebra (Math 103) with a grade of C or better.

Required Items:

***Textbook:** Chemistry: A Molecular Approach, 4th edition by Nivaldo J. Tro; *Note: You're welcome to rent or purchase a previous edition (2nd or 3rd edition) of this textbook (hardcopy or etext) anywhere you can find one. On the first day of class we'll discuss the different options you have for purchasing the textbook and other course materials. In addition, homework will be administered using an online program called Mastering Chemistry; online access to Mastering Chemistry may be purchased online, and information for getting registered for MC will be discussed on the 1st day of class in addition to being posted on Canvas.

Lab Text: The labs will be posted (free of charge) on Canvas; you'll need to print these out and bring them with you to lab each day.

Scientific calculator: Any scientific calculator is acceptable, but graphing/programmable calculators and cell phone calculators are NOT allowed during exams and quizzes.

Safety Goggles, Lab coat, & Gloves: You will not be allowed to participate in lab experiments without your safety goggles and a lab coat. Approved safety goggles and lab coats are available for purchase in the bookstore. Gloves will be provided for you in lab.

Scantron Form: #882-E, you'll need one of these for each exam we take in class.

Course Description

This is the first course in a two-course sequence in general chemistry and it is intended for students majoring in a science discipline or those attempting to satisfy prerequisites for professional schools. This course covers the principles and laws of inorganic chemistry with an emphasis on quantitative, mathematical problem-solving. Topics included in the course are atoms, molecules and ions; formulas and equations; stoichiometry; gas laws; electronic structure of atoms; bonding; atomic orbital and molecular orbital theories; solutions; precipitation reactions; oxidation reduction reactions; introduction to acids and bases; thermochemistry; properties of liquids; solids and crystal structures; solution behavior; colligative properties; associated laboratory experiments; and volumetric and gravimetric analysis methods.

Additional Resources:

- Supplemental Instruction
- Free tutoring is available in the Tutorial Center (by the library) or the STEM tutorial center (FEM). The link to the RC Tutorial Center is as follows: <http://www.reedleycollege.edu/index.aspx?page=128>

Important Dates:

- Friday, Sept. 1 – Last day to drop a full-term class without receiving a “W” on your transcript.
- Friday, Oct. 13 – Last day to drop a full-term class.

Course Policies:

Lecture Attendance:

- Lecture attendance is mandatory; attendance will be recorded for lecture and lab. You are responsible for the material that you miss if you are absent from lecture or lab.
- Any student who is not present at the start of the first class period may be dropped and their spot given to another student. Also, if a student misses more than 25% of the lectures/labs they may be dropped.

Lab Attendance:

- In order to be counted as present for a lab you must arrive on time, participate in the experiment or activity, and, unless otherwise instructed, stay the entire lab period. In other words, if you arrive late, leave early, or do not participate in lab activities, you may be counted absent and given a zero on your lab report. Note: Showing up late for lab is a safety risk for you and others as specific safety concerns are generally addressed at the beginning of lab.
- **Important: More than three missed laboratory sessions will result in an 'F' in laboratory**
Please note: As lecture and lab are integrated, it is not possible to obtain a passing grade in CHEM 1A with a grade of 'F' in lab.

Canvas:

- Canvas will be used extensively in this course, and students will be expected to check Canvas regularly for updates; lecture powerpoints and other important documents (for both lecture and lab) will be uploaded to Canvas regularly.

Reading:

- Listed on the course schedule (which is posted on Canvas on or before the first day of class) is the associated reading for each chapter. The course expectation is that you will have completed the readings before coming to class on the days those topics are discussed etc.

Missed exams, quizzes and labs:

- Make-up exams and quizzes are generally not given. Since your lowest exam may be dropped, if you miss an exam that score of "0" will count as your dropped score.
- Official RC Policy concerning absences - "There are no institutionally approved excused absences for any reason. Only your instructor may excuse an absence. Absences caused by personal engagements, transportation delays and business affairs will not be excused, nor will absences from class to complete registration or add/drop activities...Makeup work must be completed to the satisfaction of the instructor of the course. Being excused from class does not relieve the student from the responsibility for completing all assignments."

Cheating:

- Cheating is the act or attempted act of taking an examination or performing an assigned, evaluated task in a fraudulent or deceptive manner, such as having improper access to answers in an attempt to gain an unearned academic advantage. Cheating may include, but is not limited to, copying from another's work, supplying one's work to another, giving or receiving copies of examinations without an instructor's permission, using or displaying notes or devices inappropriate to the conditions of an examination, allowing someone other than the officially enrolled student to represent the student, or failing to disclose research results completely.
- You are encouraged to work together on labs. However, ***your individual work must be evident***. Do not allow others to copy directly from your work. Instances of confirmed cheating will generally result in failure in this course and be referred to the Dean for further action.
- Electronic devices such as cell phones, tablets, etc. are not allowed during exams and must be put away in a backpack or purse; confirmed use of these devices constitutes cheating.
- As an alternative to automatic failure in the course, at the instructor's discretion, you may instead be assigned negative credit for the amount of points possible on the assignment. In this instance, the score would not be allowed to be dropped as your lowest score.
- RC Academic Dishonesty Statement: *"Because cheating, plagiarism, and collusion in dishonest activities erode the integrity of the college, each student is expected to exert an entirely honest effort in all academic endeavors. Academic dishonesty in any form is a very serious offense and will incur serious consequences."*

Plagiarism:

- Plagiarism is a specific form of cheating: the use of another's words or ideas without identifying them as such or giving credit to the source. One of the most common forms of this is copying information from a website and pasting it into your document. Instances of plagiarism will be treated like any other form of cheating.

