FD99

CH 203 GENERAL CHEMISTRY I
FALL SEMESTER 1999
MWF 10:00-10:50; M 12:00-12:50
HENRY HALL 33

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TEXT: ***Chemistry: The Central*** Science by Brown, **LeMay, &** Bursten; 7th edition

WEEK	DATES	READING(#lectures)	PROBLEMS
1	Aug 30-Sept 3	CH 1(3)&2(1)	1:2,4,15,18,22,29,38,44,76
2	Sept 7-10	CH 2(2)&3(l)	2:3,6,15f16,21,28,31,32, 40, 44, 48, 50, 68
	EXAM #1-SEP 15 (CH 162)		
3	Sept 13-17	CH 3(3)	3:1,4,6,10,15,21,27,37,47, 49, 55, 67
4	Sept 20-24	CH 4(4)	4:5,7,13,20,24,27,32,40, 44, 48, 50, 51, 63
	EXAM #2-SEPT 29 (CH 364)		
5	Sept 27-Oct 1	CH 5 (3)	5:2,5,12,14,18,21,32,34, 46, 50, 51, 53, 57
6	Oct 4-8	CH 6(3)&7(l)	6:2,4,6,9,13,19,28,33,42, 46, 56, 60, 66
7	Oct 12-15	CH 7(2)&8(l)	7:2,10,13,14,16,22,24,30, 34, 38, 40, 44, 52, 66
	EXAM #3-OCT 20 (CH 5,6,67)		
8	Oct 18-22	CH 8 (3)	8:2,6,10,17,19,22,28,34, 38, 40, 43, 46, 50, 54, 57,70
9	Oct 25-29	CH 9 (4)	9:6,8,10,12,16,20,28,34, 40, 44, 46, 54
	EXAM #4-NOV 3 (CH 869)		
10	Nov 1-5	CH 10 (3)	10: 5, 7, 16, 23, 27, 35, 45, 58, 62, 73, 91
11	Nov 8-12	CH 11 (4)	11: 4, 7, 8, 12, 16, 22, 25, 29, 38, 42, 46, 51, 56, 62, 66
12	Nov 15-19	CH 12(2)&13(2)	12:2,8,14,16,24,28,32,34,
13	Nov 22-24	CH 13(1)&14(2)	13:2,6,10,11,21,27,30,35, 37, 45, 51, 56, 73
	EXAM #5-DEC 1 (CH 10-13)		
14	Nov 30-Dec 3	CH 14(3)	14:2,3,13,14,16,17,20,22, 25, 29, 39, 45, 51, 53, 56
15	Dec 6-10	**Review(4)**	

FINAL: THURSDAY, 16 DECEMBER 1999, 10:30 a.m.-12:30 p.m.

In addition to five exams given at three to four week intervals (each worth 50 points) there will be dail cooperative/take home quizzes given at the end of each class worth another 100 points. Homework will count 50 points. Stay tuned for further details. The final will count 150 points. Total points: 550 ABSOLUTELY NO MAKEUPS.

Notice that you have all been given a password to access the website for our textbook. In the Problem Solving Center, you will find many exercises to work on. As we finish each chapter, you will be required to complete Practice Exam I for that chapter and send it to me via E-mail. You will not be allowed to take the exam covering that chapter without turning in the Practice Exam.
I have given you my E-mail address above. I hope that you will all use it. If you have a question about the reading assignments (please do them before class!), an assigned problem, a difficult concept, something that I said in class, or whatever -- don't hesitate to drop me an electronic line. I'll be waiting! One extra point for each message.

Four points will be given for each homework assignment, but you must show all work and turn the homework in on time. One extra point will be given for each bracketed, additional, or integrative exercise that you turn in. Note that this only applies to the black exercises since the answers to the red exercises are found in the back of the book!

It is said that Charlie Chaplin once called chemistry "The material manifestation of the metaphysical." On a less philosophical level, my best advice for learning chemistry is to do as many problems as are physically, mentally, and morally possible. Then do a few more. The assigned problems are for openers only. There will be problem sessions, i.e., therapy, every possible Wednesday and Friday at noon in Henry Hall 39. Please also take advantage of CUH's Learning Center (located on the ground floor of Eiben Hall), where friendly tutors are anxious to "tute" you. Also remember: a scientific calculator is essential for your survival on the ground floor of Henry Hall. Don't leave home without one!

