CHM 1045 General Chemistry I – FSU

Syllabus CHM 1045
Spring 2015
Sections 32-42
Room 255, Fisher Lecture Hall
MWF 1:25-2:15 PM

Lecturer: Professor A. E. Steigman
Office: 3002 CSL
Phone: 644-6605
e-mail: steigman@chem.fsu.edu

CHM 1045 is the first course in a sequence of general chemistry courses designed for science majors, engineering, pre-med, etc., and for those wishing to take a rigorous sequence of courses to satisfy the natural science requirement for liberal studies.

TEXTBOOK: The required textbook for this course is “Chemistry”, 11th Edition, by Chang and Goldsby. We will be covering Chapters 1-11 in this course.

OFFICE HOURS: Mon 2:30-3:30 and Wed 2:30-3:30 and by appointment.

LECTURE 1:25-2:15 MWF in FLH 255. While attendance is only taken on the first day of class, you are expected to come to lecture as there are materials covered that do not appear in the text, for which you are responsible. I also reserve the right to administer graded quizzes at any time.

RECIPIATION: The recitation section is on Tuesday in the Hoffinan Teaching Laboratory (HTL) at a time determined by the section in which you are enrolled. Attendance at recitation is mandatory as it represents an important part of the course. While quizzes are not formally scheduled for recitation, I reserve the right to administer one at any time.

<table>
<thead>
<tr>
<th>Section</th>
<th>Time</th>
<th>Location</th>
<th>Instructor</th>
<th>e-mail</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>5:00-5:50</td>
<td>HTL 213</td>
<td>Hongjun Zheng</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>6:00-6:50</td>
<td>HTL 213</td>
<td>Hongjun Zheng</td>
<td><a href="mailto:hjzheng12@gmail.com">hjzheng12@gmail.com</a></td>
</tr>
<tr>
<td>34</td>
<td>7:00-7:50</td>
<td>HTL 213</td>
<td>Hongjun Zheng</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>5:00-5:50</td>
<td>HTL 214</td>
<td>Kariem Diefenbach</td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>6:00-6:50</td>
<td>HTL 214</td>
<td>Kariem Diefenbach</td>
<td><a href="mailto:karemdiefenbach@gmail.com">karemdiefenbach@gmail.com</a></td>
</tr>
<tr>
<td>39</td>
<td>7:00-7:50</td>
<td>HTL 214</td>
<td>Kariem Diefenbach</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>5:00-5:50</td>
<td>HTL 219</td>
<td>Dayton Syme</td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>6:00-6:50</td>
<td>HTL 219</td>
<td>Dayton Syme</td>
<td><a href="mailto:dsyme@chem.fsu.edu">dsyme@chem.fsu.edu</a></td>
</tr>
<tr>
<td>42</td>
<td>7:00-7:50</td>
<td>HTL 219</td>
<td>Dayton Syme</td>
<td></td>
</tr>
</tbody>
</table>

COURSE MATERIAL: There is a Blackboard web site devoted to the course, which can be accessed at:

http://campus.fsu.edu/

Posted to the web site is are Study Guides, which are essentially an outline of the course that emphasizes the key concepts from the chapter, gives the reading in the chapter that accompanies the lecture and, finally, lists problems from the end of the chapter that are the most relevant. In addition, worked sample exams will also be posted. In addition Blackboar site for the overall course you will also have access to a Blackboard site set
up for your specific recitation section and maintained by your recitation TA. This site will contain your grades as they are posted plus any information that your recitation TA decides to post.

Computer Aided Instruction (CAI): You will be expected to complete a series of computer generated problem sets through the Webassign on-line instructional system. There will be 10 problem sets worth a total of 100 possible points which are added to your total. Note that the Detailed instructions are on Blackboard.

HOMEWORK: Working problems are essential for your success in this course. The more you practice the better you are likely to do. There are no graded homework problems assigned, however, suggested problems from the text book that reinforce the important concepts of each chapter is posted on the course web site (Blackboard). The suggested problems are a good starting point but it is recommended that you work additional problems at the end of the chapter. If you have difficulty in understanding how a specific problem is worked they should be given to your recitation instructor to worked during recitation.

HELP: If you are having trouble understanding the material or working the problems there are numerous resources available to you. Recitation and your recitation instructor (who will have regular office hours) should be consulted first. I am available during my posted office hours or by appointment.

Free Tutoring from FSU:
On-campus tutoring and writing assistance is available for many courses at Florida State University. For more information, visit the Academic Center for Excellence [ACE] Tutoring Services' comprehensive list of on-campus tutoring options – see http://ace.fsu.edu/tutoring or contact tutor@fsu.edu. High-quality tutoring is available by appointment and on a walk-in basis. These services are offered by tutors trained to encourage the highest level of individual academic success while upholding personal academic integrity.

Finally, the website for the Department of Chemistry and Biochemistry has a list of available tutors (this is not a free service).

EXAMS: There will be four (4) hour exams, covering approximately three chapters each. Exams will consist of short answer and numerical problems. You must show your work for the numerical problems and use the correct number of significant figures in your answers. The tentative exams schedule is:

- Exam I: January 30
- Exam II: February 25
- Exam III: March 30
- Exam IV: April 17
- Final: April 29, 10:00-12:00 (location to be announced)

The Final Exam is a Block Exam the location to be announced.

The exams will be worth 100 points each and the final exam is comprehensive and is worth 200 points. The lowest midterm exam will be dropped. Exams cannot be taken at any time other than the scheduled time and no makeup exams will be given (if you have to miss an exam then that is the exam that will be dropped). Notably, the drop policy does not extend to the CAI homework.

To assist you in your studying, practice exams along with their answer keys, which are the exams given last year in this course, will be posted on Blackboard.

CALCULATORS: You will need a simple non-programmable scientific calculator for the course. Neither graphing calculators nor cell phones are allowed on exams; there are no exceptions to this policy.

EXAM GRADING PROTOCOL:
The exams in this course are largely problem solving in nature. In order to receive full credit on a problem it must be possible to arrive at the right answer by following the logic on your paper. In other words, all steps...
involved in arriving at the answer must be explicitly stated. Simply stating the right answer without indicating how it is arrived at will yield little or no credit. Partial credit will be awarded and its apportionment will be outlined out as quantitatively as possible on the answer key.

GRADING:

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Webassign</td>
<td>100</td>
</tr>
<tr>
<td>Exams</td>
<td>300</td>
</tr>
<tr>
<td>Final</td>
<td>200</td>
</tr>
<tr>
<td>Total</td>
<td>600</td>
</tr>
</tbody>
</table>

GRADING SCALE

While we strive to achieve a standard scale of: 90-100 A; 80-90 B; 70-80 C; and below 70 D; F; which typically occurs when the class average on an exam is around 75%. In reality, individual exam averages may fall below this. When that happens I “curve” the grades by extending the letter grade range to lower values, so, for example the A range for a particular exam or for the course as a whole may become 85-100. Letter grades will be assigned to individual exams and posted so that you will know how you are doing after each exam. It is important to note, the individual letter grades for the exam are not recorded or used in any way by me; instead, at the end of the course, the total points earned, which is the sum of the top three exam grades, the final and the Connect on-line homework grade (along with any quizzes and extra credit that may have been given during the course) are totaled and subjected to a curve appropriate to the performance of the class as a whole. In a typical course I give approximately 12-15 % of the class an A grade (A and A-), 20-25 % B (B+, B, B-), 40-50 % C (C+, C, C-) the remainder are spread out over D and F (I do not give +/ on those grades).

RETURNING EXAMS

We endeavor to get exams graded and returned in a timely manner. Exams will be returned in recitation the week following when the exam is administered. Exams are only returned in recitation only and they will be available for two recitation periods after the exam is administered. After that time you will have to make arrangements with the TA for their return, but that is up to the prerogative of the TA.