Laboratory Safety:

- On the first day of lab we will cover various safety rules. If you do not follow these rules, you will be asked to leave and you may be dropped from the course. For example, if you refused to wear safety glasses, you would be immediately and permanently removed from the course for the protection of you and those around you.

Disabled Students:

- It is our policy not to discriminate against any student. If you suspect that you have any type of physical disability or learning disability that is relevant to your performance in the course, I'll encourage you to come talk to me about it right away (though you're not required to). Additionally, it may be helpful for you to stop by the disabled student services office and talk with staff members there to determine what kinds of services and support are available to you to help you succeed in this and other courses. SCCCD policy: *If you have a verified need for an academic accommodation or materials in alternate media (i.e., Braille, large print, electronic text, etc.) per the Americans with Disabilities Act (ADA) or Section 504 of the Rehabilitation Act, please contact the Disabled Student Services as soon as possible.*

Electronic Devices:

- Use of electronic devices (laptop, tablet, etc.) in lecture is acceptable as long as it's not a distraction to the instructor or to other students. Cell phones are generally NOT allowed in lab; if/when computer use is appropriate, it must be done in such a way as to not cause a safety risk (e.g. do not handle chemicals and then use your computer without removing your gloves and/or washing your hands). Electronic devices of any kind are NEVER permitted during exams.

Classroom Visitors:

- In accordance with Reedley College policy, only students currently enrolled in the course will be allowed in the classroom during lab and lecture.

Grading: Your course grade will be calculated as follows:

Lab Reports	15%
Lab Quizzes	10%
*Exams	45% (5 unit exams worth 9% each)
Final exam	18%
Homework	12%

*I will replace your lowest unit exam score with your final exam score if your final exam score exceeds it (see "exams" section for a more detailed explanation).

***Grading Scale:**

A	90-100%
B	80-89%
C	70-79%
D	60-69%
F	0-59%

*The instructor reserves the right to alter grade ranges to accommodate borderline grades.

Lab Reports: Expectations about lab reports (including formatting, etc.) will be discussed during our orientation to lab policy and safety.

Lab Quizzes: There will be 4 lab quizzes during the term that are meant to examine whether you've gained a thorough understanding of relevant lab theory, techniques associated with lab experimentation, and, where appropriate, how these lab experiments are related to lecture topics. These will generally be given at the beginning of lab.

Exams: There will be 5 unit exams that are weighted equally and a final exam which is weighted more heavily; these exams may be multiple choice, essay, short answer, or a mixture of these. Make-up exams will NOT be given for unit exams or for the final exam; however, the score on your lowest unit exam may be replaced by your final exam score if your final exam score exceeds it (and if you miss an exam, this will automatically count as your lowest unit exam score). Though each unit exam will be written primarily to examine topics in the current unit/recent chapters, topics in chemistry build upon one another and so all exams should be considered comprehensive.

Homework: Homework will be administered online using Mastering Chemistry. A code for online access to Mastering Chemistry may be purchased online during the registration process (we'll discuss this further on the first day of class).

Student Learning Outcomes for CHEM 1A:

(Specify the learning skills the student demonstrates through completing the course and link critical thinking skills to specific course content and objectives.)

Upon completion of this course, students will be able to:

- A. Collect and analyze data and have reasonable conclusions. Assessed by the lab practical.
- B. Competent knowledge of the periodic table, molecules, and compounds. Assessed from a pre-test administered at the beginning of the semester and the final exam administered at the end of the semester.
- C. Ability to apply skills to solve chemical problems especially math skills. Assessed from a pre-test administered at the beginning of the semester and the final exam administered at the end of the semester.

Course Objectives for CHEM 1A:

(Specify major objectives in terms of the observable knowledge and/or skills to be attained.)