For starters, please memorize the solubility rules (Table 4.2, page 122) and the nomenclature in Table 2.4 (page 59) before next Friday. This should be a good review of your high school chemistry.

Welcome back to the land of atoms and molecules. Enjoy!

Now for a few words of wisdom:

> "WRITING CANNOT BE TAUGHT, BUT ONLY LEARNED, AND LEARNED BY THE INDIVIDUAL IN HIS OWN WAY, AT HIS OWN PACE AND IN HIS OWN *TIME,* FOR THE PROCESS OF MASTERING THE MEDIUM IS PART OF A CELLULAR GROWTH IN A MOST COMPLEX ORGANISM IT IS A WAY OF LIFE AND A MODE OF BEING *WHICH* CANNOT BE DIVIDED FROM THE KIND OF HUMAN CREATURE YOU WERE THE DAY YOU WERE BORN, AND ONLY IN OBEYING THE LAW OF SINGULAR BEING CAN THE ARTIST KNOW HIS TRUE DIRECTIONS AND THE'RIGHT ENDS FOR HIM."
>
> Katherine Anne Porter
> *Introduction* to Eudora Welty's A Garden of Green

stitute "chemistry" (or any other discipline) for-"writing" in the above
:ation and you will have grasped the essence of learning, viz.,
F-TEACHING. Perhaps the Chinese proverb says it more succinctly...

LEARNING CHEMISTRY

Fatigue and how to minimize it

Even if you remove from your study area all the distractions that surround Joe College, you still must overcome fatigue. After long hours at a task, people become physically and mentally tired. You will not be physically tired if you get enough sleep. If your learning efficiency is high, you will have plenty of time to sleep. High learning efficiency and adequate sleep support each other.

Mental fatigue is another matter. After lengthy work periods at the same and similar tasks, you lose sharpness and enthusiasm. you must work harder and longer for a given amount of learning. You cannot avoid fatigue altogether, but you can minimize it. Try these ideas:

1. If you have several subjects to study, tackle first the most difficult or least interesting. Then, when fatigue begins to appear, you will be at least interested in what you are doing.

2. Again if you have several subjects to study, and if they are equal interest and difficult, rotate them, if it can be done without losing continuity. When you feel yourself losing interest in one subject, switch to another. Come back to the first subject when you tire of the second.

3. Take breaks. Study for about 50 minutes, and then take 10 minutes off. Stretch. Walk around. Snack. Watch the time, so you are sure to be back in time to start the second hour at full learning efficiency. Repeat hourly.

4. Work in short sessions. You will experience less fatigue in two two-study hour sessions than in one four-hour period. Try a two hour session in the afternoon and another two period in the evening. Then relax.

Notetaking

Now you have an idea of what your assignment is about, you are ready to learn. Learn now, that is, not later. As you approach each section that has a performance goal, read it carefully and fix in your thought what to do for as you study. When you come to a point of your reading that is important and should be learn, think about it. Summarize the main ideas and write them into your notebook in your own words. If what you see what your eyes stops over in your mind long enough to be analyzed, revised and summarized, you are learning it at that time. Continue to the entire assignment in this way. When you finish, you will have a compact set of notes covering the main ideas which you have learned already. When test time comes, you will be able to revise them. That is much easier than learning them for the first time.

Most students do not study in a textbook this way. The more common procedure is to sit down with a book and felt a pen. important items are marked, not in condensed form, but in their . full textbook presentation. Many pages wind up half colored. You don't have to think about something to recognize that it is important and highlight it. If you don't think about it, you don't learn it. You have only made a date to learn it later. When test time comes, you have so many dates to keep it is impossible to keep them all. There is too much to read and too much to learn in too little time.

This is not to say you should never use a highlighter. Just use it sparingly and intelligently, as a supplement to your handwritten notes. Your notes should have a page reference to the marked materials. And when you highlight something, stop. Think about it. Learn it. Now!

Problem solving

As you begin learning how to solve chemistry problems, it helps to see clearly that your purpose is not to solve the problem, but to learn to solve the problem. You are never finished with an assigned problem until you understand it well enough to solve all other problems like it - or nearly like it.

