

TURN OFF YOUR CELL PHONE

You are most Fortunate

Course Organization

Chemistry 115 - 2:30-3:20 pm MWF Learning Community

Fall 2007

1. Staff - Lecturer - Dr. A. Friedel - office 491 Science Building -phone 481-6288
e-mail: friedel@ipfw.edu
Fax 481-6070
2. Office hours - MWF 10-11:00 am and on MWF 3:30-4:20 pm
T 8:00-8:50 am and 1:30-3:30 pm
and by appointment
3. Materials
 - a) Text: Darrell D. Ebbing and Steven D. Gammon, General Chemistry, 8th edition, 2005.
 - b) Lab Manual: Slowinski, Wolsey, Masterton, Chemical Principles in the Laboratory, 8th edition, 2005.
 - c) Chemistry 115L Special Experiments, Inhouse publication.
 - d) Class Notes
 - e) Safety Goggles
 - f) Scientific Calculator - logs and exponential numbers \$10-20.
 - g) A bound hard cover notebook. This will be your laboratory notebook. Directions for use will be given later in this packet.
 - h) All graphs submitted **MUST** be generated using a **computer**. Spreadsheet and graphing software is available in the computer laboratories on campus.
 - i) A student solution manual and study guide are available, but not required.

4. Summary of the Grading Scheme

<u>Assignment</u>	<u>Points</u>
2 one-hour exams (150 pts ea)	300
Comprehensive Final	240
6 Quizzes (30 pts ea)	180
12/13 Lab Reports and ASA's(20 ea)	240
Homework	<u>40</u>
	1000

5. The following grades are guaranteed for the point totals attained:

A	900+
B	800- 899
C	680-799
D	580-679
F	<580

6. Exams will be given on the following dates:
Exam I Wednesday, September 19
Exam II Wednesday, October 24

The final exam will be a two hour exam which will be comprehensive in nature. Approximately one-third of the exam will come from material studied since test II and one-third from material covered on each of the previous two exams. The final will be entirely multiple choice.

The date and time of the final exam is:

Friday, December 14 1:00-3:00 pm

Note: If you miss an exam for any reason you must notify me immediately at 481-6288 or through the Chemistry Department Secretary at 481-6289. Make up of exams will be handled on an individual basis.

7. Quiz dates will be announced in lecture.
8. Attendance is expected in lecture. You are responsible for all material presented and all announcements made during lecture periods. Reading the chapter before coming to class is helpful and will make it possible for you to better understand the lecture. **It should also help you answer questions in class. I will be asking questions of randomly selected individuals throughout the class time.** This is done so that I can get to know your names and find out how much you are learning or have learned in the past.
9. Appropriate behavior is expected in the lecture and laboratory. Your laboratory instructors and I expect you to be thinking about chemistry when you are in the classroom or laboratory. We expect you to listen when we are instructing and speak when you are called on to ask or answer a question or express an idea. We expect your full attention so the appropriate learning environment is available to each person in the class.
10. A one hour session of supplemental instruction will be offered with this course. The day and time will be determined through a survey of class schedules of the students in the class on the first day of class.
11. Special homework assignments will be given and collected on dates announced in lecture. Each assignment will be worth at least 5 points. Assigned chapter exercises and problems will not be collected, but I strongly recommend that you answer these questions. Quiz and exam questions will often be similar to these assigned problems. Solutions to the chapter exercises will be available from the CHM 115 home page, <http://www.ipfw.edu/chem/115friedel/>. You will need to have a copy of Adobe Acrobat Reader (available for download free at <http://www.adobe.com>). In preparing these solutions, Dr. Berger has made use of Greek characters and math symbols. These require proper fonts, WP Greek and WP Math A so that all equations can be read.
12. Lab reports are due at the beginning of the lab period following the one in which the experiment was performed with the exception of the final lab report which is due at the end of the final laboratory period. Lab reports that are late by more than one week will **not** be accepted. Any report handed in late (*i.e.* less than one week late) will have 7.5 points deducted from their score. The minimum score on a report is zero. If a student is absent from the lab when the report is due for a legitimate reason, the student must turn in the report immediately upon return to campus. In such cases no penalty will be assessed.