REGRADE POLICY

Errors can occur in the grading of exams necessitating a re-grade of the exam. Graded exams will generally be given back in recitation in the week after it was administered. Upon receipt of the exam you have until recitation the following week to request a re-grade, after that time re-grade requests will not be honored. The recitation instructor will handle re-grades involving an error in totaling the score. Questions involving oversights in scoring your answer (i.e. you have the right answer but the grader missed it) or apportionment of partial credit will go back to the specific grader of that problem for consideration. Your re-grade request must be accompanied by a detailed description of what problem was graded incorrectly and exactly why. Requests that constitute little more than “fishing expeditions” for more points such as; “shouldn’t I have gotten more partial credit on problems 3, 4 and 6” will not be re-graded.

DISCLAIMER

Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice.

UNIVERSITY ATTENDANCE POLICY

Excused absences include documented illness, deaths in the family and other documented crises, call to active military duty or jury duty, religious holy days, and official University activities. These absences will be
accommodated in a way that does not arbitrarily penalize students who have a valid excuse. Consideration will also be given to students whose dependent children experience serious illness.

ACADEMIC HONOR POLICY

The Florida State University Academic Honor Policy outlines the University’s expectations for the integrity of students’ academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to “...be honest and truthful and ...[to] strive for personal and institutional integrity at Florida State University.” (Florida State University Academic Honor Policy, found at http://doj.fsu.edu/honorpolicy.htm)

AMERICANS WITH DISABILITIES ACT

Students with disabilities needing academic accommodation should:
(1) register with and provide documentation to the Student Disability Resource Center; and
(2) bring a letter to the instructor indicating the need for accommodation and what type. This should be done during the first week of class.

This syllabus and other class materials are available in alternative format upon request.

For more information about services available to FSU students with disabilities, contact the:
Student Disability Resource Center
874 Traditions Way
108 Student Services Building
Florida State University
Tallahassee, FL 32306-4167
(850) 644-9566 (voice)
(850) 644-8504 (TDD)
sdrc@admin.fsu.edu
http://www.disabilitycenter.fsu.edu/

Required Liberal Studies Area V Statement (for CHM 1020, CHM 1020L, CHM 1032, CHM 1045, CHM 1045L, CHM 1046, CHM 1046L, CHM 1050, CHM 1050L, CHM 1051, CHM 1051L, CHM 2200, CHM 2200L):

The Liberal Studies Program at Florida State University has been designed to provide a perspective on the qualities, accomplishments, and aspirations of human beings, the past and present civilizations we have created, and the natural and technological world we inhabit. This course has been approved as meeting the requirements for Liberal Studies Area V, Natural Science, and in combination with your other Liberal Studies courses, provides an important foundation for your lifelong quest for knowledge.
Welcome

Welcome to General Chemistry I Lab! This laboratory course is the first of two in the general chemistry series. In developing the lab I tried to focus on three key concepts: 1) the experiments should challenge the student to think independently about chemistry both in the lab setting and in the world environment, 2) the experiments should support and expand upon the material that is being covered in the classroom, and 3) the experiments should build the student's skills in basic chemistry techniques.

In addition to the 3 focuses above I have also tried to install some fun back into the labs. Keep in mind that investigation and discovery are a scientist's main source of fun, but along those lines several of the labs have been redesigned to allow you, the student, to become a true investigator. Solving the puzzle, so to speak. We have also left some of the labs incomplete, allowing you to design your own method of investigation. We hope that by varying the styles of the labs and exposing you to as many different ways of learning as possible, we will both spark your imagination and deepen and prolong your interest in chemistry.

As with any science course, this lab course will demand a lot of your time and energy. I always warn students not to underestimate the time it will take them to complete the pre-lab assignments or write their lab reports as this can get you into difficulty very quickly. My best pieces of advice: Don't Procrastinate!! and get help immediately if you don't understand a concept or assignment. The TAs and I are always willing and able to help.

Well, good luck with your semester and I look forward to seeing you in lab.

Dr. Stephanie R. Dillon
Coordinator of General Chemistry Laboratories
The Florida State University

Course Description

The Liberal Studies Program at Florida State University has been designed to provide a perspective on the qualities, accomplishments, and aspirations of human beings, the past and present civilizations we have created, and the natural and technological world we inhabit. This course has been approved as meeting the requirements for Liberal Studies Area V, Natural Science, and in combination with your other Liberal Studies courses, provides an important foundation for your lifelong quest for knowledge.

CHM 1045L General Chemistry I Laboratory (1). Pre- or Corequisite: CHM 1045. This laboratory offers an introduction to quantitative techniques and to the chemical laboratory. Topics include stoichiometry, atomic spectra, gases, as well as acids and bases. Safety
goggles and a scientific calculator are required for every class. Lab meets three hours a week.

IMPORTANT: If at any time the co-requisite course CHM1045 is dropped during the semester you are enrolled in CHM1045L you will be required to drop the lab as well. No Exceptions.

**Labs Covered**

- **Exp 1**: Excel: The Scientist’s Friend
- **Exp 2**: Lighter than Air? A Density Study
- **Exp 3**: Calculating Your Jitters: The Mass Percent of Caffeine in Coffee
- **Exp 4**: Acids and Bases: A Fruity Titration
- **Exp 5**: A Rainbow of Redox: The Colors of Vanadium
- **Exp 6**: Heavy Metal Precipitation: ’Getting the Lead Out’
- **Exp 7**: Under Pressure: Studying the Formation of Clouds/ Effusion of CO₂
- **Exp 8**: Mythbusting: Candy and Soda Go Boom?
- **Exp 9**: Endothermic Enthalpy: A Calorimetric Study
- **Exp 10**: Lasers: A Study of Light and Intensity
- **Exp 11**: Fool’s? Gold: Testing Metal Unknowns
- **Exp 12**: Molecular Geometry and Shape

**Instructor**

Dr. Stephanie R. Dillon  
Office: 324B DLC  
Phone: (850) 644-0166  
E-mail: srdillon@chem.fsu.edu  
Office Hours: T 9-11am or by appointment

**Materials**

- **Required**
  1. Online Laboratory Manual from Bluedoor Labs
  2. Laboratory research notebook (carbonless copy)
  3. A NON-PROGRAMMABLE Scientific Calculator
  4. Lab Coat (thigh length)
  5. Laboratory Goggles (Indirectly Vented)

**Lab Policies**

**Cell Phones**: All cell phones are to be turned off at all times during the laboratory period. Students whose cell phones ring during a lab will be asked to leave and the missed lab will be counted as an unexcused absence.

**Lab Attire**: All students are required to wear long pants (from hip to foot, No Capris, No Shorts), closed-toe shoes and lab coats which completely cover the torso area including long sleeves and a length to mid-thigh. Long hair should be pulled back and jewelry such as rings and bracelets should be removed during the lab period. Students who do not comply with the policies regarding attire will be asked to leave and the missed lab will be counted as an unexcused absence.

**Missed Lab Policy**: Labs missed for an acceptable reason will be handled as follows: The missed lab report will be pro-rated by averaging the rest of your lab report grades and substituting that average for the missing lab grade. Pre-lab assignments should be completed as usual since they are available all the time not just on the day of the lab. Labs missed without a reasonable excuse will receive a grade of zero. **Students missing 4 or more laboratories for any reason (excused or unexcused) will recieve a failing grade.**
grade for the lab. If the absences are for illness or another excusable reason, students are encouraged to withdraw from the lab. Incomplete grades will no longer be issued for excessive absences.

University Attendance Policy: Excused absences include documented illness, deaths in the family and other documented crises, call to active military duty or jury duty, religious holy days, and official University activities. These absences will be accommodated in a way that does not arbitrarily penalize students who have a valid excuse. Consideration will also be given to students whose dependent children experience serious illness.

