

## Chemistry 102 – Chemical Reactivity - Spring 2010

<https://moodle.reed.edu/course/view.php?id=500>

<http://academic.reed.edu/chemistry/courses/chem102/>

Julie Fry  
Faculty – 10 am lecture  
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Office Hours  
M, T 3-4:30

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Faculty – 11 am lecture  
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M 2-4, Th 10:30-11:30

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Lab Instructor  
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F 2-4

*Please feel free to contact us for an appointment if our office hours don't fit your schedule.*

### *Text*

Gilbert & friends, *Chemistry: 2<sup>nd</sup> Edition*

### *Meeting Times*

Lecture	Psych 105	MWF 10-10:50
Associated Conf.	Chem 105	W 1:10-2; Th 11:00-11:50; Th 3:10-4
Lab	Chem 308	M-Th 1:10-4; F 2:10-5; Tu 9-12 AM

Lab lecture meeting locations:  
MW 1:10 (Chem 301); F 2:10 (Chem 301); T 9 & 1:10 (Phys 240A); Th 1:10 (Phys 240A)

### *Evaluation*

Midterm Exams (**2/26, 4/9** – Please mark these dates!)

These will be 50 minutes in length, to be taken in class with closed books and notes.

Final Exam (Date to be announced, do not make departure plans prior to 5/13)

Three hours long. Covering material since the last midterm as well as reviewing the entire semester. Same rules as the midterms.

Laboratory Reports - Due one week after completion of the experiment, on scheduled lab day.

Explicit instructions will be given for each lab write-up. There is a penalty for late reports, and no reports will be accepted more than one week past the due date. *To pass this class you must pass the laboratory section of the course.*

Problem Sets - Due Wednesdays in class or at the latest by 1 pm to Kathy Kennedy (Chem 303).

No late work will be accepted.

### *Academic Collaboration*

All work submitted during this course is expected to reflect the effort of the individual whose name appears on top of the page.

You are encouraged to work with friends, tutors and instructors on problem sets and lab reports. However, when the time comes to write this work up for submission, it must be your work, written in your own words and reflecting your individual understanding of the problems at hand. Moreover, in the case of lab reports, the write-up must be taken from the data that you collect in lab, unless you receive specific permission from an instructor to use someone else's data.

All exams are to be taken closed book, closed notes and without any collaboration. In using a calculator, you may only use it for arithmetic and for simple algebraic and trigonometric functions. You may not use programmed equations or graphing functions during the exam period.

## Chem 102: Chemical Reactivity

### *Lecture Schedule*

The course will cover the following topics:

Week 1	Behavior of Gases
Week 2	Solution Chemistry
Week 3	Rates of reactions, rate laws
Week 4	Mechanisms and catalysis
Week 5	Thermodynamics ( <b>Exam #1 on Friday 2/26</b> )
Week 6	Free Energy & equilibrium
Week 7	Equilibrium
<b>Break</b>	
Week 8	Acid base chemistry
Week 9	Buffers and Titrations
Week 10	Solubility ( <b>Exam #2 on Friday 4/9</b> )
Week 11	Redox Chemistry
Week 12	Electrochemistry and Fuel Cells
Week 13	Towards a hydrogen economy

### *Laboratory Sequence*

The laboratory portion of the course will follow the lecture material loosely. The order of experiments is as follows:

- Stoichiometry and the ideal gas law
- Ion Exchange
- Rates of radioactive decay
- Kinetics and mechanism
- Gas phase equilibrium
- Thermodynamics of protein stability
- Identity of an unknown acid
- Equilibrium chemistry in identifying unknown solutions

### *Course Strategy*

Chem 102 is a problem-based course. In addition to a qualitative understanding of concepts, we will focus on your ability to place those concepts in an algebraic context and to work quantitative problems. The best approach to mastering this material is *regular* and *frequent* practice. At the beginning of each lecture, we will assign chapter reading for the next lecture and problems that relate to the current lecture. We *strongly* recommend that you devote **one to two hours** per lecture out of class to working the problems and doing the reading. If you have any difficulties, you can immediately seek assistance from Arthur, Julie, and Wendy. Additional assistance is available from tutors and the DoJo.

Problem sets, lab reports and exams are a much less attractive way to advance your understanding. They come less frequently and there are longer gaps between lectures and due dates. A lot of frustration can be created by waiting a week or two to see what you've failed to learn in that time. We use these assignments to monitor your progress, but you have better tools available to you. Please use them.