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Chemistry 100

The Chemist's View of the World

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Agenda

- Roll call
- Questionnaire
- Go over syllabus and tentative schedule
- Begin unit 1

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Chemistry 100

3 exams (100 points)	300 points
1 Final exam (200 points)	200 points
Quizzes (best 10 of ~14)	100 points
Writing/Problem assignments	100 points
Total	700 points

Approximate grading scale: 90-80-70-60

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What Are the Lectures Like?

PowerPoint slides- given a choice between writing down what's on the slides and listening, Listen.

If you get behind taking notes, jot down the slide number in red in the upper-left corner. All slides will be on the web.

Most material covered both in the book and in lecture.

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Exams: Four Major Question Types

- vocabulary
 - pH- a measure of the number of protons in a solution
- concepts
 - Q: what equation is used to determine the pH of a solution?
 - A: $\text{pH} = -\log[\text{H}^+]$
- application of concepts
 - what is the pH of a solution if I add 1.5 mL of 0.5M HCl to 500.0 mL H_2O
- Multiple choice

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Exams: Other Pertinent Info

- We will have a review session before every exam. If you can't make it then, you are more than welcome to bring in questions for a one-on-one help session.

Q: What material are we responsible for?

A: A section of the web page title "Specific Chapter Objectives" will give you a very complete checklist of what to know.

- Old copies of all exams on web site

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Quizzes

- Weekly to make sure you study
- Any of the types of questions
- Make sure you can answer the questions by test time

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Writing and Problem Assignments

Problems

- Make sure you do them yourself
- Make sure you can do them on the exam

Writing

- Proper English grammar
- Maximum length
- NO FLUFF
- Re-writes

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How to Do Well in Chemistry

1. Begin with the end in mind (sp. ch. Objectives)
2. Bad habits to avoid.
3. Good study habits to cultivate.
 - a. Find your most productive time and schedule study during that time.
 - b. Find an area to study in and only study there.
 - c. Study 50 minutes, 10 minute break
 - d. Always attempt to solve a problem on your own before asking for help.

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How to Do Well in Chemistry, cont'd

- Schedule study time and recreation time.
- Don't let unclear things slide by.

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The Way to Study Chemistry SQ3R Reading

Scan assigned reading material before class

Write a list of Questions on the material

listen during class and take notes

Read material

Recite- put in your own words

Review the weeks notes every weekend

these steps should supplement class
notes

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The Way to Study Chemistry Note-taking

No best way

divide page in half and take lecture notes and
book notes side by side

After you have all your notes, if you still don't
understand something,

- ask in class
- email me
- come see me in my office

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The Way to Study Chemistry Other Tips

Have a clear understanding of what I expect
Work Lots of Problems
Complete Chapter Review Questions

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What This Class Is

- Fast-paced
- Quite a bit of material

What This Class Is Not

- An easy A
- A high school class (more in-depth)



We Begin With Science

Science- study of nature, trying to understand how and why things work, using logic and experimentation.

The Scientific Method

- Observe a phenomenon
 - Formulate a *hypothesis*
Hypothesis- "Educated Guess."
 - Design experiments to test hypothesis
 - Conduct the experiments and analyze the results
 - ?Are the results consistent with hypothesis?
 - Refine hypothesis if necessary
- A good scientist will generate as many questions as (s)he answers.

Science Definitions

Hypothesis- "Educated Guess" concerning how or why a phenomenon occurs.

Theory- A hypothesis becomes theory by becoming "widely" accepted because of testing. It is a proposed explanation for how or why something happens and generally cannot be proven.

Law- A law is a universally accepted explanation of what happens.

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Difficulties and Limitations of Scientific Investigations

Design- will the experiment answer the question asked?

- Variables controlled
- MEASUREMENT
- Time
- Bias
- Reproducibility

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Research Definitions

Research- Investigation into how things work and how they can be manipulated.

Basic- asking questions with the goal of obtaining knowledge.

Applied- asking how we can use basic knowledge to "build a better mousetrap."

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Development Definition

- Development- interrelated with applied research.
- ?How can we make a lot of something cheaply enough that people can afford it?
- Solar panels- they can be made, but the efficiency is not high enough to be cost effective.

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Taste
or Touch is a Chemical**

- Chemical does not equal toxic, does not equal hazardous
- EX: NaCl (sodium chloride or table salt)
 - Na⁺ sodium channels- important in nerve conduction
 - NaCl high blood pressure
- EX: CH₃COOH (acetic acid-vinegar) pickles
- EX: C₁₂H₂₂O₁₁ (sucrose-sugar) candy

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Good- penicillin. Has saved the lives of many thousands if not millions of people.

Bad- penicillin. People allergic to penicillin can die if treated with it.

Need risk assessment: Does the benefit outweigh the detrimental effects?