Reasonable Excuses (Documentation) Include: Illness (Note from Doctor or Thagard) Jury Duty or Court Date (Copy of Summons) Car Accident or Breakdown (Accident report or bill including time of incident) Death in Family (Copy of Obituary or service Document). This is not an all inclusive list but should give you a general idea of the magnitude of an acceptable excuse and the type of documentation required to substantiate it. Other problems will be dealt with on an individual basis. Students should provide documentation to their TA at the next lab meeting.

<table>
<thead>
<tr>
<th>Grading</th>
<th>Total Points for Each Exercise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab 1 Exercises</td>
<td>10</td>
</tr>
<tr>
<td>Prelab 2</td>
<td>10</td>
</tr>
<tr>
<td>Prelab 3</td>
<td>10</td>
</tr>
<tr>
<td>Prelab 4</td>
<td>10</td>
</tr>
<tr>
<td>Prelab 5</td>
<td>10</td>
</tr>
<tr>
<td>Prelab 6</td>
<td>10</td>
</tr>
<tr>
<td>Prelab 7</td>
<td>10</td>
</tr>
<tr>
<td>Prelab 8</td>
<td>10</td>
</tr>
<tr>
<td>Prelab 9</td>
<td>10</td>
</tr>
<tr>
<td>Prelab 10</td>
<td>10</td>
</tr>
<tr>
<td>Prelab 11</td>
<td>10</td>
</tr>
<tr>
<td>Lab 12 Exercises</td>
<td>40</td>
</tr>
<tr>
<td>Lab Notebook</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Lab Reports are due one week from the completion of the lab experiment. See Lab Report Format for more details. Reports must be typed into the Lab Report Generator in your lab manual and submitted as a PDF file through Turnitin in the Lab Reports folder in Blackboard. No late or emailed lab reports will be accepted. Lab reports are due one week after the completion of your lab experiment. For example: If your lab is Wednesday at 2:30 PM, your lab report must be uploaded no later than 3:00PM the following Wednesday. Due dates and times will be clearly posted in the Lab Reports folder in Blackboard. Please keep in mind that the Turnitin system can only handle so much traffic at a time so the closer to the due date and time you attempt to submit your report, the longer it will take and there is always a possibility that the system will get overwhelmed and your report not accepted. It is totally your responsibility to get the report in on time. If you procrastinate and your report is not accepted, we will not accept an emailed copy. No exceptions.

NOTE: If you experience technical difficulties when uploading your report you should contact Blackboard Support Immediately (not Dr. Dillon or your TA as they cannot fix technical
Pre-lab Assignments are located on the WebAssign system. An access code to the system is packaged with your new lab manual. Once you use the access code to register for the system you will need to add your laboratory course section. Each lab section has its own webassign course code based on the section for which you are registered. Pre-Labs are available from the beginning of the semester up until 30 minutes before the lab meeting time corresponding to that Pre-lab. No late pre-lab assignments will be accepted.

The Lab Notebook should be kept up-to-date and in traditional scientific format. The notebook will be collected and graded at the end of the term. See Lab Notebook Format for details regarding the grading criteria.

Lab Prep Assignments are available in the laboratory manual and include the writing of a hypothesis and creation of tables to complete the lab. The sheet containing these documents is to be turned in at the beginning of each lab. Although there are no points associated with these assignments, failure to complete this lab preparation will result in your not being allowed to perform the lab experiment and a corresponding loss of those lab report points.

The Grading Scale: Final grades in the course will be assigned based on the percentage of total possible points in the course, according to the following percentile scale:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90-100%</td>
</tr>
<tr>
<td>B</td>
<td>80-89%</td>
</tr>
<tr>
<td>C</td>
<td>70-79%</td>
</tr>
<tr>
<td>D/F</td>
<td>Below 70%</td>
</tr>
</tbody>
</table>

Lab Schedule

The CHM1045L Lab Schedule contains not only the list of labs being performed but also the due dates for both the pre-labs and the lab reports. Please consult the lab schedule each week to make sure you are preparing for the correct lab experiment. The lab manual is a book and we will not always follow the manual’s order of experiments.

Academic Honor Policy

The Florida State University Academic Honor Policy outlines the University’s expectations for the integrity of students’ academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to “... be honest and truthful and ... to strive for personal and institutional integrity at Florida State University.” See Academic Honor Policy for more details.

NOTE: All violations of the Honor Policy will result in a failing grade in the laboratory course.

Americans With Disabilities Act: Students with disabilities needing academic accommodation should: (1) register with and provide documentation to the Student Disability Resource Center; and (2) bring a letter to the instructor indicating the need for accommodation and what type. This should be done during the first week of class. This syllabus and other class materials are available in alternative format upon request. For more information about services available to FSU students with disabilities, contact the:

Student Disability Resource Center 874 Traditions Way 108 Student Services Building
Florida State University Tallahassee, FL 32306-4167 (850) 644-9566 (voice) (850) 644-8504 (TDD) stdr@admin.fsu.edu http://www.disabilitycenter.fsu.edu/

Free Tutoring from FSU For tutoring and writing help in any course at Florida State University, visit the Academic Center for Excellence (ACE) Tutoring Services.
comprehensive list of tutoring options - see http://ace.fsu.edu/tutoring or contact tutor@fsu.edu for more information. High-quality tutoring is available by appointment and on a walk-in basis. These services are offered by tutors trained to encourage the highest level of individual academic success while upholding personal academic integrity.

Syllabus Change Policy
Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice.
CHM1045 General Chemistry I – FAMU

Florida Agricultural and Mechanical University
Department of Chemistry
1530 South M.L. King, Jr. Blvd.
Tallahassee, Florida 32307

COURSE SYLLABUS

<table>
<thead>
<tr>
<th>Course Number: CHM 1045</th>
<th>Course Title: General Chemistry I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prerequisite(s): CHM 1020 or equivalents with passing grade.</td>
<td></td>
</tr>
<tr>
<td>Course Credit: 3</td>
<td>Course Hours: 3 per week</td>
</tr>
<tr>
<td>College: Science and Technology</td>
<td></td>
</tr>
<tr>
<td>Department: Chemistry</td>
<td></td>
</tr>
<tr>
<td>Supplies: Non-programmable scientific calculator</td>
<td></td>
</tr>
<tr>
<td>Faculty Name:</td>
<td></td>
</tr>
<tr>
<td>Term and Year: Spring 2015</td>
<td></td>
</tr>
<tr>
<td>Section:</td>
<td></td>
</tr>
<tr>
<td>Place and Time:</td>
<td></td>
</tr>
<tr>
<td>Office Location:</td>
<td>e-mail:</td>
</tr>
</tbody>
</table>

Office Hours Monday Tuesday Wednesday Thursday Friday

Course Description

Fundamental principles and concepts of chemistry will be introduced. Topics include properties of matter, nomenclature, reactions, including redox reactions, concepts chemical stoichiometry, concepts of aqueous reactions and solution stoichiometry, concepts of thermochemistry, concepts of electronic structure of atoms, concepts of periodicity of elements, concepts of chemical bonding, concepts of molecular geometry and bonding theories, concepts of gases and gas laws.

This course should instill in you a strong appreciation of the importance of chemistry to other disciplines, such as biology, pharmacy, medicine and engineering. This course will also teach you to solve problems using analytical thinking skills as opposed to memorization techniques.

Course Purpose

Required course for science, engineering, pharmacy and pre-health professions majors.

