

**Course Purpose / Objective**

The objective of this course is that each student gain chemical literacy, the quality of being able to understand chemical concepts, make moral and ethical judgments about chemical issues, and solve real-world problems that involve chemistry. This course will be presented from a Christian perspective.

**Instructor**

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**Textbooks**

Heath Chemistry (1993) Herron *et al.*  
Prentice Hall Chemistry (2005) Wilbraham *et al.*  
Prentice Hall Small-Scale Chemistry Laboratory Manual (2005) Waterman

**Course Outline**

*the first 12 chapters plus topics from 13-25...*

Chapter 1	Introduction to Chemistry	Chapter 13	States of Matter
Chapter 2	Matter & Change	Chapter 14	The Behavior of Gases
Chapter 3	Scientific Measurement	Chapter 15	Water & Aqueous Systems
Chapter 4	Atomic Structure	Chapter 16	Solutions
Chapter 5	Electrons in Atoms	Chapter 17	Thermochemistry
Chapter 6	The Periodic Table	Chapter 18	Reaction Rates & Equilibrium
Chapter 7	Ionic & Metallic Bonding	Chapter 19	Acids, Bases, & Salts
Chapter 8	Covalent Bonding	Chapter 20	Oxidation-Reduction Reactions
Chapter 9	Chemical Names & Formulas	Chapter 21	Electrochemistry
Chapter 10	Chemical Quantities	Chapter 22	Hydrocarbon Compounds
Chapter 11	Chemical Reactions	Chapter 23	Functional Groups
Chapter 12	Stoichiometry	Chapter 24	The Chemistry of Life
		Chapter 25	Nuclear Chemistry

**Workload and Grading**

homework	one set per section, 5 points per question
quizzes	one per section, 10 points each
exams	one per chapter, 50 points each
labs	one per week (on block day), 50 points each
finals	one per semester, 50 points each

**Required Materials**

1" three-ring binder  
three-hole punched lined paper  
composition book (line or graph paper, not spiral-bound)  
TI-83+ (or similar) graphing calculator  
black or blue pen

**Rules**

Respect & Safety (see also Student Handbook)

**Procedures**

seating	assigned (at lab tables) bring everything needed for class including planner may bring a drink but not food (except during laboratory exercises)
behavior	in class: mature adolescent Christian, "eyes here" in lab: extremely careful, no horseplay
homework	handed in on due date, always individual work (no groups), "over and up, yours on top"
cabinets	closed cabinets off-limits (except under microwaves) open bookshelf for reference materials (all which stay in room)
dismissal	bell for instructor, then instructor dismisses class
tardy	stand at door and ask permission to enter during natural break
absent	receive assignments from classmate

**Laboratory Exercises**

The heart of any chemistry course is hands-on lab work, which compliments, reinforces, and extends the material presented during a lecture. Labs will occur about once per week on the block day. Labs for this course will use a small-scale chemistry approach, which is comprehensive, relatively safe, and time-efficient, also inexpensive and environmentally sound compared to traditional chemistry with conventional glassware and large quantities of chemicals. Eye protection, chemicals (dry & in solution), and laboratory equipment are provided. Students are to keep a laboratory notebook documenting each experiment.

**Safety Contract**

I understand a chemistry laboratory has the potential to be either a safe or dangerous place depending upon my adherence to safe laboratory practices. I have read the pages from the *Small Scale Chemistry Laboratory Manual* that describe laboratory safety, laboratory hazards, and safe laboratory techniques [including, but not limited to, the list below]. I have asked questions about any section that is unclear to me.

1. Wear safety glasses
2. Reduce inherent risk by reading, listening, and asking
3. Pipets are pipets, not squirt-guns
4. Use minimum amount of chemicals
5. Conduct assigned experiments with supervision
6. Follow cleanup and disposal instructions
7. Know location of fire extinguisher & blanket, shower, eye wash, and emergency exits
8. Assume all chemicals are toxic – nothing in mouth; no food or drink; wash hands
9. Report all incidents
10. Electricity and water do not mix
11. Do not handle heated or broken glass
12. Protect clothing and hair (roll up sleeves, remove dangling jewelry, tie back hair, etc)
13. Wear closed-toed shoes
14. Keep work area orderly
15. Report and clean up spills
16. Watch for safety symbols and take appropriate precautions

I agree to approach laboratory work with maturity. I agree to behave in a way that always promotes a safe laboratory environment for myself, my classmates, and the instructor. I agree to use chemicals and to clean them up in a way that protects myself, my classmates, the instructor, and our environment.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

**Laboratory Notebook**

Discoveries become a part of science when they are communicated. In writing, scientists must express themselves so clearly that a person can repeat their procedures exactly and be able to understand every detail of their work. Scientific reports for this course will be written into a laboratory notebook (and not the *Small Scale Chemistry Laboratory Manual*) using the following form:

- |                          |           |                                     |
|--------------------------|-----------|-------------------------------------|
| 1. Title                 | 02 points | name of laboratory exercise         |
| 2. Objectives            | 05 points | why are we doing this?              |
| 3. Safety                | 05 points | lose 5 points per minor infraction  |
| 4. Materials & Equipment | 05 points | list of all supplies needed         |
| 5. Procedure             | 10 points | list what you did                   |
| 6. Data / Results        | 10 points | detail what happened                |
| 7. Analysis              | 10 points | ponder meaning of results           |
| 8. Sign & Date           | 03 points | verify work at bottom of every page |