13. With the exception of the first lab, all lab experiments have associated with them an advanced study assignment (ASA). The purpose of the ASA is to familiarize you with the types of exercises and calculations you will do during the lab. You are expected to complete the ASA before attempting the lab. The ASA will be collected at the **beginning** of the last lecture period of the week preceding the scheduled laboratory. ASA's turned in after class begins will be considered late and subject to a penalty.
14. The laboratory is a vital part of the course. **Because you are part of a learning community, Mr. LaMaster and I have developed a special laboratory experience for you. You will be doing exercises intimately connected with MA 153. There will be no make up time for some of these. For 8 of them, there may be the opportunity to make up in the other 115 labs. Keep me informed of what is happening to you if you are absent.** I realize that some absences are unavoidable, however, when you are absent you lose out on the educational experience we have planned for you, and there is no way to replicate that experience. It also can affect your grade. If you miss 1 lab, there is no penalty. Missing 3 labs could result in a failing grade for the course.
15. If you have a disability or acquire one and want to find out what special services and accommodations are available, you may contact Services for Students with Disabilities in Walb 118 and 218 (481-6657, voice ITDD). If I or your laboratory instructor can be of assistance don't hesitate to inform us of your special needs.
16. If at any point during the semester that you find yourself in need of talking to someone about a personal or family crisis, please call any of the following individuals: Don Smith, IPFW personal counselor, at 481-6595; Ben Gates, Protestant campus minister, at 481-6992; or, Catholic campus minister, at 481-6994.
17. The last day to drop is **Friday, October 26**. You must officially withdraw from the class to avoid getting an F. If you simply stop coming to class, this will result in your receiving a grade of F.

Chemistry 115**Tentative Lecture Schedule MWF Learning Community
Dr. Friedel****Fall 2007**Text: Darrel D. Ebbing and Steven D. Gammon, General Chemistry, 8th edition 2005Week of: Assignment:

- Aug. 20 M Chapter 1 Chemistry and Measurement
 W Chapter 1
 F Chapter 1
- Aug.27 M Chapter 1
 W Chapter 2 Atoms, molecules and Ions
 F Chapter 2
- Sept. 3 M **No Class - Labor Day**
 W Chapter 2
 F Chapter 2
- Sept. 10 M Chapter 3 Calculations with Chemical Formulas and Equations
 W Chapter 3
 F Chapter 3
- Sept. 17 M Chapter 3
 W **Exam I September 19**
 F Chapter 4 Chemical Reactions: An Introduction
- Sept. 24 M Chapter 4
 W Chapter 4
 F Chapter 4
- Oct. 1 M Chapter 5 The Gaseous State
 W Chapter 5
 F Chapter 5
- Oct. 8 M **No class, FALL BREAK**
 W Chapter 5
 F Chapter 6 Thermochemistry
- Oct. 15 M Chapter 6
 W Chapter 6
 F Chapter 6
- Oct. 22 M Chapter 6
 W **EXAM 2 October 24**
 F Chapter 7 Quantum Theory of the Atom
- Oct. 29 M Chapter 7

W Chapter 7
F Chapter 8 Electron Configurations and Periodicity

Nov. 5 M Chapter 8
W Chapter 8
F Chapter 9 Ionic and Covalent Bonding

Nov. 12 M Chapter 9
W Chapter 9
F Chapter 9

Nov. 19 M Chapter 10 Molecular Geometry and Chemical Bonding
W **No Class - Thanksgiving Recess**
F **No Class - Thanksgiving Recess**

Nov. 26 M Chapter 10
W Chapter 10
F Chapter 11 States of Matter; Liquids and Solids

Dec. 3 M Chapter 11
W Chapter 11
F Chapter 11

Final Exam - Friday, Dec. 14 - 1:00-3:00 p.m.