General Objectives and Outcomes

Submitted for ABET Review October 5, 2015
In accordance with the Academic Learning Compact specific outcomes of the Department of Chemistry for CHM1045 students can be summarized under the following rubrics:

- Demonstrate critical thinking skills as measured by the ability to solve chemical problems, and read, evaluate, and interpret numerical, chemical and general scientific information.
- Demonstrate proficiency in written and oral communications.
- Possess a thorough knowledge of basic and subfields of chemistry
- Possess the ability to make effective use of information resources and the ability to use computers in chemistry applications.

Online Materials

Constant use of the course website will have a major impact on your success in this course. Most of the relevant course material (i.e., syllabus course outline, problem sets, quizzes, test/quiz grades, assignments, etc.) will be presented to you online via the website, and not in class. If you do not have access to a computer in your dormitory room, you may use the computers located in the various facilities on campus such as Coleman Library.

Mastering Chemistry

Students are strongly urged to enroll in Mastering Chemistry. All course material will be posted on blackboard.com (famu.blackboard.com). All homework and quizzes will be posted on mastering chemistry (homework).

Learning Objectives by Exam

At the conclusion of the course, the student should:

EXAM 1 (CHAPTERS 1, 2, and 3)

Chapter 1

Matter, Measurement and Problem Solving

1. Describe the features of the three states of matter. Be able to classify matter according to its composition. (1.3)
2. Distinguish between physical and chemical properties and changes. (1.4)
3. Define energy and work, distinguish between kinetic and potential energy, and understand the law of conservation of energy. (1.5)
4. Learn the basic metric measurement units and the metric prefixes and factor multipliers. Distinguish between basic and derived units. (1.6)
5. Use the conversion factor approach to convert units within the metric system (for example, convert cm to cm or km). (1.6, 1.8)
6. Use the conversion factor approach to relate density to mass and volume. Define extensive and intensive property. (1.6, 1.8)
7. Transform between the Celsius, Kelvin and Fahrenheit temperature scales. (1.6)
8. Properly use scientific notation and the significant figure (SF) convention to report the degree of uncertainty in a measurement or calculation. Define accuracy and precision. (1.7)
9. Master the conversion factor (dimensional analysis) approach to solve chemical problems. (1.8)

Chapter 2

Atoms and Elements

1. Understand the laws of mass conservation, define composition and multiple proportions. (2.3)
2. Describe the results of the key experiments by Thomson, Millikan, and Rutherford that lead to the discovery of the electron and its properties. (2.4)
3. Explain the structure of the atom, the main features of the subatomic particles, and the significance of isotopes; use atomic notation to express the subatomic makeup of an isotope (number of $p$, $n$ & $e$); explain the formation of ions. (2.5, 2.6)
4. Describe the format of the periodic table and the general location and characteristics of metals, metalloids, and nonmetals. Learn the names of groups 1, 2, 17 and 18. (2.7)
5. Memorize the elements that form ions with predictable charges (Figure 2.14, in 2.7)
6. Be able to calculate average atomic mass from isotopic composition. (2.8)
7. Define mole and molar mass. Learn the Avogadro’s number. Be able to convert between mass, moles, and number of particles. (2.9)

**Chapter 3**

**Molecules, Compounds, and Chemical Equations**

1. Explain the essential features of ionic and covalent bonding and distinguish between them; predict the monatomic ion from a main group element. (3.2)
2. Be able to recognize empirical, molecular, and structural formulas, as well as ball-and-stick and space-filling models. (3.3)
3. Know the common forms of the most common nonmetals: H₂, F₂, Cl₂, Br₂, I₂, N₂, O₂, P₄, S₈. Define molecular, ionic compound, and polyatomic ion. (3.4)
4. Memorize the common polyatomic ions in Table 3.5. Write names, formulas and formula masses of single-atom ions, polyatomic ions, oxoanions, and anion compounds (including hydrated). Know when to include a Roman numeral in the ion or ionic compound name. (3.5, 3.7)
5. Write names, formulas, and molecule masses of binary molecular compounds, and acids (including oxoacids). (3.6, 3.7)
6. Realize the usefulness of the mole concept, and use the relation between molecular (or formula) mass and molar mass to calculate the molar mass of any substance as well as to convert between mass and number of molecules. (3.8)
7. Be able to calculate the percent composition of compounds as well as to utilize it as a conversion factor in calculations. (3.9)
8. Be able to derive an empirical formula from elemental analysis data provided as masses, percent composition, or from combustion analysis data. Be able to calculate a molecular formula. (3.10)
9. Write and balance chemical equations given formulas or names. (3.11)
10. Recognize and differentiate different types of organic compounds (saturated and unsaturated hydrocarbons and functional groups). (3.12)

**EXAM II (CHAPTERS 4, 5, and 6)**

**Chapter 4**

**Chemical Quantities and Aqueous Reactions**

1. Understand the meaning of stoichiometry. Be able to perform mole-to-mole and mass-to-mass conversions. (4.2)
2. Understand why one reactant limits the yield of product, and solve limiting reactant problems. Be able to calculate theoretical and percent yield from initial reactant masses. (4.3)
3. Understand the meaning of concentration and the effect of dilution. (4.4)
4. Understand how water dissolves an ionic compound compared to a covalent compound. Define weak and strong electrolytes, and non-electrolytes. Learn the solubility rules as given in Table 4.1, and be able to apply them. (4.5)
5. Be able to identify the combination of compounds that will form a precipitate (Table 4.1). (4.6)
6. Understand the difference between molecular, complete ionic, and net ionic equations. Be able to write either for a chemical process. (4.7)
7. Understand the key events in precipitation, acid-base, and gas-evolution reactions and use ionic equations to describe them. Distinguish between strong and weak acids and bases, and memorize names and formulas of the six most common strong acids (HCl, HBr, HI, HClO₄, HNO₃, and H₂SO₄) and the most common strong bases, group 1 and 2 hydroxides (NaOH, Ca(OH)₂, for example). Memorize Table 4.2. (4.7, 4.8)
8. Understand molarity and dilution and utilize them in acid-base titration calculations. (4.8)
9. Understand the ideas of oxidation and reduction. Know how to assign oxidation numbers to each atom in a formula. Be able to identify reducing and oxidizing agents. Recognize and balance combustion reactions.

(4.9)

Chapter 5
Gases

1. Understand the definition of pressure. Understand the principles of the barometer and manometer. Know basic pressure units (Table 5.1). Be able to convert between them. (5.2)
2. Understand the relationships described by the simple gas laws (Boyle's, Charles's, and Avogadro's laws). (5.3)
3. Use empirical gas laws to predict how a change in one of the properties of a gas will affect the remaining properties. (5.3)
4. Understand the ideal gas law \( PV = nRT \), and be able to use this expression to perform \( P,V,T \), dependent calculations. (5.4)
5. Use empirical gas laws to calculate the molar volume, densities, and molar mass of a gas. (5.5)
6. Understand the derivation of Dalton's Law and its application. Understand the concept of partial pressure in mixtures of gases. (5.6)
7. Use volume-to-mole relationships obtained using the empirical gas laws to solve stoichiometry problems involving gases. (5.7)
8. Use the ideal kinetic-molecular model to explain the empirical gas laws. Be able to calculate the root-mean-square velocities of gas molecules. (5.8)
9. Define mean free path, diffusion, and effusion of gases. Be able to apply Graham's law of effusion in calculations. (5.9)
10. List deficiencies in the ideal gas model that will cause real gases to deviate from behaviors predicted by the empirical gas laws. Explain how the model can be modified to account for these deficiencies. Understand the effect of the intermolecular forces on the gas parameters. Understand the meanings of the corrections in the Van der Waals equation. (5.10)