Here are some general hints on how to solve problem:

1. **Be sure you have read and understand the theory or principle behind the problem. Know the definitions if any mathematical relationships you will use, how they are written mathematically, and the units in which they are expressed.**

2. **As you use the question-and-answer method on an example, be sure you understand each step before going on to the next. THIS IS THE TIME AND PLACE TO LEARN HOW TO SOLVE PROBLEMS.**

3. **If you are solving a problem from the end of the chapter, solve the problem without referring to an example in the chapter. In particular, do not put one finger at the place of the problem and another finger at the page where a similar example is solved and then flip back and forth, repeating for your problem each step that appears in the example. This technique gets answers, but no understanding. Instead, if you get stuck,, turn from your end-of-the-chapter problem altogether and work through the matching example from start to finish. When you thoroughly understand the example, close that page of the book, go back to the problem, and solve it completely.**

4. **Once you get an answer, be sure it is reasonable. (Just because an answer came from a calculator does not make it reasonable!**

5. **Finally the crucial questions: "Did I learn how to solve this problem and others like it?" Even if you have a correct answer, but cannot give a "yes" answer to this question, you have not finished with the problem.**

KEEP YOUR OBJECTIVE IN MIND. YOUR PURPOSE IS TO LEARN HOW TO SOLVE PROBLEMS, NOT TO GET A CORRECT ANSWER AND COMPLETE AN ASSIGNMENT.

LEARNING FROM LECTURE

What a student learns from a lecture depends on what the student does before, after, and during the lecture. We will exam all three.

Before the lecture

Just as a preview of a text reading assignment improves learning from reading the text, so a preview of the lecture improves learning from the lecture. If you know in advance what part of the textbook to be covered in your next lecture, flip through the pages the night before--or even better, the hour before-- the lecture. Glance at section headings and illustrations. Make notes on what you think the main points will be. Try to guess how these ideas go together. Being right or wrong is not important. The act itself prepare you to learn during lecture, rather than after. This should take about ten minutes, but it can save an hour or more of study after the lecture to accomplish the same amount of learning.

During the lecture

What you learn from a lecture depends largely on the quality of the notes you take. In general, the best lecture notes are brief summaries that list the main ideas presented. Phrases are used rather then sentences. Ideally they are in outline form, showing major topics and subtopics. The notes are short, but they include all special conditions that are essential to the main ideas. Good lecture notes also anticipate a follow-up in which the comments are expanded. This is done by writing notes on only one half of the page, or one of the facing pages in a bound notebook. The remaining space is available for additional comments.

After the lecture

This is a crucial time. It has been demonstrate that a student who waits 24 hours before studying lecture notes forget almost half (46%) of the material presented in the lecture. In two days, 50% is forgotten, and at the end of the week 62% is gone. By contrast, the student who goes over the lecture notes within a few hour after the lecture retain about 98% of what was said, hold 97% a week later, and still remembers more than 90% of the lecture three weeks after.

It is during the review of the lecture that you use the open space in your notebook. Write in greater details the items that were condensed to a few words during the lecture. Check your text for anything you didn't quite understand. Summarize the main points of the lecture. As in notetaking from the textbook, it is the act of thinking through something to the point that you can write at it in your own words that assures learning. Review the lecture just as soon after it is over as possible. Nowhere you will find the better bargain in time and learning.

LEARNING EFFICIENCY

If you have homework that required three hours of genuine learning, how many hours will you study to accomplish that learning? Surely it will be more than three hours. For some students it would be a lot more. How much more for you depends on your LEARNING EFFICIENCY (LE). Learning efficiency is the ratio of minutes learning to minutes of study multiplied by 100. If a student gets 48 minutes of learning in one hour of study, the learning efficiency is

LE = (minutes of learning)/ (minutes of study) X 100 = (48/60) X 100 = 80% efficiency

The object, of course, is to make the numerator as large as possible--- maximize learning-- while making the denominator as small as possible--- minimize the time spent studying.

CONCLUSION

Learning is very individual matter. An excellent study technique for one student may be unsatisfactory for another. We do not mean to suggest that you should intermediately adopt all the suggestions given here, but we do suggest that you consider them. They have worked for other students, and there is every reason to believe that most of them will work for you too.

FINALLY: Row difficult it is to learn chemistry? Here is one opinion:

> If to comprehend is the same as forming an image, we will never form an image of a happening whose w Me Is a millionth of a millimeter, whose rhythm is a millionth of a second, and whose protagonist are in their essence invisible
>
> PRIMO LEVI, `°The Periodic Table'

A GM ILLUSTRATING SOME OF
THE RELATIONS BETWEEN THE BRANCHES OF NATURAL SCIENCE AND TECHNOLOGY
H.J.T. Ell h