Suggested Problems*

- Chapter 1: 7, 13, 20, 29-37 odd, 41, 45, 49, 51, 55-63 odd, 69, 71, 77, 81, 83, 87, 95, 103, 105, 107, 115, 121, 127, 133, 137
- Chapter 2: 2, 13, 15, 19, 31-41 odd, 45, 47, 55, 61, 63, 69-95 odd, 101, 103, 106, 109, 113-119 odd, 125, 129
- Chapter 3: 6, 8, 10, 15, 19, 21, 27, 31, 35, 39, 45, 49, 51, 57, 59, 61, 65, 69, 73, 77, 81-95 odd, 113
- Chapter 4: 1, 2, 5, 6, 9, 10, 15, 23, 25, 27, 31-41 odd, 45, 49-67 odd, 79, 83, 85, 89, 93, 95, 99, 103, 109, 111, 115, 125, 127, 135, 139
- Chapter 20: 29, 31, 33, 35
- Chapter 5: 9, 12, 13, 15, 21, 22, 23, 27, 33, 39, 41, 45-57 odd, 61, 67, 69, 79, 81, 89, 91, 93, 95, 101, 107, 129
- Chapter 6: 6, 7, 8, 10, 11, 18, 19, 25, 26, 37, 41, 47, 55, 57, 61, 67, 73, 77, 79, 87, 91, 95, 105, 115
- Chapter 7: 19, 22, 29, 33, 37, 41, 45, 51, 55-63 odd, 69, 73, 77, 81, 85, 89
- Chapter 8: 2, 3, 4, 5, 8, 35, 37, 41, 43, 49-59 odd, 63, 65, 77, 85, 87
- Chapter 9: 1, 3, 4, 5, 6, 10, 14-18, 23, 25, 29, 33-43 odd, 49-73 odd, 77, 79, 85, 91-99 odd, 103, 109, 113
- Chapter 10: 2, 3, 4, 5, 7, 9, 11, 14, 17, 18, 19, 23, 27, 29, 33-41 odd, 42, 47, 53-77 odd, 81
- Chapter 11: 4, 10, 12-17, 21, 25, 27, 29, 33, 37, 43-49 odd, 57, 65-75 odd, 79-85 odd, 103, 109, 115

* "General Chemistry," Ebbing and Gammon, 8th Edition, Houghton Mifflin Co., 2005. Solutions to these problems are available on the CHM 115 web page.

Chemistry 115 Lab Learning Community

MWF Fall, 2007

Laboratory Schedule			
Date	Assignment	Reference*	ASA Due**
Aug. 21	Check-in/Calculator OS and APP Upload Computer lab time		
Aug. 28	The Measurement of Experimental Data, Powers of 10	SPEC A*	
Sept. 4	The Manipulation of Experimental Data /Duelling Sensors	SPEC B and C	
Sept. 11	Density	SPEC	Sept. 7
Sept. 18	Determining the Concentration of a Solution: Beer's Law	SPEC	Sept. 14
Sept. 25	Reaction Stoichiometry: The Mole Ratio Concept	SPEC D	Sept. 21
Oct. 2	Identification of a Compound by Mass Relationships	SWM #5	Sept. 28
Oct. 9	Fall Break		
Oct 16	Exploring the Properties of Gases	SPEC	Oct. 12
Oct 23	Molar Mass of a Volatile Liquid	SWM #9	Oct. 19
Oct 30	Heat Effects and Calorimetry	SWM #14	Oct. 26
Nov 6	Vapor Pressure and Heat of Vaporization	SPEC	Nov. 2
Nov 13	The Emission Spectrum of Hydrogen	SPEC E	Nov.9
Nov 20	Logarithms	SPEC	Nov. 16
Nov 27	The Alkaline Earths and the Halogens-- Two Families in the Periodic Table	SWM #12**	Nov. 19
Dec 4	The Geometrical Structure of Molecules/Check-out	SWM #13	Nov. 30

* SPEC = Special Experiments Packet, SWM = Slowinski, Wolsey and Masterton, "Chemical Principles in the Laboratory", Saunders, 8th Ed., 2005

** Advance Study Assignments (ASA) are generally due in lecture on the Friday before each lab cycle begins. The ASA for SWM#12 is due on **Monday, November 19**. Refer to this column for specific due dates.

No labs meet the week of Fall Break

DESTINATION: EXCELLENCE

Chemistry 115

I think that it is important that students and teachers have an understanding early in the game. It can save headaches later on. With this in mind, let me tell you about Chemistry 115; what the course is designed to do, what I hope to do in order to get the job done, and what I will expect of you.

Chemistry 115 is a challenging course. It is for students who sincerely want a college education and are willing to work for one. It is challenging because it requires you to put together several skills, especially the ability to use mathematics, and scientific ideas about how the world works and apply them to problem situations simultaneously. In other words it requires you to THINK. There will be a lot of problem solving in this class. That does not mean you search for an algorithm which will give you an answer. Those are exercises. Problems are those questions which do not lend themselves to be solved through a memorized algorithm or formula.