Chapter 6
Thermochemistry

1. Understand the Law of Conservation of Energy. Know the basic energy units and the relationships between them; be able to convert between different units of energy. (6.2)
2. Understand the use of the law of conservation of energy to determine work and the amount of heat transferred. Understand the meaning of system and surroundings. Define state functions, define the first law of thermodynamics. (6.3)
3. Understand the difference between a temperature change, \( \Delta T \), and heat energy transferred, \( q \). Define heat capacity, specific heat capacity, and molar heat capacity. Be able to utilize the equation relating the amount of heat transferred and other parameters, for different calculations. Understand specific heat-volume work. (6.4)
4. Work constant volume calorimetry problems involving heat transfer between the reaction (system) and the surroundings. Understand why it measures \( \Delta H \) of the reaction. (6.5)
5. Define enthalpy, \( \Delta H \), exothermic and endothermic processes. Understand that enthalpy is an extensive property, and utilize it in thermochemical equations. (6.6)
6. Solve constant pressure calorimetry problems. (6.7)
7. Understand the principles of Hess' Law. (6.8)
8. Be able to determine reaction enthalpies using standard enthalpies of formation. (6.9)

Exam III ( Chapters 7 and 8)

Chapter 7
The Quantum-Mechanical Model of the Atom
1. Describe the wave nature of light and interconvert wavelength and frequency. Qualitatively identify the different regions of the electromagnetic spectrum (X-ray, UV, visible, IR, microwave, radio). Define interference and diffraction. (7.2)

2. Describe the particle (photon) nature of light and determine the energy of a photon from its frequency or wavelength. (7.2)

3. Determine when and how the Bohr Theory of the atom is useful, and as well as its limitations, and why it is not really correct. Explain atomic emission based on Bohr’s model. (7.3)

4. Relate the frequency of an absorbed or emitted photon to a change in electron energy level. (7.3)

5. Understand the De Broglie’s wavelength, and the uncertainty principle. (7.4)

6. Know the significance of the ns, (n) and (n,l) quantum numbers, and valid values for each. Be able to use them to code for a level (shell), a sublevel (subshell), or a specific orbital in an atom. Be able to calculate the parameters of atomic transitions. (7.5)

7. Know the shapes of the 90% probability contours for s, p and d orbitals. (7.6)

8. Use the spin quantum number with the other three quantum numbers to code for a particular electron in an atom.

Chapter 8

Periodic Properties of the Elements

1. Understand how the periodic table was developed. (8.2)

2. Apply the Pauli Exclusion Principle and Hund’s Rule to determine the placement of electrons in orbitals. Describe the effect of electrostatic interactions (nuclear charge, effective nuclear charge and penetration) on orbital energies. Define shielding, penetration, and be able to calculate the effective nuclear charge. (8.3)

3. Write the electron configuration or orbital diagram (boxes) for any atom. (8.3)

4. Describe how atoms are arranged in the periodic table. Define inner (core) electrons, and outer (valence electrons). (8.4)

5. Discuss the relationship between similar valence electron configuration and similar chemical behavior. Also note the unusual configurations for transition and inner transition elements. (8.5)

6. Know periodic trends and reason for the trend for predicting atomic size. Remember the role of the effective nuclear charge! (8.6)

7. Be able to predict the trends in the first ionization energy (IE). Explain the electron configurations, magnetic properties, and ionic radii of ions. Explain the successive values of ionization energies of elements. (8.7)

8. Describe the trends in the electron affinities and metallic character for the main group elements. (8.8)

Exam IV (CHAPTERS 9 and 10)

Chapter 9

Chemical Bonding I: The Lewis Model

1. Describe different types of chemical bonds. (9.2)

2. Be able to represent valence electrons of atoms. (9.3)

3. Be able to write Lewis dot structures of ionic compounds. Explain lattice energy and the steps of a Born-Haber cycle. (9.4)

4. Explain the trends in ionization energy based on ionic size and charge. (9.4)

5. Apply the Octet Rule to construct Lewis structures for multi-atom molecules. Understand formation of double and triple bonds. Recognize violations of the octet rule. (9.5, 9.7, 9.9)

6. Understand the relationship between electronegativity and bond polarity. Define dipole moment and percent ionic character. (9.6)

7. Use resonance and formal charge to describe the most "correct" Lewis structure. (9.8)

8. Use bond energies to calculate $\Delta H_{\text{fus}}$. (9.10)

Chapter 10

Chemical Bonding II: Molecular Shapes, Valence Bond Theory, and Molecular Orbital Theory
1. Use VSEPR Theory and Lewis structures to describe approximate molecular geometries, including shape and bond angle. (10.2)
2. Make a clear difference between electron groups' geometry and molecular geometry (the effect of lone pairs). (10.3)
3. Be able to predict molecular geometries from Lewis structures (10.4)
4. Determine molecular polarity using molecule shape and bond polarity. (10.5)
5. Understand the principles of the valence bond theory. (10.6)
6. Describe the mixing of pure atomic orbitals to form hybrid atomic orbitals, and how this rationalizes observed molecular shapes, and be able to determine the hybrid orbitals of a central atom. (10.7)
7. Describe the orbital overlap that forms sigma and pi bonding, and how these form single and multiple bonds in molecules. (10.7)
8. Explain chemical bonds in terms of the molecular orbital (MO) theory. Understand bonding and antibonding orbitals, be able to draw MO of the first period homatomic molecules, use bond order to predict their stability. (10.8)

**Academic Learning Compact (ALC) / Expected Outcome**

The ALC is located at the home page of the University [http://www.famu.edu](http://www.famu.edu) under ‘Academics’

Graduates will demonstrate the following:

1. **Communication:**
   - Effectively communicate concepts and principles of organic chemistry both orally and in writing.

2. **Content:**
   - Knowledge of chemical principles and other chemical information gained through the aforementioned ‘Learning objectives’.

3. **Critical Thinking:**
   - Ability to analyze and solve chemical problems, read, evaluate and interpret numerical and general chemical information.

4. **Information Resources:**
   - Ability to make effective use of information, resources, and technology in chemical applications.

**Teaching Methodology**

Lecture style, Use of overheads, and Power Point, whiteboard, group problem solving, Web-based instruction (Mastering Chemistry, Blackboard, etc.)
<table>
<thead>
<tr>
<th>Week of</th>
<th>Lecture</th>
<th>Topic</th>
<th>Chapter/Section</th>
<th>Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>7</td>
<td>Basic Math Review: Matter, Measurement, and Problem Solving: Composition of matter; Classification, physical and chemical properties of matter; Definition of energy, work, statement of the law of conservation of energy; Measurements and units; SI base units; Temperature scales; Prefix multipliers; Volume and density; Intensive and extensive properties; Exact and inexact numbers, rounding, significant digits in calculations; Accuracy and precision; Conversion of units (dimensional analysis); Solving chemical problems;</td>
<td>1/</td>
<td>Homework Chapter 1</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>Atoms and Elements: Atomic theories and laws that lead to them; The discovery of the electron; The structure of an atom; Subatomic particles, Introduction to the periodic table; Elements, isotopes, ions; Periodic law and the periodic table; Atomic mass, calculation of atomic mass by isotopic composition; Molar mass, the mole, Avogadro’s number; Converting between mass, number of moles, number of particles.</td>
<td>2/</td>
<td>Homework Chapter 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Molecules, Compounds, and Chemical Equations: Chemical bonds, Representing chemical compounds; Writing chemical formulas and equations; Composition of and bonding in molecular and ionic compounds; Predicting formulas of ionic compounds, nomenclature (naming) of molecular and ionic compounds;</td>
<td>3/2 3.5</td>
<td></td>
</tr>
</tbody>
</table>