In the process of completing this course, students will:

- A. Use systematic nomenclature to name and classify chemical species.
- B. Predict ionic and covalent bonding between species.
- C. Convert from the English to the metric system in weights, volume, and linear measurements.
- D. Calculate molecular weights, formula weights, gas volumes, temperature, pressure concentration of solutions, molarity, empirical and molecular formulas, and percentage composition.
- E. Define the structural periodicity of the elements and discuss the trends in all directions on the periodic chart and the terms for grouping elements, i.e., metalloids, transition elements, inner transition, etc..
- F. Use stoichiometric relationships to calculate quantities of reactants, products, limiting reactants, theoretical yields, percent yields, and chemical formulas.
- G. Describe covalently bonded structures using Lewis theory, valence bond theory (including hybrid orbitals), and molecular orbital theory of diatomic molecules.
- H. Define the theoretical and mathematical description of ideal gases, including the concepts of temperature and kinetic energy distribution.
- I. Identify types of reactions, predict the outcomes of chemical reactions, and write and balance chemical reactions.
- J. Apply the first law of thermodynamics, contrast internal energy and enthalpy, describe how energy changes are related to temperature, atomic motions, and change in chemical bonding and perform thermochemical calculations.
- K. Describe colligative properties of solutions of ionic and non-ionic substances and solve their numerical problems.
- L. Effectively collect, record, and analyze experimental data, recognize the limitations of measurements and identify sources or error, and interpret experimental results and correlate experimental results with the appropriate theory.

Tentative schedule

Week	Date	Lecture topics	Text section	Lab experiment
1	8/14	M Intro. to Chem. 1A + Matter and Problem Solving	Ch 1.1-1.5	Intro to Lab Policy/Safety + Locker Check-in
1	8/16	W Matter and Problem Solving Cont'd + Atomic Structure	Ch 2.1-2.6	Exp 0a – Laboratory Techniques
2	8/21	M Atomic Structure Cont'd	Ch 2.7-2.9	Measurements/SigFigs (1.6-1.7 = Ch1b ppt) + Exp 1a – Intro to Measurements
2	8/23	W Compounds	Ch 3.2-3.4	Exp 2a – Intro to Qualitative Observations
3	8/28	M Compounds Cont'd	Ch 3.8-3.10	Exp 3a – Determination of a Chemical Formula
3	8/30	W Stoichiometry and Solution Concentration	Ch 4.2-4.4	Exam #1
4	9/4	M Labor Day (No Lecture)		No Lab
4	9/6	W Balancing Reactions	Ch 3.11	Nomenclature Discussion (3.5-3.7, 3.12 = Ch3b ppt) + Nomenclature Worksheet
5	9/11	M Reaction types	Ch 4.5-4.7	Exp 4b – Densities of NaCl Solutions
5	9/13	W Net Ionic Equations + Balancing Redox Reactions	Ch 4.8-4.9, 18.2	Catch up if necessary + Lab Quiz #1
6	9/18	M Gases	Ch 5.2-5.6	Exp 4a – Net Ionic Equations
6	9/20	W Gases	Ch 5.7-5.10	Exp 4a cont'd
7	9/25	M Thermochemistry	Ch 6.2-6.6	Exp 5a – Molar Mass of a Volatile Liquid
7	9/27	W Thermochemistry	Ch 6.7-6.9	Exam #2
8	10/2	M Quantum Mechanics	Ch 7.1-7.4	Exp 6b – Calorimetry/Hess's Law
8	10/4	W Quantum Mechanics	Ch 7.5-7.6	Exp 6b cont'd
9	10/9	M Electron Configurations	Ch 8.2-8.5	Catch up if necessary + Lab Quiz #2
9	10/11	W Periodic Trends	Ch 8.6-8.9	Exp 7a – Emission Spectra
10	10/16	M Ionic Bonding	Ch 9.2-9.4	Exp 4k – Gravimetric Analysis of Calcium
10	10/18	W Covalent Bonding	Ch 9.5-9.6	Exam #3
11	10/23	M Polarity, Resonance, Formal Charges	Ch 9.7-9.11	Exp 4k cont'd
11	10/25	W VSEPR Theory	Ch 10.2-10.5	Exp 4l – Determination of Citric Acid
12	10/30	M VSEPR Theory Cont'd		Exp 4l cont'd
12	11/1	W MO Theory	Ch 10.6-10.8	Molecular Geometry + Polarity Worksheets
13	11/6	M MO Theory Cont'd		Catch up if necessary + Lab Quiz #3
13	11/8	W Intermolecular Forces	Ch 11.2-11.6	Lab Practical (TBD, Group 1)
14	11/13	M Intermolecular Forces cont'd		Lab Practical (TBD, Group 2)
14	11/15	W Intermolecular Forces cont'd	11.7-11.8	Exam #4
15	11/20	M Crystal Structures	Ch 12.2-12.8	Exp 4i - % oxalic acid in a solid (redox)
15	11/22	W Solution Concentrations	Ch 13.5	Exp 11b – Paper Chromatography
16	11/27	M Colligative Properties	Ch 13.6	Catch up if necessary + Lab Quiz #4
16	11/29	W Colligative Properties cont'd	Ch 13.7	Exp 13a – Freezing Point Depression
17	12/4	M Selected Topics + Final Exam Review		Exam #5
17	12/6	W Final Exam Review		Make ice-cream + check-out of lockers
18	12/11	M Final Exam 1:00-2:50pm		