Let it be clear from the beginning that grades in this course are not based on effort; they are based on performance. Some of you will need to work much harder than others in order to be successful. I intend to provide you with all of the help that I can give but I can only provide opportunities for you to learn; you must do the learning.

Some of you may become discouraged early in the course and want to drop. Perhaps some of you should. However, I believe that I will be able to provide sufficient opportunities for you to learn that every one of you can be successful if you are willing and able to do the work that I recommend for you. Don't be discouraged too soon. Some of the material that we will cover requires an incubation period before it becomes clear. Any student that I believe is likely to fail will be warned in time to drop the course without a failing grade.

Memorizing vs. Thinking. Memorizing important facts is an important part of any education. Certain information is important and there is no way to get it other than storing it in your head. But many students place too much value on memory. They believe that all they need to do is memorize what they are told and be ready to recall that information when test time rolls around. This just isn't true. Unless you are able to use information that you have learned, it is of little value. Using the information means that you will need to think. You will need to decide what information is needed to solve a problem and you must often decide how you can use some bit of information that you remember to get some information that you don't remember. The kind of thinking that I am talking about often comes up when chemical problems are to be solved. Many students try to remember formulas or "problem types" so that they can plug in numbers and get the answer without knowing what is involved in the problem. This will work sometimes. But it will not work when a slightly different problem is given which doesn't seem to fit the formula or the "problem type" that was worked in class. In these cases, it is absolutely necessary that you understand the chemical and mathematical principles that are involved and reason how these principles can be used to solve the problem at hand. May I urge you from the beginning to make every effort to understand each and every idea that is presented in the course. You must ask questions--even questions that you fear will appear stupid! [There is really no such thing as a stupid question, you know. If you don't know the answer, how can you find out if you don't ask? And in most cases there will be ten other people in the class who want to ask the same question but are afraid to ask!] I will do my best not to embarrass you, **but** if I have just given the information and your statement indicates you were not paying attention, then you may have some issues with how I and the class treat your response. You **will not be labeled stupid** for the answer, just **stupid** for not paying attention. No points are removed for not answering correctly.

What are you expected to learn? I want you to know what is expected of you. I want you to be able to answer questions on exams similar to those in the homework assigned. I will issue review sheets for each exam with a list of topics covered and sample questions. If you are able to do these assignments, you should be able to make a very high score on every exam. Remember that copying the answers from someone else without understanding

is a recipe for failure. We will use ideas that are developed early in the course in later sections and all of the ideas that are developed in Chemistry 115 will be used in subsequent courses in chemistry. It is one thing to demonstrate a skill in isolation; it is more complex when several skills or ideas must be applied simultaneously. You will encounter many problems in this course in which several skills and ideas must be applied.

How will you learn? **By study, of course!** Also, you must work problems. **You must be able to do problems without looking at the sample problems in the book by the day when we have a quiz or exam.** There will be the normal class discussions and lectures, a text to read, homework problems to provide practice, Supplemental Instruction Sessions (SI), and labs.

Too many students think that the lab is just an exercise to do with a report to write. It is. But it is more. It is the one place where you see real chemicals and have an opportunity to see the relationship between the principles that are discussed in class and the chemical systems to which they apply. Please, be sure to understand what you are doing in lab and why you are doing it. If it isn't clear, ask questions of your laboratory instructor or me until it is. The laboratory work is one of the most important aspects of this course.

About the Laboratory

Chemistry is an experimental science and the laboratory is considered a very important part of this course. The eventual value of this course to you as well as your grade in it will depend heavily on your attitude towards your laboratory work. Several ingredients important to the successful completion of a laboratory experiment are discussed below.

Check-In and Check-Out

Check-in will occur during the first lab period. Notify your instructor immediately if you are missing any equipment. Check-out will occur on the last day of lab.

Advance Preparation

The better your understanding of each experiment before you enter the lab, the more you will get out of performing that experiment. Accordingly, **you must study the laboratory manual or handout before you come to lab.** Instead of your instructor seeing you do the write up for the experiment you did the previous week, which is due this week, the instructor should see you looking over the experiment for today. Most experiments include an advance study assignment. This assignment will be collected on the dates listed on the laboratory schedule page. Late ASA's will not be accepted unless you are absent on the day due.