NO CLASSES ON JANUARY 19- MARTIN LUTHER KING Jr. HOLIDAY
<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>6-7</td>
<td><strong>Molecules, Compounds, and Chemical Equations:</strong></td>
<td>3,/</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Molar mass of a compound; Using molar mass to count molecules by weighing. Percent composition of compounds. Determination of chemical formulas (empirical and molecular) from experimental mass measurements – data given as masses, percent composition, or combustion analysis; Balancing chemical equations. Organic compounds.</td>
<td>3.6–3.12</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Homework Chapter 3</td>
</tr>
<tr>
<td>26</td>
<td>8</td>
<td><strong>In class quiz #1, Monday, January 26th</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>**EXAM 1: In class, Wednesday, January 28th, 2015, chapters 1-3</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>9</td>
<td><strong>Chemical Quantities and Aqueous Reactions:</strong></td>
<td>4,/</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reaction stoichiometry, mole-to-mole and mass-to-mass conversions; Definitions and calculations of limiting reactant, theoretical yield, and percent yield</td>
<td>4.2–4.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Homework Chapter 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>February</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Chemical Quantities and Aqueous Reactions:</strong></td>
<td>4,/</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Continued</td>
<td>4.4–4.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Definitions of concentration, molar concentration, dilution, utilization in calculations; solution stoichiometry; Solubility, electrolytes and non-electrolytes, weak and strong electrolytes, solubility rules; Precipitation reactions – writing molecular, complete ionic, and net ionic equations; Acid-base and gas evolution reactions, strong and weak acids and bases; acid-base titrations; Oxidation reactions, assigning oxidation numbers to atoms; identifying oxidizing and reducing agent.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Gases:</strong></td>
<td>5,/</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pressure, units of pressure, conversion between units of pressure, instruments to measure pressure; Simple gas laws, ideal gas laws.</td>
<td>5.2–5.4</td>
</tr>
<tr>
<td>9</td>
<td>13-14</td>
<td>Applications of the gas laws: molar volume, density, molar mass of a gas, definitions of partial pressures and Dalton's law, Gases in chemical reactions: Stoichiometry involving gaseous reactants or products; Kinetic molecular theory, mean free path, diffusion, effusion, Graham's law of effusion; Effect of intermolecular forces, real gases, Van der Waals equation.</td>
<td>5/</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>
| 16 | 15-17 | **Thermochemistry:**
   Key definitions; The first law of thermodynamics, internal energy, state function, system, surroundings, energy flow;
   Quantification of heat and work: heat capacity, specific heat capacity, molar heat capacity, pressure-volume work; utilization of a bomb calimeter to calculate ΔE.
   Enthalpy, exo- and endothermic processes;
   Thermochemical equations, stoichiometry involving enthalpy; Coffee cup calorimetry and measuring the enthalpy of a reaction. | 6/ | 6.2-6.9 | Homework Chapter 6 |
| 23 | 18 | **Thermochemistry continued**
   Hess' law, standard enthalpy of formation, calculation of reaction enthalpy using standard enthalpy of formation. | 6/ | 6.8-6.9 | |
| 19 | | **In class quiz # 2, Wednesday, February 25th** | | | |
| | | | | | |
| | | EXAM II: In class, Friday, February 27th, 2015, chapters 4-6 | | | |
| March | | | | | |
| 2 | 20-22 | **The Quantum Mechanical Model of the Atom:**
   The nature of light, parameters describing the wave; calculations of frequency and wavelength; electromagnetic spectrum, trends in energy, wavelength, and frequency; interference and diffraction; The particle nature of light, calculation of the energy of a photon; Bohr's model, explanation of the atomic emission; Wave nature of matter and De Broglie's wavelength | 7/ | 7.2-7.4 | Mastering Chemistry Homework Chapter 7 |
| 9 | | NO CLASSES-SPRING BREAK | | | |

Submitted for ABET Review October 5, 2015
<table>
<thead>
<tr>
<th>Page</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>23</td>
</tr>
<tr>
<td></td>
<td><strong>The Quantum Mechanical Model of the Atom:</strong>&lt;br&gt;Definition of uncertainty and undeterminacy. Quantum mechanical model of the atom, quantum numbers, atomic spectroscopy explained; Shapes of atomic orbitals.</td>
</tr>
<tr>
<td></td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>24-25</td>
</tr>
<tr>
<td></td>
<td><strong>Periodic Properties of the Elements:</strong>&lt;br&gt;Development of the periodic table; Definition of spin, Pauli’s principle and Hund’s rule; Electron levels and sublevels; Shielding and effective nuclear charge; Distribution of electrons in multielectron atoms; Periodic table and electron structure; Properties of elements related to electron structure. Periodic trends in the atomic sizes.</td>
</tr>
<tr>
<td></td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>26-27</td>
</tr>
<tr>
<td></td>
<td><strong>Periodic Properties of the Elements: Continued</strong>&lt;br&gt;Electron configuration of ions; Magnetic properties of ions; Trends in ionic radii; Ionization energy and trends in the ionization energies; Electron affinity and trends in the electron affinity.</td>
</tr>
<tr>
<td></td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>In class quiz #3, Monday, March 27th</td>
</tr>
<tr>
<td></td>
<td><strong>EXAM III: In class, Friday, March 30th, 2015, chapters 7-8</strong></td>
</tr>
<tr>
<td></td>
<td>April</td>
</tr>
<tr>
<td></td>
<td><strong>Chemical Bonding I: Lewis Theory:</strong>&lt;br&gt;Types of chemical bonding, Valence electrons in single atoms; Lewis dot structures for ions and ionic compounds; covalent bonding; Lattice energy, Born-Haber cycle; Trends in lattice energies based on sizes and charges of ions; Lewis structures for covalent compounds</td>
</tr>
</tbody>
</table>
| 6 | 30-32 | **Chemical Bonding I: Lewis Theory:** Continued  
Electronegativity, bond polarity based on electronegativity differences; Trends in electronegativity; Dipole moment and percent ionic character; Lewis structures of molecular compounds, resonance structures, multiple bonds, formal charge; Exceptions to octet rule; Bond enthalpy, bond strength and bond length; Calculation of reaction enthalpy from bond energies. | 9/9.6-9.10 |
|---|---|---|---|
| 13 | 33-35 | **Chemical Bonding II: Molecular Shapes, Valence Bond Theory, and Molecular Orbital Theory:** Molecular geometry;  
Prediction molecular shapes using the VESPR model; Electron group geometry and molecular geometry; Molecular symmetry and the polarity of molecules, Valence bond theory and covalent bonding; Explaining molecular geometries using hybrid orbitals; Describing multiple bonds using hybrid orbitals; | 10/10.2-10.7 |
| 20 | 36 | **Chemical Bonding II: Molecular Shapes, Valence Bond Theory, and Molecular Orbital Theory:** Continued  
Molecular orbital theory and covalent bonding; Bonding and antibonding orbitals; Bond order | 10/10.8 |
| | 39 | In class quiz # 3, Wednesday, April 22nd | |

**EXAM IV:** In class, Friday, April 24th, 2015, chapters 9-10

Final Exam According to registrar schedule: Tuesday April 28th, 3:00-5:00 pm, comprehensive, chapters 9-10)

Note that the exam and quizzes dates given in the above table are tentative, and are subjected to change. You will be promptly notified if such changes are made.

*Course Evaluation*

Written quizzes and exams

*Examinations*

There will be 3 periodic examinations and a comprehensive final examination. Questions may involve multiple choice, essays, problem solving, mechanism writing, definitions, short answers and true/false responses.
The following dates have been set for the three exams, unless otherwise changed: **January 28th (Exam I, Chapters 1-3), February 27th (Exam II, Chapters 4-6), March 30th (Exam III, Chapters 7-8), and April 24th (Exam IV, Chapters 9-10).** The comprehensive final exam (entirely multiple choice questions) will be given during the final examination week in accordance with the University’s final exam time table.

**Make-up exams:**

Make-up exams will only be given for special circumstances with the permission from the dean within a week of the particular exam. A dean signed excuse form must be presented prior to the makeup exam. You must be aware that no makeup exams for exam 3 and final exam will be provided under any circumstances.

**Make-up quizzes:**

No makeup quizzes will be given in this course. Quizzes must be completed in class.

**Grading**

The final grade for this class will be based on the following:

<table>
<thead>
<tr>
<th>Event</th>
<th>% Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Three (4) Hour Exams</td>
<td>60</td>
</tr>
<tr>
<td>Final Exam</td>
<td>20</td>
</tr>
<tr>
<td>Quizzes</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

**Final Grades (%)**

- A: 85-100
- B: 75-84
- C: 65-74
- D: 50-64
- F: below 50

WF: Assigned to students, who stop attending class before published last day to withdraw (March 27th, 2015), without officially withdrawing from the class.

The above scale should serve as a guide to how your grade will be calculated. The instructor reserves the right to adjust the grading scale so as to conform to the performance of the class. Please note that this does not in any way imply “CURVING.” Students will be informed when and if any adjustments are made to the grading scale.

**Note:** last day to withdraw from course/term is March 27th, 2015.

**Course Policies**

**Attendance Policy:**

Attendance is taken during each class meeting. It is your responsibility to write your signature next to your name on the daily roll sheet. If you fail to do this, you are absent—no exceptions. Two (2) unexcused absences for the class result in a lowering of your grade. “A student exceeding the number of unexcused absences may be dropped from the course and assigned the grade of “F.” Students may be reenrolled to the class with the dean’s and the instructor’s permission.” These regulations are fully given on page 31 of the 2006-2008 General Catalog.

**Unexcused Absences:**

Please note that students are allowed one (1) unexcused absence per credit hour of the course. A student
exceeding the number of unexcused absences (3 for a three-credit hour course) will be dropped from the course and assigned a grade of "F".

Student Conduct

Cell Phones: Once a class period has begun, cell phones are not to be seen or heard in the classroom. Complete all calls before entering the classroom, and once in the classroom, turn off all cell phones, pagers, etc. VIBRATION MODE IS NOT OFF. Students will be warned about violation of this request. A persistent disregard for this request will result in a student being asked to leave the classroom and not returning until they have conferred with the Chair of the Chemistry Department. Any text messaging will result in automatic and permanent dismissal from the course.

Exams: Once an exam has begun, if the ring or any cell phone sound is heard, or cell phone use is observed the instructor reserves the right to give zero for the specific exam.

Please, use the restroom, etc before class begins.

Lateness to class is discouraged. If you are entering the classroom late, please, do not walk in front of the podium. Please use the side isles if late to class.

Please do not talk when the instructor is teaching. This is very distracting to the instructor and to the rest of the class. If you have something to say or question(s) to ask, please simply raise your hand, and you will be recognized. Please do not disrupt the class. If you choose to disrupt the class, you will be warned and if the problem continues, asked to leave the classroom.

Academic Honor Policy: It is the aim of the faculty of Florida A&M University to foster a spirit of complete honesty and high standard of integrity. Anyone caught cheating in any manner is awarded the grade of “F” (No warnings will be given). It is your responsibility to do your own work. The use of textbooks, notes, pagers, cell phones, and programmable calculators are not allowed in any quiz or exam. Both persons collaborating by cheating will receive the final grade of “F” with offenders also liable to serious consequences, possibly academic suspension.

The University’s Academic Honor Policy is located in the FANG Student Handbook, under the Student Code of Conduct- Regulation 2.012 section, beginning on page 55-56.

Students with disabilities: All students with disabilities should notify me immediately at the latest before the beginning of the third week of classes. Documentation of disability is required and should be submitted to the Learning Development and Evaluation Center (LDEC). For additional information please contact the LDEC at (850) 599-3180.

Official Statement: Any student whose disability falls within the American Disabilities Act (ADA) and requires accommodations should contact the Office of Services for Students with Disabilities. The office is located in the Student Service Building Room 204. You may also reach the office by phone at 259-6035.

Class demeanor: If you disrupt the class in any way or show disrespect to the professor and/or fellow student, you will receive an F in the course.

Policy Statement on Non-Discrimination: It is the policy of Florida Agricultural and Mechanical University to assure that each member of the University community be permitted to work or attend classes in an environment free from any form of discrimination including race, religion, color, age, disability, sex, marital status, national origin, veteran status and sexual harassment as prohibited by state and federal statutes. This shall include applicants for admission to the University and employment.

Re-grade policy: If you feel that your test has been graded improperly, you may request in writing that it be re-graded. After a test is returned, you have exactly one week to hand in your test paper and written request for re-grading. The written request must be a single paragraph stating that the test has been graded improperly and why you are turning it in for re-grading. Staple the request to a copy of the test. Under no circumstances a test is
accepted for re-grading after one week or without the written request. Under no circumstances disputed test items will be discussed until this procedure is exactly followed. If a different score is resulted from the re-grading process, the latest score (higher or lower) shall replace the old exam score.

Office hours: During office hours I am available to help you in any way I can. To be most effective, you should bring all work regarding the topic of interest. Please bring failed attempts at problems. I will be figure out your problems and help you. It is of little value to you if you come in and ask me to solve a problem that you have not considered.

Etiquette, Behavior, and Attitude

Classroom
- Students are expected to enter the classroom, seat at their assigned seats, have notebooks/paper and pencil/pen ready and ready to write when the instructor begins his/her lecture.
- Students should only be talking when they raise their hands to ask questions.
- Students may only leave the classroom after receiving permission from the instructor. During the class period, students should only ask for permission to leave to go to the lavatory or for medical reasons. If a student knows they need to leave early the student must ask for permission to leave before class begins.
- Cell phones should neither be seen nor heard during the class period. A student who violates this request more than once will be asked to leave the room and will be considered absent.
- A student should not come to class to read newspapers, read fiction books, study for other classes, finish assignments for other classes, listen to MP3 players, etc. Students who violate this request more than once will be asked to leave the room and will be considered absent.

Exams
- Students are strongly encouraged to be prepared for each exam at least two days prior to the scheduled date so that they have time to resolve any questions that may arise. Do not wait until the last minute to study!!!!
- On exam day students should enter the classroom, keep all their belongings including cell phones in front of the class. Students must not take anything except pen and/or pencil(s), an eraser, and a non-programmable calculator to his/her assigned seat. The calculator function of cell phones must not be used. Students should follow instructions about receiving exams and identifying themselves on the exams. When the instructor indicates that the exam has ended, students should have their names written on the exams and scantron sheets (if there are any). The students hand in their exams quickly and according to the instructor's instructions. No cell phones or other electronic devices except non-programmable calculators are allowed during the exam under any circumstances.

Procedure for Resolving Faculty-Student Conflicts:
- Student first attempts to resolve issue with instructor
- Student submits written statement of problem to Departmental chair
- Chair forwards student statement to instructor
- Instructor responds in writing to chair
- Chair meets with instructor and/or student if necessary
- Chair forwards response/recommendation to Dean's office.