Technique

An important part of experimentation in any area is knowing how to carry out the various procedures that are required. One of our goals in this course is to observe you at work in the laboratory and help you correct your mistakes. One of your goals in this course is to learn good laboratory technique.

Recording Procedures and Data

It is useless to perform an experiment and lose the resultant data or record data for which experimental conditions are not carefully recorded. We will expect you to keep an approved **BOUND LABORATORY NOTEBOOK** (spiral-bound or other notebooks with removable pages are not acceptable). You will record in your notebook all relevant procedures as well as all data as they are collected along with experimental conditions. Writing data to loose sheets of paper for later entry in the notebook is unacceptable. For a more detailed description of the required format for the lab notebook, see below.

Objectivity

Scientific experiments and the results of those experiments should be approached and reported objectively. We recognize that there may be times when, in spite of your best efforts or for reasons beyond your control, things will not go well for you in the lab. If this happens, see your instructor immediately for guidance on how to proceed. If you have given a good effort on the experiment, then the least you should do is prepare a report including your experimental data, however bad you may think them to be. **NEVER** borrow results from others.

Safety

When you check into lab, your laboratory instructor will discuss the Chemistry Department Safety Regulations. You will then be required to read and sign a copy of the regulations indicating that you agree to abide by these regulations. Everyone is required to have safety goggles which can be purchased in the bookstore. You must wear shoes and socks in the lab. Sandals or flip-flops are not permitted. You must wear slacks or jeans. Shorts are not permitted. Wear a cotton T-shirt that is large enough to cover you from the neck to below your slacks or jeans. The more of you that is covered the less of you that can be damaged or scarred permanently from an acid spill or boiling water.

Lab Reports

Lab reports are due at the beginning of the lab period following the one in which the experiment was performed with the exception of the final lab report which is due at the end of the final laboratory period. Lab reports that are late by more than one week will **not** be accepted. Any report handed in late (*i.e.* less than one week late) will have 7.5 points deducted from their score. The minimum score on a report is zero. If a student is absent from the lab when the report is due for a legitimate reason, the student must turn in the report immediately upon return to campus. In such cases no penalty will be assessed.

FORMAT FOR BOUND LABORATORY NOTEBOOK

Your laboratory notebook should conform to the protocols expected in most science laboratories. Your entries should be timely, unambiguous, complete, permanent and dated. **Your notebook must have a permanent binding so that pages are not removable.** It should be sturdy enough to hold up against spills, scorches and occasional wettings. **Failure to bring your notebook to lab will result in the loss of two points from your lab report.**

1. All pages must be retained in their original places, even those which contain errors. **The first two or three pages of the notebook should be reserved for a table of contents listing the titles of all experiments performed and the page on which each begins.** These entries should be made when the experiment is performed.
2. **Permanent ink must be used for every entry you make. Each data entry must be made as soon as**

the information is available. This implies that you carry your notebook with you to instruments such as balances and barometers, etc. **Errors should be corrected by placing a single line through the erroneous datum. Wite-out[®], Liquid Paper[®] or other correction fluids are not acceptable, nor is scratching out errors. Failure to comply will result in the loss of one point from your lab report.**

3. Your notebook should carry enough information that it can be returned if it is ever lost. Your name and the course number must be written on the outside along with your address or the Department of Chemistry address if you prefer.

The format of the entries for each experiment should be as follows:

- A. Title Section -- Title of Experiment, Date, and Number of Experiment (From the lab manual)
- B. Data Section -- The format for the data section should be the same as that of the data sheet from the lab manual or the special experiment sheet. This section must be initialed by the instructor before you leave the laboratory. If more than one lab period is necessary, multiple initials are required.
- C. Calculations -- Show **all** calculations so that in event of erroneous results, it can readily be determined whether you have an experimental error or arithmetic error. You may wish to include calculations in the data section in which case sufficient room should be left in the data section so that the calculations are not cramped. Alternatively, you may include a separate calculations section.
- D. Evaluation -- A concluding section giving your evaluation of the experiment and your performance in executing the experiment will complete the laboratory notebook write-up for the experiment. You should include in this section any possible sources of error which might impact your results.