Tutorial Laboratory

The Chemistry Department provides tutors in Rm. 223, Jones Hall for any student who is taking CHM 1031, CHM 1045, or CHM 1046 and needs help. The schedule for tutoring sessions is posted at Rm. 223, Jones Hall or can be obtained from the Chemistry Department office in Rm 219, JH. Do not wait until you are struggling to request help!!!!
CHM1045L – General Chemistry I Laboratory - FAMU

Florida A&M University
Department of Chemistry

CHM 1045 Lab Syllabus

| COURSE SYLLABUS |
|-----------------|-----------------|
| **Course Number:** | CHM 1045L |
| **Prerequisite(s):** | |
| **Co-requisite:** | |
| **Course Title:** | General Chemistry I Laboratory |
| **Course Credit:** | 1 |
| **Course Hours:** | 3 per week |
| **College:** | Arts and Sciences |
| **Department:** | Chemistry |
| **Required Text(s):** | The laboratory manual, Experiments In General Chemistry, 6th Edition by Peter Cottrell, Jesse Edwards, & Richard A. Ford, Jr., |
| **Faculty Name:** | |
| **Term and Year:** | Fall 2013 |
| **Place and Time:** | 401/413 Jones Hall |
| **Office Location:** | |
| **Telephone:** | ( ) |
| **e-mail:** | |

Office Hours | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday

**Curriculum Status:** Required for chemistry, Biology, Pharmacy and engineering majors.

**INTRODUCTION**

General Chemistry I Laboratory (CHM 1045L) is the first course of a sequence of two laboratory courses primarily for students who are in science or science-related majors. In this laboratory course, students will have an opportunity to observe some of the phenomena of matter and obtain practical skills in using various items of laboratory equipment. Upon completion of this course students should have a deeper and more concrete understanding of the experimental science of chemistry.

There are 10 different laboratory exercises scheduled to be done during the weeks specified in the SCHEDULE section of this outline. Because of the large number of laboratory sections and the full use of time available during the semester, there will be no opportunity to make individual laboratory exercises. Only in cases of emergency, you must notify your instructor before the class session. In such case, the laboratory
experiment should be made up during the week that it was assigned. In order to make up the experiment, these procedures should be followed:

*Notify your instructor and get a note from them stating their approval and awareness of your absence.

*Obtain an official excuse from your dean.

*Bring the excuse and the note to laboratory coordinators office in JONES HALL room 405.

*At this time, you will receive a confirmation with the time that you can make your experiment up. All experiments should be made up during the same week in order to be given credit.

Appointments for office visits other than during scheduled office hours may be made on an individual basis for the mutual convenience of the students and instructor. The instructor may also be reached by phone at 599-8176.

LABORATORY OBJECTIVES

There are several objectives of the laboratory course. Among these are to:

a. Train students to observe and follow the standard safety practices while doing experiments.

b. Provide a means for students to examine, analyze, and verify chemical principles by carrying out simple exercises in the laboratory.

c. Provide an opportunity for students to practice making careful observations and measurements, and to perform critical analyses of the observations made and data obtained.

d. Train students to carry out laboratory exercises using standard techniques, while keeping a record of the observations made and data obtained.

Academic Learning Compact

As a result of your experience at FAMU chemistry students should be able to communicate chemical concepts in oral and written laboratory reports. Your reports should discern what you think happened from what indeed did occur based on sound chemical reasoning. You are to interpret laboratory data, measurements, procedures and results. Eventually, you should solve chemical problems and design and evaluate experiments. After taking this class you will be able to recognize potentially hazardous substances and reactions. You should be able to make effective use of information resources and use a computer to gain information about chemical compounds and reactions.
LABORATORY MATERIALS

The following materials will be required for the laboratory:

a. Laboratory safety glasses
b. The laboratory manual, Experiments In General Chemistry, 6th Edition by Peter Cottrell, Jesse Edwards, & Richard A. Ford, Jr., which is available at the University Bookstore.
c. Laboratory coat
d. Expt In General Chemistry Lab Safety & Techniques DVD

Safety

Students must always wear eye protection and laboratory coats when they are doing the laboratory exercises. There are no exceptions to this requirement. Students not having eye protection and laboratory coat cannot remain in the laboratory.

a. Wear approved eye protection at all times.
b. Never eat, drink or smoke in a chemical laboratory
c. If any glassware is broken, it should be cleaned up by the student.
d. Never perform an unauthorized experiment.
e. Never work in a chemical laboratory without proper supervision
f. Never pipette by mouth or inhale gases or vapors
g. Exercise proper care in heating or mixing chemicals
h. Be careful with glass equipment

PROCEDURE

Each laboratory experiment must be read and carefully studied before coming to the laboratory. This must be done to ensure that each student is thoroughly familiar with the principles, procedures, calculations, and anything else with the exercises may be involved.

Unless otherwise directed to do so, students should work alone in doing in the laboratory exercises. Take extreme care when using the analytical balances, thermometers, and other items of equipment that are expensive and/or may be easily broken. When the laboratory exercise is completed, all equipment should be cleaned and put in its proper place or in the locker in an orderly way. The bench top and common work areas should also be cleaned.
LABORATORY REPORTS

The pre-laboratory assignments of each laboratory experiment must be turned in to the instructor before the beginning of the laboratory. Laboratory Reports are to be completed and turned in as directed by the instructor along with a lab write up sheet. The laboratory report will usually consist of the Data Sheet from the laboratory experiment and a Questions and Calculations Sheet that will be available from the instructor.

Students who do not actively participate in the laboratory experiment will be subject to point reduction.

THERE ARE NO MAKE UP LABS, SO DO NOT MISS A LAB DATE. LATE LAB REPORTS WILL NOT BE GRADED. NO EXCEPTIONS WILL BE GRANTED AND NO EXCUSES ARE ACCEPTABLE.

PUBLIC HOLIDAYS AND LABS

If your lab falls on any public holiday (except Thanksgiving week) or university convocation, please endeavor to attend any other section of the lab within the same week. The missed lab will not be repeated the following week. Please ensure that the lab instructor of the lab you attended for makeup signs your work as evidence of attendance. Then submit your lab report to your lab instructor as usual.

The total score for the course will be based on laboratory reports, write up, and exam. Each laboratory report will have equal value but not necessarily the same number of points. The laboratory reports will count between 80-90% of the total score. The laboratory examinations will count between 10-20% of the total score. There will be a mid-term and a final exam.

The various parts of the lab exercises and reports will contribute towards the final grade as follows:

<table>
<thead>
<tr>
<th>Lab Reports</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Report Sheet and Data</td>
<td>50</td>
</tr>
<tr>
<td>Pre-Lab</td>
<td>10</td>
</tr>
<tr>
<td>Post Lab</td>
<td>10</td>
</tr>
<tr>
<td>Write up</td>
<td>30</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100</td>
</tr>
</tbody>
</table>

Submitted for ABET Review October 5, 2015
There will be a total of Ten Labs and one Final Exam worth 100 pts.

At the end of the semester, an overall fractional score will be calculated. It is anticipated that the grade will be based on the following scale for fractional scores:

A- (90% or above) (990-1110)
B- (80-90%) (880-989)
C- (70-80%) (770-879)
D- (60-70%) (660-769)
F- (Below 60%) (659 & Below)

Some general items to be considered in grading the reports will be the neatness and legibility of the report, the correct use of English, and the proper use of significant figures and units. Other items that may be considered, depending on the specific exercise, will be the closeness of a result obtained to what the result should be the correctness of any calculations, and the completeness of any observations that may be expected. A subjective evaluation will also be included of the student’s attitude toward the laboratory exercised and the correct use of the laboratory equipment.

**Academic Calendar: Fall 2013**

<table>
<thead>
<tr>
<th>Monday</th>
<th>August 26</th>
<th>Classes begin (Full-Time Studies)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>September 3</td>
<td>Labor Day</td>
</tr>
<tr>
<td>Monday</td>
<td>November 8</td>
<td>Last day for withdrawal from Course/University</td>
</tr>
<tr>
<td>Monday</td>
<td>November 11</td>
<td>Veteran’s Day</td>
</tr>
<tr>
<td>Friday</td>
<td>December 6</td>
<td>Last day to submit I change of grade</td>
</tr>
<tr>
<td>Friday</td>
<td>December 6</td>
<td>Last day of classes</td>
</tr>
<tr>
<td>M-F</td>
<td>December 9-13</td>
<td>Final examinations Week</td>
</tr>
</tbody>
</table>